Developing Game Worlds:
Gaming, Technology, and Innovation in Peru

by

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Abstract

In this work, I've documented the origins, growth and structure of the Peruvian video game industry.

Because of its underground origins, the Peruvian game industry provides an alternative, more organic gateway to developing technology industries than forms of the "technological sublime" that have been recurrent over Peruvian technological history. Driven by creative rather than commercial objectives, people interested in game development figure out ways to get around gaps in existing training options to acquire the interdisciplinary skills they need to create games — setting up alternative infrastructures to connect to each other, share information, and set up collaborations. Peruvian developers are also experimenting with ways to gain access to global networks and markets, which affects their design decisions and how they present themselves to peers and customers around the world. Games designed to present local cultural elements for international audiences — which I've called "borderland games" — have become sites where tension around self-presentation gets played out.

Game studios are experimenting with various configurations of business practices, figuring out empirically what arrangements put them on the better path to engage international partners and secure creative and financial sustainability. Studios are collaborating with each other to address structural barriers affecting the industry as a whole, which is putting them in a stronger position to engage government agencies and gain support to address structural issues.

This relatively unknown industry has been able to introduce complex skills and work around structural gaps and obstacles to create the foundations for a potentially viable technology and creative industry. How, exactly, the industry will develop remains to be seen, but its evolution can provide interesting lessons for the emergence of digital creative industries in developing economies.

Thesis Supervisor: T.L. Taylor
Title: Associate Professor of Comparative Media

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Introduction

"You mean there's video game developers in Peru?"

This was the question I got used to hearing whenever I told people I was doing research on the video game industry in Peru — a strange mixture of disbelief and contempt. Peru is known around the world for many quaint and curious things, and in recent years, the story of its recent economic boom has been a hallmark of business magazines all over. But it is not an economy or a society known for its highly technological production. To make the claim that there was an emerging video game industry in the country was therefore not only counter-intuitive, but to many people sounded almost delusional.

And yet, over the course of many months of research, I uncovered and followed a growing industry in a highly unlikely place, and began mapping an energetic community that was driven by a powerful creative energy. As it turned out, not only did the gaming industry in Peru exist, but it had been around for over two decades, largely operating beneath the radar. As I started untangling the narrative thread of the game industry in Peru, I found myself following people, organisations, and games around through multiple timeframes, contexts, and geographical locations. I've seen game development studios come together and fall apart, projects push through and fade away, and developers finding and losing their way within a dynamic and fast-changing community.

The Peruvian gaming industry is at a key moment in its evolution, where a series

of previously disconnected initiatives are beginning to acknowledge each other and consolidate into a sector, more self-aware of its own identity, challenges and position in the global gaming industry. My challenge in researching the industry and its network of stakeholders and practices has been to determine how this specific moment has come about, and perhaps even more importantly, whether this transition moment represents a jumping off point towards the next stage in the industry's evolution, or rather just a fluke in the normal chain of events. And whether this next big thing is actually attainable is a key matter not only to game creators, but to technology practitioners in general, as it represents the test on whether the Peruvian economy can seed, sustain and grow various forms of technology-based industries.

In what follows, I will argue that not only does the Peruvian video game industry exist, but it has also managed to grow consistently over the last few years, despite its relative invisibility and a series of structural issues that limits its growth. I will also make the case that the growth of the industry has been primarily driven by transactions in social capital as opposed to financial capital, as people who are part of this industry are driven by creative desires rather than potential financial returns when deciding they want to be a part of the production of this medium. The Peruvian game industry has been able to come together and grow because people were driven by a creative passion to take on more risk than they would have had they been making strictly rational decisions, in the economic sense. While the costs they bear and the risk they assume are perhaps higher than they should be, they make up for it through the increased learning and creative returns they find in engaging with an emerging technological practice that connects them to global communities of makers.

The world I was able to uncover in my research turned out to be extremely rich and diverse, full of creative people bursting with energy and drive to transform it into new creative products. What they didn't know, they learnt, and what they did know, they shared. Of course, it was not without issues and complications, which I'll attempt to unpack in the following chapters, trying to voice the wants and concerns of the many people who eagerly agreed to talk to me and tell me about their work. By putting their stories in context and trying to weave together the narrative of the

game industry and surrounding game development community as a coherent whole, I want to make the case for three core ideas that I found most salient after spending a lot of time with video game developers in Peru.

The first is the story of the Peruvian game industry itself, and how it has managed to slowly and organically come together over the last couple decades despite systematic lack of support and considerable prejudice from multiple actors. The game industry has been able to push forward through the establishment of a series of alternative infrastructures that facilitate its operations, and by building heavily on tight social networks that transact in social capital everything they're incapable of acquiring through material means. The story of the industry, and the loosely-structured community that surrounds it, is a collection of stories from primarily young people who've grown up playing games and feel strong emotional connections to them — and then, at some point, decide they want to express themselves through this medium. It is their creativity that, in most cases, drives them to adopt a risky decision such as wanting to make a living out of developing a technology and a medium that is virtually unknown in their local context. Over time, these networks have grown tighter and have managed to build some nascent institutions that formalise and provide continuity to many of the informal arrangements on which the industry was built — providing a critical platform for old and new actors to achieve a sustainable practice and pursue more ambitious creative objectives, reaching out to international markets and having their games downloaded by players around the world.

The second core idea is not only how this industry was possible at all, but how meaningful it is that it's there. From an economic point of view, there should be no Peruvian video game industry: the cost of getting the operation in place is far larger than the potential financial returns it can get. And the larger share of that cost is related to skill acquisition: the game industry depends on a number of interdisciplinary skill sets that are simply not popular enough in the local economy to provide steady streams of qualified talent. In other words: the building blocks required to have a sustainable game industry are just not in place. And yet, there it is. By exploring the practice of game development in Peru through an ethnographic approach I've been

able to uncover networks of learning and production that would otherwise remain invisible, and then try to reconstruct the reasons why this anomaly has been possible. The Peruvian game industry exists because it is *not* driven primarily by financial or commercial motives. People in the industry are consistently not looking for profits, but rather for sustainability. But their activities are nonetheless still economically significant, and still have a larger impact in their ecosystem: the interdisciplinary skills related to game development that are being introduced into an economy — related to software development, project management, computer animation, and so on — become available not only to the development of games, but to other creative industries as well. Because of this, we can consider the possibilities this sort of creative communities — loose assemblages of people brought together by their shared interest in a creative practice — offer for the emergence of new creative industries, especially in the context of developing economies.

The third core idea that I've surfaced through this research is related to the singular relationship with technology that people in the Peruvian game industry are developing, both for the context of a developing economy lacking a significant technology base, and as compared to other creative industries. There's a recurring pattern in Peruvian technological history of treating technologies as black boxes that are deployed at varying scales, with the expectation that they will generate radical transformations in social and cultural conditions and bring about a "modern" nation. The game development community breaks with that tradition: it has been built from the ground up, without any major backing project or implementation, and has grown out of individuals reverse engineering forms of both technology and process. The result is that members of the game development community have a much more straightforward, informed, and organic relationship to technology: without everyone being a hacker or a coder, people come to understand what technologies can do for them, and how they fit into their everyday lives. This has become to me an interesting template to rethink how we understand the deployment of new technologies in developing economies: rather than push for radical transformations coming from black boxes, we need to think about the entanglements between local cultures and

practices, social networks and institutions, and technologies and processes. The result is, perhaps, less sexy than the imaginary possibilities of airdropping shiny toys into remote locations, but if the Peruvian game industry is any indication, it can be more sustainable and have a stronger impact not only in people's relationship with technology — but also how they relate to larger, opaque systems that affect their daily lives.

The chapters that follow will provide a number of stories and accounts that have led me to these high-level ideas. But before jumping into the details and layers of all of these, I want to begin by narrowing down some of the background information that's available related to these aspects: by focusing on existing research about games and the game industry, on creative communities in "peripheral" locations and how they engage global networks, and on the development of technologies industries, especially in developing economies. This will both help narrow down the field within which this research is situated, and to provide relevant connections to theory and previous research that have informed this work. I will conclude this introduction by providing some notes on the methodological approach I've followed, as well as an outline of the chapters that follow.

1.1 Mapping the Global Game Industry

As recently as 2002, research suggested that the Latin American gaming industry was simply not possible beyond a cheap labour model of building consoles in free trade zones (Lugo *et al.* , 2002). Yet over a decade later, there are meaningful pockets of game creation activity popping up throughout the region, which are starting to interact with each other. A loosely coupled game development community has started to consolidate as an actual industry and to think about the role it can adopt within the regional and the global industries.

This is to a large extent a result of the changing landscape of the game industry globally. As technological advances have made it possible to increase the computational power and connectivity of smaller devices, gaming has gone from being bound

to specific spaces to becoming an experience that can be had anytime and anywhere. This, in turn, has resulted in the emergence of new player profiles, such as the so-called "casual gamer" (Juul, 2012). Especially as access to game development has widened and independent development has become a viable option, there's a growing number of people who are expressing all sorts of visions through games (Anthropy, 2012) — personal memories and anxieties, political messages, cultural critiques, and so on. Games are becoming an established medium for cultural expression, which is driven by incentives that need not be economic. This is also happening through the creative and critical re-appropriation of existing commercial video games through newly-available modding tools and software development kits (SDKs) developers are making available to their audiences to increase user engagement and capitalise on user-generated content (Sotamaa, 2010; Postigo, 2007; Newman, 2005; Yee, 2006).

These technical changes have resulted in industrial and organisational reconfigurations, as new forms of video game studios become viable and new means for engaging audiences become accessible. The last few years have seen significant growth from the independent side of the video game industry, who are now experimenting with new business models and forms of monetisation (Zackariasson & Wilson, 2010, 2013). As games continue to grow in popularity (Entertainment Software Association, 2013) and gaming experiences become more pervasive and popular, new options are becoming available for indie developers and studios in terms of securing funding for projects and companies (Della Roca, 2014; Lasky, 2014; Guillaud *et al.* , 2013).

The game industry has changed significantly over the past few years — and so has the practice of game development itself. While game development began as a mostly experimental affair where solutions to computational problems had to be hacked together as cleanly as possible so as to not break a player's sense of immersion and interactivity (Montfort & Bogost, 2009), over time the industry has stabilised enough that a number of roles and processes have come to be expected of any typical development team (Bates, 2004; Moore, 2007; Salen & Zimmerman, 2004) — even if individual teams have a lot of latitude in terms of deciding how they want to prioritise and allocate the various components in their production process.

How teams are designed, roles allocated, and decisions made, is also heavily influenced by a studio's alignment with broader media practices and understanding of the nature of the game industry. Different national traditions have had different evolutionary trajectories for their respective game industries (Izushi & Aoyama, 2006), building them out of pre-existing culture, media, or technology industries. While there tends to be a closer affiliation between the game industry and software development because of the importance of the software components that make video games work, the industry cannot really be reduced to being an offshoot of software development (O'Donnell, 2012b). There are broader things at stake when creating game worlds, including issues of cross-cultural communication (Carlson & Corliss, 2011) and identity representation (Leonard, 2006) — issues that are not necessarily foregrounded when developing non-entertainment software (Eischen, 2003) — though there are multiple examples of software analysis and design that do push for this foregrounding (Harrell, 2013; Manovich, 2013).

While the game industry is made up of a number of globally circulating practices, it necessarily operates on an everyday basis as a local affair, and there has been some research on the operations of various specific local and national industries. This prior research has included studies on locations that are considered to be more central within the realm of game development, such as the game industry in the United States (O'Donnell, 2012a), Canada (Dyer-Witheford & Sharman, 2005), Japan (Aoyama & Izushi, 2003). Other studies have performed a more comparative analysis between different national industries such as those of Ireland and the United Kingdom (Kerr, 2012) or across Europe (Preston & Kerr, 2001), or between the industries in the United States and India (O'Donnell, 2014, forthcoming), or focused on less central locations, such as the Swedish game industry (Sandqvist, 2012) or Korea's online gaming industry (Jin, 2010). For the Latin American region, there is a remarkable gap in existing research, with little information available about various national game development industries or player communities other than informal sources. It is worth singling out as an exception the work of María Teresa Quiroz and Ana Rosa Tealdo, who developed and published a study on gameplay impact on Pe-

ruvian school kids back in 1996, in an attempt to contextualise growing moral panics with actual data and scholarship (Quiroz & Tealdo, 1996). There is some additional research available that analyses the presentation of Latin American reality within the context of game worlds (Penix-Tadsen, 2013) and formulates a number of categories under which typical portrayals are presented.

There are two additional threads of previous work worth pointing out. One is the interpretation of the video game industry as global system of culture and capital circulation (Dyer-Witheford & De Peuter, 2009), trying to develop a big-picture understanding of the network of inputs and outputs connected to the video game industry. In contrast, there are various researchers who have focused instead on the individual practices of video game developers, providing not only a local understanding of their actions but also a highly individualised and detailed account of what game development looks like. These readings include both analysis of how video game developers make their decisions (O'Donnell, 2009) and how production decisions are made at the creative and commercial levels (Tschang, 2007; Zackariasson *et al.* , 2006; Cohendet & Simon, 2007).

These multiple understandings of the various layers of the game industry have configured the work I've done with the Peruvian game industry, trying to contextualise it both within the realm of processes that make up the global game industry, but also helping delineate what the cultural and operational specificities are to game developers operating in Peru, and more specifically, the city of Lima. Following that thread, developing a more nuanced understanding of how geographies come into play when thinking about technology and creative industries around the world is especially important to unravel how Peruvian producers are connected to transnational networks of production and consumption.

1.2 Creative Communities in the Global Periphery

In my research, there have been four major studies I've found especially important both thematically and methodologically to anchor and contextualise my own process

and data. These have been especially relevant to me because they also work around issues of globalisation from the point of view of more or less "peripheral" locations and specific creative industries within them.

One example of such research is the work on the Nigerian film industry by Brian Larkin, which focuses on how and why the industry came together in close interaction with the country's colonial and cultural history (Larkin, 2008). Larkin's analysis sheds some light on the range of effects technology had as a spectacle of power and progress during colonial rule, something that is also relevant to the interpretation of Peruvian technological history: Larkin speaks of a "colonial sublime" formulation where technology and infrastructure became placeholders for Nigeria's emergence as a modern, global nation, something that resonates quite clearly with the Peruvian historical dependence on foreign financial and cultural capital to design and implement large-scale nation-building projects. For the Nigerian film industry to come together, infrastructures — both social and technical — became an especially important issue that enabled or disabled what a creative community could produce and distribute, an element that is also resonant of challenges face by the Peruvian game industry.

Another example is the work done by Ian Condry on the Japanese anime industry, which maps its origins as a loosely-structured creative communities and its struggles to become a globally-accessible commodity that remains authentic and local in its production (Condry, 2013). The Japanese anime industry had to negotiate its way through multiple issues before consolidating as an important reference point for animation around the world, and in many cases what drove groups and individuals through this negotiation was the pursuit of primarily creative objectives: despite its popularity as an animation form, Japanese anime has not become a financially-driven hit production machine, but rather a platform for animators in Japan to explore creative possibilities under a sustainable model. This industry is an example of how creative communities can become organised over time and articulated as productive sectors within the creative industries, building on the organic incentives creators have to share their visions with an audience.

Yuri Takhtevev's ethnographic account of software development practices in Rio

de Janeiro, Brazil, was also especially helpful both because of the thematic and geographical proximity (Takhteyev, 2012). Many of the same issues and questions Takhteyev mentions from working with *carioca* software developers resonated heavily with things I ran into myself in the Peruvian game industry, especially when related to the understanding developers have of their own practice within a larger global network of practitioners. Just as with Peru, Brazil is an emerging Latin American country that has long been struggling with gaining access to modernity and reinterpreting itself as a modern, globalised nation. Its software development industry is itself struggling to carve out a position for itself and negotiating an identity that's split between being anchored in a very much local reality while working on intangible products that are circulated around the world.

Finally, a study by Anita Chan published shortly before I was finishing this research was especially helpful, as not only did it deal with the issues of authenticity in local and global technology and creative industries, but also because it dealt specifically with Peru and government efforts over the last decade to create innovative intellectual property regimes that contribute to the establishment of local creative industries (Chan, 2013). Chan's account was helpful in that it clearly articulated the analogue with the digital and evidenced the complexity of managing these new creative industries in ways that remain authentic, sustainable, and respectful of local social networks and institutions.

These four studies also provided very helpful methodological framings to orient the qualitative work I was interested in developing with game creators in Lima. And there is additional research roughly located between the areas of creative industries and global/local relations that has been especially helpful in unpacking many of the issues I found during my time in Lima. One of the core issues that gets played out in various ways is, for example, the issue of authenticity (Peterson, 2005) and how it affects design decisions and the presentation of products and ideas to global audiences — something that was especially relevant when developing the ideas on borderland games. In a country such as Peru, the social construction of authenticity is clearly instantiated in all its complexity in the tourism industry, which becomes a relevant

marker for understanding the global packaging of a cultural history (MacCannell, 1999). Beyond this specific example, there is a wealth of research that theorizes on the various issues affecting local cultures and communities in their global interactions and how information flows are transforming conceptions of both the local and the global (Moore, 2004; Appadurai, 1990, 2010) and creating systems that are simultaneously both and none (Vertovec, 1999; Kearney, 1995; Fischer, 2007; Olwig, 2003).

1.3 The Challenge of Creating Creative Industries

A third category of relevance to briefly unpack before moving forward concerns the knowledge infrastructures that support an economy, and the connection between skills and industries. The work on economic complexity by César Hidalgo and the Macro Connections research group at the MIT Media Lab together with Ricardo Hausmann from the Harvard Kennedy School is especially helpful to illustrate this connection (Hausmann & Hidalgo, 2011a,b; Hidalgo & Hausmann, 2008, 2009; Bahar *et al.* , 2012). The perspective of economic complexity looks at how products are connected to each other, understanding products in terms of the skills required to produce them. Some products then become more complex than others because they require a larger number of skills; economies become more complex because they contain within them the skills required to produce larger numbers of products. More complex products become more valuable because fewer countries have the total number of skills required to produce them, while less complex products become contested areas where many countries compete over who can provide the lowest price. Some products' skill components are shared with other products, and therefore, countries able to produce one will be closer to producing the other than countries producing none of them. Economies then become networked structures, where command over various skills provides a foothold into the creation of new industries and the availability of new products. This also accounts for why some countries are able to innovate and expand into other industries faster: as the available pool of skills grows, the marginal cost

of introducing the additional required skills becomes lower[1]. Over time, this implies that newcomer advantages compound, and the difficulty and cost for latecomers to catch up keeps rising exponentially, rather than linearly.

To compensate for this, policy makers usually make the argument for the intentional building of clusters following Michael Porter's well-known analysis of the benefits of aggregating the needs of multiple firms in the same industry within one same location (Porter, 1998) — the proximity of these firms creates formal and informal "knowledge spillovers" from people in the industry being able to easily collaborate and share information, increasing the opportunities for inter-firm collaboration, or companies working together for specific projects (Ahuja, 2000; Powell *et al.* , 1996). But the investments required for building these clusters tends to be very high, without any assurances that returns on investment will match expectations (Huber, 2011).

To a large extent, these investments are oriented towards the introduction of new skills into an economy — just as products can be interpreted as combinations of skills following Hausmann and Hidalgo's work, new products can be interpreted as new combinations of skills. Investments in education by public and private parties then become especially relevant, and available reports show increased access to education across the Latin American region (Blom & Murakami, 2008). But there seems to be a misalignment between the skills being introduced and the skills these economies need to move in more strategic directions in terms of technology development and innovation (Bassi *et al.* , 2012), as there continues to be a lack for intermediary spaces that enable academic research and translate it into commercial projects and ventures (Ismodes Cascón, 2006).

Skill acquisition then becomes one of the hardest challenges for developing economies, as the cost is high and often trumps the incentives an economy might have for it — especially as it is not simply a matter of enabling a teaching infrastructure for it, but rather an operational matrix for putting it in practice (Arrow, 1962). Economic

[1]For example, despite being very different activities, the process of manufacturing cars shares some subset of skills with the process of manufacturing planes. A country that manufactures cars will be closer in complexity, time and resources to manufacturing planes than a country that does not manufacture cars.

analysis has also suggested that just having the requisite skill base is not enough, but rather the surrounding ecosystem for the creation of new ventures is also an important factor (Schumpeter, 1949), as it encourages risk-taking and innovative combinations of skills and ideas — not all of which will ultimately become sustainable.

Access to new technologies of communication and coordination has been shown to reduce the transaction costs for groups and organisations, thereby indirectly reducing the risk for new ventures to form and expanding the diversity of actors that can undertake all sorts of projects (Benkler, 2006, 2002). Not only that, but research has also shown how especially young people are picking up skills in various areas through informal exposure to technologies and learning communities, without having to necessarily go through more formalised training programs (Jenkins *et al.* , 2009; Ito, 2009). In combination, these two research threads — lowered transaction costs for groups and organisations, plus the opportunity for people to pick up new skills through informal work in project settings — show potential for these largely informal, unstructured environments to become the foundation for new skill combinations and new creative projects to be created within an economy, without the need for massive and carefully allocated public investments. This becomes especially more interesting in an economy such as the Peruvian one, where one the one hand, a sizeable share of the economy remains primarily informal (Durand, 2007), and on the other hand, the state's capacity to quickly respond and adapt to changing necessities has been proven ineffective as public services became overwhelmed by surges in demand and cuts in resources over the last few decades (Matos Mar, 2012).

The urgency regarding this economic reconfiguration is also backed by two further threads. First, it is important to consider that the work and the learning being done in many of this informal settings is going entirely unrecognised, often simply because there are no specified forms of measurement that are looking out for them — something that has become a recurring problem when trying to measure innovation happening inside and outside firms (Brynjolfsson & Saunders, 2010). This forced invisibility speaks to the need for the redesign of our observational techniques when it comes to innovation and creativity to be more attuned to things happening informally.

But secondly, it is also important to consider that the accelerated rate of innovation within technology industries in the last few years is forcing the reconfiguration of many interlocking systems (Brynjolfsson & McAfee, 2012) around the economy, business practices, and labour regulations. The implications in this context for the Peruvian economy, and for the Peruvian game industry, become especially significant: on the one hand, the Peruvian economy should have a much higher sense of urgency about increasing its complexity so it can become more resilient to impending technologically-driven shifts in production and market organisation; on the other hand, informal communities, such as that which became the origin for the local video game industry, offer the potential for less costly and more organic building of new industries and sources of innovation that would otherwise be too costly to implement if done with sufficient diversity.

As I will try to show in the various chapters that follow, the Peruvian game industry is providing a template for a new sort of economic and technological engagement that has been driven almost entirely by creative motivations. New skills are being introduced and new technologies being developed even in the absence of significant financial investments, resulting in the consolidation of a small but growing industry that has managed to remain sustainable, as a whole, for over two decades. The operations of the game industry in many ways address many of the concerns and issues I've listed here, and it'll be important to consider as we move forward whether this model is sustainable, scalable, and replicable to other potential creative industries.

1.4 Following Games Through Society

The ideas so far establish the basis on which I performed research on the video game development community in Peru — specifically, in the capital city of Lima — in order to develop a better understanding of an emerging industry's prospects, and whether it actually had the potential to become a driver of technological growth and the foundation on top of which other forms of technology development could grow. I was interested in exploring how the game development community had developed

various forms of peripheral innovation, putting together various forms of alternative infrastructures to overcome the structural obstacles impeding its growth and the pursuit of its creative objectives.

I've attempted to capture the realm of diverse practices, large and small, making up an emerging industry, which would otherwise probably remain invisible to many outsiders (Geertz, 1977). I've been especially interested in trying to reconstruct the various strategies and tactics (De Certeau, 1988) that developers and studios deploy on an everyday basis to move their projects forward, and that are reflected in the multiple creative and business decisions they need to make all the time. Games have not attracted huge amounts of attention nor driven enormous sales numbers, and in many cases, the activities of independent communities and producers have remained entirely invisible because they did not register under any economic indicators. Over the course of my research, I've come to realise that many of the challenges the industry is facing today pertain more to the social structuring and cultural evolution of a community of producers, rather than the business and economic underpinnings of their activities (which is not to say that the latter become unimportant). In other words, while the industry has significant financial and commercial potential, it is rather the creative returns and the social networks that are actually keeping it together.

My research approach has been varied, and resembling what Hugh Gusterson has termed "polymorphous engagement" (Gusterson, 1997) — following the social dimensions of games through its multiple pathways. The bulk of data for this project came from several visits to Lima, Peru, and primarily from a prolonged stay between May and August 2013, when I interviewed people in various roles connected to the industry, visited local game studios, attended industry and community events, and got to play with both finished games and prototypes. My time in Lima was also key to understanding the context within which the industry is emerging, among a strong rhetoric on the importance of technology and innovation, and a growing movement pushing for innovation ecosystems, entrepreneurship and start-up communities. Being in Lima provided much needed layers of texture and nuance about the environment, and the ways in which technological development and innovation systems intersect with many

other social structures and institutions, including education systems, financing mechanisms, real estate markets, and even more seemingly disconnected aspects such as transportation networks or public safety. I've attempted to pay close attention not only to the statements and actions of people connected to the industry, but borrowing a page from Actor-Network Theory, to the systems, technologies, and non-human actors that are also participating in its practices (Latour, 2005). Following the discourse of how people talk about technology, and mastering the technical language involved in the production process of games, has therefore been a key component of this project.

There is also a very deliberate reason why I've chosen to pursue an ethnographic approach to my research: because many of the networks and practices I've studied remain mostly invisible to many people, ethnographic techniques proved to be the most appropriate in digging up and shedding light on aspects that otherwise remained invisible (Boellstorff, 2006). Because many of the projects I found are quite small, or non-commercial in nature, many of the existing indicators just fail to register at all the enormous creative activity that's going on under the radar. Adopting a qualitative approach was helpful in uncovering many of these networks and their multiple entanglements with economic, cultural, and institutional systems.

I've also benefited from the proximity to the game development community in and around Boston, Massachusetts, being able to attend various events happening in the area, such as the local edition of the Global Game Jam or the Boston Festival of Independent Games (both in 2013), and to have conversations with people connected to the local industry. Being connected to the network of people and activities associated with the MIT Game Lab was extremely helpful in understanding how patterns, practices, and anxieties were effectively global constructions instantiated in local contexts.

I was also able to attend the 2014 Game Developer Conference in San Francisco, California[2], where I was able to shadow a number of Peruvian developers who had

[2]I was fortunate enough to receive support for this travel from the International Game Developer Association in the form of the IGDA Scholarship, which provided me with access to the conference and a number of events and mentoring resources which were especially helpful.

travelled for the event. I also visited and learnt more about an official country booth sponsored by a Peruvian government agency within the conference exhibit floor, which represented the single most important form of support the game industry has received to date from the Peruvian government.

Following games through society involved looking at many other things happening simultaneously (Marcus, 1995): looking back at the local history of game development and placing it in context meant performing some archival research on various sorts of documents, including news articles, photo archives, websites, online forums, "discmags", Facebook groups, and especially playing through games — sometimes having to figure out how to emulate old platforms in order to execute ROM files. The history of game development in Peru has very little documentation to it, and I was able to find traces of games that have probably been lost forever. I've tried to compile as much metadata as I've been able to, at the very least to preserve some record of efforts that happened in the past, with the hope that this process of documentation can become a useful tool for future research[3].

In working with game creators and technology practitioners in general, it was impossible to not have to negotiate my own role in the process as a researcher coming from MIT to document a fairly invisible community. My presence could often be misconstrued as an institutional interest on the industry, or as the arrival of an "expert" capable of providing knowledge and resources. While I had to negotiate expectations continuously, I also found that because of this perception, I could be allowed access to information, people, or interactions that would've otherwise remained invisible to me. I was aware at all times of my obligation not to abuse this opportunity, but I did find a lot of value in turning myself into an active participant in the industry — at times even a champion or an advocate. Providing mentoring and counselling to individuals and groups who sought my opinion gave me some of the most informative interactions of the entire project, and it also provided opportunities for me to give back to

[3]As a side project to my research, I've began aggregating and curating metadata on as many games and organisations as I've been able to identify throughout the history of Peruvian game development. I've made this (admittedly rough) archive available to anyone who might be interested in pursuing further research through a web interface I developed, available at http://gamedex.lvl.pe.

a community that was already sharing a lot with me. While I'm personally invested in the success of this emerging industry moving forward, I'm also perfectly aware that I'd be serving no one's best interest if I was to avoid unpacking the tensions, contradictions, and issues that sit at the heart of the game industry's practices. I've been as transparent as I've been able to with anyone collaborating with my research and shared insights and perceptions repeatedly, and have attempted to turn what I've interpreted as structural obstacles to the industry's development into design and collaboration opportunities with people in the industry.

It was also important for me to be aware of my ambiguous status as an insider/outsider (Kanuha, 2000). Being originally from Lima was extremely helpful in providing me with the knowledge of how to get around the city, figuring out who to talk to, and how institutional arrangements were entangled. It also provided me with a richer sense of just how meaningful transnational networks and information circuits were to local developers. But in many ways I remained an outsider: I was unfamiliar with the video game industry or the local game development community, and arriving as a researcher from MIT also contributed to my condition as an "outsider" looking for access.

In what follows, I'll develop these issues and attempt to provide a description of how the Peruvian gaming industry operates, how it understands itself, and what its prospects are moving forward. Chapter two begins with a historical look at Peruvian game development, and goes back over a century to understand how technology growth has been connected in Peruvian history with boom-and-bust economic cycles going all the way back to the nineteenth century. I argue that the country's technological history has been built on a rhetoric of the "technological sublime", or the promise that the nation would come together under the opportunities offered by technology. But in contrast, the Peruvian game industry has not been part of any officially-sanctioned narrative of technological development or the construction of a modern version, and as such, it has been able to establish a relationship with technology on its own terms that has become more sustainable and organic, providing an interesting counter-narrative to the official histories of technology in Peru.

Chapter three looks at how people in the industry (developers, designers, illustrators, musicians, and so on) developed their interest for games, how they acquired the skills they needed and went about building careers related to games. In this chapter, I pay special attention to the alternative infrastructures set up by developers to bridge the structural gaps stopping or slowing their creative pursuits — because of the lack of local formal options related to game development education, people interested in exploring this practice have put together informal ways through which they can acquire and perfect the skills they need.

In chapter four, I focus instead on the games being developed by studios in Lima — specifically, I look at games where cultural presentation is an issue and where local traditions, styles, or themes are incorporated into a game for its presentation to international audiences. I call these games "borderland games", as they become contested areas where issues related to culture, authenticity, and transnational production become clearly instantiated. I want to consider the multiple actors and expectations that go into deciding whether and how to make this sort of game, as well as the local industry's conflicting position regarding how they present themselves to international audiences.

Chapter five turns to consider the business practices of established and emerging game studios and how the industry as such is structured, including thinking about business models, distribution channels, audiences, and so on, and the various sources of tension and discussion about where the industry is or should be headed. It also looks at the forms of institutional organisation being developed by local studios, and how they're being effective in engaging government agencies to secure essential forms of support, such as the Peruvian official representation at the 2014 Game Developer Conference.

Finally, chapter six turns the attention to the relationship being forged between the video game industry and various government agencies, and how the Peruvian government is creating new channels to engage emerging technology industries through access to various resources. I also want to consider how other governments across the Latin American region are engaging their own national game industries, and how in

the Peruvian case, the game industry is figuring out how to construct a singular and exceptional relationship with government agencies that's very different from that of other local creative industries.

I will conclude by returning to the three core ideas described above, and by going over the current state and future prospects and challenges for the industry, as well as by providing some possible futures and recommendations. I'll attempt to identify opportunities for intervention that might both help consolidate the industry and community further, and accelerate its growth process moving forward. When I first began pursuing this project, I was of the belief that many of the issues and the solutions I'd begin to identify through fieldwork would be related to technological concerns and opportunities — access to newer tools or distribution channels, for example. But as I began to find out, and as I hope I'll be able to convey in what follows, the primary issues affecting this emerging industry are rarely related to technology. In fact, local developers and studios, for most purposes, have roughly the same access to tools and technologies to their peers located around the world. The primary difference, however, lies closer to issues of process and institutions, how production is organised and how projects are managed in order to make them attractive and interesting to international audiences and clients. And in order to fully understand how these various layers are connected to each other, we need to consider how technologies have evolved through Peruvian history, and what the place is for video games within Peruvian technological history.

2

Reconstructing a Technological History

The technological history of Peru has received very little attention. As a developing nation with little internal capacity for the development of new technologies, it has largely been absent as a primary character in most historical and social analysis, though frequently mentioned in passing in various forms — infrastructure projects, industrial capacity, consumer goods, etc. These various forms of technology, as they tend to do, have faded into the background of our understanding of Peruvian history as something that happened outside the realm of agency of the nation.

But just as various forms of technology have become pervasive in everyday life and have also jumped to the forefront of social analysis as an often overlooked presence affecting and shaping behaviour (Latour, 2008), we would probably be well served by re-evaluating the role technologies have played in the coming together of the modern Peruvian republic. Technologies exert various forms of agency by enabling, disabling, connecting, exposing, facilitating, encouraging, or in multiple other ways providing access to social networks and activities. Failing to account for these gives us an incomplete view of how social phenomena are configured, and how our understanding of the world around us is, too, configured by the tools and technologies at our disposal — and, in turn, these tools and technologies modify our sense of how that world around us can be transformed and reconfigured.

As such, technologies have had an ongoing presence and influence throughout the history of the Peruvian republic — both as objects, and as narrative constructions embodying ideals, desires, and expectations of becoming a modern, independent nation. Understood largely as outside forces, they've been often portrayed within these narratives as drivers of progress and promises of change. And they've just as often failed to materialise those promises into lasting, structural transformations.

In what follows, I will examine how various narratives of progress and modernity have been constructed over Peruvian republican history around specific forms of technology, often developing hand in hand with a period of economic growth fuelled by booming exports of some natural resource. I will describe how these narratives became alternating interpretations of the "technological sublime" — a belief in some form of radical improvement brought about by the introduction of some new technology — and became established as official narratives regarding the country's future and access to a condition of modernity. But I also want to contrast this with the possibility of emerging counter-narratives that offer the possibility of reinterpreting our collective relationship with technology not from the point of view of official narratives, but rather from the practices of creative communities operating almost invisibly, and even obscured and obstructed by these official narratives.

I will begin by examining how the recent export boom in Peru has been couple with a transformative project connected to the deployment of information and communication technologies (ICTs) in various forms, illustrating the process of attempting to articulate a national ideal through technology. I will then provide a more detailed explanation of this concept of the "technological sublime", to then relate it to successive developments taking place over the last 150 years — particularly, the boom in guano exports in the 19th century and the accompanying rush to construct railroad networks across the country, as an especially illustrative case of an official technological narrative — looking for recurring patterns between economic booms and the emergence of discourses and narratives of the technological sublime. I will try to show that these arrangements consistently exhibit a distinct lack of agency from Peruvian society in determining its economic futures, and often result in the

deployment of black box constructions of technology under the promise of access to modernity and, more recently, globalisation. This first section is built primarily on a review of key works by Peruvian historians and social researchers analysing the evolution of the Peruvian nation, as well as the analysis of more recent official documentation from various agencies of the Peruvian government. Moving forward and in contrast, I want to consider in detail a much more recent example of an emerging technological counter-narrative, examining the case of the Peruvian video game industry and how it emerged from an underground culture of hacking and tinkering into a growing industry and community, establishing various alternative infrastructures for learning and play along the way. By examining this case, I want to consider a very different form of relating to emerging technologies occurring within the same geographical space, but treating technologies not as black boxes but rather as flows of knowledge and social relations that can be grasped, analysed, and tinkered with. This section is informed by an analysis of the documentation trail left behind by a video game hacking and development group active between the late 1980s and early 2000s, as well as interviews with current members of the video game industry in Lima, Peru, during a field research trip between May and August 2013. Finally, I will conclude by pointing out some ways in which these contrasting interpretations of the relationship with technology have present-day consequences and implications for technology industries and public policy.

2.1 Peru 2.0

If you were living in Peru towards the end of the 1980s, it would've been perfectly understandable for you to have thought the world was about to end.

Peru transitioned back to democracy in 1980, after twelve years of military rule, in an environment that was quickly becoming terrifying. During the 1980s and early 1990s, the country experienced its most devastating internal conflict in the fight between terrorist movements, primarily the Shining Path radical communist group, and the Peruvian government and armed forces. The conflict spanned over a decade across

large areas of the country, resulting in the death or disappearance of about 70,000 people. The causes and development of the conflict have been studied in detail (Comisión de la Verdad y Reconciliación, Perú, 2003) and are a matter of continuing discussion and political debate, but the Peruvian Truth and Reconciliation Commission, tasked with investigating the causes, development and consequences of political violence between 1978 and 2000, concluded unambiguously that the structural divides cutting across the nation socially, culturally and economically had been the breeding ground for the growth and spread of terrorist discourse. The failure to articulate a nation throughout geographies and social classes had ultimately led to thousands of people failing to acknowledge the legitimacy of the legal and political order under which they were living. The recurring failure of both government and society to capitalise on the unexpected and unintentional opportunities for development that had materialised over the course of the republic's history had ultimately exploded into a situation of extreme violence.[1]

As the country was being torn apart by the fighting between the terrorist groups and the armed forces, hundreds of thousands of people fled from the countryside seeking refuge in the cities along the country's coastline. But the cities weren't doing much better: the country's economy had collapsed during the last military regime, and hyperinflation was ravaging the entire continent all through the 1980s. A series of financial and monetary blunders by then-president Alan García would

[1]From the Conclusions to the Truth and Reconciliation Commission's Final Report:

"The TRC has confirmed that a clear relationship existed between the condition of poverty and social exclusion, and the probability of being a victim of violence. The Andean region of Ayacucho concentrated over 40 percent of the dead and missing reported to the TRC. When added to the victims registered by the TRC in the regions of Junín, Huánuco, Huancavelica, Apurímac and San Martín, they add up to 85 percent of the victims registered by the TRC. (...)
The TRC has observed that, along with socio-economic gaps, the process of violence made explicit the severity of ethnic and cultural inequalities still present in the country. From the analysis of testimonies received, 75 percent of fatal victims in the internal armed conflict were primarily speakers of Quechua or other native languages. This contrasts starkly with the fact that the population sharing this characteristic represents only 16 percent of the Peruvian population according to the 1993 census. (...)
The TRC has found the conflict exposed limitations to the State's capacity to guarantee public order and safety, as well as fundamental rights of its citizens within a democratic frame of action.
The TRC, as well, has found a precarious validity of the constitutional order and rule of law, which were vulnerated in those times of crisis." (Comisión de la Verdad y Reconciliación, Perú, 2003, vol. VIII, pp. 315-316, translation mine)

result in the country's economy going into free-fall towards the later part of the decade, with a failed attempt to nationalise the entire banking system, a default on most international obligations, crippled industrial and agricultural infrastructures and, most notably, a cumulative inflation rate of about 2,000,000% by the end of his five year term in 1990.

The country experienced drastic, but also traumatic transformation in the 1990s. The administration of Alberto Fujimori, after unexpectedly being elected into office, pushed forward an agenda of radical neoliberal reforms that were able, over time, to jolt the economy back into shape. Counter-terrorism initiatives put in place in the late 1980s also reaped large gains with the capture of the leader of Shining Path, forcing the highly centralised organisation of the terrorist group into major disarray and retreat. But these largely accidental victories for the Fujimori regime were capitalised politically, giving him enough political capital to shut down Congress in 1992 and enact a new Constitution favourable to him (Contreras & Cueto, 2004, pp. 304-404). This gave him free reign to articulate the largest and most complex corruption apparatus ever seen in Peruvian history, ultimately remaining in power under a questionable legitimacy until the year 2000, when he was forced out of office by major corruption scandals involving his top aides and himself.[2]

Since the late 1990s and through the 2000s, Peru has been reaping the benefits of a natural resource boom fuelled by the high prices its mineral exports have been commanding in the international market. The country has been an important mining enclave ever since colonial times, if not even before. Nowadays, rising mineral prices have motivated massive investments in large mining projects, more often than not financed and implemented by foreign corporations capable of bringing together the human and financial resources required for these large endeavours. Riding on the back of these massive investments and the infrastructure projects required for their

[2]Fujimori's resignation from the Presidency while at an international summit in Brunei was rejected by the Peruvian Congress, which opted instead to censure him on moral grounds. He fled to Japan were he was immune to extradition on account of being a Japanese national. He travelled to Chile in 2005 where he was arrested by local police at the request of the Peruvian embassy, and after lengthy judicial proceedings was extradited to Peru in 2007. He was tried, found guilty and sentenced for crimes against humanity including abuses by State and paramilitary forces under his command, for which he is presently serving a 25-year prison sentence.

operation, the country has seen several years of continuous economic growth and the betterment of many economic and social indicators even through a devastating global financial crisis. But even still, mining activities come at a huge social and environmental cost. Natural landscapes are dramatically transformed, resources are many times inevitably contaminated, and local economies are radically distorted by the sudden influx of people and money to areas that are often remote and secluded. As of June 2013, the national Ombudsman's Office reported 223 instances of social conflict nationwide, of which 145 were caused by socio-environmental issues (Defensoría del Pueblo, 2013). While these are not necessarily violent conflicts, it paints a clear picture of ongoing social and cultural tensions which are reminiscent of the social climate that has already erupted in significant systematic patterns of violence in the past.

The boom in mining exports does bring about a renewed opportunity for the country, and the government in particular, to close the massive infrastructure gap that contributes to keeping the country divided and large portions of its territory entirely disconnected. Among the measures taken to modernise the country and to capitalise on the export boom to bring about a new nation, better connected and articulated, there is the promise of the radical transformation that will come about though the implementation of new technologies — in particular, information and communication technologies (ICTs) promising direct line of connection with the globalised world.

Starting in 2001, the administration of Alejandro Toledo launched the ambitious "Plan Huascarán", which sought to provide computers and Internet access to all public schools in the country (Ministerio de Educación, 2001). Toledo campaigned heavily on the project during the elections, and once in office, it widely promoted next to big-name partners such as Telefónica, the Spanish telecommunications giant, and Bill Gates, then-CEO of Microsoft (Caretas, 2001). The project's colossal ambitions were ultimately met with disappointment — the program aimed primarily at introducing computers in schools, but deployment was poorly planned, often lacking basic infrastructure to make use of the computers (even, in some cases, electrical connections) or proper teacher training. Allocation of resources to schools was done arbitrarily,

leading to computers being assigned on a political basis, and ultimately, the obscure and confusing procurement process — in itself poorly designed — became entangled in accusations of corruption (La República, 2006).

Just a few years later, the second administration of Alan García[3] pushed forward a massive deployment of XO-1 laptops from the One Laptop Per Child project. The Peruvian government distributed a reported total of 797,352 laptops (Ministerio de Educación, 2013) with the objective of providing one to every child in a public primary or secondary school — the largest deployment of XO-1s by any single government in the entire world. The XO-1s were technically a much better fit for the Peruvian context — relying on batteries that could be hand-cranked, and capable of creating *ad hoc* mesh networks to share available Internet connections with other units wirelessly. Yet the project ended up displaying many similar faults: little attention was paid to teacher training, and consequently, the units received very little use time in class. School administrators were more concerned about the possible personal consequences of having machines break down or disappear, choosing instead to lock the units within single-use computer rooms where kids got limited access to computer time. These emergent issues, coupled with similar accusations of mismanagement and unresolved issues with the procurement process, have made the project widely considered to be a large-scale failure despite its staunch defence by then-government officials in charge of its design and implementation, and an ongoing maintenance problem for later administrations. A representative from the Ministry of Education under the subsequent administration explained to me not only how hard it had become to source content for the XO-1s given the limited size and energy behind the Sugar operating system developer community (prompting them to have to switch to better supported by less optimised versions of Linux), but also how they were already dreading an impending problem once it became necessary to replace the existing machines. In short, as a local researcher of the deployment process told me during a conversation, it is a "journalistic exposé waiting to happen."

[3]After spending several years in exile following political persecution from the Fujimori regime, García returned to Peru and, despite the catastrophic results from his first term, managed to win the 2006 presidential elections.

The latest iteration of this trend is now focused on fostering technology entrepreneurship such as that found in places such as Silicon Valley, as hundreds of people in Lima and across other cities begin to contemplate the prospect of being the ones to come up with the "Peruvian Facebook" — a prospect that is fuelled by the media (El Comercio, 2011) and, to some extent, by government agencies hoping start-ups might be the ones to take over the technological transformation of Peru. Young people in Peru are presented idealised narratives of entrepreneurship and success, such as those of Mark Zuckerberg in the film *The Social Network*, or Steve Jobs in *Jobs*, along with quotes, mantras, and tips circulated through publications, social networks, and a growing number of events aimed at young entrepreneurs hoping to make it big with a new website or a mobile app. To support this emerging trend, the Peruvian government launched the Startup Peru initiative in late 2013 (Stewart, 2013), modelled on similar initiatives implemented in Chile and Brazil. Startup Peru provides seed funding for early stage ventures in technology industries, along with mentoring resources to develop and validate a business plan capable of attracting outside investment. It is also an exceptional collaboration between the Ministries of Production and Finance, as well as CONCYTEC (the National Science and Technology Council) and FINCYT (the Science and Technology Innovation Fund). Startup Peru is a clear reflection of the way discourses of innovation and entrepreneurship around technology have attracted much more attention in previous years than more infrastructure-focused concerns, largely because of the massive financial returns of technology industries based in Silicon Valley and technology and financial media trumpeting their combination of high-risk entrepreneurship with free market disruption as a highly successful one to follow.

There is, however, a pattern in all these iterations worth analysing more closely. These three interpretations of articulating ICT infrastructures with the resources from an export boom are similar in that they all deal with technologies as linear black boxes — devices that can be easily dropped into a social context and reconfigure its inputs into more modern, globalised, networked outputs. Whether it is deploying computers in schools, delivering laptops to kids in rural areas, or having young people building

apps, these are all operating as largely linear processes under the assumption deployment of these technologies and processes will lead to roughly uniform results. And the desired results are all aligned with pushing a technologically-challenged country, used to banking on its vast stock of natural resources for its survival, onto the track of modernity: if only we can get these technologies in place, these projects assume, then we will become a modern nation and overcome the geographical, cultural, and social challenges that have stopped us from being one.

The boom in mining exports is not so much buying computers and paying for Internet access, but rather it is underwriting a promise of nation-building. That promise, in turn, becomes instantiated in black boxes attributed with almost magical powers: it becomes a promise, ultimately, of a technological sublime.

2.2 Pursuing the Technological Sublime

In the 18th century, Immanuel Kant set about in his critical project to determine the bounds of reason and of what could legitimately be claimed as "knowledge" in the sciences, morals, and, as explored in his third critique, the *Critique of Judgement*, aesthetics and taste. Within his description of the operations of aesthetic judgement, Kant associated aesthetic experience with the categories of the beautiful and the sublime (Kant, 2007). He described the experience of the beautiful as something different from intellectual understanding — whose main purpose was to subsume judgements under broader, more universal concepts and categories — but still related to one's intellectual faculties. Namely, the beautiful was that which produced in the subject an alignment or a certain harmony, and requiring no words to be explained. The experience of the beautiful can perhaps be better illustrated through Walter Benjamin's later concept of the *aura* (Benjamin, 2008), the experience of contemplating a work of art in its "there-and-then", an experience impossible to reproduce outside of its original context.

In contrast, the experience of the sublime was that in which an object entirely overwhelmed a subject's capacities and faculties and resisted any intellectual or moral

categorisation. The sublime was best illustrated by Kant through the contemplation of the vastness of nature, like an endless ocean, or a huge mountain, or other natural phenomena which, rather than requiring no words to be explained, cannot be explained through words. The sublime refuses to be domesticated by language; as soon as its overwhelmingness can be communicated, it ceases to be sublime to become ordinary.

The idea of a *technological* sublime was introduced by Leo Marx to describe such overwhelming capacities being attributed to technological objects (Marx, 2000). But the technological sublime does not refer to technological objects being sublime in and of themselves, as per through some metaphysical capacity. Marx spoke of a "rhetoric of the technological sublime" that was deployed in specific patterns and practices as a social construction surrounding specific technologies, an idea later appropriated by James Carey when describing the impact of such technologies as the telegraph and the railroad in establishing an idea of a modern nation in 19th century America (Carey, 2008b) — a more specific experience of the sublime which he terms the "electric sublime". Carey's electric sublime is similarly a rhetorical construction in which ideals, desires and expectations were projected onto a technological object — building the notion that the introduction of a technology could, by virtue of its own affordances, bring about qualitative and significant social change:

> The relationship between communication and transportation that organicism suggested — the nerves and arteries of society — had been realized in the parallel growth of the telegraph and railroad: a thoroughly encephalated social nervous system with the control mechanism of communication divorced from the physical movement of people and things. (...) This belief in communication as the cohesive force in society was, of course, part of the progressive creed. Communications technology was the key to improving the quality of politics and culture, the means for turning the United States into a continental village, a pulsating Greek democracy of discourse on a 3,000-mile scale. This was more than a bit of harmless romanticism; it was part of an unbroken tradition of thought on commu-

> nications technology that continues to this day and that Leo Marx (1964) named and I appropriated as the "rhetoric of the technological sublime." (Carey, 2008a, p. 110)

The rhetoric of the technological sublime is deployed at multiple levels: it is not only the implementation of technologies, but the surrounding descriptions and narratives that are built around them. Official discourse, advertising, press coverage, public policy, literary and artistic depictions, social anxieties, moral panics, spiritual and religious beliefs, educational systems, and institutional arrangements all come into play. Technologies on their own don't come packaged with specific idealised constructions of possible future societies; but rather, when elevated to the position of the sublime, a whole universe of discourse comes together describing a new state of affairs. Throughout Peruvian history, this has come together quite clearly during periods of rapid economic growth that has offered the unusual opportunity of modernising the nation at an accelerated pace. Technologies deployed during these times came to symbolise not only practical improvements to social affairs (i.e., the possibility of faster, safer travel across the country), but also the overcoming of the many historical obstacles the country had faced in truly coming together as a nation: geography, ideology, race, poverty, all became issues that could be leapfrogged over through the deployment of technologies such as those available in industrialised nations.

The power of this rhetoric lies in its capacity to mobilise multiple layers of society at the service of fulfilling its promise for transformative social change — often, as we'll see below, regardless of the actual probability of such promise being fulfilled. In Peruvian technological history, the technological sublime became the recurring establishment of a vertical, top-down relationship with technology, where it was perceived as an outside, opaque force capable of realising that which social actors were incapable of. As such, the technologies that were to transform the nation were just as external as the sources of prosperity that made their deployment possible, perpetuating both political and technical asymmetries within Peruvian society and with the outside world.

To fully articulate that, we can observe more closely the cycles of economic pros-

perity throughout Peruvian history and their associated rhetorics of the technological sublime — in particular, the guano boom of the mid-19th century that led to the first big push for modernisation in the form of the national railroad network.

2.3 The Promise of a Nation

For a lengthy period of time during the nineteenth century, Peru's economy lived primarily off the exports of guano — a fertiliser discovered to lie in abundance across a series of isles just off the coast. Its high nitrate concentration led to it being adopted across industrial Europe to boost the yield of farmlands, which in turn led to skyrocketing demand and a sudden influx of capital the still-new government was unable to channel properly. For the first time since its republican inception, Peru had some money in the coffers to actually try and build a nation after decades of infighting between regional *caudillos* had dilapidated any resources and failed to establish any solid institutional basis (Orrego, 2005). The sudden influx in capital became the platform on which to build a renewed idea of a modern nation which would finally be able to make the leap forward into industry, and the image of the technological sublime then became associated with promises of huge infrastructure projects like the national railroad system.

The history of the guano economy in Peru is interesting both because of its long-lasting effects on Peruvian society, but also because as a process, it came to crystallise what would come to be a recurring cycle in Peruvian economic history.

The benefits of guano were discovered by foreign researchers who shipped some samples to Europe for analysis of its potential as fertiliser. The guano economy was not locally initiated, nor was the technical and scientific infrastructure in place for local researchers to notice or develop this potential. When the unexpected demand for bird poo started to come in, the Peruvian government scrambled to put together an export operation, especially as local entrepreneurs found themselves incapable (and largely unwilling) to handle the know-how and capital requirements of the process. Once the country was rid of the colonial bureaucratic apparatus managing all things,

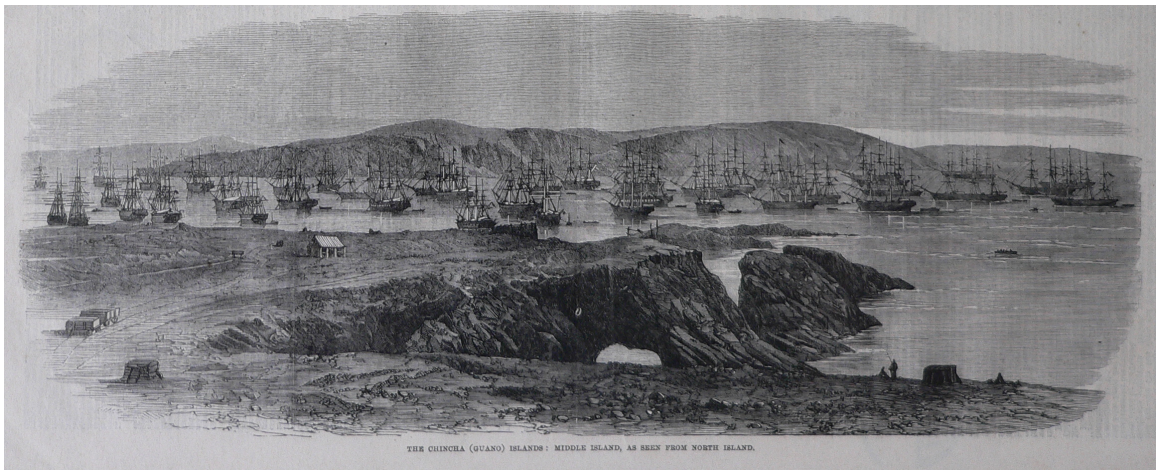

Figure 2-1: A photograph of ship traffic around the guano islands of Chincha. Manuel González Olaechea y Franco for The Illustrated London News, 1863.

including (perhaps especially, given the interests of colonial rule) international trade, the new republic found itself deprived of processes, people, institutions and capital to manage large-scale export operations. When guano was found to have enormous demand, building the layers of infrastructure to successfully get it out of the isles, loaded on to a ship, and ferried all the way to the European markets that wanted it, required local entrepreneurs and the national government to relie entirely on international sources of human and financial resources. Rather than building profitable enterprises around guano exports, the government opted instead for a model in which foreign entrepreneurs would make the required investments and reap all the profits from sales of guano in international markets, in exchange for paying very high fixed amounts of money to the government. In this way, the government assessed it would be sheltering itself from any sort of risk associated with the trade of guano (Contreras & Cueto, 2004).

The availability of a fixed source of income, however, offered a sense of stability previously unseen ever since independence was attained. This sense of stability allowed the government to actually think of itself as a Nation-State for the first time, and to consider how to bring together a country that was fragmented across historical, economical, geographical, and cultural dimensions. The country was able to produce its first national budget in its history in 1848, and during the administration

of Ramón Castilla, an aggressive plan to reach out into the Andean highlands and into the Amazon jungle was drafted, built atop a technological promise: the industrial prospects offered by the introduction of the railroad. For a bourgeoisie that was just beginning to come together — and that had been surprisingly absent from the independence process (Bonilla & Spalding, 1972) — it was an acceptable formulation that the nation had failed to coalesce over time because of clearly understood infrastructural shortcomings, rather than complicated and self-implicating social and historical explanations:

> [T]he diagnosis from a sector of the proprietor class centred on the problem being the lack of communication of potential productive areas with Europe. The solution, therefore, would be the pursuit of loans to be dedicated to the construction of railroads to articulate mines and farms with ports. Reducing the cost of shipping should have a considerable impact in reducing cost of production of raw materials, making them competitive in the international market. At the same time, this situation would motivate proprietors to invest in those sectors, establishing a new economic circuit that would ensure, definitively, social peace. (Cotler, 2005, p. 114, translation mine)

While the Inka Empire had connected vast extensions of land across the continent through networks of roads and running messengers, the Spanish colonists had paid attention only to those roads and connections bringing together important economic hubs, such as Cusco or Potosí. By the mid-ninteenth century, most cargo and people transport from the highlands was done on the back of mules or llamas, at huge expense and risk. The railroad carried a promise of national unity and economic development, by connecting the remote towns and villages in the Andes to the ports and cities along the coast. But it was also the driver of an important aspirational idea: to become articulated as a nation through the railroad was to become a modern nation, one that rode around on the same technologies as the European powers of the time — forging a promise of modernity and development that resembles what anthropologist Brian

Larkin describes as "the necessary spectacle of colonial rule" (Larkin, 2008, p. 36). It would have just as much direct impact on everyday life as it had symbolic power in bringing the country closer to the developed world.[4]

Across several administrations, the Peruvian government made huge investments into building railroads, most of them poorly calculated, and all of them awarded to foreign engineers. The railroad lines were plotted not so much in terms of convenience or economic benefit, but more in terms of political affiliations and calculations. The peculiar nature of legislation at the time, which established different legal regimes and protections for indigenous peoples, established a paradoxical situation where the government had to bring in large amounts of unskilled labour into the country to work on the railroads, who were brought mostly from south-east Asia to become locked into extremely poor and abusive working conditions. Just as with the trade of guano, local entrepreneurs lacked the human and financial resources for large-scale infrastructure developments, forcing the government to contract out the building of railroads to international investors, and financing the operation through international credit with the income from guano as collateral. As the railroad projects grew larger and more complicated, and therefore more expensive, the government kept signing off on new loans as the guano reserves grew smaller because of overexploitation, and as demand began shrinking in Europe because of new technical developments. Over time, the payments on the loans eventually became larger than the income the government received from guano, while the railroads remained unfinished and were providing virtually no contribution to the national budget other than their operating costs.

[4]Larkin, referring to the deployment of infrastructure as part of the construction of what he terms the "colonial sublime", describes it as follows: "One intent in using infrastructural technologies in colonial rule was to provoke feelings of the sublime not through the grandeur of nature but through the work of humankind. Th erection of factories; the construction of bridges, railways, and lighting systems; indeed the terrifying ability to remake landscapes and force the natural world to conform to these technological projects by leveling mountains, flooding villages, and remaking cities; these were the ways in which the sublmie was produced as a necessary spectacle of colonial rule. (...) But the colonial sublime carries within it two distinct models of colonial rule. One is based on difference and the sharp separation between colonizer and colonized when technology is used to incite awe. The other proffers technology as a mode of development. It proffers access, through education and training, that domesticates the sublime and thus destroys it. This mode collapses otherness through the lure of technology as a way of becoming modern." (Larkin, 2008, p. 36-37)

The implications were far-reaching. The railroads were never completed, and whatever portions were finished were handed off in concession to foreign corporations with which the government had contracted enormous amounts of debt.[5] The income from guano trade slowly diminished over time, as the foriegn corporations who managed it found little value in improving the product or the process and found it more profitable to switch to alternative fertilisers. The Peruvian government and local entrepreneurs were unwilling or incapable of doing so either. Towards the 1870s, saltpeter (or potassium nitrate), found in abundance in the south of Peru and the coast of Bolivia (later to become the north of Chile), began to replace guano as the more popular fertiliser. International competition over leadership of the saltpeter trade would later become one of the factors leading to the War of the Pacific between Bolivia, Chile and Peru, resulting in the Chilean annexation of the Antofagasta region of Bolivia and the Arica region of Peru, where the main saltpeter deposits were located, and in the crippling of the Peruvian economic, military and political establishment for many decades to come. Jorge Basadre, the foremost Peruvian historian, described the outcome in the following way within his massive *History of the Republic of Peru*:

> Peru suffered multiple shocks as a nation during the 19th century. None such as the war of 1879. It was the roughest shock Peruvian men experienced during that century. It ignited the entire territory, south to north, from the coastline to the highlands. It implied enormous fiscal loss, penetrated the economic and industrial domain of cities, the villages and the fields, the homes and even the indigenous communities. There was no one at the time, young or old, man or woman, who was not affected by this drama in one way or another. Once the State's scaffolding was wrecked after the two battles outside Lima, simultaneous and opposing regimes

[5] Julio Cotler, renowned Peruvian social researcher, adds this when describing the failure of the the railroad projects: "The natives were forced to work on such projects to the benefit of provincial oligarchies. On the other hand, internal demand was being satisfied primarily through imported goods due to lower costs and the abundance of currency. Finally, the railroads failed as a means to reduce the cost and promote production and shipping of commodities. After a couple years of having been awarded the Arequipa-Puno railroad concession, [American contractor Henry] Meiggs was giving it back to the Peruvian government, claiming mule transport represented an unbeatable competition." (Cotler, 2005, pp. 117-118, translation mine)

> emerged, all of them illusory, attempting to rebuild it. Beneath them, and more importantly, the national identity expressed an unbreakable will to carry on existing, to endure.
>
> After the nightmares of war and occupation ended, the nation was still alive. But it was a weak, amputated, hurt country. In summary, an ailing country. (Basadre, 2000, vol. 8, p. 1977, translation mine)

The guano economy became a symbolic episode for many reasons that have merited an enormous amount of analysis, and continue to do so to this day. But despite its well-known significance, the same basic patterns have repeated themselves over time on many occasions. About four decades after the guano boom, during the 1920s the nation experienced a similar, though smaller boom around the extraction of natural rubber, discovered in abundance in regions of the Amazon jungle. The pattern was similar: the potential was identified and developed by foreign investors, and the technical, institutional, and social layers of infrastructure proved incapable of capitalising on the sudden influx of resources due to increased exports. And so was the corresponding image of the technological sublime: where previously it was railroads that would unite the nation, this time it was highways and cars that represented the technological pathway to becoming a modern nation. In less dramatic fashion than with guano (but with dire consequences to the population in the regions were extraction took place), the outcomes would be ultimately just as disappointing: once the natural rubber boom was come and gone, no significant infrastructure changes materialised. The jungle regions of Peru continued to be left behind as the rest of the country struggled to consolidate as a functional nation.[6]

The 20th century saw an additional natural resource boom in the 1970s around

[6]Historians Carlos Contreras and Marcos Cueto describe the terrible exploitative conditions under which rubber trade took place: "Although it is difficult to quantify exports because of the large amount of contraband, apparently towards 1910 rubber came to represent 30 percent of total Peruvian exports. It then vanished almost entirely, when British interests found sources of rubber in colonial plantations in India and Ceylon to be more profitable and safe. The rubber system was one of savage, primitive, and wild exploitation, which depredated resources and dispossesed hooked natives and highlanders it brought to work in the Amazon. Workers were subjected to a system of virtual slavery, and were limited to gathering rubber from the trees in conditions of total isolation." (Contreras & Cueto, 2004, p. 216, translation mine)

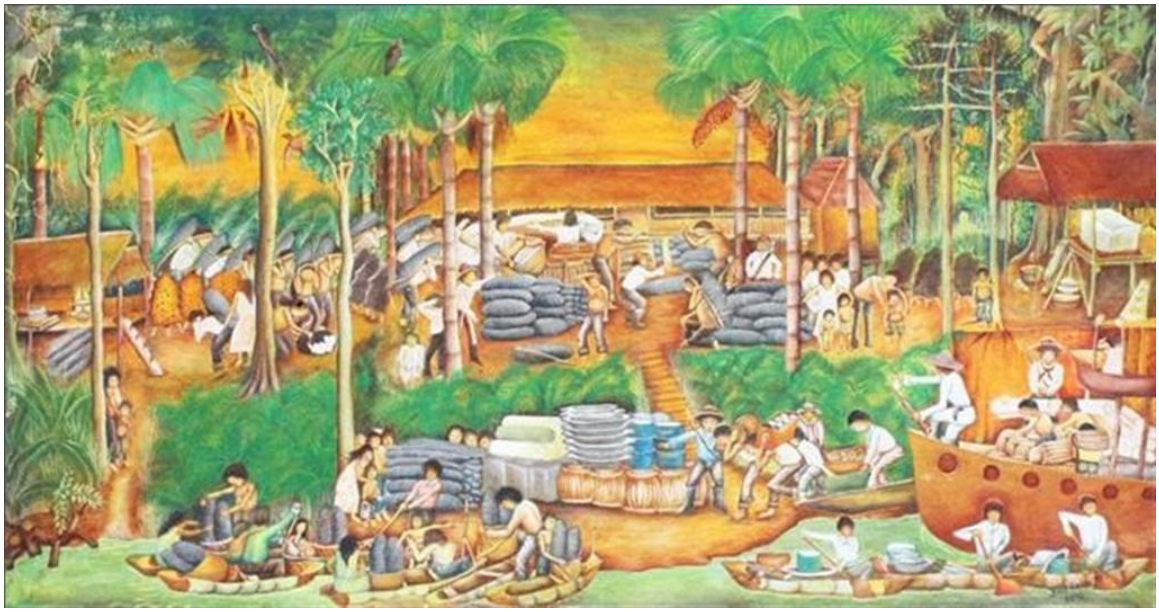

Figure 2-2: Brus Rubio. *La explotación del caucho en Pucaurquillo* (*The Exploitation of Rubber in Pucaurquillo*). Natural tincture on tree bark.

the exploitation of Peru's fishing resources and the production of fishmeal, leading to the nation becoming the first worldwide exporter of this resource for a while. The fishmeal boom had its corresponding image of the technological sublime in the implementation of industrialisation through import substitution. The nationalist Revolutionary Government of the Armed Forces, which took power by force in 1968 and maintained military control of all aspects of government and production until 1980, established fierce import controls intended to stimulate the development of locally-produced substitutes, following a model that had been successful in achieving rapid industrialisation decades earlier, among others, in countries such as Brazil and Argentina (Murmis & Portantiero, 2004). Overproduction of fishmeal led to depredation of the natural resource, while artificial price and trade controls became unsustainable over time, forcing the military government to relinquish power back to civilian authorities amongst growing population unrest.

All throughout, ever since the guano boom we can identify a series of recurring elements that have been present in these boom-and-bust cycles — including the present boom around mineral exports. Economic booms throughout Peruvian history have all (1) been connected to the exploitation of some natural commodity which has un-

expectedly (and because of foreign interest) seen high international demand; (2) faced infrastructure, knowledge and financial inadequacies that have required the intervention of foreign investors for the potential to be developed; (3) been closely connected to the actions of government, which has typically sought to establish a mechanism to derive some form of fixed income from the economic activity, rather than assuming any form of risk; (4) consistently failed to materialise into long-term impact, develop the capacities of local populations, or spill over into the emergence of other productive activities; (5) been closely associated with some narrative construction of the technological sublime, promising radical qualitative change into a modern, industrialised nation through the deployment of fashionable technologies.

In short, these cycles display three important characteristics: a distinct lack of agency regarding the economic development of the nation, a reluctance or incapacity to assume the burden of risk associated with driving change and growth, and a fixation with anchoring the national identity in relation to an ideal of progress and modernity.

I've chosen to provide a lengthy, though still superficial account of key aspects of Peruvian economic and social history because I believe there are structural elements to be found that are relevant to our more specific present discussion around the emergence of new technology industries in the Peruvian context. Since these elements are unfamiliar to most people (even in Peru itself), I think it is especially relevant to look back and consider everything that has been and still is at play in the negotiation of Peru's self-understanding as a modern nation or otherwise. This self-understanding cuts across multiple categories of analysis: it permeates into issues not only of technology, but also of institutions, discourses, and everyday practices.

Significantly, the various forms adopted by the discourse of the technological sublime are always an officially-sanctioned narrative, articulated as to mobilise social actors and political interests at the service of the country's modernisation. But just as there have been official narratives governing Peruvian technological history, there have been less discussed, often invisible counter-narratives of technology deployment taking place not only without official sanction, but even facing significant opposition for social and cultural reasons. The history of the video game industry is one

such counter-narrative that may hold an alternative way of interpreting how Peruvian society relates to technology.

2.4 Gaming as a Technological Counter-Narrative

Perhaps what's most interesting about the emergence of the gaming industry in Peru is how it is arguably not supposed to be there at all.

To be certain, video games are not a component of this latest incarnation of the technological sublime constructed around digital technologies. Video game development in Peru has had its own independent history almost entirely in the shadows, operating not as a top-down deployment of technologies as tools and processes, but rather as a bottom-up, chaotic and iterative assemblage of various moving pieces. The history of video game development in Peru is illustrative not so much of a clean jump into the creative production of modernity, as it is a messy cycle of trials and errors through which hobbyists and makers have stumbled their way to the foundations of an industry. Because of this, I believe games provide a very interesting counter-narrative to the deployments of the constructions of the technological sublime that we've seen above happening throughout Peruvian history, and therefore, an alternative understanding as to how peripheral communities in developing economies establish relationships with technology on their own terms, in ways that may become interesting and meaningful for their larger contexts to engage in — and perhaps healthier and more sustainable for social actors to engage in.

Video game development in Peru can be traced back to the 1980s, when the first experiments in this area began to take place. The oldest game developed in Peru that I've been able to trace was *Aventuras D'Onofrio*, an advertising game developed for the Atari VCS (a.k.a. the Atari 2600) by a group called SISTAP in 1987 (and later ported as well to the Apple II). *Aventuras D'Onofrio* is interesting for several reasons: firstly, because it might very well be the first *advergame* developed in the Latin American market (though this claim remains to be verified or, alternatively, challenged). Secondly, because of its distribution method: the game was developed

Figure 2-3: A screenshot from *Aventuras D'Onofrio*. Game developed by SISTAP for D'Onofrio (now part of Nestlé Perú).

for D'Onofrio, a popular local brand of ice cream, and players were able to acquire a copy of the game by trading in a number of ice cream wrappers as part of a promotion. Thirdly, because of the technical achievement: as I've heard in interviews with people who were part of the scene at the time, there was a very limited number of people who were doing any form of programming at all, and even fewer resources for people to learn about coding. In addition, the Atari VCS was a notably difficult platform to develop for because of its technical limitations, forcing programmers to come up with ingenious hacks and workarounds to get the system to perform as expected (Montfort & Bogost, 2009). Given the combination of both these factors, that an Atari VCS game was developed at all in this context is remarkable; that it was developed for an established brand in an unproven medium, doubly so.

While *Aventuras D'Onofrio* is interesting, by far the most important reference in early Peruvian game development is the Twin Eagles Group (TEG), a coding and hacking group founded and managed by a controversial figure known mostly as Mr. Byte. The history of TEG is captured in various levels of detail in the group's website —- a frozen online archive apparently last updated in 2006 (Twin Eagles

Group, 2006).[7]

Their story unfolds across an especially remarkable timeline —- one that could be rightfully labelled as "a series of unfortunate events". The group was active between 1989 and 2003, when it ultimately dissolved (after going through several iterations and reconfigurations in between). This situates its inception just at the tail end of one of the toughest periods in recent Peruvian history: the later years of the first presidency of Alan García and the catastrophic consequences described above. Severe import restrictions generated by an aggressive import substitution policy, and a monetary policy generating yearly inflation rates of up to 8,000% and restricted access to foreign currency, made access to any form of technology or electronics incredibly limited. Informal distribution circuits for consumer electronics smuggled into the country became common in the bigger cities such as Lima, and as far as games were concerned, they became the primary distribution channel throughout the 1990s.

In this environment, TEG was born as a Commodore 64 (C64) coding group, heavily focused on making software available to the C64 community existing at the time in the city of Lima. Their self-documented history portrays them as a "Robin Hood" figure of the C64 informal software distribution scene: many other groups active at the time were in the business of importing and selling C64 pirated software at a profit, going through the process of cracking the software themselves to defeat various early forms of copy protection. These groups would sometimes go as far as to appropriate software from other cracking groups and replace their credit and attribution information with their own, something with which TEG took huge issue on the grounds of respecting the intellectual moral rights of authors over their "creations" — because of the skill required by the programmer to crack the software, TEG and others considered this accomplishments to be creative in itself. By contrast, TEG made no profit on the software they made available (although they would sometimes charge

[7]Perhaps as a testament to its 90s heritage, the website runs on outdated Active Server Pages, a relatively popular mechanism for dynamically generated content at the time, delivered by what seems to be an aging Microsoft IIS web server which can often be found offline. When fully printed out (as I had to do on account of the frequent blackouts in availability), the archive spans 236 pages containing articles, game descriptions, member lists, event records, photographs, amongst other various things. The online archive also contains assorted related files such as disk images and playable files for some of their game projects.

depending on the amount of effort invested, or the cost of acquiring the original software) and encouraged its distribution through then-nascent telephone Bulletin Board Systems (BBS) where the files were available for download, or through self-organised "copy parties" where people could bring their own 5 1/4" floppy disks and get their own copies of software. In some instances, TEG would even take the commercially-available cracks and crack them again openly to then distribute them through these alternative channels. When I spoke to Mr. Byte in Lima, he described to me how TEG's distribution network reached dozens of operators across the entire city, giving them the capacity to spread software across the entire community in a matter of days, and doubling as an intelligence-gathering network providing information on their competitors.

The BBS they operated and the copy parties were the early forms of alternative infrastructures TEG set up to enable community building and information circulation. At the time, the Compañía Peruana de Teléfonos (Peruvian Telephone Company, CPT) was publicly owned and operated, making telephone calling rates very cheap. While quality of service was inconsistent and connectivity speeds for data connections very low, it made it affordable and feasible for users to connect to a BBS and download files, even if it meant remaining connected for several hours.[8] At the same time, an outdated legislative framework regarding intellectual property encouraged a fairly lenient attitude towards transgressions and violations of copyright, which became the umbrella under which informal markets around counterfeit and pirated goods grew and events such as the copy parties could take place with relatively little concern. Copy parties, in turn, were about more than just the circulation of software: because of the high regard TEG had for cracked software as a form of authorship, copy parties were partly about celebrating these authors and providing them with a venue where they could present their work. Through this exposure, TEG was also contributing towards building a sense of community among crackers and modders in the C64 scene in Lima — something that was, to an extent, intentional: Mr. Byte, the group's

[8]Bulletin Board Systems operated through direct telephone connections: users would use a modem to dial directly into another terminal (a host) waiting for connections. Some hosts were capable of sustaining multiple concurrent connections.

founder, had been exposed to the *demo scene* of hackers and crackers while living in Europe at a young age, and upon his arrival in Peru he was very interested in replicating that sort of community feel in Peru. This connection made the early game development scene in Lima resemble in several ways the ethos, practices, and attitudes of the European *demo scene*.

In the 1990s, the neoliberal reforms of the Fujimori regime would affect the group's operations in various ways. Fujimori's victory was a surprise to everyone in 1990 — even himself — and he quickly found himself in need of a team to take control of the Peruvian government. His economic team came to be composed of neoliberal economists and businesspeople who quickly pushed for a market-based agenda of deregulation and privatisation, following the recommendations of the so-called "Washington Consensus" pushed for by the United Nations Economic Commission for Latin America and the Caribbean. The package of reforms implemented in Peru — collectively known as the "economic shock" — included privatising several inefficient and costly private utilities, including the CPT, which was auctioned off to the Spanish telecommunications giant Telefónica. After privatisation, calling rates rose dramatically and essentially crippled the BBS community, while Internet adoption was still slow and costly. As the country was trying to re-embed itself in the international financial and commercial community, it was especially susceptible to international pressure on trade issues. This led to a sustained effort from the government to strengthen property rights, leading in turn to a full overhaul of the nation's intellectual property legislation in 1996, which was updated to contemplate newer media (such as software) and to facilitate enforcement by law agencies. A new government agency for the protection of intellectual property was created (INDECOPI, the Institute for Consumer and Intellectual Property Protection), and pressure to crack down on piracy, contraband and counterfeit goods was significantly incremented in line with the interests of new trade groups such as the Business Software Association (which represents the interests of software firms such as Microsoft and Adobe, among others).

The rapidly changing context made it increasingly difficult for TEG to operate as

a hacking and coding group, as originally conceived. The group was active through the entirety of the Fujimori regime and the democratic transition between the years 2000 and 2001, when they attempted to regain some traction after long periods of inactivity and instability by releasing a series of games fitting the political theme of those years: *The King of Peru*, a fighting game starring local politicians participating in the elections as playable characters, garnered them enough media attention that they developed and released a sequel the following year. *The King of Peru 2* was the first locally developed game to be published and distributed for the domestic market, at the time being sold in physical CD-ROM format at retail establishments. However, it ended with them getting into a complicated legal dispute with their distributor over royalties generated by the game (which is, of course, extremely ironic considering the group's origins). The financial pressures stemming from the legal dispute took a big toll on the group, which quickly had to scramble alternative forms of funding: the group released *Samba de Oruga*, a pornographic knock-off of Tetris, under a model they termed "polladaware" (following the Peruvian popular tradition of "polladas", neighbourhood parties thrown by hosts to raise funds towards some particular cause) — an independent release for fundraising purposes. Unable to raise any further resources to continue their battle in the courts, the group ultimately folded for the last time in 2003.

The influence TEG had in the overall game development scene in Lima is hard to map. Their production was certainly remarkable: according to their own records, they released three games commercially (including the first Peruvian independent release, *The King of Peru 2*, and the first Peruvian release in the European market, *Gunbee F-99*), seven games as freeware, two game development code libraries and twenty-six hacked versions of console games. They're perhaps better known amongst players in Lima in the 1990s because of their console hacks: *Fútbol Excitante*, a hacked version of Konami's *International Superstar Soccer* that included teams, players and uniforms from the local football tournament, was a big hit with local players, circulating exclusively through informal markets and to this day being one of the very few references regular players will associate with Peruvian game development. According

Figure 2-4: A screenshot of *Fútbol Excitante*, displaying two of the local teams hacked into the game. Mod by Twin Eagles Group based on an original game by Konami.

to Mr. Byte, the projects they did for consoles became one of the main funding sources for the group because of high demand, but it quickly became troublesome to manage: pirated game distributors were less-than-trustworthy characters, and Mr. Byte described to me how, upon trying to disassociate themselves from one project, group members suddenly found themselves targeted by police agents who went as far as to raid one of their houses, seizing various forms of equipment. After that, the group decided the risk of operating in that market were not worth the potential rewards.

A significant share of this work was just happening through a process of reverse engineering: given the lack of formal training or available documentation, and until access to information through the Internet became widespread, the only way for TEG members to understand how these technologies worked was through elaborate forms of tinkering. They would observe a piece of software operating, paying close attention to how changes on the interface translated to changes in memory addressing and instructions at the lowest level of programming. Based on their reconstructed

understanding of the software, they would then recreate pieces of code until they behaved exactly the same; or they would intervene in the normal operation of a program to inject operations and instructions at that very low level. The relative simplicity of computing platforms at the time played doubly to their favour: given the limited capacity of available technologies, the ceiling for what could be accomplished by smaller groups of programmers was within their reach; while at the same time, user expectations were considerably lower than what one would find today in the market. The Commodore 64 machines on which they began their work on were special in that they made no distinction between user and programmer: to use the machine was to introduce BASIC code into it directly. Software distribution had very little difference from code distribution, a distinctive trait that would vanish over time first with the IBM Personal Computer model, and later with the hegemony of Graphical User Interface (GUI)-based commercial software such as Microsoft Windows. But in the world of the C64, if you could operate a terminal it pretty much meant you could program that terminal to operate differently.

However, TEG's reverse engineering practices were not strictly limited to the technological. At a micro level, TEG was also negotiating their inclusion into global practices of software development and of gaming culture, and negotiating the place for local culture in the emerging transnational world of games. The ideals of the Free Software Movement were just beginning to be crafted through the 1980s, and the open-source operating system Linux would not see a first release until 1991, but the news about these developments had clearly not reached the group when they were circumventing copy protection on software and openly distributing it online —- there is no mention of any of these in their records and, especially, in the issues of their early-90s discmag, *Smiling Panda*.[9] But they were engaging with communities at the international level: their Amiga commercial release, *GunBee F-99*, was distributed and reviewed in Europe, and they have several records of communications with similar cracking and coding groups in Europe, Mexico and Argentina — as TEG's cracked

[9] *Smiling Panda* was published and distributed as floppy diskettes containing C64 executable code, or as disc images downloadable from TEG's BBS.

software improved in quality it found its way to neighbouring countries, where fellow crackers would write back and share their own works over postal mail. TEG managed to build a transnational reputation when the circuits for doing so were elementary at its best, and it also managed to import a series of practices, attitudes, and beliefs from their connections with the European demo scene. Furthermore, a significant part of their documentation was made available in both Spanish and English, evidencing they understood their audience to go beyond the strictly domestic, or even regional community. In some ways they operated as a bridge between both worlds, for example by actively maintaining a dictionary file to help programmers in the local community better acquaint themselves with technical terms in English commonly found in books and magazines. And their own game production can also be said to exemplify this reverse engineering of global practices: with games such as *Fútbol Excitante*, they were making a global commodity more meaningful to a highly specific local community. In terms of what those representations symbolised, however, they were also opening up a space in which the local community and the local culture could begin to imagine itself as portrayed in games — a space that has become heavily contested and controversial over time.

Yet the fact remains that not only did TEG disappear from the gaming scene in the early 2000s, but it also failed to leave behind a clear legacy. A significant share of older gamers today are still able to identify and relate to *Fútbol Excitante* to this day, but only a small subset of them would know that TEG was behind it, or that it existed at all. For all their efforts and contributions towards bringing together a community of developers, many of their attitudes and beliefs towards the practice of game development would turn out to be divisive over time. The issues of *Smiling Panda* are composed of a series of poorly constructed interviews to group members and friends where they attack, mock, and ridicule people from other groups in no uncertain terms. Their rhetoric was built on an essentialist dichotomy between the categories of "crackers" and "lamers", the latter being a category used loosely to describe people who couldn't code, people who stole other's code, people who relied on game development toolkits and game-making software, or generally anyone who

disagreed with TEG's practices. Their collected archive of Peruvian video games includes a telling disclaimer: "We take in count videogames that were developed by programming them (in assembler or C, mainly). Games made with authoring tools like Flash, game-makers and level map editors will be NOT INCLUDED in this list because those tools do not promote the Investigation, Programming and Optimization knowledgment"[sic]. Because so few people at the time knew much about programming, setting such a high bar for inclusion meant most people going through the learning process would automatically fall under the category of the lamer. Technology evolution also contributed to this, as IBM-compatible PCs emphasised the distinction between users and "professional" programmers with access to development tools, pushing the practices of hacking and tinkering away from everyday computing. Over time, the group would find it increasingly hard to recruit members as it clung to fading technologies such as the C64 and Amiga as generic PCs and video game consoles, which they regarded as inferior machines, began to gain the larger market shares. The group went through multiple cycles of deactivation and reactivation as it reinterpreted its technological base, its operating model, but also as it dealt with the fallout of alienating people in the local development community through things such as *Smiling Panda* — in all fairness, probably just as you would expect from a group of kids who were barely allowed to legally drink, and suddenly found themselves managing a clandestine software distribution network with an international reputation. When I talked with Mr. Byte at his home in Lima, he leans back and smiles when talking about those days — "we were just kids", he tells me in disbelief.

2.5 Local Area Networks

The video game industry in the early 2000s looked very differently from what it looks like even just a decade later. The big splits in the gaming community were perceived mostly in terms of platform selections, with big camps around console gamers and PC gamers. Multiplayer experiences were limited to concurrent forms of play on console games, or Local Area Network (LAN) play for PC games. Because of the cost factor

associated with both these forms of play experience, access remained limited in the Peruvian market throughout the 1990s for play experiences within the home. Instead, alternative environments of play became increasingly popular, and were collectively referred to as *"vicios"* (literally, "vices"). *Vicios* became very popular especially in lower and middle class neighbourhoods in cities (and then again, primarily in Lima), where families had a smaller chance of getting access to their own hardware at home. Console-based *vicios* would regularly operate at some neighbourhood home or commercial establishment, where the operator would set up a bunch of television sets connected to consoles, and players — usually kids and teenagers — would rent out time on one of those consoles and play any of the games available in the vicio's collection during that time. Time was rented by the hour and was usually very cheap, and because operators were often known in the neighbourhood there was not too much concern (at least initially) about kids spending time in the establishments. This sort of operation made it possible for gaming to become a media experience available to people across social classes, and it also structured the play experience as considerably more social than it would have been for kids had they had the hardware available to them at home.

A similar thing happened with PC-based *vicios*, although in their case operations tended to double as Internet cybercafés at least for part of the time. Internet cybercafés, known locally as *"cabinas públicas de Internet"* or "Internet public booths", became very popular throughout the 1990s and the main vehicle for Internet connectivity for most of the population until very recently in Peru.[10] Precisely because they became so popular, competition was fierce and prices were extremely low, effectively precluding operators from any business model other than just sustainability. Some operators started incorporating gaming options as a way to diversify their offerings, including setting up more powerful hardware to withstand the requirements of popular games, as well as networking features such as hardware and protocol layers to improve the gameplay experience (El Comercio, 2008). In some cases, operators

[10]Public Internet access through cybercafés was an important driver for connectivity in many countries in Latin America during the 1990s and 2000s. Cf. Proenza (2012) for an updated take on its impact in several countries.

would set up a separate room within their facilities specifically for gaming, both to isolate the noise from the rest of the patrons and to provide a distinct experience for players — a cybercafé I recall visiting frequently in the 1990s would have the gaming machines in a darkened back room, with graffitis and player nicknames all over the walls and black lighting defining the ambience — or, when their client base became so inclined, would just change their focus entirely to games, with Internet access becoming a secondary focus. Playing in *cabinas* became popular enough that it got its own verb — *"cabinear"* — and would become a regular activity even for kids who did have access to the hardware at home.

Unsurprisingly, these seemingly unregulated and unsupervised play spaces — where kids were getting exposed to new, poorly understood forms of media and entertainment often including graphic depictions of violence — began to draw attention and to become the focus of a new generation of moral panic surrounding kids, media and technology. The first systematic study of the relationship between video games and children done in Peru that I've been able to find was published in response to this moral panic: in 1996, María Teresa Quiroz and Ana Rosa Tealdo published *Videojuegos o los compañeros virtuales* (Quiroz & Tealdo, 1996), notable in that it was the first attempt to respond to these growing anxieties with actual research and data. Quiroz and Tealdo attempted to situate the video game experience in the context of other media experiences and studies, and through interviews and surveys administered to school-age children they wanted to find out what kids were actually thinking about, rather than what adults were claiming kids were thinking about. While their study had little impact on the public perception of games, it is nonetheless interesting because of its attempt to open up broader conversations and considerations regarding the impact of games and the social context in which play is happening:

> From the point of view of intergenerational communication, it could be said that there is a sort of transmission of the "knowledge" of games taking place that resembles what oral tradition is like. (...) Obviously games are, too, a cognitive exercise, and in that sense, small children are unaware of "being playing". For them, games are a serious activity,

> we could even say constructive, in that it works towards constructing and developing intelligence, exercising symbolic thought, assimilation and accommodation. (Quiroz & Tealdo, 1996, pp. 43-45, translation mine)

The knowledge transmission that was taking place in the *cabinas* and *vicios* began to articulate into strong community ties over time, as people who patronised individual establishments would become acquainted with each other through play, and hierarchies would form based on skill and dexterity. The communities that formed around *cabinas* and *vicios*, in turn, became over time the foundation for teams and leagues of competitive play, with teams establishing their home base and their training regime around a specific *cabina* — often receiving support from operators who would allow them to pull training all-nighters at a discount. The more experienced players would often help newer players in understanding strategy and tactics for a game, and in this way, they developed and established their expertise and credentials as resident specialists. Almost a decade later, many of the Peruvian players currently on international professional circuits such as the World Cyber Games (WCG) had their start playing in the *cabinas*, with many still doing so for training purposes (Gestión, 2013a).

The evolution of these play spaces is also interesting for two additional reasons. On the one hand, because they were, for many people currently in the industry, an initial point of contact with the universe of gaming, as they provided an affordable access point with a wide distribution. As I heard consistently when interviewing developers, *cabinas* and *vicios* had been in many cases not only forms of entertainment, but also the beginning of their engagement with games more broadly. On the other hand, the spaces themselves went through a process of formalisation and professionalisation, as competitive gaming went from being a hobby, to an interesting niche, to a sizeable business opportunity — not only in Peru, but around the world (Taylor, 2012). While the original tournaments were largely community affairs, more recent editions are already attracting big brands and, consequently, finding it necessary to "clean up their act" just enough that sponsors will be willing to get involved, and players will still feel the space as their own.

This trend towards a cleaner, more formal scene was in line with larger changes in the game industry happening through the 2000s, and that would also impact the game development industry directly. Both *cabinas* and *vicios* made sense as play spaces because games were mostly bound to either consoles or PCs. With the industry so heavily configured around the hardware, it seemed at the time hugely unlikely that a Latin American video game industry would emerge that would be anything other than cheap labour assembling consumer electronics (Lugo *et al.* , 2002) — certainly not the most exciting of prospects. TEG had proven that making games, even in this landscape, was indeed possible; its decline had also clearly shown how little command was available over the rest of the value chain for a group to get a product out to the market.

But the entirety of that value chain would significantly change in the course of a decade. When Valve Software introduced Steam in 2003, a new digital distribution platform specifically for games, nothing materially changed overnight around how games were circulated. But it did introduce a series of new possibilities for people to imagine: Steam (or rather, digital distribution) offered, at least in theory, the prospect of developing a game anywhere in the world, and then being able to sell that game to players anywhere else in the world. If your local market was underdeveloped or small, you could theoretically reach a massive audience spread out around the world. In other words, digital distribution introduced the possibilities of Chris Anderson's long tail model to the world of games (Anderson, 2008). Given the Internet, your potential audience was the entire world — or at least, that was the promise on paper.

The prospects of digital distribution became even more interesting as they decoupled from the desktop computer. Newer generations of consoles also introduced some mechanism for digital distribution of content, in an effort to not only introduce channels for selling games to customers, but also to engage more broadly with the growing independent development community. The introduction of mobile phones with increased computational capacity — smartphones — along with faster persistent data connections shifted what gaming and gamers looked like, and the platforms for content and software distribution that came along with them (such as Apple's

iTunes App Store or Google's Play store) essentially created entirely new audiences for games, including audiences who would be hesitant to self-identify as "gamers". New devices and new audiences also implied new experiences related to gaming and play in new contexts, leading to the appearance of "casual games", as described by Jesper Juul: "games that are easy to learn to play, fit well with a large number of players and work in many different situations." (Juul, 2012) Especially for independent developers, casual games and mobile devices meant a significant increase in their potential reach: console development implied gaining access to heavily policed and protected walled gardens, making PC game development the chiefly viable independent option. Smartphones, without being universally accessible or immediately available to anyone, still created a significant expansion in the possibilities.

Just as distribution and consumption were undergoing heavy transformation, so was production. Many new options for game development have become available in the last few years, beginning with Adobe Flash, which made simple animation for the web more affordable and accessible (and coupled with Actionscript, Flash's built-in scripting language, capable of handling events and actions in a game) because of its huge installed base. The evolution of the HTML5 standard and various forms of Javascript libraries for game development have made it considerably easier to develop games for distribution through the web for desktop computers or mobile devices — at the same time, allowing for content distribution without the need for additional plug-ins such as the Flash player. Additionally, new options are now available for game development engines that are powerful and considerably more affordable than popular commercial options in the past. Released originally in 2005, the Unity game engine — a darling of the independent game development community, regularly sponsoring events and conferences and actively engaging developer groups — enables people to develop complex 3D games at a fraction of the cost of building the same toolkit on their own, while also having the option of exporting binaries for multiple platforms from the same codebase. Similarly, the Construct 2 game engine, developed since 2007, provides tools for simplified HTML5 game development, with its output being compatible with multiple platforms and mobile-friendly. While game development

is by no means easy, the evolution of these tools, frameworks, libraries, and engines has made it considerably easier than it was, for example, during the time TEG was active.

But I do not wish to give the impression that because game production, distribution, and consumption were undergoing transformation and expansion, the industry was somehow becoming more open, welcoming and easier to navigate. While these largely technical changes created new opportunities, they also generated their own challenges. As an illustration, while digital distribution made it easier to reach wider audiences, it also made the environment more competitive with thousands of projects now competing for the attention of a more fragmented audience. Similarly, the introduction of casual games required new design and marketing approaches and introduced tensions between "hardcore" and "casual" gamer markets. And the expansion in development tools and resources opened up new creative opportunities for game developers, but it didn't necessarily make the process of getting a game out to players any simpler.

The structural transformation of the gaming industry did mean that institutions built on top of it were forcibly reconfigured. In the Peruvian context, for example, it has translated into a diminished importance of the role of *cabinas* in providing a space for general gaming experiences, and the almost complete disappearance of *vicios*. And it should also lead us to re-examine the claim that a Latin American gaming industry would be impossible except for low-cost console manufacturing, or similar forms of precarious technology transfer. For one, the story of TEG is a clear indicator that video game development was already happening at the informal and non-commercial level. And these structural changes in the industry opened doors and windows of various shapes and sizes for new people to become engaged with game development. A clear example of this shift can be found in the story of Bamtang Games, the largest and most successful video game studio to come out of the Peruvian industry, which began operating in 2003 — precisely the same year that TEG was coming to its end.

Bamtang Games is an illustration of how the game development industry underwent a formalisation process of their own through the 2000s, distancing itself from

its grittier roots and attempting to develop a clearer understanding of what it meant to operate as a game studio. Right from the start, Bamtang was set up as legally constituted organisation, fulfilling tax obligations and providing full benefits to the members of its very small team (no more than six people through at least its first three years of operation) — on account of one of its founders having a background in law and wanting to make sure they were covered on all grounds. For a long time, Bamtang operated basically as a research organisation, working on a physical boxing game prototype which required significant investment in both hardware and software development, most of it done in-house, while at the same time trying to figure out how the market and the industry operated in order to secure distribution for their game. Even though their early physical prototype was never released, it provided them with enough understanding of how the industry operated and enough exposure internationally through venues such as the Game Developer Conference (GDC) in San Francisco, California, that they were able to shift their own expectations and reconfigure their operation around game development for desktop and the web, using Macromedia (later to become Adobe) Flash. For almost three years, Bamtang was essentially going through a learning process, both technical and operational.

With the creation of Bamtang begins what I consider to be the second stage in the history of Peruvian video game development — when a largely informal creative community began to move from the hobbyist/hacker mentality towards the independent developer ethos. Bamtang became the first experiment of this new era, but just as it illustrates a significant shift in practices and attitudes, it is also a highly exceptional case that can hardly be said to stand for the entirety of the industry. For one, Bamtang was able to put together enough resources to sustain itself through its learning and research process. For another, the studio was founded on the premise that it would aim directly for the international market and totally bypass the domestic one, because it was so riddled with piracy issues it would just prove unsustainable. Even further still, Bamtang was founded by people with significant professional experience in different fields — and while they did not have a clear understanding of the game industry when they started, it spared them from having to figure out legal,

Figure 2-5: Opening screenshot for *Adventure Time: Righteous Quest*. Developed by Bamtang for Cartoon Network.

accounting and other operational issues just as they were trying to get a sense of the games component. These three characteristics already set Bamtang apart from many other game studio projects in the Peruvian game industry, but while they may make Bamtang exceptional, they also stand as indicators as to things the broader industry needs to establish successful, sustainable operations.

All of which brings us, after doing this long and diverse historical overview, closer to the current configuration of the Peruvian video game industry, and the result of its evolution and its practices. To understand how the video game industry has come about and what's at stake in its growth and existence, it is important that we have a historical sense of how technological processes have unfolded throughout Peruvian history and how they've been connected to larger negotiations of agency around the economy and the deployment of the structures considered to make a nation "modern". Conversely, it is important to understand how the history of game development provides an interesting counter-narrative to the way technology is usually deployed in countries such as Peru, pointing in this case to the creative activities informal communities are already deploying on their own. Finally, an overview of

how the game industry has been structurally transformed over the last decade, and how that has been correlated to the transformation of the institutions that configured game culture and industry in Peru, provides us with the platform from which we can zoom in for a closer examination of what the industry looks like today — beginning with the ways in which developers are engaging the industry, picking up skills, building expectations, and exploring new creative opportunities.

3

How to Become a Worldbuilder

As it turns out, making games is really hard. A lot harder than playing them.

Making games is challenging enough that you can make a game out of it: Australian game studio Greenheart Games released *Game Dev Tycoon* in 2012, a game about, well, making games. In the game, the player takes the role of an entrepreneur working on their own game studio project out of a garage and having to manage the various aspects of developing a game. The player makes decisions on the genre and type of game, the development platform, as well as various design decisions as to how to allocate developing time — all while trying to stay current on emerging technologies and design trends, hiring and managing staff, marketing their products, and making sure the studio doesn't run out of money. As the game progresses, the player's studio grows out of the garage and into its first office, as development budgets increase and the studio's fan base begins to expand.

Game Dev Tycoon does a very good job at illustrating how video games are complex systems with multiple moving parts. Even the simplest of games requires the successful coordination of many things happening at the same time: the display of graphics, the capture of user input, the calculation of rules and positions, the updating of records and databases, and the transmission of game information across data networks, to name some of them. The process through which all these pieces are assembled together in careful fashion is the process of game development, a process in which many different people with many different skills need to come together, make

decisions, build on each other's work and deliver a finished product before running out of resources — those resources being financial, social, or creative in nature.

But from an outsider's — or even a player's — point of view, it is very hard to understand just how complex the game development process is. It is not immediately evident how complicated it can be to even make a bad game, and as games have a tendency to being conflated with entertainment products such as toys, they can often be taken as not being "hard" or "serious work". Even more so, the opacity of game development also obscures the journey it takes for a game developer to become skilled at their craft, and the various hoops they need to jump through to acquire competence. There is no one path for the game developer, but rather a garden of forking ones, with the additional difficulty that many of those paths circle over themselves or exit the garden entirely. While some people are content to remain at an amateur level, making games for fun whenever possible, some others actively look for ways to turn fun into profit, and to break that boundary that distinguishes a hobby from a career.

This has certainly been the case of the game industry in Peru, where the game developer's journey towards competence and skill is complicated by both a very tangible lack of learning and training opportunities and options, and a very intangible set of social prejudice and stigma around a practice often portrayed as being "childish" at best, and even "deviant" as worse. Would-be professional game developers not only need to figure out creative ways to learn their craft, often turning to forms of alternative infrastructures whenever the established ones have failed them, but they also need to navigate carefully around awkward conversations at family dinners and concerned questions from close friends. Both these aspects contribute to structure the way in which Peruvian game developers come to be and come to operate, by banding together not only to learn from each other, but also to operate as a support group within which their choices become meaningful. These developers are assuming perceived levels of social and financial risk that are not always correlated to the game industry's actual prospects and opportunities. This social construction of risk ends up affecting people's willingness to move into the industry or to remain within it over time.

In this chapter, I will outline the various mechanisms through which video game developers I met while in Lima have learnt the skills they need to fulfill roles in the video game development industry. In doing so, I want to show how this learning process has been relatively chaotic in that it has been organically driven by a community of people sharing a common creative interest and experimenting with various mechanisms to enable them to pursue their individual and collective creative objectives. Because people developed an interest in creating video games, they've slowly come together to figure out, mostly through trial and error, what they need to learn and what the best way learn it is, and they've done this while facing severe shortages and gaps in terms of educational infrastructures and professional training options. Because of the structural deficits in Peruvian education, for a long time the game development community has been forced to set up forms of alternative infrastructures — *ad hoc* assemblages of technologies and social networks that compensate for gaps in established infrastructures — that build on the community's drive to create learning and information-sharing opportunities and environments. These alternative infrastructures are also becoming effective at exerting pressure on traditional infrastructures, by highlighting the gaps and evidencing demand for solutions, and thus driving the creation of traditional learning opportunities in various aspects of game development. In summary, what I want to present in this chapter is just how important the issues of learning and skill acquisition are for creative industries such as video game development, how the Peruvian game industry has self-organised to address the gaps in this processes, and how these issues are connected to broader industry problems affecting available talent and the capacity to scale projects and firms.

I will being by briefly describing how I engaged the game development community in Lima and how I gained access to them, explaining the various identities I had to negotiate myself in the process. Then I want to unpack what the process of game development looks like, to provide a sense as to what the roles are in a team, what the production process looks like, and how that general sense is reflected and appropriated by the industry in Peru. I will follow that by jumping into the perceptions and

experiences that drove people into the industry and continue to drive those who remain engaged with it, in turn to follow that by analysing the learning processes and systems the community has put in place to circulate information and develop skills when formal learning opportunities are scarce, inadequate or plainly non-existent. Finally, I will address the social prejudice and stigma that has existed around games and game development in Peru for over two decades and how it affects the industry broadly, as it affects how young people interested in game development create their own perceptions of career path, status, and the risk they're willing to take to pursue their creative objectives.

3.1 Gaining Access

In May 2013, I arrived in Lima to spend three months there getting acquainted with the local game development industry and, as much as possible, to embed myself in the production process and the culture of the local community. Between May and August, I talked to as many people involved with the game industry as were willing to talk with me, as well as people involved with the broader startup ecosystem that surrounds and has multiple points of contact with the game industry. I was able to hold both formal and informal interviews with game developers working in the industry in various functions, including programmers, artists, game designers, producers, and business managers, as well as hang out with them in their offices or their homes, and collaborate in projects, game jams or brainstormings.

While these conversations and visits were extremely helpful, I also had the opportunity to engage one particular game studio much more in depth. I became closely acquainted with the work of a studio established just a few months prior, made up entirely of younger people who were having their first experience together trying to make games commercially, and as such were facing a series of organisational issues and growing pains that became extremely illustrative and resonant of the common issues other people were bringing up to me. After having some initial conversations, the members of this studio agreed to allow me to meet with them regularly and tell

me more about the progress of their projects as I helped them brainstorm through the business and marketing strategy they felt they needed. This collaboration proved to be especially helpful in providing me access to the inner workings of a Peruvian game studio, and after meeting with me on a weekly basis the group felt much more comfortable and confident sharing with me more private information that helped me better understand the mindset of local developers.

How I gained acess to the game development community as a whole merits a few additional comments. Firstly, it quickly became obvious to me that my presence around these studios and developers would never be even remotely neutral: arriving as a researcher from MIT, the institution's clout around innovative technologies became something I had to sort through, as it had an influence on people's expectations of who I was and what I was able to bring to them. Many conversations would not have happened had I not been able to hand out business cards with an MIT logo on them; at the same time, I had to be very careful not to abuse this and create unwarranted expectations of what I could or would contribute.

I had to be permanently aware that that same effect acquired importance because my presence as an MIT researcher gave credence to the industry's prospects and claims. The very fact that I was doing this research meant for many people that there was something worth researching and sharing internationally. Which in turn meant that members of the industry also had their own agenda in trying to showcase me in front of themselves and other institutions as providing a sense of validation. This became evident to me as people I was interviewing told me of how they knew of my research even before I had contacted them, and spoke excitedly about the high hopes they had for the results. With or without my collaboration, I had to quickly become aware that a championing role had been carved out for me, while at the same time, receiving the support of so many people in the local industry implied for me I couldn't just be a neutral bystander as to what happened to the community. While this does not imply that I need to become a cheerleader for the industry, it does lead me to the understanding that the most important contribution I can have towards the Peruvian gaming industry is an honest and informed assessment as to its needs,

its challenges, its prospects, and how best to realise them.

Thirdly, in embedding myself into the operations of a highly technical creative industry, it was extremely important that I was myself at least somewhat technically proficient — at the least, proficient enough that I'd be able to carry conversations including references to algorithms, compilers, engines, development platforms, and not feel entirely overwhelmed. This was important in terms of establishing my own credibility with the people I was talking to, but also especially when trying to frame my role as bringing a contribution to the people I was working with. In becoming an attached team member, there had to be something I could contribute to the team based on my own expertise. Having prior experience working in technology development and being well acquainted with technical vocabulary and processes became a very important asset for me in gaining access to the game development community.

I make this aside because I believe it is important to articulate what my role was with these developers and the relationships we established, and how those connections were originally made and how they evolved over time. As in any instance of participant observation, my presence in the field immediately reconfigured the actions of the people around me; far from assuming this was a configuration that could be overcome, I want to acknowledge the ways in which my presence was felt and the influence it had and continues to have in the affairs of this community.

3.2 Opening the Black Box of Game Development

Shortly after my arrival in Lima, I was invited to be a part of a small game jam organised by a local studio with their own team and some friends.

Game jams are events were people gather over a weekend and crank out game prototypes as fast as they can, going from concept to design and implementation in less than 72 hours. People will often not sleep during a game jam, or alternatively it is not uncommon for people to show up with sleeping bags and tents to camp out during the event. The largest of these events is the Global Game Jam (GGJ) organised by the International Game Developer Association every year, happening

simultaneously in hundreds of cities and venues around the world over a common topic. Local editions of the Global Game Jam have kept growing in size and scope over the years, to the point where organisers were forced to turn people away for the 2014 edition because their space was simply at capacity, and satellite sites have emerged in other Peruvian cities such as Ica and Arequipa.

But thousands of game jams take place all the time, organised by smaller organisations or for specific purposes — such as this one, put together by a studio both as a fun thing to do over the weekend and as a mechanism to quickly formulate and evaluate potential game concepts they might want to put some more work into. Game jams, in this way, become a cheap and fun mechanism to do rapid prototyping, a practice that is not entirely alien to the indie game scene: high profile game studios, such as Tim Schaefer's Double Fine Studios, have a standard practice of running what they call "Amnesia Fortnights", a time during which they drop all of their projects and work on entirely different things and often come up with concepts and prototypes they'll return to in the future. For small teams operating on shoestring budgets, internal game jams, pitch competitions, or "Amnesia Fortnights" can all fulfill the role of alternative infrastructures for research and development.

I arrived early at the address I'd been given to discover the studio I was visiting had its offices in some of the rooms of a rather large house, in the upscale seaside district of Miraflores. The house had been retrofitted as office space to several companies, the largest one taking up most of the main areas, and two or three smaller companies working out the rooms in the back, past a small open-air terrace with patio furniture. As such, the space was hardly optimised, with small plywood desks with desktop computers filling as many nooks and crannies as possible. While I didn't know this at the time, this spatial pattern would become a regular feature of many of the studios I visited: retrofitted spaces where people make do as best they can.

Upon arriving, I was led to the terrace at back of the house, and where the people coming for the game jam were congregating as they arrived. Since the house operated as an office, the jam couldn't really begin until most of the people working had left for the weekend. In the meantime, people gathered to chat and drink soda and eat

Figure 3-1: Pitching game ideas at the beginning of a small game jam.

crackers, some with their laptops open working on code or image files. As I told them what I was doing (and where I came from), they were eager to show me the things they were working on, and already I began to get a better sense of what developing video games looks like as people didn't rush to show me their latest concept art or game prototype. Rather, the spotlight was put on helper tools: "I just finished working on this level editor," one of the programmers tells me excitedly. He then explains the logic: "We were hand-coding each of the levels for our new game, and each of them was taking us several hours. So we built this and we can now do it in minutes. And now anyone on the team can create their own levels, not just the programmers."

They showed me how it worked. The level design for their game required you to set up time-based puzzles around objects displayed on a touchscreen the player needed to tap in a specific sequence. The level editor turned the puzzle making into a drag-and-drop affair, with a sidebar to edit settings such as the amount of time a player will have to finish the puzzle. Once all elements are set up, a level designer could test the level without having to compile a full new build of the entire game, and then tweak accordingly based on the desired difficulty level. From a resource management point of view, not only could levels be created, tested, and improved much faster, but

the programmer's time was also released from the task of level design, allowing them to continue working on other coding tasks while other members of the team could then work on level design. This was doubly helpful, as well, because programmers are not necessarily ideally suited to level design: the team I was talking to at the time reported, rather, getting spectacular results when having a computational biologist working on level design problems, which he couldn't have done at all without the level editor. The developer of this sort of tools is contributing to opening up the range of available industry positions for people who don't necessarily hold technical backgrounds, creating a wider intake funnel for people who want to transition from being players to being developers (Tschang, 2007).

All through the following hour more people began to arrive, across a wide range of profiles. They were all in their late teens or early twenties, and while the ample majority were men, there were also a few women in the mix. Most people arrived with their own distinguishing equipment in tow: people working in sound carried full-sized keyboards, while artists packed sketchbooks and Wacom tablets. Most everyone had their own laptop, and especially for those who were lugging around larger equipment, they were already planning to camp out at the jam through the weekend. Many people lived considerably far away from the office location, and thought it was neither convenient nor safe to be moving across the city with such bulky equipment. This was the first indication for me of how the surrounding city was more than just a backdrop to the game development story, but rather an enabler or disabler to the creative activities happening within it: distance, mobility, safety, and convenience were all recurring issues that affected what people were willing or unwilling to do. Game jams and other projects require people to lug their equipment around the city, without having access to robust networks of public transportation and with growing insecurity problems through the city. For a young person working in code, design, audio, or some other task, getting their equipment stolen along the way is not only a major hindrance, but can also easily mean losing a very expensive and difficult to replace livelihood. This is an important issue to which I'll return on chapter five, when discussing how the perception of risk is constructed and how it affects the game

industry.

Once most of the people expected had arrived, everyone got together in a large conference room, and we went around the room doing introductions and talking about our individual backgrounds, experience, and skill sets. Some people worked in existing game studios, while perhaps most had very different day jobs and were just excited about the opportunity to work on making a game, if only for a weekend. Some were programmers, some were artists, some had had experience in game design from their jobs or from a previous game jam. Almost everyone had some previous experience, at the very least having attended a previous game jam, but this is not true of all jams: large jams, such as the GGJ, have no basic skill requirements, and people who've never gone through game development and have no familiarity with the process are equally welcome.

As the number of tasks and roles involved in the game development process grows larger, it is worth explaining in some more detail how game development teams are structured, and what their production process looks like — a microcosm of which was being instantiated over the game jam. While there is no one approach to rule them all when it comes to how games are made, there are a series of things that need to happen in one way or another for a game to come together. In his textbook account of the game development team, Bob Bates describes it as follows:

> Every company divides the subtasks of making a game in its own peculiar way. The work itself doesn't vary, but what each job is called and how it's done can change greatly from one company to the next. No matter where you work, though, the tasks stay the same. Each game must be managed, designed, and programmed, it needs art, sound, and music, and it must be tested. (Bates, 2004, p. 149)

While not all teams will necessarily have a person dedicated full-time to each and every task, all tasks usually need to be accounted for in order to develop a complete game (these roles are described individually in table 3.1). How local studios in Lima are structured is not too different from established industry practices for the

game industry globally, but what plays out differently is how resources are allocated based on their local availability. Exactly how many resources and attention a team will devote to any given production task is a result of the team's decisions before and during the production process, and what they understand to be more or less important.

The interactions between these roles and skill sets in the local community were playing out in the microcosm of the game jam. For example, the scarcity of available programmers meant that, realistically, there could only be as many jam teams as there were available programmers — and only if they agreed to not cluster around specific projects. If an idea pitch attracted no programmers, the idea was considered to be inviable. Musicians and sound designers could join any team they wanted, but they were expected to be available to any other team at some point over the weekend. And people participating who had no prior experience in game development were invariably lumped into the game designer category. There were few or no questions asked about people's skills in the narrative design or production areas, and as I would come to learn over time, these were tasks that were also expected from game designers, or not expected altogether. That the role of the game designer can simultaneously encompass so much (lumping together many different tasks) and so little (anyone without experience can do it) is a reflection of relatively little understanding there is about the contributions of game design as such towards a game development project — an issue that is inevitably connected to the lack of training and learning opportunities in the area of game development.

After an explanation of the logistics for the entire weekend, a member of the organising team stepped up to provide an initial creative jolt to the crowd and inspire them to come up with great ideas. He talked about creativity, and how successful teams in the indie game development scene around the world worked and what their stories were, showing how really successful and entertaining games had been the result of extremely simple concepts and mechanics, and reinforcing the notion that those some simple concepts could be developed in a single weekend — almost all of them anchored within the casual and mobile gaming categories, smaller games that could

Production Roles in Typical Game Development Teams	
Game Design	Game designers are responsible for formulating the core mechanics of a game and designing its system of rules. Designers will often be responsible for ensuring game balance between effort, reward, and difficulty, and for level/puzzle design.
Programming	Programmers turn the result of the game design process into a computational representation — a game engine, processing rules and presenting mechanics as interactions available to the user. Not only do they need to program games, but also a series of helper tools that support their work and their team's through the production process. Programmers will also manage any networking and connectivity issues related to a games' multiplayer capabilities.
Art	Game artists are responsible for the visual feel of the game world, its elements and characters. Video game art requires artists to be skilled at both traditional artistic techniques, and their digital representations: artists are responsible for turning their designs into elements programmers can interact with in the code. Some artists also double as 2D or 3D animators, and similarly need to be aware of the technical requirements of including their animations into a game.
Music & Sound	Not all teams included a full time sound designer or music composer, and they're not usually brought on board until the final stages of production. They're responsible for the audio feel of a game, including creating and synchronising any sound effects and producing the music for the soundtrack. They tend to work as freelancers, allocating a portion of their time to multiple projects.
Narrative	Narrative designers are responsible for creating the story world of the game, including the main plot and any side stories, as well as the design of any characters featured in the game. Writing for video games is a highly specific form of writing, as it needs to account for the possibility of the player traversing through the game world in non-linear fashion.
Production & Project Management	Within any team, someone is always responsible, or at least more aware, of where all the production elements are at any given time, and what remaining tasks are required to complete the project. The producer is ideally responsible for making sure everyone on the team has whatever they need to get their job done, and for solving any bottlenecks or issues that may come up during production.
Business/Support Roles in Typical Game Development Teams	
Business Management	Keeping the lights on and paying the bills. Commercial projects need to keep track of how much money they have left, and making sure people are getting paid.
Marketing & Distribution	Before a project is done, teams need to think about how they will handle distribution and getting their game into players' hands.
Research & Development	Not all teams invest separately in R&D, but some might devote some of their time into learning about industry trends, new technical tools and platforms, and to learn more about their target audience.
Testing	Testers systematically play through test builds of a game, based on a test script, and document any issues and bugs that come up to relay back to programmers. The scale and complexity of the testing process is proportional to the scope of the project.
Community Management & Customer Support	Teams are variably responsive to fans and followers, and especially to the concerns and needs of paying customers.

Table 3.1: A summary of the roles involved in game development and distribution

be pulled together by small teams in shorter timespans. Game titles and development stories from around the world were featured prominently, pushing forward the idea that *this, too, could happen to you*. The climax of this came towards the end of the presentation, with a slide showing an image from *Angry Birds*, by Finnish developer Rovio: "If Finland can do it, so can we" — a sentiment that I saw expressed multiple times during my time in Lima, and to which I'll return in detail in the next chapter.

What followed was a quick pitch session of game concepts from people who already had some idea to share with the group, and then we all broke out into smaller groups according to the idea we found most interesting. I joined a group working on a game called *Conclave*, a satire of the papal election process where players have to scheme and plot in order to get the other cardinals to elect them as the next Pope. The game design conversation ranges from the canonical and metaphysical to the highly operational, trying to determine what attributes, as a cardinal, the player would have, and what actions they could perform, as well as what conditions would need to be satisfied to win or lose the game. We were essentially designing the basic architecture for the game, and one of the members of the team was capturing everything within a shared document, the "GDD", or game design document. As I came to learn over time, putting together a GDD for a project is an extremely important stage in its lifecycle (Ryan, 1999a,b). In short, having a comprehensive and carefully designed GDD is not necessarily an indicator of a project's success; yet not having one is almost certainly an indicator of a project's impending failure, or at least of significant complications through its development process. What the GDD affords, in a nutshell, is a layer of arbitration between members of the team: it consolidates early design decisions so that discussions don't need to happen over and over again.

> Documentation means different things to different members of the team. To a producer, it's a bible from which he should preach. If the producer doesn't bless the design documents or make his team read them, then they are next to worthless. To a designer they are a way of fleshing out the producer's vision and providing specific details on how the game will function. The lead designer is the principle author of all the documen-

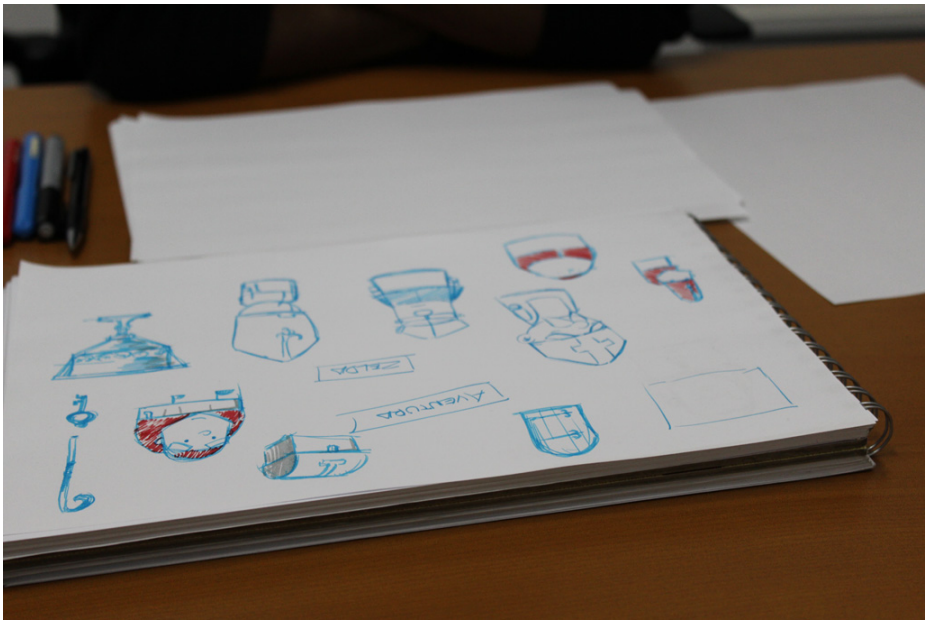

Figure 3-2: Early character illustrations for *Conclave*.

> tation with the exception of the technical specification, which is written by the senior programmer or technical director. To a programmer and artist, they are instructions for implementation; yet also a way to express their expertise in formalizing the design and list of art and coding tasks. Design documentation should be a team effort, because almost everyone on the team plays games and can make great contributions to the design. (Ryan, 1999a)

Many projects never get anywhere beyond the GDD stage; but no project should move forward without a GDD. In that regard, GDDs fall within a broader tradition related to the importance of documentation for the management of software projects (Berkun, 2008). The resulting GDD for Conclave included detailed descriptions of game mechanics and attributes, character profiles, as well as written out portions of dialogue for various character interactions. At any point during development of a project, any member of the team should be able turn to the GDD for orientation about what needs to be done and how.

The team worked on game design for a couple hours, and as we moved along, the team's artist was already sketching some possible character designs, and the team's

programmer was already scoping out some of the tools that could be used, clearly illustrating how, as abstract as game design can be, its process already touches upon the technical and artistic components of the project. Game design — understood in terms of establishing a game's rules, mechanics, and core interactions — cannot really move forward on its own, and while a project may have one or more people dealing with the game design layer, their work necessarily needs to touch upon the production aspects. After a while, it had already become pretty late and we had been having conversations non-stop for about three or four hours when people started to get tired and hungry, and we heard as much from the other two teams working on projects simultaneously in other rooms around the office space.

The group began to gather around the office lobby to take a quick break and go out to dinner. By now, it was almost 11pm, and we had been working almost non-stop for about five hours — with people fully intending to grab dinner quickly and get back to work. We walked a couple blocks to the nearest *pollería*, a restaurant serving Peruvian-style rotisserie chicken, where waiters pull together a long table for us all to sit down together. There were probably somewhere around twenty people, the large majority being men, and skewing visibly towards a younger crowd most likely in their early twenties. Most of them already knew each other from previous events which themselves made up the main topic of conversation, along with discussions of new tools and techniques ranging from game engines to graphics optimisation to audio software to graphics tablets, and so on. I got to learn more about the personal stories of the people around the table, as well: most of them were indeed young, and played around with game projects on the side, mainly concerned with being students or working in something different — for example, working in graphic design or producing audio for advertising, and working on game projects as much as time allows. None seemed to have any formal training specifically around games, but rather in more traditional careers that they had reoriented towards game development. And many had made a special effort to get there that evening, either travelling long distances within Lima or finding some time after long hours in their day job to spend their weekend making games.

The chicken was great, and although the conversation was kind of awkward, I learnt a lot from the people around the table and had a much better sense of what it means to make games, and to be a game developer. The conversation over dinner, as with many others I had during my time in Lima, was also an important indicator of just how important these informal spaces are for the overall health and sustainability of the community: game jams are spaces that trade heavily on social capital to compensate for the gaps in other forms of capital and infrastructure that would otherwise make game development significantly more complicated — perhaps altogether inviable. An industry this small needs to build on its social networks and personal relationships both to get things done, and also to make the process more bearable for everyone involved. More than once did I hear people say they were tired, and ready to give up, but it was the energy and drive from other people that kept them going: informal gatherings, whether they're chicken dinners, getting together for a few beers, or putting together a game jam, are therefore important sites for creation, accumulation, and circulation of this social capital that can later be transformed into collaborations, partnerships, and projects.

While I couldn't join the group for the entire weekend, I had only just arrived in Lima, and would run into several of them many times over in the following months. We left the restaurant and I said my good-byes. It was almost midnight, and the rest of the group is walking a couple blocks back to play a few games before jumping back to working on their projects — it was going to be a long weekend for them.

3.3 Gaining Experience Points

The personal stories of two relatively senior people in the local industry can be illustrative of how local developers figure out ways to learn the skills they need.

I met Martín[1] at his apartment, just a few blocks away from where his office was in Miralores. The apartment was adapted out of the back rooms of a larger house, so

[1]I've chosen to use pseudonyms when referring specifically to the personal stories many people shared with me.

the layout was a bit funky. We walked past a garage, turned around, then up a set of stairs. We sat at his dining room table, the walls around us sparsely decorated. He apologised for the simple *décor* — he and his girlfriend had only moved in there recently and hadn't had much of a chance to liven up the place. He pulled a tray of pastries out from the kitchen and set them for us to snack on, unleashing a wave of excitement from a small dog running laps around us. Perhaps more clearly than with other people, I got the sense that Martín was happy to have me over and very eager to talk with me about his work — a reflection, perhaps, of the fact that most people connected to the industry today seldom get the chance to talk about their work with outsiders.

Despite having only a few years in the industry, Martín could be easily considered a veteran, and a well-known figure across multiple studios. Before meeting with him, I had already heard his name being mentioned often, especially when asking people for names of others I should be meeting with in the course of my research. He's surprised, though, and perhaps even a bit uncomfortable when I mention this to him — but it still makes him smile. Martín has been programming video games for almost seven years, but he would be the first one to challenge that statement by claiming that most of that time, he wasn't *really* programming. "The difference," he explains to me, "between programming and *really* programming, is a passion."

Having had the opportunity to play games since he was a kid, and being around computers and programming thanks to his father being a programmer himself, Martín pursued a degree in software engineering at a technical school in Lima.[2] Shortly after that, he found the opportunity to begin working in video game programming for the first time — something he was not technically trained to do, but which he decided to try nonetheless.

> I always said that I programmed by intuition. I would code something, and it would work, sometimes it would fail, but I didn't really understand it fully. That's why I say that I wasn't *really* programming.

[2]While university degrees in Peru take usually a minimum of five years to complete, degrees from technical schools are usually finished around three years and are much more oriented towards practice.

Martín's journey from merely programming to *really* programming is illustrative to the journey many people, regardless of their skill set or the particular role they end up playing in the game industry, need to go through in order to acquire competence and become professional developers. Though there are many ways to describe how an individual acquires a skill and develops competence and confidence using it, C's description of his own learning process is reminiscent of Stuart and Hubert Dreyfus's model of skill acquisition, developed in the early 1980s (Dreyfus & Dreyfus, 1980). According to the Dreyfus model, the learner of a new skill, starting as a novice, transitioned sequentially through competence, proficiency, and expertise, before finally becoming a master at said skill. As the learner becomes better acquainted with the skill, the knowledge of it recedes from its practice, becoming something of an instinctive response, while at the same time becoming increasingly malleable and flexible. In the later stages of the Dreyfus model, improved skill levels are actually the basis for increased creativity, as practitioners are acquainted enough with the rules governing the practice of a skill that they can push and bend them, and play around with the boundaries.[3]

A similar transition can be found in Martín's recollection of his own learning journey. His early choices were inevitably constrained by the lack of diversity in options for pursuing careers related to software and computation in Peru. Most degree-earning programs, either at universities or technical schools, are branded as software or systems engineering. Computer science has only become available as an option in universities Lima since around 2013.[4] And the focus for most programs is heavily based on enterprise-level software. "They teach you how to work with databases, XML, but it's all enterprise software. They don't teach you how a computer works,

[3]Tim Ingold has a similar thing to say about skill acquisition from an anthropological point of view: "The novice becomes skilled not through the acquisition of rules and representations, but at the point where he or she is able to dispense with them. They are like the map of an unfamiliar territory, which can be discarded once you have learned to attend to features of the landscape, and can place yourself in relation to them. The map can be a help in beginning to know the country, but the aim is to learn the country, not the map." (Ingold, 2000, p. 415)

[4]It is worth mentioning that programs in computer science were available a few years prior in the city of Arequipa, in the southern Andes. Peru, however, does not have the tradition or infrastructure of the residential college system, and most young people either attend university in their own cities, or travel to larger cities such as Lima in search for better schools.

how an operating system works, how memory is managed, how a graphics card works, how it communicates with the processor." And much of this knowledge is what developing video games actually requires, as more powerful games have higher demands on hardware, and efficient optimisation can go a long way in improving one's product.

Almost inevitably, Martín had to work his way around this boundaries over time, by first becoming aware of how those constraints limited the kind of work he was able to do. It was this self-guided learning process, coupled with the tolerance from the studio he was working in at the time to allow him the space to do research on his own, that eventually gave him the tools to become much more confident — and creative — in his practice.

> I no longer see programming as something logical or perhaps structured, but rather as something creative, because programming can give you a bunch of variable types, a bunch of data structures, but if you see it from a different perspective, from another angle, it's like a puzzle.
>
> It's like Legos. You can build the same structure with a lot of pieces, or by using the least amount of pieces but achieving the same result. I see that as creativity. The more creative you are in programming, you can make wonders, using the least amount of resources.

In many ways, Martín is exemplary of an ideal of the learning programmer: one who not only goes beyond the code itself but becomes entranced by everything behind it as a driver of creativity (Papert, 1994). It is not easy to reach this level of skill, though. As mentioned above, for a long time there has been a lack of options for studying any of the skills needed for the development of video games at the professional level. The best most people have been able to do has been to peripherally introduce themselves into the relevant skill sets by acquiring peripherally connected skills — such as going into software engineering rather than computer science in order to acquire programming skills. Because the industry has remained small and mostly invisible to the public eye — as well as strongly discriminated against in the media — most learning institutions, even when offering programs that could be connected

to video games, have had no incentive to develop course offerings or specialisations in that direction. This makes it especially hard for practitioners to become acquainted with what James Paul Gee refers to as semiotic domains (Gee, 2007), "a set of practices that recruits one or more modalities (e.g. oral or written language, images, equations, symbols, sounds, gestures, graphs, artifacts, etc.) to communicate distinctive types of meanings" (p. 19). That is: active learning, as Gee describes it, comes not from being aware of specific forms of content or techniques, but from being able to deploy contents and techniques in productive, creative combinations. Martín did not have access to the environments that would have supported this sort of learning exploration, nor to the learning communities that would provide context and support to that learning.

In short, even for someone having the interest in getting involved in the development of video games, there were virtually no academic options available in order to get the skills to do so. And whenever the academic options were tangentially connected, the skills actually acquired were not directly aligned with what a game development project would require. This applies not only to programming: an art student can develop an impressive level of skill in their work, but they will still lack an understanding of the requirements of video game art, and how they affect the practice itself: textures, memory buffers, polygon counts, and other aspects that are fundamental in the creation of video game art.

The matter is somewhat moot, however, because to a large extent these learning institutions have merely been responding to actual demand — for a long time, people have just not been very interested in learning how to make games, from whatever point of view they might approach it. I learn this from Fernando, another veteran in the industry who's been around to see it grow from virtually nothing, to the stage where it is today. Fernando works for one of the oldest and largest studios in the local industry, and has been around almost since the studio got started — making his way up from artist, to art lead, to being creative director for the whole studio, just as the studio itself grew in number and size of projects.

Fernando himself went through the transition from traditional training to video

game-specific skills. He was able to do so to a large extent, again, thanks to the openness of his studio and the large investment they were committed to making in terms of research and development. "I would do the art," he explains, "I'd do one thing, and afterwards I wouldn't like it because I could see it was terrible. When I felt I had learnt, a few weeks would go by and I'd see myself getting better so I would throw away everything I'd done, and so every two months, every week I was throwing away stuff because we were getting better because I didn't know what the processes were like. It was constant learning from scratch. We really had no idea how to make a vido game."

Fernando's studio had to set up their own alternative infrastructure for learning — bringing in people who knew how to do things like algorithms or 3D modelling in order to train their staff, simply because there were no other options for them to develop those skills. But their commitment to a sustained research effort was not in itself indicative of a broader wave of interest in the world of game development, nor did they become a beacon for the community around them to flock in search of knowledge and skills. As it turns out, it was actually quite the opposite:

> We were isolated. We didn't know anyone else in the industry. 2005, 2006, there was no one, and it was really hard to get programmers, artists, because no one was even remotely interested in making video games. Nobody would bet on games, they didn't find it interesting at all. We even had one kid, a really good programmer — an odd fellow — one day he tells us he was leaving the company for a government institution — [the Bureau of] Immigrations, that was it — he said he loved it. [Immigrations] is a lot of information and data, but video games are much more interesting! And he left, because that's what he was into. It was really hard to find a programmer after that. We were still small, 5-6 people tops, and finding programmers was complicated because nobody was interested.
>
> Even keeping our first programmers was hard because they wanted to leave. Because they saw they had no future, they didn't see a career path,

> because in nobody made video games in this country, and doing it had no value. They were just there because we were paying them. And the same with artists.

A significant reason why people were not drawn to the industry, and perhaps even actively drawn away from it, was the large costs involved in acquiring the relevant skills. While some studios were able to set up their own alternative learning infrastructures, this was by no means the norm, as the direct financial cost associated to this were not insignificant. But other than private, isolated investments to refine the skills of people who had some form of peripheral training, there were really no additional options at the time. In the very early times of the game development scene in Lima, one could have found alternatives in the coding groups and the hacking scene that was modifying and circulating games through informal channels. But since those groups were deactivated, and the scene died out, these were no longer options.

Martín and Fernando are amongst the few who were able to make it past that relative scarcity of information and guidance. They're more exceptions than they are the norm, and the lack of learning and training options was — and to a large extent remains — one of the biggest constraints limiting the growth of the industry. Even when picturing highly optimistic scenarios of unlimited deal flow and ever changing projects, the number of available, talented people is simply not enough. As Fernando explains to me, "if we could get more professionals, we'd be making [games for the] Playstation now. It's our main bottleneck, trained professionals. Because the people we have, while they're great, they have a limit, and that limit is how far our company can go." The shortage of qualified talent is not unique to programming, either, but is consistent across other areas such as art and, especially, game design. More often than not, whenever I met anyone who described themselves as a game designer, or who was effectively fulfilling game designer-like tasks, their backgrounds and training would be in anything *but* game design: engineers, graphic designers, architects, journalists, advertisers, and other profiles would find themselves working on the game design aspects of a project and having to pick up the skill set as they went along.

In the last few years, though, a couple interesting things have happened that are

directly affecting this huge bottleneck. The first one is the reappearance of a broader community of people interested in game development, best evidenced by the growing numbers that began attending the first game jams organised in Lima. This emerging community, different from the one that had been active throughout the 1990s, had new tools and forms of organising at their disposal, leading to the creation of Game Devs Perú, a Facebook group that has grown to become one of the main hubs for information and problem-solving for local game developers. As of April 2014, the group numbers almost 2,000 members who are sharing news and posting questions to the group every day. People regularly post announcements of games they're working on or releasing, as well as links to learning resources such as online tutorials or web-based courses on topics related to game design.

The momentum acquired by the Facebook group eventually led to the successful founding, in mid-2012, of the local chapter for the International Game Developer Association. IGDA Perú was the result of a number of things becoming roughly aligned independently of each other: the coming of age of a new generation interested in making games and their entrepreneurial interest in wanting to band together and collaborate, the increased interest from some interactive media studios (mostly focused in the areas of web design and mobile application development) to initiate timid experiments in game development, and the shift in the development landscape itself towards smaller projects in casual and mobile games using newly available tools and platforms for development. But the founding of IGDA Peru was also the result of a community beginning to come together, that process being crystallised in the foundation of the local chapter. This process had begun as far back as two or three years earlier, when groups of people mostly connected through personal social networks began to come together to organise the first game jams in Lima, and their capacity to build a community was amplified by resources such as Game Devs Perú. Facebook is not the only digital tool that has been helpful to support the organising of this new community: tools such as Eventbrite for managing event registration, or Google Forms for putting together quick surveys from the community, are also helpful tools that enable small teams to manage large amounts of information. Digital tools

are not drivers of community efforts, but they enable the community to operate in smarter fashion, keeping track of who's showing up, how to reach out to people, and what members of the community are interested in.

Game jams deserve a special note. As described above, a game jam is an event held over a weekend, where people get together to work on game projects from concept to prototype in 72 hours. People sleep very little, camping out at the jam's location to make the most out of available time. Jams can be more or less formalised: while larger jams, such as the Global Game Jam, are endorsed and traditionally organised by local IGDA chapters (or similar organisations) and usually feature thousands of participants around the world, smaller jams can easily take place in someone's living room with a bunch of friends, bringing in their computers and ordering some pizza. It was precisely this sort of more informal jam that started happening in Lima a few years before IGDA Perú came about. The Lima version of the Global Game Jam literally grew out of someone's living room, and as it grew, it began to enlist the collaboration of sponsors and supporters providing larger spaces, better facilities, and the capacity to keep bringing more people in. At the 2014 edition of the GGJ, organisers were forced to turn people away because their venue simply had no more capacity.

Game jams have become an extremely important institution for the local industry, and it is because they've become a foundational alternative infrastructure that simultaneously addresses many of the challenges the industry faces — learning being one of the main ones. I was able to experience as much when attending the Boston edition of the 2013 Global Game Jam, having very limited game development experience myself: I was part of a small team of just two people, working with a much more experience programmer than myself whose day job was in web application development. My partner was much better versed than I was in the matter, so I deferred to him in most technical design decisions, and he would walk me in detail through the steps of whatever he needed me to be doing while he was busy with the heavy lifting. In the end, we were able to put together a prototype for a web-based game in time for the presentations happening at the end of the jam, and I learnt quite a lot

about the technicalities that go into game development — and while I don't believe my partner learnt as much from me, he did manage to finish a working prototype, so we both gained something from the collaboration. Jams are a very simple and effective way to get people to practice and, especially, to practice together and learn from each other in the process. Jams have no skill requirements, and there's usually no selection process to attend any of the public ones. This gives newcomers an opportunity to work on project teams with much more experienced people who are working in the industry, and to understand what the game development process looks like and what it's requirements are out of a scaled reproduction of the larger process. In other words: jams are a way to get your feet wet without having to jump straight into the pool. This appears to be more significant in a smaller, younger community such as the one in Lima, than the one I worked with in Boston: there were far more people who were actually working in the industry and had been doing so for longer stretches of time than you'd find in Lima. Showing up at the Boston GGJ would be a great idea for someone looking to network their way in to a job; in Lima, it is mostly about figuring out just what game development is all about to begin with. The jams provide a crucial industry touch point for people to connect and transfer skills and information, as well as to experience what the industry is like.

To some extent, then, the jams are fulfilling the role of learning and research institutions (Preston *et al.* , 2012). Just as only a few years ago, studios would find it necessary to invest heavily to set up their own alternative processes to compensate for learning gaps. Game jams socialise that investment and build similar environments out of the circulation of social rather than financial capital. Game jams are community events, where costs and labour are allocated between participants, and project teams are built around interest rather than company affiliations. Technologies developed and learnings generated are similarly circulated freely amongst participants, and the conversations that happen within and amongst the teams usually find people from different studios and projects sharing tips and references about platforms, tools, and techniques, as well as people testing out and giving feedback to each other's games. This has become a highly effective way for the community to self-organise towards

Figure 3-3: Group photo of participants at the 2014 Global Game Jam in Lima. Photo credit: IGDA Perú.

facilitating the circulation of its scarcest resource: contextualised, refined information on how to make games.

But the other interesting thing that has happened in recent years is the flip side to game jams' loosely structured learning environments, as more traditional infrastructures of learning have quickly began to appear just as interest in game development has spiked.

3.4 Learning as an Ancillary Industry

The lack of learning options for people interested in the development of video games has been, as we've seen above, one of the biggest challenges the industry has faced through its evolution. Yet surprisingly, the opposite might have become true lately: a sudden spike in the number of training programmes and professional degrees in or around video games has quickly and confusingly changed the landscape for many young people just beginning to get involved with the practice and the industry. The appearance of these established learning opportunities illustrate two develop-

ing trends: on one hand, the need for the industry to professionalise and formalise its operations as it seeks to grow and target international markets[5]; on the other, a response to a growing community of interest that, in itself, represents an interesting market.

Perhaps as a move to rapidly capitalise on an emerging market demand, several learning institutions have moved quickly to begin to offer training programmes in various aspects of video game development. The existing programmes can be grouped into three categories, that themselves appeared in sequence: smaller and shorter programmes between a few months and up to a year, often unaccredited and delivered by small institutions as combinations of short courses; technical degrees in game development, usually lasting about three years and trying to encompass both programming and artistic aspects of the process, delivered by existing technical institutes; and full university programs, with a five-year curriculum focused around some aspect of game development and delivered by existing universities — at present, there is only one such programme in Lima: a computer science programme at a local university with a concentration on "entertainment software", which has only become available in 2013.

Especially towards the lower tier of shorter programs, there has been a boom in recent years with several new learning institutions beginning operations. Most of their offerings are structured as a series of short-term courses on specific aspects of video game development, ranging between one and three months, with the possibility of being awarded certificates by the teaching institution after completing sets of courses. Most of these institutions are quite new and little known in the industry, even less so outside of it, and most are concentrating their teaching offerings around highly specific technical aspects of games. But for many currently working in the industry, these new institutions are overstating what their training can actually accomplish, with marketing claims of teaching how to make 3D, AAA, commercial games in anywhere

[5]This aspect of the process is not unique to the Peruvian game industry, and similar transformations can be found in the histories of other national game industries, such as the British game industry: "The skills accumulation of self-trained teenage programmers has been replaced by the foundation of courses on video-game design and programming by higher and further education institutions as well as the entry of graduates into the industry from relevant academic subjects such as computer science and mathematics." (Izushi & Aoyama, 2006, p. 1853)

between three and twelve months.

People already working in studios are highly sceptical, and even concerned by the impact these claims may have in potential new talent — expectations are being warped and distorted by this sort of claims, and especially for young people, an unrealistic picture is being painted as to what can be accomplished in the local industry. When I talked to the manager of a prominent studio in the local industry — responsible, among many other things, for managing the hiring for her company — she explained to me how these were "false educational options. There are seven or eight institutes teaching how to make video games. Many of them are claiming you can begin programming games in a year. It can't be done." To a large extent, the reason why these propositions are unfounded is because these training programmes are not really addressing the foundational skills and knowledge game development requires — just as Martín's or Fernando's learning journeys required them to achieve mastery of the fundamentals of their craft so they could adapt that knowledge to game development. These shorter, highly technical programs are instead focused on teaching how to use specific tools and platforms, but not how to understand the underlying technologies or processes. From this manager's point of view, people are being set up with expectations that are later going to clash with the industry's actual needs:

> To be a video game programmer, you need to know maths and physics. Everything else you can pick up later. But if you don't have good maths and physics, you can hardly be a good video game programmer.
>
> Now we're going to have people coming to us with a degree in video game development, thinking they can work here, and they won't be able to if they don't know their maths. In Peru, there are very few people, at least that we've been able to find, that know how to do low-level programming.

The increased availability in more traditional learning opportunities has proven to be a contentious matter. On the one hand, it is a reflection on both a growing interest in, and a growing public acceptance of the video game industry, and it is contributing towards spreading the idea that there are careers to be made from making games.

But at the same time, they're also setting up unrealistic expectations by overstating what can actually be taught, and by mischaracterising what should actually be taught when compared to what people in the industry are looking for. The perceived increase in qualified talent is rendered moot when people coming out to the market with these degrees will find themselves unable to secure jobs from existing studios. The issue was clearly illustrated when an article came out in a local newspaper describing job opportunities in the game industry (Perú 21, 2013b). The article was widely circulated and commented in forums such as Game Devs Perú. It described the industry's job prospects as follow:

> People can work in video game design companies, both for computers or large consoles (Nintendo Wii, PlayStation) as well as smartphones and tablets. This last niche, by the way, is currently quite a boom. There is also significant demand from marketing and advertising, especially in the development of interactive products. (Perú 21, 2013b)

While these claims are all generally true, they hold no specific bearing for the local market. At the time of publishing, no local studio had internal capacity to sustain console development, nor were there any significant larger computer game developments being talked about. While mobile and advergaming are indeed existing market, as we will see in chapter five, access to these markets is not straightforward nor self-evident, and they require a number of skills different from game development that are scarce in the local industry themselves.

Teaching, however, has become one of the main revenue-generating activities for many studios and developers in the local industry, and a much needed way to pay the bills until game development begins to pay off. I ran into several cases of people who were making ends meet by moonlighting in one or more of these programmes, and there are also cases of studios whose business model has adjusted as of late to accommodate teaching as one of their core operations. Even further, there is at least one case of an existing studio that has almost entirely shifted from actual development to teaching, banking on their (admittedly limited) previous experience making games

to set up their own teaching and training programme, offering to teach people how to make 3D games of AAA quality in only a matter of months. For many people making this jump, balancing development and teaching activities or switching to teaching altogether are a way to remain engaged with the video game industry through an activity that implies much lower risk for their venture.

The flip side of this arrangement, however, is that most of these training operations are being delivered by people who are themselves untrained in their subject matter, and whose real development experience is necessarily limited precisely because the size and scope of the local industry are limited. While there are institutions promising to teach such things as how to make large-scale, commercial 3D games, the fact remains that no studio in the local industry has been able to actually accomplish this. But because that remains, in the popular view, what making games is mostly about, other things such as casual and mobile game design — where the local industry has significantly more experience and capacity — are downplayed in the marketing of these training programmes.

The result, as pointed out above, is that people going through these programmes are not necessarily getting the training they need to fill the openings the industry actually has. Fernando, who is also engaging local IGDA working group on education, and whose studio has a number of job openings they can't adequately fill, shared this concern over the incomplete training many of these young people are getting:

> These institutions being created around the video game industry need to have a real video game development structure. Right now, some of them are completely disoriented in terms of how to be a game designer, how to be an artist, how to be a programmer. Because what I have seen is programmers are trained more from a business point of view, and artists who are more technical, or game designers who are artists and know nothing of basic knowledge and are a bit disoriented, and this needs to change.

This was the same sense I got when meeting with the entire IGDA education

working group, who had been working for several months on adapting the Curriculum Framework, designed by a core group of the IGDA (IGDA Education Special Interest Group, 2008), to the local context. Their objective is to provide some semblance of articulation across a landscape populated by overlapping and conflicting teaching opportunities over multiple scales and academic levels. Made up by people either working in the local industry or in academia, the local working group is in a position to both observe how existing programmes do not meet actual industry needs, and to both articulate and communicate what those needs are. But by their own admission, they were having trouble getting through to the teaching institutions to understand and adjust to this. Their efforts around the Curriculum Framework were oriented towards creating a base template these institutions could leverage in building their course offerings by drawing from a vetted and carefully evaluated design process. Leveraging the IGDA brand, they hoped, would provide them leverage to discriminate good programmes from bad ones. Over time, their hope was that they would be able to use the brand almost as an informal accreditation mechanism, by being able to claim programmes conformed or failed to conform to IGDA recommendations as a marketing strategy — a *caveat emptor* for prospective students evaluating their professional future.

In any case, these two approaches at setting up learning infrastructures — the *ad hoc* approach of alternative infrastructures and the sudden spike in more traditional learning opportunities — forcibly coexist, and are actually capable of supporting one another. Game jams and similar events provide opportunities for experimentation, connections, and learning from practice. They are also much needed touch points for newcomers to engage with what is otherwise an overly confusing black box of technology, institutions and social practice. On the other hand, traditional learning institutions, big or small, provide structured environments for knowledge dissemination, and given the right set of conditions (for example, for people who already command working knowledge of basics such as maths, physics, or artistic technique) can actually be effective methods towards re-purposing existing knowledge into game development projects. But without these base conditions, the teaching offerings cur-

rently remain not only incomplete, but also not aligned with actual industry needs. Efforts such as those of the local IGDA chapter to consolidate the fast-growing game development training industry will hopefully be able to raise quality standards and push for this alignment, while also paying closer attention to managing the expectations of the many young people who are beginning to seriously consider pursuing careers in game development.

Both approaches, the *ad hoc* and the traditional one, are also fulfilling a very important role in providing industry touch points for outsiders to peek inside and learn more about projects and processes, without having to become fully engaged with a studio or a project. Either by attending a game jam, or taking a short course, people now have opportunities to test their own interests and skills before having to make significant investments of time and resources.

3.5 Growing Up and Getting a Job

All the developers who shared their personal histories with me had two things in common. First, their stories were all strongly motivated by passion. The developers I talked to not only spoke about enjoying their jobs — they each had very personal stories about how they discovered their passion in games, and how they could hardly think of themselves doing anything else anymore. Being driven by passion was extremely important to the overall balance of the industry. Because people's returns from their jobs go considerably beyond just the financial, they can justify for themselves working in an industry that does not pay very well. Since financial returns are meagre (especially as compared to the opportunities programmers could pursue in other industries), people are more interested in developing a sustainable practice that continues to provide them with creative satisfaction. Passion compels people to put themselves in a riskier personal position than they would otherwise choose to do: because of the non-financial rewards of their practice, they're willing to personally assume the costs for things that would ordinarily be assumed by a company. I saw this very clearly in examples of young people putting in considerable shares of

their free time to do RD and skill acquisition that would benefit their day jobs, or investing personal or family funds to acquire information resources or finance trips to important industry sites such as the Game Developer Conference (GDC) in San Francisco. People in the industry taking on more personal risk is similar to what Gina Neff (2012) has described as forms of "venture labour", where risk is being offloaded in technology industries from firms and companies onto individuals under rhetorics of individualism and entrepreneurship. There are a number of issues associated to this offloading of risk, as it puts individual workers in a considerably more precarious position. But at the same time, as far as the Peruvian game industry is concerned, there would be no industry at all if it wasn't for these individuals bearing the burden of risk for setting up both traditional and alternatives forms of infrastructure to enable their practice.

The other thing everyone I talked to had in common was that they were, one way or another, survivors: as obvious as it is, the people who are currently working in the industry are the people who made it. But for everyone who made it, there are many others who didn't: people who didn't make it past their first game jam, people who never found their way to an industry job, or people who only managed to have a short run before leaving the industry entirely. The fact is, it is especially complicated to retain a job in the industry because of the social pressure and stigma people get for being affiliated with the game industry. As we saw previously in chapter two, video games occupy an awkward social space in Peru, often scapegoated by the media and politicians for all sorts of social anxieties around portrayals of violence and addiction. Because games have this generalised negative perception, so too does the notion of working in the industry.

Working in the game industry is perceived by people outside of it as being relatively childish or immature — something that has been associated in general with perceptions of adult gameplay (Thornham, 2009), and when related to work and professional expectations, inevitably becomes entangled with issues of class and social status. The manager of a large studio I talked to summarised the situation really well for me:

> I've lost two good programmers that are now in entirely different industries, because when we began they were young. It was a problem that it wasn't prestigious to work in video games.
>
> They were young kids, living with their parents, who'd tell them "I paid for *la Católica* [one of the most prestigious schools in the country] for you so you'd do something with engineering and now you're just playing around." That was the main problem, but it has gotten better. (...) They were embarrassed to be working here, because it wasn't recognised, you didn't get any recognition.

This echoed similar stories I heard from multiple people, and a trend that has remained in the industry ever since its earliest times. For the people who managed to stay and overcome this, having support from friends and family was very important — it is customary in Peru for parents to pay for their children's college education, which consequently gives them considerable influence as to their educational and professional choices. Because of the generational split between kids who play games and their parents (Novak, 2008; Watkins, 2010), it is unlikely the latter will be familiar with and understanding of the former's potential professional interest in game development. Because the local industry has remained relatively small and largely invisible to the public eye, and because portrayals of games in the local media have tended to be unfavourable, it becomes even more understandable why parents investing in the future prospects of their children would be highly sceptical of an industry they largely don't comprehend, and risk-averse about investing in it.

For many of the people I talked to who did enter and remain in the industry, having their families supporting them was crucial. Family support was often correlated to familiarity with the medium of games or having parents with some technical background themselves — parents who were engineers, for example, and saw their kids engaging with games and game development as a way of dabbling in engineering. These people were afforded a degree of freedom in making choices about their educations and careers that many of their peers were not. And while many of said

peers did have an interest in getting involved with the game industry, there were often constraints limiting how engaged they could get. One developer I talked to, who was finishing his undergrad in Systems Engineering and already working in game development at a local digital media agency, described it this way:

> A lot, really a lot of people you ask why they're studying computers and systems have told me it was because they wanted to make games. And in the end none of them ended up making games. For several reasons. One is because I think they're financially dependent — many of them have to pay their way through college, or part of it, or their parents give them responsibilities like you have to find an internship to be able to pay college. So they need to intern and they begin to work in IT, they start to earn well and they stay there. And they also don't have the contacts to find game development in Peru. Before the IGDA, video game careers were too spread out. There was no good way to find out about it. To be honest, only recently have I found out about it through the IGDA, and I think this is just getting big right now.

So not only is gaming perceived as being uncertain in terms of career prospects, it is also costly for newcomers both because of the opportunity costs associated with it — that is, deciding to join the game industry implies ruling out other more lucrative opportunities — and because of the information acquisition costs involved — because figuring out how the industry works and how to find one's way into it takes more of an effort than other industries that are better known and more visible. Industry touch points such as those presented above contribute significantly to lower information acquisition costs, by allowing one to attend a game jam and learn a lot about the industry much faster than otherwise. But the issue remains an important one, and one that inevitably contributes to the social structuring of the industry: if the costs associated with pursuing game development as a career option are too high, it follows that only people with a significant amount of resources to spare will be able to pursue that option. In my experience talking to developers, this was not a distinctive trait of

the industry, as I had the opportunity to talk to people from very diverse backgrounds and personal histories. But there's a limit to this diversity, as I was often talking, for example, to people who had had the opportunity of receiving some form of higher education, even if only limited or incomplete. In a country such as Peru, where people with higher education represent a small minority of the overall population, this quickly becomes an important issue to consider. Even further still, in a country with some of the lowest testing scores in reading and maths skills for children in the entire world, an industry that forcibly needs to bank so much on basic science and maths skills operates at a severe handicap, and the people with the opportunity to pursue a creative desire to express themselves through games are definitely a statistical minority.

These are all larger issues that we'll return to in what follows, and important ones that the industry, as a whole, is only recently beginning to consider, evaluate, and address. Despite these changes, it remains true, as I pointed out at the beginning of the chapter, that game development is not perceived as serious or hard work. The game industry is perceived as being closer to toy making than to computer science. But as I've attempted to unpack in this chapter, making games involves a lot of hard, complex work, itself requiring a number of advanced skills that are hard to come by. That training is highly specific to games seems to be of secondary importance — in the Canadian game industry, for example, people tend to be highly educated without such education being focused on games (Dyer-Witheford & Sharman, 2005). Failing the traditional mechanisms for learning and skill-building, people in the industry self-organised to create their own alternative infrastructures to share knowledge and information in a way that fostered creative collaborations — but they're still working at a significant disadvantage if they need to deal with gaps in foundations such as maths and science. The question of what the limits are for these alternative infrastructures in terms of allowing for growth and sustainability remains, for now, an open one — a question that's connected to the way in which the industry is reconfiguring itself to be more visible and attractive to clients, investors, and prospective employees.

As the industry levels up in preparation for its next set of challenges, the question of what kind of games they want to make, are able to make, and are expected to make — and how they're all not necessarily aligned — becomes an especially important one.

4

Not All Peripheries Are Created Equal

It is a nice, sunny afternoon, as you stroll down a street in Rio de Janeiro riding copilot in a car. A van in front of you suddenly stops, forcing your driver to do the same. Two men come out of the van, and approach a third one walking out of a building. All of a sudden, the third man pulls a gun and shoots the other two. You rush to take cover and the next thing you know, the driver of your car has been shot as well. Someone jumps out from the back seat of your car, shouting at you to follow quick as the shooter is quickly getting away. One thing leads to another, and you're running down the streets of Rio de Janeiro, guns blazing, shooting your way through crowds and eventually into a *favela*, where you're pushed back aggressively by gang fighters trying to stop you from getting to the top of the hill. With your team, you shoot your way through winding, narrow streets that criss-cross into each other, shooting your way through forces that outnumber and outgun you.

You somehow reach the top of the hill, find your target and extract the *intel* you were looking for — now you have to get out. You fight your way out, blasting through cars and houses looking for the promised LZ, the landing zone where a helicopter can safely fly in and do an extraction. You make your way up to the metal rooftops and make a run for it, dashing in the last few seconds in a daring escape and jumping off the side of the cliff onto the rope ladder hanging from the helicopter drifting away.

Your team from Task Force 141, an elite international counter-terrorism unit, flies away in the nick of time, leaving behind a trail of dead bodies, the destroyed property of hundreds of simulated underprivileged Brazilians, and an uncountable string of broken international treaties, human rights conventions, and local laws and regulations.

You've also just played through one of the most popular video game representations of Latin America: the *Takedown* and *Hornet's Nest* scenarios from *Call of Duty: Modern Warfare 2*.

From a production point of view, the levels are finely crafted: the visual depiction of the favelas is extremely detailed, from the geography to the construction style of the houses to the layout of the streets. But from a representation point of view, it is a great illustration of the sort of portrayal of Latin American countries typically found in video games: a highly abstracted portrayal of stereotypes from the region's countries, constructed from the outside for the outside. In analysing game portrayals of Latin America, Phillip Penix-Tadsen found that they could all easily fit into three categories (Penix-Tadsen, 2013): *contras*, or depictions of the "thematic subcategories of paramilitary warfare in the combat genre" (p. 181) that play to the history of political and military conflict in Latin America; *tomb raiders*, or "games [that] generally employ Latin American geography (and rarely its population) as the setting for treasure-hunting jungle adventures" (p. 182); and *luchadores*, or "games that literally foreground Mexican wrestlers (...) and those engaged with what I see as a deeper struggle — or *lucha* — for a more nuanced simulation of Latin America and its inhabitants" (p. 181). The scenario I just described falls clearly under the first category of *contras* and is, of course, in many ways problematic: as Penix-Tadsen explains, these sorts of representations are troublesome because they negate the agency, in multiple ways and levels, of the populations being represented. Not only are these populations being negated their agency within the game world very explicitly (through guns, grenades and helicopters), but so is the agency over the parameters of the representation being negated by taking one, albeit significant, dimension of a local reality and having it stand for the whole of a much more complex

Figure 4-1: Entering the *favela* in the *Takedown* scenario in *Call of Duty: Modern Warfare 2*. The Cristo do Corcovado displays prominently in the background. Image copyright by Activision.

and diverse living system.

While representations in media always need to make some concessions and can never completely convey what a specific cultural and social reality is like, that representations of Latin America — to single this region out from the rest of the global south only because it is of direct relevance to the issues we've been discussing so far — are skewed so heavily can also be attributed largely to the fact that most of these representations have originated outside the region, by developers trying to capture and portray the core aspects of a reality that is foreign to them. The lack of authorial voices and creative projects originating in Latin America for a long time has been a significant part of the reason why this is the case. But the reasons causing this lack are multiple and tied into other issues we've been following so far that affect local industries such as the Peruvian one.

This chapter will analyse how the local video game industry in Peru is articulated with the global industry, and how it is trying to find its own voice and identity within a globally distributed network of practice (Takhteyev, 2009). In doing so, the indus-

try is negotiating its status as a peripheral industry, figuring out the type of games it wants to make and how that aligns with the type of games it is capable of making and those it is expected to make — expectations that come from local stakeholders, from global actors in the industry, and from both a local and global market. I want to make the argument that many of these expectations and the issues surrounding them are finding their expression not only in people's self-descriptions, but also in the design decisions orienting the development of new games — specifically, a type of game that I'm calling "borderland games", where local cultures are being simulated in digital environments for the consumption of globally situated audiences. I believe borderland games are interesting for three reasons: first, because they clearly illustrate how games themselves can be contested sites for the performance and consumption of culture. Second, because these presentations exemplify both how developers understand themselves and the role they play in a global industry. And third, because they are very interesting cultural and commercial opportunity for developers interested in experimenting with this form of game.

I will begin by situating the peripheral status of the Peruvian gaming industry and how its situation in relation to other centres of game development structure its challenges and opportunities. Following that, I will look at the process through which cultural commodities are structures as "global dialogues" between local cultures and global markets, borrowing from the example case of Chulucanas ceramics in Peru to frame the challenges game developers face when thinking about their own creations as culturally significant products. I will then expand on this by elaborating on the category of "export quality", or how, from the point of view of government, products and firms need to fulfill a series of requirements before being eligible for official support and promotion in international markets. We will then take a look at some of the locally produced games that have begun to incorporate cultural and identity elements within their design in recent years, and conclude by evaluating how these international circuits of cultural commodities are creating tension for local developers trying to determine their own identity through their creations.

4.1 "If Finland can do it, so can we"

As I was wrapping up an interview on a Friday afternoon, I got a text message from one of my informants. "There are people from Rovio having meetings in Lima. If you come quick I can probably get you in as press." He signed off by pointing me towards a fancy hotel in the heart of the Miraflores district, the main tourist neighbourhood in Lima. I quickly jumped on a cab and headed in that direction, arriving shortly afterwards and remarkably underdressed for the occasion: barging into one of the hotel's event halls I stumbled upon a TV crew in the middle of an interview, their interviewee proudly wearing an *Angry Birds*-themed hoodie. As I walk in, all eyes were turned on me, clearly the outsider. Scanning around the room, I quickly spotted two, three known faces, and I walked over and said hello — having proven myself an acquaintance, the tension of my arrival was thus defused.

I started asking around to figure out what, exactly, I had just walked into, as the TV interview went on. I soon learnt the people from Rovio had travelled to Lima after being invited by PromPerú, the Peruvian tourism and export promotion agency, but not because of their game development activities but rather because of the entertainment franchising universe they've built around their flagship brand, *Angry Birds*. "Theme parks," I was soon told, are the new area where the company is investing, creating real-life entertainment experiences and further expanding the reach of their intellectual property. Lima was one stop in the tour the company's representatives were taking around Latin America, scouting for partners and locations to open up new parks.

I loitered around the back of the room, discretely munching some of the leftover sandwiches in the buffet table, trying to get some information from the event's organisers, a very nice and well-meaning group who nevertheless appeared to be mostly oblivious to the visit's potential implications for the gaming community. From another loiterer such as myself I learnt that the news had spread quickly and an event had hurriedly been put together for the Rovio people to do a presentation for the local game development community at a nearby tech academy. The event was scheduled

Figure 4-2: Peter Vesterbacka, Chief Marketing Officer for Rovio, being interviewed for Peruvian television.

to begin 15 minutes later. The interviews and one-on-one meetings seemed to be nowhere near ending.

Listening in on the TV interview, I caught some of the things the two guys from Rovio were telling the reporter. How Rovio came out of a game making competition, and how they had made 51 games before they had a hit such as *Angry Birds* in their hands. Then, the inspirational note: "If we did this in Finland, there's no reason why you couldn't do it in Peru."

"You should have the ambition to make the next Angry Birds," they advised. "It's not like a big secret. Create great games, great experiences. You just have to do a great job."

It was very surprising to me to hear the same claim I'd heard so often in conversations in Lima, now being made by someone coming from the Finland side. Yes, Finland is at the periphery of the game-making world, and a Finnish studio still managed to pull together what is perhaps the most successful mobile game, ever.[1] So if Peru is similarly at the periphery, it stands to reason that a Peruvian studio might

[1]According to the same Rovio people, the *Angry Birds* universe had reached an estimate of 1.2 billion people around the world, making it — in their own words — a larger platform even than Facebook (which at the time had only an estimated 1 billion users).

be able to pull a similar feat.

But perhaps it is not so simple. When the interview was over, I approached them and introduced myself, and then I borrowed someone's smartphone to show them a game called *Charapita Flyers*. The game is essentially an *Angry Birds* clone, using the same basic mechanic of aiming and releasing using the touchscreen on the phone. But *Charapita Flyers* is exceptional for being the first video game developed by a group called Iquitos Play, based in the city of Iquitos, in the middle of the Peruvian side of the Amazon rainforest. The group's founder described to me their history over e-mail:

> Iquitos Play was born in classes I teach, secret classes we were holding at a friend's hotel, as the university was shut down because of worker strikes. I proposed that we created working groups whose final projects would be a finished, marketable product. The general rule was that the games should be educational, focused on Amazonian themes (biodiversity, indigenous cultures, mythologies, Amazonian geography) and easy to play, which is why we based ourselves on the Angry Birds format and Mario Bros-style surrealism. (Translation mine)[2]

This description is already pointing to so many different things happening that

[2]In the same e-mail, the group's founder listed the reasons why he was interested in encouraging game development in a city like Iquitos:

- There is no need for ports, warehouses, heating or cooling facilities
- Software is not a perishable product
- There is no need to occupy or extract resources from thousands of hectares
- It is less polluting than agriculture, mining, and other activities, and it does not contaminate rivers
- It does not require containers or other elaborate shipping infrastructure
- It develops human capacities, and invests more in education than machinery
- It does not depend on weather o flooding
- Salaries and revenues are high and there's a worldwide market through the Internet
- It trains professionals for a global world
- There is a low dependency on intermediaries

These issues are especially interesting because they speak to the issues Iquitos faces as an isolated and hard to reach city in the middle of the Amazon rainforest — that could potentially be bridged by investing more heavily in creative industries.

make it, firstly, that much harder for *Charapita Flyers* to become as polished an experience as *Angry Birds* is — fewer development resources, smaller team, much shorter history, and so on[3] —; and secondly, that much harder for the game to effectively circulate globally the same way *Angry Birds* did. What's really misleading here is to assume both contexts — Peru and Finland — in as much as they're both removed from established and acknowledged centres of the practice such as the US, UK, Canada or Japan, become somehow interchangeable, or the relative differences in their performance or success strictly an accidental matter. The key point here is that not all peripheries are created equal, and it is not the same to make games in Helsinki than to make them in Lima, just as it is not the same to make them in Lima than it is to make them in Iquitos. Borrowing a much older idea from Niccolò Machiavelli (2010, ch. 25), the successful game developer will exhibit the right combination of *virtú e fortuna*: the skill and drive to make things happen, combined with the right opportunity and context to make it effectively so.

The guys from Rovio were unimpressed but still polite about *Charapita Flyers*, having seen many *Angry Birds* clones before. But they pointed out how it did resonate with something they were mentioning during their TV interview: "You have to stand out, it's a very crowded market. Leverage the fact that you are from Peru — can you do something different? Leverage stories, characters, images. Be as Peruvian as you can." This is the message they'd be taking only a few minutes later to a crowded room full of current and potential game developers. They invited me to come along with them to the presentation, and a minivan was already waiting for us as we left the hotel. They were carrying bags full of gift souvenirs from both PromPerú and several of the business leads they were meeting with. "Should we drop these at the hotel and then walk over?", one of them asked, but the party was almost an hour late to the presentation event already, and the local hosts were getting anxious.

Just a few minutes later, we arrived at the next event. We walked past a store

[3]Iquitos, the city where the game was developed, has only had broadband Internet coverage since 2014, and it is not uncommon for areas of the city to experience power blackouts. Iquitos Play's founder explained to me how the group started meeting and holding workshops in a room at a friend's hotel because the local national university was on strike at the time.

Figure 4-3: Rovio people presenting their history to a classroom packed with developers in Lima.

front selling an assortment of Peruvian handicrafts and textiles and into an otherwise nondescript building with white tile flooring. Two guys from Rovio, one from PromPerú and myself were quickly walking behind the main organiser of the event we're arriving at, happening on the third floor of the building. We quickly climbed the stairs and reached the lobby of what appeared to be a makeshift IT training centre, and we were led to one of its classrooms. The room was already packed with people who had been waiting there perhaps for as long as an hour, but nobody seemed upset about it and, quite to the contrary, everyone got really excited when the Rovio people walked in wearing their *Angry Birds*-themed hoodies.

This room stands in stark contrast to the one we had just been in at the hotel. There were no buffet table nor nicely dressed government officials hanging out around the back, nor fancy dressed tables or air conditioning. There were enough people in the room it was starting to get really hot in the middle of winter, and a series of pedestal fans laid out along the walls had been turned on to get the air circulating. White fluorescent lighting provided modest but functional illumination to about sixty

school desks, over half of which were filled mostly by young developers. They had only learnt about this in the last few hours through personal connections and postings on social media channels such as Facebook or Twitter. There was even a small family towards the back of the room — a couple who had brought their small child along, himself wearing an *Angry Birds* t-shirt.

Rovio's presentation is meant to be inspirational above anything else. They go through the history of the studio since the very beginning — how it all began with two guys getting together in 2003 wanting to make a game, and how it took them 51 games before they struck a massive hit like *Angry Birds*, a project that grew out of some character designs a member of their team created and they decided to develop a game around that. But the focus of the presentation is very much to promote a "you can do it" mentality on the audience: they stress how Finland is itself peripheral to the gaming industry and does not have a huge population, but how despite the context they were able to break out globally by paying "insane attention to detail" in their product development. Because of the expanded spectrum of choices in mobile devices and connectivity options, "it's much easier now to reach scale", they claim.

It also became evident that, as much as *Angry Birds* is a game, Rovio doesn't really think of itself as a game studio anymore. "We built the fastest growing consumer brand ever. We have more people playing our games than Twitter has users." It is their reach as a consumer brand that is now the focus of the company's efforts: "Angry Birds is also a massive distribution network. (...) 45% of our business last year came from consumer products."

Their presentation wasn't very long — under an hour — and they wrapped it up but emphasising how this, too, can happen to you. Just a few weeks earlier, and in multiple occasions after that, had I heard it expressed by local developers that "if Finland can do it, so can we." Now, Finnish entrepreneurs were expressing the same sentiment back: "If we can do it in Finland, you can do it. You can't create these things through government money. You have to do it yourselves."

Sure, Finland and Peru might be both peripheral with respect to long-established industry centres. But again, not all peripheries are created equal. As we'll see in

what follows, how different national realities have access to the international market, and what that market expects of them in terms of cultural commodities, goes a long way in structuring what this peripheral relationship looks like.

Several months later, back at MIT, I would get a very clear sense of how convoluted relations between centres of the practice and their peripheries can become, when I was sitting in a Cambridge classroom overlooking the Charles river, and I'd listen to a game industry veteran professor asking his class — in reference to the runaway success of Rovio — "Does anybody even know where Finland is?"

4.2 The Making of a "Native Product"

As I was writing this chapter, an intense controversy erupted among the global video game development community over *Flappy Bird*, a game developed by Hanoi-based Dong Nguyen in only a few days and released in May 2013 for Apple's iOS platform (Warren, 2014). After a very slow buildup, the game unexpectedly went viral in early 2014 and became extremely popular because of its simple mechanics and very high difficulty. *Flappy Bird*, distributed freely and embedding ads into the game to generate revenue, became the most downloaded game in the iTunes App Store, generating an estimated $50,000 *a day* for its lone creator (Hamburger, 2014), who suddenly found himself having to deal with the unexpected notoriety of having millions of people playing his game.

As the game grew in popularity, it began to draw not only huge amounts of attention to itself, but also a fair share of scepticism, disbelief, and criticism (Totilo, 2014). Many in the game development community questioned that such a small game could become such a huge hit so quickly (even though the game had been out for over eight months before it became popular) without resorting to shady tactics — accusing Nguyen of having paid for promotion, or having used automated bots to generate favourable reviews. Many others became highly critical of the game because of its design, claiming it was a poorly-designed game and even going as far as accusing it of plagiarism and copyright infringement, based on its artwork and mechanics being

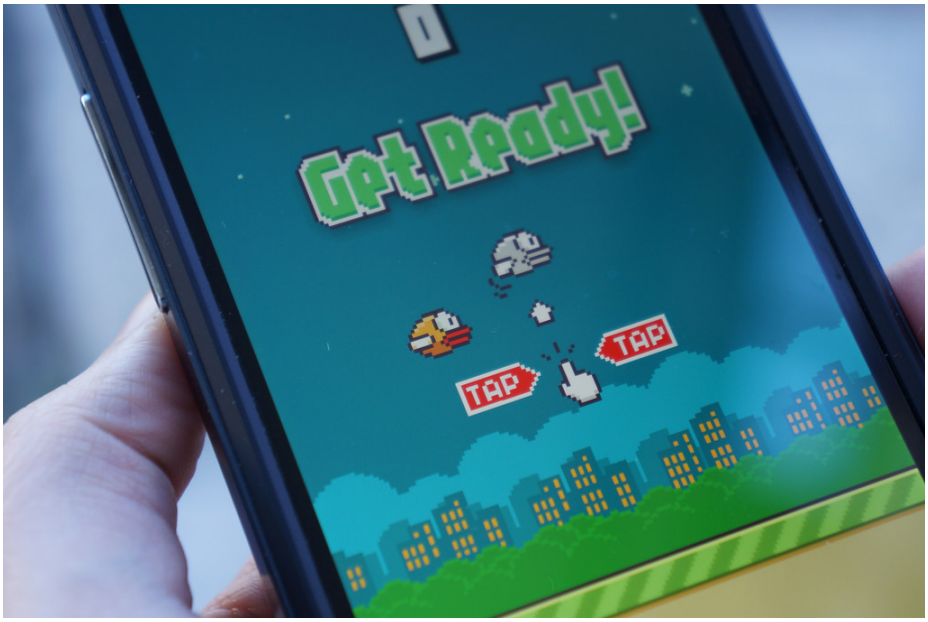

Figure 4-4: *Flappy Bird's* austere and controversial interface. (Photo by Desiree Catani, available on Flickr under a CC license.)

similar to other games — notably, Nintendo's Super Mario series.

Nguyen has denied all of these claims, all the while being subjected to increasing levels of scrutiny and aggressiveness from people in the gaming media and over Twitter (Nguyen, 2014). The backlash on his game and unwanted attention became so hard to bear, he voluntarily took the game down from distribution from both the iTunes App Store and Google's Play Store, after claiming on his Twitter account that he'd been driven to hate his own game, and couldn't take it anymore. Nguyen has kept a low profile ever since, as gaming publications have published apologies or retractions of some of the claims made in the controversy, and much more attention has been paid in conversations to the psychological pressures to which independent developers are subjected (Vogel, 2014).

An alternative interpretation, however, pays more attention to Nguyen's situation with respect to the global development community. Game developer Robert Yang hypothesised that to fully understand the *Flappy Bird* controversy, we need to also think in geographical and cultural terms:

> Instead, Dong Nguyen committed the crime of being from Vietnam, where

> Electronic Arts or Valve or Nintendo do not have a development office. The reasoning is that no one "outside of games" can become so successful, except through deceit. The derivative nature of Flappy Bird's assets and mechanics was taken as confirmation that technologically-backward Southeast Asians were "at it again" – stealing and cloning hard-won "innovation in games" invented by more-beloved developers. (Yang, 2014)

In other words, we need to pay attention to Nguyen's peripheral status within the game development world to understand how the controversy unfolded. In an e-mail to Gamesnetwork, the mailing list for the Digital Games Research Association (DiGRA), Jesper Juul called attention to *Maverick Bird*, a clone/tribute game to *Flappy Bird* by acclaimed game designer Terry Cavanagh (Juul, 2014; Dredge, 2014). Cavanagh's blog post presenting the game was met with highly positive reception in the comments to it, in stark contrast to *Flappy Bird*'s reception — even though the games largely share the same basic mechanic. As Juul himself pointed out in his e-mail, "I suspect that Flapp[y] Bird would have been received much more positively if it had been promoted as the 'new Terry Cavanagh game'." It is hard not to pay attention to the fact that these two games are getting very different treatment, one coming from a known developer and the other one coming from someone at the periphery of the practice.

Lest we forget, it is important to remember that game development, too, is a situated practice, and despite the popularity of rhetorics making the claim that locations have become irrelevant, the *Flappy Bird* example quickly anchors our perspective back. Of course, Dong Nguyen and Terry Cavanagh did not make the same game, so their intentions were significantly different. But the differentiated treatment they both got — one being celebrated, the other publicly questioned and harassed — is an important reminder of the geographical, social, and cultural differences that explicitly and implicitly govern the practice of game development. While Helsinki, Hanoi, and Lima can all be peripheral to the more traditional centres of game development scattered throughout the US, UK, Canada, and Japan, they are not all equally peripheral, or peripheral in the same way. How this connection between centre and

periphery are structured affects both how developers think of themselves, and how they're perceived from the point of view of the centres of the practice.

In talking with developers in Lima, how they thought about this connection and their own role and place in the industry was often a complicated matter. It often reflected a conflict between what they understood as the role they were *expected to play*, and the role they actually *wanted to play*. And these two are not always in alignment.

At a game developer event put together by PromPerú, people from local studios got the opportunity to listen to presentations from representatives of some very big name publishers, including Electronic Arts and Square Enix. The event was a component of the Peru Service Summit, a large initiative by PromPerú to connect local producers in multiple industries with foreign buyers and clients — in this case, the video game industry had been included as part of the larger software development sector. The Summit is a good indicator as to what the expected role is for the industry in producing culturally-relevant content for international markets, just as other industries such as the tourism industry or the handicrafts industry might. PromPerú is interested in bolstering Peru's cultural specificity and commodifying it into packages that can be easily and widely circulated around the world, building not on the objects themselves but on cultural experiences that are hard to reproduce and contribute significant added value to a product.

This is, in turn, reflective of a broader strategy PromPerú has been implementing over many years to capitalise on traditional knowledge and practices as tradable intellectual property. This is what happened, for example, to ceramics from the northern region of Chulucanas (Chan, 2013), where the government helped articulate a process through which production was formalised and systematised so it could be taken to scale, creating a "native product" that would be culturally interesting to international buyers. Anita Chan describes the making of these products as follows:

> One of the first steps, she [Madeleine Burns, Peruvian National Director of Folk Art, 2007] indicates, for the success of these initiatives is the making of a "native product." She asks, "What are the requirements to make a

Figure 4-5: An example of Chulucanas ceramics. (Photo by David Stanley, available on Flickr under a CC license.)

> native product? First, that *artisans themselves* are the ones [who] decide what is their 'native product."' That product, Burns specifies, should use local, regional materials and integrate "ancestral" techniques in its elaboration. It should also already be associated with a group of artisans who are committed to promoting its entry into and circulation in local, national, and international markets. "Native products," once properly realized, should help to not only create "value in local regions," but they should also further help to "define the identities" of their consumers and producers. (Chan, 2013, p. 27)

It is important, then, that "native products" not only crystallise local traditions and cultures into commodities that are easy to circulate, but also that these same commodities speak to the expectations of their target audience, and remain foreign enough to be interesting, but familiar enough to be incorporated into everyday practices and spaces — just as pottery from Chulucanas might easily fade into the background in a European or American living room, and jump to the foreground when

summoned as a conversation item. For this process to be effective, "artisans should see themselves as responsible for engineering 'global dialogues' with consumers who are culturally diverse and globally dispersed" (Chan, 2013, p. 42).

At the Peru Service Summit, local developers are told precisely that — and not only by government officials, but by international publishers highly sought out by the local industry. A representative from the Latin American office of Square Enix, one of the largest global video game publishers, tells the crowd that they're "looking for games that have a 'latin flavour', things highly specific to our culture" as the kind of games they're interested in funding and distributing. She goes on to lay a series of recommendations for how to structure and streamline the entire production process which developers later tell me is very appreciated. But the notion that developers are expected to design their games from the point of view of a so-called "latin flavour" sits uneasily with many of them, and they voice as much. The very next day, at another developer event put together by the local IGDA chapter, the same Square Enix representative repeats her claim, but in this more informal setting she gets pushback from the audience: "Games with national themes ['temática nacional'] are like a form of stagnation. When are we going to be able to overcome that?"

Very diplomatically, she explains how, from the point of view of the publisher, that's not really an issue, and how they won't think any less or hold it against a game to be designed around national identities or cultural concepts. But after that boilerplate answer, she shifts gears and answers the question from her point of view as a developer: "It doesn't mean the game will be bad, but it doesn't necessarily mean the game will be successful in the long term. It's just a matter of attitude, thinking what everyone might like. Something you like."

For many local developers, these culturally-themed games are not something they like — they're not the games they grew up playing, nor the games they imagined themselves making. For some, the matter simply comes down to that: given the choice, they want to make different games about personal interests. But for others, the interest in making culturally-themed games is a huge constraint of the local industry, a weight that keeps them from playing in the major leagues of video game

development. This latter group associates many of the typical elements of the Peruvian motif — llamas and ruins and guinea pigs and Inkas and so on — as low-hanging fruit developers are forced to turn to either because of client pressures or in the interest of scoring quick points with the media and the public. Getting rid of this weight, by contrast, is seen as gaining access to modernity, as unshackling from an ancient culture that provides no value in the futuristic global market of high technology. In a heated discussion around this topic within Game Devs Peru, IGDA Peru's main discussion forum on Facebook, one of the commenters very succinctly summarised this point of view:

> If you think about a game like Zeno Clash [a game developed in Chile], probably 90% of the people who played it thought it had been made in the US because of its high production values. I think that's the kind of surprise Peru should make in game development. It's true we're not yet at the development level of South American countries like Brazil or Chile, but with creative and different concepts you can make a difference. Sadly games made here almost always fall in the same loop of *hiper-Peruvianising* them and doing so without solid design or mechanics, makes them fall apart. That's why nobody remembers Peruvian games... "Peruvianness" is used without the right support.

Taken at face value, the argument makes a lot of sense: games shouldn't be made with Peruvian themes just because it's fashionable or convenient, nor at the expense of proper design and quality assurance. But if we probe further, the underlying reason why this comment — and overall, this position — is problematic is because it disregards the nefarious history of racism and discrimination that has been at the core of Peru's social structuring ever since colonial times (Cotler, 2005). Or, rather than disregard, it perfectly instantiates it: the idea that making culturally-themed games is a weight bringing down the industry as a whole is a rehash of the argument that traditional cultures in Peru have been the weight holding back the country from modernity and development (Mariátegui, 2005; Drinot, 2011) — an argument that has

been made to justify everything in Peruvian history from eugenics to exploitation to the present-day criminalisation of peasant protests opposing large-scale infrastructure and resource extraction projects. As disconnected as these issues may appear, they are but two sides of the same coin: obscuring and concealing the country's cultural identity and heritage with the purpose of gaining access to pseudo-universal values and identities. A "better" game (or just a "better cultural commodity"), from this point of view, is understood to be that one whose origin cannot be traced or identified, one that could easily stand as an example of cosmopolitanism or, as Chan terms it, "technological universalism."

In a way, these developers want to conceal their origin and be able to pass as if they were operating elsewhere — as if they were operating, perhaps, in any of the better established centres of the practice across many industrialised nations. These conflicts of identity between locally-situated developers engaging in globally-distributed practices are not unique to games or Peru: Yuri Takhteyev has chronicled how Brazilian software developers in Rio de Janeiro go through very similar processes (Takhteyev, 2012), with these same issues manifesting themselves in the choices they make about tools and programming languages they use, or in the ways they write and comment their code — Takhteyev discovered, for example, that developers in Brazil would tend to write their variable and function names in English, while writing the code comments in their native Portuguese, regardless of their fluency in the language. The issue runs so much deeper with culturally-themed games in Peru not only because of the wider variety of "assets" at play (visual imagery, sounds and music, places, plants and animals, etc.) but because the "assets" being systematically eschewed are precisely those associated with cultures and populations that have been systematically excluded from the historical record and the political system — and not coincidentally, also to a large extent those cultures and populations with very little exposure to digital technologies or video games, even less so to resources for game design and development.

Which is not to say that all Peruvian games should be culturally-themed games, but just to point out how the strong pushback on these culturally-themed games falls

Figure 4-6: *Marca Perú*, the Peru country brand developed by PromPerú.

squarely within long-standing issues of racism and discrimination, and need to be addressed as such — one of several reasons why the Ministry of Culture, through its Office for Audiovisual, Phonographic and New Media Production, has taken it upon itself to get more involved with the gaming industry (the Ministry of Culture counts amongst its portfolio of initiatives several projects designed to raise awareness and reduce racism nationwide, as well as to bring attention to and raise the value of traditional cultural practices and national heritage). And yet, it is also true that there is a market incentive for these culturally-themed games: making one such game would allow a developer to capitalise on existing private and public investments in cultural promotion, such as the creation of the Peru country brand, *Marca Perú*, which is being actively promoted around the world by PromPerú for industries such as tourism and gastronomy. Culturally-themed games can benefit from this heightened public awareness and from the government's interest, through agencies such as PromPerú, to actively promote those cultural commodities that will help bolster the image of the country abroad by highlighting its traditional (and perhaps more exotic) qualities.

This flip side of the argument on culturally-themed games therefore raises two other issues in turn. The first one is that, since the effort around the *Marca Perú*

and the push for cultural commodities is structured around the promotion of trade and tourism, the cultural approach is one of exoticization, of highlighting just how different a cultural commodity is — strange, yet still familiar — from the vantage point of modernity. It is not so much about creating the "global dialogues" mentioned above, but more about creating global display windows. As Dean MacCannell puts it in analysing the emergence of the tourist as a by-product and instantiation of modernity itself:

> Interestingly, the best indication of the final victory of modernity over other sociocultural arrangements is not the disappearance of the non-modern world, but its artificial preservation and reconstruction in modern society. The separation of nonmodern culture traits from their original contexts and their distribution as modern playthings are evident in the various social movements towards naturalism, so much a feature of modern societies: cults of folk music and medicine, adornment and behavior, peasant dress, Early American decor, efforts, in short, to museumize the premodern. (MacCannell, 1999, p. 8)

This issue can be re-framed around the highly contested category of "authenticity", and just what exactly makes a product made in Peru qualify as being "authentic." The story of Chulucanas ceramists points to how authenticity as a category is mediated through multiple formal and informal layers, ranging from fidelity to tradition to institutional mechanisms and legal devices that define and prescribe what things can be considered authentic. As Peterson (2005) suggests, authenticity is socially constructed and negotiated through two interlocking circuits, that of authenticity work — how works are produced in a way that is considered to be "authentic" — and that of authentication — how experts and audiences come to understand said works as effectively being "authentic." Authentic production is not just about being true to some version of the self, but to a large extent it is also about conforming to an audience's expectations about what makes an authentic product, similar to the way outside expectations are key configurators to how individual identities are modelled

and presented to the outside world (Goffman, 1990)

The second issue, as an extension to the previous one, is that because of this effort to "museumize the premodern", there would appear to be little room remaining for creative re-appropriations of culture, history, and tradition within this approach. The cultural is packaged as commodity, and as such the efficiency of its production becomes more important than the meaningfulness of its creative expression — in other words, the cultural commodity becomes much more of a commodity than it is cultural. This was one of the key issues Chan identified when talking to the ceramists of Chulucanas: their access to the global market came not with the opportunity of improving and expanding their craft, but with the contractual obligation of freezing it in time as a cultural exploration but accelerating the production process so as to satisfy the demands of the market, leading to the formation of what she calls "promiscuous assemblages" where requirements of production topple and overwhelm social networks, institutions, and traditional practices.

What's going on with these games is almost exactly the reverse of what game and software industries refer to as localisation: how software products are not only translated into a different language, but also slightly or heavily tweaked to make the product more palatable and acceptable to a specific cultural market. Localisation experts think about choice of words, idioms, colours, numbers, graphics, sounds, and just in general need to be aware of what design elements could potentially compromise the introduction of a software product into a new market (Carlson & Corliss, 2011). The negotiation and cultural contests I began to observe in these games was the opposite process: the packaging of local cultures into products that could be locally circulated, and the tweaking of cultural representations and simulation to make them more accessible to international audiences. The results of this process are examples of what I've come to call "borderland games" — games that dramatise and simulate the presentation of a local culture with the intention of making it accessible to an abstract international or global audience. Borderland games are a site of cultural conflict, where local cultural issues are being negotiated in their representations and design decisions, and where expectations are being interpreted and integrated into

the game development process.

The issues at stake in borderland games can be driven to various levels of resolution or stability. In order to explore them, it'll be helpful for us to pay a closer look at what these cultural commodities are actually doing — to look closely at what some examples of borderland games look like, what they simulate, and what they represent, in order to better understand both the challenges and opportunities to promoting them.

4.3 Games as Sites of Cultural Negotiation

While I was in Lima, I heard about a lot of game projects and had the opportunity to play through a handful of prototypes. Some of these prototypes were eventually released to the public, and following the narrative arcs of these games' development processes was in itself fascinating. Out of these, there were several games that would qualify under the category of culturally-themed games, and I want to pay some closer attention to a small sample of them.[4] I want to quickly do an overview of three Peruvian games developed and released within the last year: *Palomilla Hunter*, by The Boneless; *Inka Madness*, by Pariwana Studios; and *Kilka Card Gods*, by Bamtang Games. I also want to contrast the analysis of this small sample with a quick look at *Guacamelee!*, by Toronto-based Drinkbox Studios — a game which, in my opinion, is highly effective and successful at creatively appropriating cultural narratives and elements.

Palomilla Hunter

Released in 2013, *Palomilla Hunter* was one of the first projects by The Boneless, released originally for Newgrounds, an online Flash game portal, and later receiving a sponsorship from Monkey Games World and being included in their own game portal.

[4] A note about my sampling criteria: these are not, by any means, all the culturally-themed games I ran into, and these are not necessarily the most representative ones. This sample is made up of games that I just happened to hear more about during my time in Lima. It should not be taken as comprehensive, but merely as an illustration.

Figure 4-7: Screenshot of *Palomilla Hunter*. Copyright by The Boneless.

The game is inspired by real-world news events of a group of teenagers that vandalised ancestral ruins in Peru a few years ago, recording the whole stunt on their mobile phones and later uploading the video to YouTube. News of the stunt were widely circulated and received universal censure from the public, and when brainstorming ideas about their early projects, the team at The Boneless thought this would be a fun concept to explore. The game presents the player with a series of caricature versions of historical sites and ruins — not any one in particular, but generic depictions such as sand and clay constructions with depictions of myths in the middle of the desert — that are under attack by a bunch of mischievous child demons that because of their trickery have managed to escape from the underworld. The demons run into the player's view and stop to nibble at the ruins, at which time the player can click on them to shoot them and make them disappear. If the player takes too long, the demons progressively nibble out all of the ruins and hurt the players health, and as levels progress, more and more incoming waves of various sorts of demons arrive in increasing number and speed.

At the top of the screen, the sun god, Inti, watches over everything going on

below. Players can use their special power by hitting the right key and summoning the sun god to eliminate all demons on the screen, but they need to wait for their special power to recharge before doing it again. The more the ruins get destroyed, the sun god's expression changes from smiling to sad.

There's no specific historical accuracy to the game — the ruins depicted are not those of any specific historical site or traditional culture, but the design style clearly conveys the fact that these are historical ruins. The game's not heavy-handed nor does it intend to conceal or convey any ulterior message on cultural responsibility — as the team at The Boneless told me, they were just thinking it would be a fun game to play and give people the opportunity to express their anger over the news of the ruins being damaged. But the game still does a very interesting thing: it spins a playful side on the whole issue, and whether intending to do so or not, puts the player in the position of having to defend cultural and historical heritage without dwelling on it or forcing a point about it. Still, the game takes a very static approach towards this playful version of preservation, indirectly making the claims, firstly, that culture is something primarily instantiated through physical structures and spaces (simply by virtue of the fact that these are the only elements defended, rather than practices, beliefs, or other cultural objects); and secondly, that the correct approach towards preservation is conservation: after all, you don't really get to play with the ruins themselves, but only stop the mischievous demons from interacting with them. Of course, one game cannot do everything, and what *Palomilla Hunter* does it does in a very interesting way, creating a playable system around an important cultural issue without feeling moralistic about it. As such, it is an interesting example to look into when we think about borderland games.

Inka Madness

Another such example, also released in 2013, is *Inka Madness*, developed by Pariwana Studios, the game development division of software and application developer Magia Digital, and their first self-developed and self-published project. The game was developed for mobile platforms and released originally for Windows Phone, with iOS and

Figure 4-8: Artwork for *Inka Madness*. Copyright by MagiaDigital.

Android versions following soon thereafter. It is a platformer style game, inspired by classics in the genre such as *Super Mario Bros.* and *Donkey Kong Country*, as explained to me by the lead developer on the project.

The player plays the role of Atuq, second son to the ruling Inka, Tupac Qhatari — all of whom are fictional characters. An aging Tupac Qhatari has decided to abdicate power in favour of his first son, Sarey, but on the day of the coronation ceremony, an evil warlock, Phawack, appears in the middle of it all and casts a spell on Sarey. Phawack then demands from Tupac Qhatari control over the empire in exchange for Sarey's life. As imperial guards rush to capture Phawack, he vanishes, and Tupac Qhatari asks his other son, Atuq, to find Phawack and release his brother from the spell.

As Atuq, the player needs to travel over the Inka roads and destroy Phawak's totems to weaken his power in order to break the spell. The various levels in the game are played against the backdrop of natural and historical environments of Peru, including famous locales such as Machu Picchu or distinctive elements such as stone-built houses. The mechanics of the game are fairly standard for the platformer genre, with players walking across the level and jumping onto and off platforms to navigate obstacles, all while fighting enemies and collecting objects to increase score. In that regard, one could be tempted to include *Inka Madness* under the *tomb raider* category

of Latin American representations in games (Penix-Tadsen, 2013), described above — that is, games that merely take the Latin American cultural, geographical, and historical backdrop as the exotic setting for an otherwise unrelated story. But there's a crucial difference here that we need to take into account: rather than Peruvian locales being simply the setting for gameplay, the player is actually playing the role of a character originally belonging to these locales. It is not the story of a Lara Croft-like character traversing an anonymous ruin in search of artifacts and secrets, but a character that is fighting to restore order and balance to their own realm. This is why *Inka Madness* is interesting and different to most other games occurring within similar scenarios: in this narrative, a character belonging to this reality is empowered with agency to transform the game world.

In *Inka Madness*'s case, the setting and cultural elements are by no means a coincidence. Working within the realm of cultural heritage and capitalising on the cultural and commercial opportunities that can be associated with borderland games are things Pariwana Studios is intentionally aiming for, as explained to me by one of the studio's managers:

> It was then that we decided, let's make a game using Peruvian cultural heritage, and we set ourselves the goal that our video game division — which we're calling precisely "games division from Peru to the world" — because we were going to be developing world-class games for mobiles, for casual gamers, using Peruvian cultural heritage as our main asset. And that's how Pariwana Studios was born, and it is still our goal.

This explicit attitude and commitment shows that the strategies to approach and deal with borderland games are diverse, with some studios and developers exhibiting a stronger, more conscious commitment to how culture is treated within their games, and other leaning more towards drawing inspiration from their everyday environments and happenings.

However, this narrative contribution does not necessarily translate to the game design. Game mechanics are fairly standard to the platformer genre — walk, jump,

Figure 4-9: Screenshot of *Inka Madness*. Copyright by MagiaDigital.

attack, and so on — as is the level design. Players do not get the chance to explore more from the narrative during the levels nor do they learn anything about the game world from actual gameplay, but only from the narrative interludes occurring in between stages. The game's limitation as a borderland game, therefore, lies in the fact that it ends up being a skinned or themed version of a platformer, onto which an interesting narrative structure has been layered, but which doesn't fully articulate it with the gameplay. In that sense, *Inka Madness* also illustrates the challenges of designing and building this sort of games, especially the challenge of thinking beyond the strictly narrative elements — plot, characters, settings — and to articulate the subject matter all the way through the design process. Borderland games can (and are probably better when they do) go beyond treating culture and history simply as assets to be deployed in the game world.

Kilka Card Gods

Kilka Card Gods is another Peruvian-developed game, released in 2013 by Bamtang Games, the largest game developer in the local industry. The game is available for multiple mobile platforms such as iOS, Android, and Blackberry, plus a future version

announced for the PS Vita — which would become the first Peruvian game officially released for a major console. Bamtang is one of the most established players in the local industry and has been developing games for international clients for almost a decade, and *Kilka Card Gods* represents one of its early attempts at building and marketing their own intellectual property.

Figure 4-10: Artwork for *Kilka Card Gods*. Copyright by Bamtang Games.

In the game, players are told the story of Yupanki, who has just won the latest world tournament of a card game known as Kilka. As the Kilka world champion, Yupanki is entrusted with the care taking of the Altar of K'arex, with a collection of eight golden relics. As soon as this happens, however, the relics suddenly disappear, and a shadowy figure emerges to challenge Yupanki to defeat seven gods in order to return the relics. The player is then tasked with helping Yupanki travel around the world and defeat each of the gods to restore the Altar of K'arex. Each god is located at some historic locale around the world — for example, Machu Picchu, or the Taj Mahal — and at each locale, the player must win about a dozen rounds of Kilka to be able to face and defeat that level's god, who are each able to use some unique ability to make the game harder. All of this is, in a way, a meta-game: what the player actually plays is Kilka, the card game itself. Each round, players are dealt a number of cards from a standard card deck, and shown a grid which has a combination of letter values on the edges and card suit icons in the grid cells themselves. The objective of the game is to fill all the cells in the grid with the cards dealt before time runs out.

Players need to match the values indicated both at the top and right of the grid, find the corresponding card of the right suit amongst their available cards, and drag the card to the cell. If correct, the card remains in the cell and the player gets additional seconds on the timer. If incorrect, the card slides back to its original location.

Figure 4-11: Screenshot of *Kilka Card Gods*. Copyright by Bamtang Games.

There are two things worth commenting about *Kilka Card Gods* as a borderland game. The first one is that the cultural elements deployed in the game are almost entirely cosmetic. While the game design is excellent and the Kilka card game itself super entertaining, there's nothing specifically cultural about it — the card decks are standard and the core game mechanics revolve around card relationships rather than on the narrative descriptions of the characters in the game. In fact, the player doesn't actually play as Yupanki, a distinctively Andean character in name and dress, but is rather enrolled by the game to assist Yupanki. Unlike the card gods you face, however, who each have specific unique abilities at their disposal, neither Yupanki nor the player have any special abilities. So while distinctively Peruvian elements are invoked in the art, the back story, and the music — with Peruvian folklore making up the entirety of the soundtrack — that's about as far as the creative appropriation goes.

But the other thing that is interesting to observe is how traditional Peruvian culture is depicted as being equal to many other prominent civilizations in world history, such as Egypt, Rome, or China, amongst many others. "Kilka" — the Quechua word for visual arts such as drawing or painting — is, in the context of the game world, presumably a game of Peruvian or Andean origins, that has clearly gone mainstream as a global phenomenon, as the game begins at the conclusion of the Kilka world championship in Paris. And Yupanki, the world champion, is on track to defeat the seven card gods with the help of the player, presumably then becoming something akin to a card god himself. So what's really interesting here is the presentation within the game world of a more level cultural playing field, where traditional Peruvian culture not only has value locally, but has potentially a lot of value ot be shared locally. In this way, borderland games are also expressive of beliefs or expectations as to the intrinsic potential value of the cultural system being represented, either procedurally through the rules and mechanics of the game, or narratively through the configuration of the game world.

These three games provide a good sample of both the interesting things happening with borderland games, and their challenges. They also share one very interesting aspect: they've all been published in English (or in multilingual versions at best), despite being entirely developed by Peruvian teams based in Lima. While the reason for this is clearly market-driven — there's a larger number of people paying for games in English-speaking markets than Spanish-speaking ones — this already points to the identity splits local developers and studios need to go through to get their game content out to the world. It is also interesting because how local developers use the English language in their games usually betrays their origin, regardless of whether the game in question is culturally-themed or not: many interface texts or dialogues are written in broken English that quickly give away the fact that they were not written by a native speaker. But having these games published in English is an important marker to assure that they are being presented as global commodities (something which is again reminiscent of Takhteyev's similar findings with *carioca* software developers). But of course, this sort of game is not unique to Peru, nor is

it the exclusive territory of, roughly speaking, developers in the global south. Which is why I also want to briefly consider one additional example of a game that, in my opinion, deploys cultural elements successfully, but operates under a different logic and comes from a very different place.

Guacamelee!

The final example I want to consider is also peculiar but for different reasons. In 2013, Toronto-based DrinkBox Studios released *Guacamelee!*, originally published for the Playstation 3 and PS Vita, and later also published for Windows, Mac, and Linux (with future releases announced for additional platforms). This game is different from the others in that it wasn't developed by a Latin American-based or even periphery-based developer, but rather by a studio operating in a comparatively strong game industry such as the Canadian one. It is also different in that the cultural elements included in the game belong to a significantly different culture and worldview, as opposed to previous examples where developers were drawing inspiration from their country or region of origin. *Guacamelee!* was, instead, developed by a Canadian studio portraying and parodying elements from traditional Mexican culture — a proposition that could easily go very, very wrong.

Figure 4-12: Screenshot of *Guacamelee!*. Copyright by Drinkbox Studios.

But DrinkBox Studios did a very interesting job with the game and its treatment of cultural elements. The game puts the player in the role of Juan, an agave farmer in a rural Mexican town, who is getting ready for the celebrations of the *Día de los Muertos*, the Day of the Dead. Juan meets with his old friend, the daughter of *El Presidente*, but when she goes to visit her at her mansion, he runs into an explosion and fire, and into a skeletal figure who kidnaps *El Presidente's* daughter, kills Juan and sends him to the land of the dead. When he is there, he is selected by the mask of a famous *luchador*, a Mexican wrestler, to become a hero, and upon wearing the mask he is transformed into a *luchador* himself and allowed to go back to the land of the living to rescue *El Presidente's* daughter. With his newfound powers, he battles and wrestles through hordes of undead crossing over from the land of the dead as he finds his way to *El Presidente's* daughter, having to jump back and forth between the lands of the living and the dead along the way. This cosmological order is thus articulated back with the mechanics of the game itself. The design of the game world is built around traditional elements of Mexican culture often displayed satirically, such as having the names of people, buildings, and places in combinations of Spanglish, but without going as far as to become a caricature of the culture being portrayed. *Guacamelee!* is interesting to think about under Penix-Tadsen's *luchadores* category as it does exhibit the double logic he describes: while it explicitly deals with Mexican wrestler references, it is also the story of one character navigating a creatively appropriated game world that doesn't just contemplate traditional Mexican culture, but instead it adapts and plays with it in new and entertaining combinations.

At a presentation during the 2014 Game Developer Conference by the game's lead artist, Mexican-born Augusto Quijano, I was able to hear a first-hand account of how these various elements influenced the game's design and were ultimately integrated into the visual styling, the narrative, and the game mechanics (Quijano, 2014). Quijano explained how the game's original concept came from his proposal during an internal pitch competition, where he was playing with the idea of building a game where Mexican *luchadores* would be a special form of heroes emerging from the culture clash between indigenous traditions and religious culture — "a heroism that was

very Mexican to me," as he described it. When the other members in his team liked the concept and began to explore it further, he set about on the task of "combining Mexico with fantasy" by drawing from his personal experiences growing up in a small town, and inventing a visual language for many things for which he had only vague notions: "these guys are the legends I grew up with. There are no images, they're just oral stories." The visual style and the inspiration for the settings and the narrative came from various other traditional elements from Mexican culture: the altars for the *Día de los Muertos*, the *piñatas* usually seen in popular parties, or Mexican art influences such as the paintings of Diego Rivera.

Figure 4-13: *Vendedora de alcatraces* by Mexican artist Diego Rivera, whose style was one of the inspirations for *Guacamelee!*'s art style.

Quijano had a number of recommendations for people in the audience interested in making games about other cultures, including trying to capture or incorporate an insider's cultural perspective within a team (such as his own position as part of Drinkbox Studios), and especially doing lots of research so that a team can comprehend a different point of view as much as possible — so it can "go beyond just the shell" of a culture in trying to represent it. "It's important to talk to people," he recommended. "You're not going to please everybody."

I chose to bring up *Guacamelee!* for two reasons. On the one hand, it is because I believe it is doing interesting things in not just presenting culturally-specific interpretations of games, but rather doing so in a highly elaborate way that goes beyond simply skinning an engine or a genre — while being firmly anchored within the platformer "Metroidvania" genre[5], the game attempts to give the genre its own special twist. It is not just about proudly displaying cultural elements, but about integrating those cultural elements with the design of the game itself and its core mechanics, as well as having a game world configured to provide interesting and living interpretations of a culture rather than just a static view of a crystallised tradition or practice. Culture as presented in *Guacamelee!* is not something static and clearly bound, with precise beginnings and ends. It is instead messy and permanently under redesign, in constant collision and articulation with other cultures, and as such, transgressions and explorations — serious as they may or may not pretend to be — are not only welcome, but successfully deployed in gameplay. The game points towards an understanding of culture as an open, complex system, rather than as a closed, defined set of traditions.

On the other hand, I wanted to bring up this game because it complicates our reading of the connection between periphery, culture, and success. That is, they help make the case that borderland games are not something relegated to the periphery, but also something that can be interesting to developers operating within centres of the practice (Harvey, 2014). Further still, borderland games can be produced successfully and interestingly, generating various levels of critical and commercial success. It would seem, paradoxically, that developers and studios closer to the centre of the video game industry, especially in the indie development space, are more willing (or more able) to take creative risks and explore diverse cultural assemblages than their counterparts at the periphery, potentially closer to the places of origin of many of the cultures and voices that have not found proper representation in the game industry. *Guacamelee!* illustrates how centre and periphery remain disconnected in

[5]Metroidvania refers to platformer games combining elements from the *Metroid* series by Nintendo and *Castlevania* series by Konami.

many ways, or rather, how peripheral perceptions of what goes on in industry centres is not necessarily aligned with reality (and vice versa) but is actually more indicative of issues local to the periphery itself: it is not so much an informed understanding of the industry that drives developers' and studios' decisions regarding cultural depictions in games, but rather a folk interpretations of how "the industry" thinks and behaves as global abstraction. Games such as *Guacamelee!*, however, point in the direction of very interesting creative and commercial opportunities for those willing to take the risks and explore the possibilities offered by borderland games — something that, as the sample of games we evaluated shows, is already starting to happen.

4.4 Reverse-Engineering Transnationalism

To be fair, I'm not describing this evolution in borderland games as a one-way path towards cultural emancipation in game development. Even the history of game development in Peru thus far has not been a linear development: issues of local and global negotiations and appropriations were already at stake in the 1990s, when cracking groups were busy taking commercial games such as Konami's *International Superstar Soccer* and reverse-engineering them to include teams and players from the local soccer tournament, to produce a game that would be more appealing to the local market. But even at the time, just as today, both community and production were split between people interested in incorporating local or regional cultural elements, and people more interested in appealing to narrative elements perceived as being more universal in scope — the Twin Eagles Group web archive of games developed in Peru, examined in chapter two, could easily be classified in terms of these two broad categories. As I've attempted to show in this chapter, how this issue is negotiated by local developers is variously complex, and it invokes discussions on social issues such as racism and discrimination, cultural issues such as how tradition and heritage are understood, and commercial issues such as how culture is commodified for the global market.

The global networks that extend through and around games are conflicting and

confusing, and encompass many conflicting interests at the same time. This has led authors such as Nick Dyer-Witheford and Greig de Peuter to place a lot of emphasis on the tension between "games of Empire" and "games of multitude" (Dyer-Witheford & De Peuter, 2009) — in reference to Hardt & Negri (2000) and their work on the category of Empire as world-system — to highlight how the growth of the gaming industry as a global assemblage has entangled it with multiple other social, cultural, and political systems that are exploitative and unjust (and, conversely, how "games of multitude" offer the possibility for creating game experiences that provide opportunities for an "exit" from the world-system of Empire). Their analysis of the political economy of game development and circulation is an important reminder that the game industry is not politically neutral and that the global expansion of cultures of leisure through digital games is, in itself, politically and socially loaded. How game worlds come to depict cultural realities and how game systems are constructed to portray social systems are processes that are affected by political ideologies and economic concerns, as well as by the various beliefs, desires, and expectations that developers bring to their studios and projects on an everyday basis. It is important that we unpack all those layers to develop a better understanding of what's actually going into a video game and what's coming out at the other side of the process.

Their analysis is also a reminder of the importance of diversity amongst the voices capable (both technically and socially) of participating within the world of game development. While the opportunities for becoming involved in game development have expanded significantly in the last few years (Anthropy, 2012), the capacity to make games has expanded at a much faster rate than the diversity of voices in the industry. Part of the reason for this, as we've seen in this chapter, is because even when new people are able to join the industry, they're often driven towards building on top of a handful of cultural narratives because of various reasons, further reinforcing a limited set of hegemonic voices rather than expanding the set of interesting worlds that could be built. As Dyer-Witheford and De Peuter put it:

> If in game studios the "lone wolf developer" has been supplemented by the hundred-member development team, in game culture as a whole, games

> are now altered, generated, and made from basic tools in intensely collaborative and networked milieus. (...) Thus game culture revolves around the social production of possible worlds. If games are a means for the collective construction and exploration of possible worlds, it is easy to see why a gaming culture might have an affinity with social change. (Dyer-Witheford & De Peuter, 2009, p. 221-222)

Radically different game worlds are not only possible, but are indeed proving that the creative and market opportunities are out there and especially available to developers working at the periphery of the industry. In this chapter, we've looked at many of the cultural challenges and opportunities for developers interested in operating within the space. I've attempted to show, firstly, that games are a site of cultural negotiation and contest. This is exemplified in the series of games I've chosen to call borderland games, which are attempts at packaging local cultural elements into a game design for the intended consumption of a global audience. Borderland games are useful to us because they become the focus of discussions about what's expected from developers and how they develop a folk understanding of how global markets operate and global audiences expect, while at the same time they're beginning to open up interesting opportunities both culturally and commercially.

5

Playful Ventures

Why do people make games?

Making games is hard. Making games is risky. Making games is not well understood by your friends and family, even if they might play games themselves. Game developers are often assumed to be childish and geekish, nerdy kids way too obsessed with immature forms of entertainment. Making games is ungrateful.

The 2012 documentary *Indie Game: The Movie* chronicles just how hard it is not only to make a functioning, but especially to get it out into the world, break through the increasingly unmanageable clutter and reach a person on the other end willing to play it (Swirsky & Pajot, 2012). The movie follows the stories of three games before, during, and after their respective public launch, and paints a picture of the stress and anxiety game developers — and "indie" developers specifically — endure when pushing their games out to the market. It's a frustrating account of how people find themselves having to navigate complex sociotechnical systems involving distribution channels, marketing strategies, and public outreach, without having any real training or even disposition for either of the above. What these developer stories convey quite clearly is just how paradoxically little of a game's success is actually determined by the development process or the actual design decisions. Having a great game can be understood to be a necessary, but not sufficient condition for having a successful game (and even this can be debated at length). What makes games successful as cultural or commercial objects is rather determined by a host of

other things, including an understanding of how the market works, the capacity to reach tastemakers and gatekeepers of various sorts, the resources necessary to support distribution, marketing and customer support, and even an acute sense of timing. As game developers often remind themselves, for every game you actually release into the world, there is a significant number of others that simply didn't make it, and were either cancelled somewhere along the development process, or were even finished and perhaps released but simply never took off.

At the same time, it is now easier than ever before for people to become involved in video game development — which is both a good and a bad thing. As we briefly examined towards the end of chapter two, the emergence of new developer tools, smartphones as gaming platforms, digital distribution, and flexible models of infrastructure allocation through cloud computing, all make it possible on paper for the lone coder to come up with a great idea, deliver a clean execution, and have it quickly picked up by users all over the world. All of this is now more possible than ever — on paper. As we later examined in chapter three, there's a lot more to making games than simply having a good idea and a well-defined skill set. Examples of individuals managing their entire development process on their own and successfully releasing a game abound, but rarely will one also hear about just how exceptional and rare that is. Individual success stories in the game industry are not only misleading, but can also have a chilling effect on new members of the industry: driven by these examples of exceptional entrepreneurship, young people are drive to explore the developer's journey on their own, often running into so many obstacles they end up becoming frustrated, disenfranchised, and perhaps ultimately leaving the industry altogether. At the same time, the increased openness to game development has introduced the problem of "player acquisition", as described by specialised companies within the industry: the more games are out there, the harder it is for any given player to find your game. In this context, player acquisition has become a crucial component to a successful game's release strategy over the last few years, with tactics ranging from traditional community and audience building approaches, to more questionable techniques involving data mining and social network targeting of specific slices of

users.

My approach towards the game industry thus far has been focused on development practices — how people acquire their skills, how they organise to make a game, how they make design decisions regarding content and themes, and everything that structures and models those decisions. This chapter focuses on the business practices of the game industry, especially as they're reflected in the case of the industry in Peru and how this specific peripheral industry is organising its production to achieve a sustainable, growing practice. My goal here is to understand how the basic unit of analysis for the game industry — the game development studio — configures itself to manage risk in the Peruvian context. Studios adopt multiple different strategies to assume or deflect risk, and their calculations of how much or how little risk there is in any given project is influenced by many things, and certainly not only by financial specifics. As we will see, risk as a category is socially constructed (Neff, 2012) and also socially performed: how studios and in the industry as a whole present themselves to outsiders as more or less risky affects the type of business model they can pursue, the volume of resources they can put together, and the level of support they can receive from the larger ecosystem. When thinking about the business practices of the game industry, we're then asking about the various strategies and tactics they're deploying on a daily basis to get themselves near tolerable levels of risk (De Certeau, 1988). And as we'll see, the *perceived* levels of risk can often be at odds with the *actual* levels of risk, both for insiders and outsiders to the industry, ostensibly due to a lack of communication and information channels.

I'll begin the analysis of the industry's business practices by looking in detail at the case of a group I'll be referring to as Studio Alpha[1], a relatively new studio to the industry in Lima founded and run by a small group of young people from different backgrounds. Their story is especially interesting because it illustrates both the potential and the challenges emerging groups are facing as they experiment with various business practices and models to achieve a sustainable formula for operation.

[1]There were some studios in Lima I was able to work much closer with, and because they shared some more private information with me, I've chosen to anonymise the account of their operations.

Following that, I'll outline the various business models I was able to identify in the local game industry and how they provide various strategies and tactics to deal with risk, as well as different expectations in terms of potential rewards. I'll then take a step back to consider the various ways in which the game industry can be interpreted as connected to previously existing industries (such as the software industry, the media industry, or the cultural industry) to illustrate how these multiple alignments have an influence on the sort of talent that it being drawn to work in games, or the kinds of support industry actors can enroll from outside institutions like government, education, or the media. Finally, I'll describe how institutional arrangements are coming together to collectively process these industry alignments and structural risk problems, through the establishment of the CVA, the Video Game Chapter of the Peruvian Software Association, which for the first time bands together a number of local studios in order to address larger issues no single one can face by itself.

The information for this chapter, as before, comes largely from developer interviews in Lima and many studio visits that took place during my fieldwork. This information has greatly benefited from having conversations with other industry players, including people responsible for funding, publishing, and marketing game projects, and from attending industry events such as the Boston Festival of Independent Games in 2013, and the Game Developer Conference in San Francisco in 2014. These expanded field sites have helped me articulate an understanding of how game development and distribution are carried out across transnational networks of technology, capital, and relationships, and how access to these various networks can both be acquired, nurtured, and exploited in order to push a game project towards the almost-mythical status of "shipped".

5.1 Starting Up

Out of all the studios I was able to visit and talk to during my time in Lima, there were a couple cases where I was able to hang out with the team considerably more, and get a very close glimpse into several aspects of their operations. I first met the

team at Studio Alpha through another studio they were collaborating with at the time. After a round of initial introductions, the team sat down with me for a long group interview where they both shared their individual introductions to game design and, especially, how they had come together to launch their studio project, which at the time had only been running officially for a couple months — even though they had been working together as a group for a few months longer than that. This slow path towards formalisation is a common feature for many other smaller studios starting to operate in Lima: most of them start out as a relatively informal group of friends or acquaintances working on some smaller game projects, many times getting to know each other through game jams, local IGDA events, or even through Game Devs Peru, the Facebook group for the local video game development community that became one of the focal points out of which the local IGDA chapter grew. People will often experiment with a few small projects as a group before making the jump to becoming an actual studio, an experiment that is as much about learning how to makes games as it is about figuring out whether the team can actually work together. If after experimenting for a while the team decides they want to get serious about game development, then they'll make the jump and set up a legal entity to be able to sign contracts and do business with clients and partners.

Studio Alpha's path roughly followed this description. One of the founder's was determined to set up a game development studio and originally enlisted the help of a friend as a partner, but at the time they lacked game development experience and were not equally committed to the project — leading to the partner leaving the venture a few months after. But in the process, they hired the people that would eventually make up Studio Alpha's core team, who all together decided to start a new studio project. They worked on smaller projects they could show to clients or partners until the opportunity to collaborate on a big project with another studio come along, at which point they were encouraged by the managers of the other, larger studio to incorporate as a business in order to formalise the terms of their collaboration. The four members of the team then signed on as co-founders of what then became Studio Alpha.

Setting up a new business in Peru is relatively easy, but it can be confusing for anyone who hasn't done it before — especially in terms of employment and taxing regulations. But for the most part, people setting up new companies can navigate the process without having to get legal support, which greatly reduces the overall cost. The Development Finance Corporation (COFIDE), an independently managed public company, offers a counselling service that guides would-be entrepreneurs through the process of setting up a company in less than a week at a cost of approximately S/.400 (about $150)[2]. The Peruvian Ministry of Production offers a similar option through the consolidated citizen and business services web portal from the Peruvian government, offering the possibility of setting up a company in 72 hours through a mostly online process. The service itself is free of charge, although some of the legal procedures involved have a cost associated to them, but fall within the same range if not lower than the service from COFIDE. Alternatively, choosing to work with an attorney to handle the process is comparably more expensive, with fees depending on the complexity of the operation but hovering around S/.1000 (about $360) or more depending on the specificity of the situation. Unless founders are going through very specific exceptional situations, however, they can turn to one of the cheaper services to get quickly set up with a legal entity and some template incorporation documents describing roughly the type of activities or services they want to perform, along with a basic corporate structure to deal with ownership, shares, starting capital, and executive team appointments and responsibilities. Notably, templates describing various sorts of products and services don't usually include an option for "video game development", so studios using these services will have to resort to more generic descriptions of "software development" or just very ambiguous "general consulting services".

When I first met with Studio Alpha, they had been operating as a legally established company for almost a couple months, and at the time they were starting their fourth game project while still finishing their third project and making some updates

[2]For reference, as of January 2014 the average individual income in Lima was roughly S/.1460 ($525) a month (Gestión, 2014). The minimum wage as of April 2014 is S/.750 ($270) a month.

on their second. They were energetic and highly optimistic, and just as many other people I talked to were largely driven by a passion for playing and eventually making games. We met at their office, the back room of a larger office for an accounting firm that was lending them the place through personal connections — shared or otherwise improvised office spaces were another recurring trope of game studios in Lima. The room was large enough to sit their entire team and the many visitors often dropping by their office to help out with some of their projects or just friends wanting to hang out. One of the walls was dominated by a massive whiteboard with various tasks, drawings, reminders, and in-jokes from the team. Another wall had a much smaller corkboard with active project information pictures of the team pinned to it. There was one very large, old wooden table in the middle of the room around which they all worked, with various laptops and computer screens laid out along with graphic tablets and sketchpads with test illustrations. Various video game posters, books, and memorabilia were scattered through the room, in distinct contrast to the outside of the room, an otherwise nondescript working space as one would probably expect from an accounting firm.

During our first conversation, the Studio Alpha team had me play through their games as they walked me through their development and studio history, and I asked a lot of questions about how they made their design decisions, the technologies they used in development, how they organised themselves to produce their games, and so on. The four members of the founding team were all in their early twenties, and had moderate to little prior work experience with other companies. Two of them worked primarily as game and level designers, one of them was the illustrator and animator, and one was the studio's only full-time programmer. They occasionally contracted out some elements of their game development when they needed increased capacity, and they ran most of their projects collectively, without anyone explicitly assuming the role of a producer or project manager, and with production roles being very flexible and most people completing very different tasks over the course of a project. All members of the team agreed about wanting as much of a horizontal organisation as possible, without nobody explicitly assuming leadership of the organisation or

management of production.

But as much as they were all very committed and passionate about what they were doing, they were still facing and figuring out many challenges, which were primarily related to the business side of the operation. After our initial conversation, I began to visit them regularly to catch up on how they were doing and to start asking more detailed questions about how they were organising their business operations, and I would also contribute some advise and recommendations on how to manage some relationships and projects based on my own experience. Studio Alpha was operating under several business models at the same time, partly doing work-for-hire, partly advergaming, and partly trying to position themselves to be able to sustain independent development. They operate under so many models in order to broaden their opportunities and potential clients as much as possible, and this versatility makes it possible for them to quickly shift to a different strategy when something is working more effectively for them or, alternatively, to move away quickly from things that are not working as expected. And they have this capacity because their a small team with very few and very small expenses for their day to day operations.

For the most part, however, their largest problem was not really having a planned strategy for how they were going to achieve their creative objectives, such as being able to work on and release the game project that got them together in the first place, and that they had been nursing for over a year making slow progress along the way. Studio Alpha was trying as quickly as possible to develop an understanding of how the industry worked, but because most studios in the industry are relatively new there aren't too many people to turn to in search of information or mentoring about how to get things running. The relatively young tech startup ecosystem also does not provide many resources or information about how to run a technology company, and most existing services and resources for small and medium-sized companies simply don't have any understanding of how game companies operate. Most of the advise Studio Alpha was looking for was related to how to run a company, how to figure out their cash flow, and how to figure out whether they could either find investors to provide some seed funding for the company or, alternatively, find new clients they

could develop games for — primarily thinking about the local advergaming market, very small in itself and populated by clients having little understanding of the product.

The lack of market knowledge was further complicated by the studio not having a full understanding of their own internal operations. After a few conversations, it became clear the studio did not have a full understanding of exactly how much money they were spending, or how much money they needed to bring in in order to break even and, ideally, make a profit — precisely the information they needed to figure out other things such as how to price their services, and what sort of clients they needed to go after. During one of my visits, we sat down together, opened up a new spreadsheet, and started working on figuring out what their operating budget looked like. We went over everything they were spending money on, and estimated how much they were spending on each line item every month, trying to think whether their spending would go up for each category over time. This simple exercise was very helpful to us all in understanding everything involved in the process of making games and how they were establishing their expectations towards the future: the amount of money they were budgeting for their own salaries, for example, was barely over the minimum wage, showing how much they were more interested in getting a sustainable operation running than in making significant financial returns. But once we had a sense of how much money they were actually spending, it also became evident that their financial situation was a dire one: based on their projected expenses and the size of their cash reserves, the estimate at the time was that they had roughly just a couple more months to go before they ran out of money, if they weren't able to find an investor or a new client. The exercise also revealed that, to a large extent, they had been underselling their own services below their break even point, and gave them a sense of how much they needed to be charging (or, alternatively, how they needed to restructure their production process to spend fewer hours on every project component) for their income stream to be larger than their expenses. Based on those estimates, we drew a small box in the corner of the whiteboard, and inside we drew a small red heart, similar to the health indicator in many video games. Next to it, we wrote "60d", for the sixty days they still had left before they'd have to shut down

the operation.

One of the things the team at Studio Alpha realised from this was that they didn't necessarily have all the capacity they needed to operate as business given their current team composition. While they were doing very well on the creative side of things, their relaxed process often meant they spent too much time working on some game component over and over, or had too many people involved in working on something that could've been sorted by only or two people. Additionally, because they were so committed to the creative aspects, they really didn't have much time available — and much interest, really — in working on such things as client acquisition and relationship building, things they understood they needed to do but didn't particularly enjoy doing, and a role they rotated by sending different people to various events and meetings. Their options were either to hire someone new to join the team and fulfill this role — something for which they didn't really have the cash, and therefore would've had to bring someone in as an additional partner to the company — or acquire these skills themselves with the existing team members — something that they didn't quite have the capacity or interest to do.

The other thing they realised was that they desperately needed to take on new paying clients or develop revenue-generating projects in order to stay afloat. This was related to their capacity issue: they specifically needed additional people who could focus exclusively on growing their client base and generating new projects. Their existing efforts to reach out to potential clients had generated some interesting conversations and potential partnerships, but they were consistently finding clients didn't really see the need to or value of investing in developing games. For local clients considering advergaming options, the size of the local market was unclear, and the potential for converting random players to customers remained an untested hypothesis. And the path to reach larger international clients interested in work-for-hire arrangements was harder to map and more expensive to execute. The team did have some moderate success partnering with international publishers in the casual, web-based game space that found them online, but the licensing deals they signed were only able to offset the development costs of games that had already been finished.

How the studio organised itself and built relationships with clients structured its risk profile, and the measure of risk the studio was able to manage had a direct influence on the creative decisions that could be made. As is the case with studios operating at various locations around the world, operating conditions often clash with creative expectations as to what work can be done (Tschang, 2007).

Just as the various business models adopted in the industry are each different approaches to how studios manage risk (and operating under various models simultaneously is, in itself, a risk management strategy), these additional issues Studio Alpha was facing can also be understood as consequences from the increased perception of risk people attribute to the Peruvian game industry. Because the industry has remained so invisible over time, there is very little local awareness of the studios that exist or the work they've done, and most people associate game development with something that happens elsewhere, where technology industries are much stronger. As a consequence, to make games in Peru is seen as risky business, as something destined to fail because the environment is simply incapable of supporting it. This inevitably structures many of the industry's relationships: potential funders and investors, for example, are much more hesitant to become involved with the gaming industry because they don't have access to information about how the industry operates and how the international market is structured. Similarly, studios don't quite know how to approach the (admittedly precarious) angel investor and venture capital market in search of funding, or what's at stake when they seek initial seed funding for their company or, alternatively, for any individual project.

A similar thing happens with clients: lacking accurate information about the size of the market and the potential returns they can get, it becomes extremely hard for them to assess whether the investment will generate enough returns to justify itself, or how it compares to investments in other forms of media where, despite being imperfect, measurements and indicators do exist and are widely recognised. Even if for some brands investing in a game might be a smart proposition leading to increased conversion rates, most studios are not in a position where they can back these assumptions with actual data. The result is that investing in games for

advertising purposes is risky not so much because the success rate is low, but rather because it is simply unknown: the lack of data makes it an extremely risky investment for potential clients. And the risk perception also affects the willingness of qualified talent to join the industry: because the widespread social perception is that there is no Peruvian game industry, or that technology industries cannot grow in Peru, even when people have an actual interest in joining the industry and are matched to existing opportunities they might walk away from them because the job prospects over the long term and their career paths are not clear. Working in the game industry is a risky proposition and most people who do it compensate for it through sheer creative passion — a luxury not everyone can afford in every situation.

Many of these challenges are above and beyond what any given studio can solve on its own — they're connected to industry visibility, social perceptions, and structural issues that take a lot of time and energy to address. But they inevitably affect the individual stories of studios such as Studio Alpha, that still have to figure out how to navigate this landscape and develop coping strategies and tactics for mitigating risk on an everyday basis. Studio Alpha is a nice illustration of what it means to be a playful venture: not only are these projects building playful experiences as their core product or service offering, but they're also very much playing at being a venture. Teams experiment with multiple options at the same time until they find a strategy that works for them, almost as if they were playing through a game.

5.2 Funny Business

The business of games has changed a lot over the last decade, as new technologies such as smartphones and digital distribution have transformed the landscape significantly (Sandqvist & Zackariasson, 2013; Lasky, 2014). Audiences have also grown and diversified, with so-called casual players now representing an enormous and fast-growing market segment, and "hardcore" players being smaller in numbers but with much larger spending per player (Juul, 2012; Entertainment Software Association, 2013; Zackariasson & Wilson, 2013). Business models are essentially the mechanisms

put in place by studios in order to become sustainable — that is, to have revenues generated from their activities be larger than the costs of operation. But they're not necessarily acknowledged in every case as being a business model as such, as most studios are continuously experimenting with various options and configurations of audiences, platform choices, distributions mechanisms, and so on. Because the industry is primarily structured on a project-based model, studios often get the opportunity to iterate and experiment with something different for every project. Just as learning how to make games has been an experimental process for studios, learning the business of games is also an iterative process of trial and error.

In my experience researching Peruvian game studios, I was able to identify four typical models under which studios operated: work-for-hire, advergaming, independent development, and peripheral services. Most studios operated under a combination of some of these, usually moving towards one or the other based on available opportunities; almost all aspired to being able to operate as an independent developer working on their own intellectual property. I will now look at each of these in detail, examining briefly sample cases of studios operating under each of these models.[3]

The Work-For-Hire model

Developing a game is a very risky operation, and even more so when doing it in a peripheral location such as Peru, where funding and talent are scarce. Funding options for risky ventures are not well developed, and there are virtually no such things as seed funds, angel investors, or venture capital funds one can turn to when seeking the resources to start a game development studio. One way studios have to mitigate the lack of early-stage funding and increased risk is to operate under the work-for-hire model: under this model, studios are hired by a client who is the owner of some form of intellectual property (IP) or game concept, with the purpose of developing a game out of said IP. The client pays the studio for all development

[3]In establishing categories and descriptions for how these various business models operate, I've also drawn a lot of extremely helpful information from a presentation by Jason Della Roca (2014) on funding strategies for game projects and game studios, delivered at the 2014 Game Developer Conference.

costs, usually making payments when a series of development milestones are reached, and the client is responsible for marketing and distributing the game they fully own.

Some of the longest-running local studios had their start and continue to operate under this model. One such studio I visited had as one of their explicit purposes from the beginning to partner with foreign companies to get around many of the limitations of the local market. As their manager explained to me, "we were born to export, because we knew Peru was widely known because of piracy. We were very afraid of having our work be pirated, so we never wanted to sell locally." They focused on building an export-oriented operation providing work-for-hire services to foreign companies, and over time managed to work with many well-known consumer brands — many of which they couldn't disclose to me because of non-disclosure agreements (NDAs) very common for companies working under this model. The prevalence of NDAs illustrates the double-edged sword of work-for-hire contracts: while they can provide for a lot of stability and a recurring source of funding if you can establish good relationships with a partner, the nature of the contracts and the limitations on being able to advertise and share the work you've done with other potential leads usually means the studio is dependant on a limited number of partners for new work. At the same time, these partners are usually scouting the market for new potential studios to work with, further putting the studio at risk over time.

The studio I was visiting had managed to successfully navigate this, and make a name for themselves internationally: "I have clients that started [working with me] in 2006 and they're still clients. I don't have a single client that has only worked with me once. They always come back for more. And I have separated myself from a couple of clients." Managing relationships becomes that much more important under the work-for-hire model, just as having a presence at industry forums were relationships are built and often deals are closed — such as the Game Developer Conference in San Francisco, amongst others. For this studio, GDC became a make-or-break proposition in its early stages: "GDC in San Francisco is *the* event. If you want to make it, you have to be there. We made a bet for GDC with everything we had."

The work-for-hire model is useful because it helps smaller or newer studios defray

the risk of starting a venture but working with relatively stable contracts, but it comes with a number of challenges: the need for relationship building, the limits on advertising work, and the relative dependence on a small number of clients. It is also hard to scale and generates limited returns: if anything the studio works on turns out to be massively successful, rarely will they get any share out of that success (conversely, if anything is a massively failure, the studio doesn't suffer directly from that loss either). And work-for-hire has a series of design challenges as well: because the player is different from the client, studios need to satisfy the demands of two very different groups that are not necessarily aligned.

The Advergaming Model

A slight variation of the work-for-hire model is advergaming, or games developed for advertising purposes, usually directly for a brand or indirectly for an advertising or media agency. Advergaming offers some of the same advantages as other work-for-hire contracts: they provide studios with a way to mitigate risk by working on set contracts, where the studio gets a predictable return based on the work they're putting into a game. Similarly, as well, managing relationships and sourcing new partners becomes an integral part of working under this model.

Perhaps the largest difference for the advergaming model is that most companies tend to look for potential partners in the local market. The lead game designer for one such local studio explained to me how their game development unit was actually a division within a larger digital agency, working on various projects such as websites, social media campaigns and mobile applications, all of them for local companies investing in their online presence. Games were a natural extension to the number of options the agency could offer to clients when pitching their services, which had the added value of being something "new" and "innovative". Being able to source clients locally means the cost of client acquisition is much lower, making it accessible to even smaller studios. The downside, of course, is that there is a lot more competition for a smaller pool of clients.

Additionally, local clients have very little understanding of the game industry

operates or what sort of results they can reasonably expect from games, making the prospect of developing a game for their brand a rather risky proposition they need to justify to accountants and managers. Studios I talked to in the space had little preparation in terms of providing potential clients with facts and figures about the results they could expect from games, or with the appropriate hand-holding to walk them through an initial engagement. Because of this risky perception for potential clients and the additional competition, rates on contracts tend to be a lot lower than with other forms of work-for-hire contracts, with clients expecting much quicker turnarounds and higher quality than they're willing to pay for.

The Independent Developer Model

Perhaps the model most studios aspire to is to get to the point where they can operate as independent developers, or *indies*, as depicted in films such as *Indie Game: The Movie* and countless media stories and profiles of successful indies. There's a fair share of romanticism attached to the idea of the indie: people who are able to get their own ideas out there, work on their own projects, and through sheer willpower and effort manage to produce a massively successful game that will be picked up and celebrated by their peers and thousands of players around the world.

It is, of course, a lot more complicated than that. Indie development is incredibly risky, with most project being cancelled during development, or being unsuccessful upon launch. Studios get to work on developing their own IP, so if they manage to make a successful game they get to reap all (or most) of the benefits, but if the game is unsuccessful, there is nobody covering for the losses. This also means that studios need to secure funding for their projects on their own, a complicated feat in itself, and even more so in a context such as Peru. It is not uncommon for studios to operate under a work-for-hire model until they can pull together enough resources to fund their own independent projects. However, success as a work-for-hire studio does not necessarily indicate a higher probability of success as an indie.

Some studios in Peru are nonetheless figuring ways to experiment with indie development, working on their own game concepts and getting them out to the market.

I was able to follow two such projects during my time in Lima. One of them was a studio's first independent project, a fast-paced puzzle game designed for iOS and Android tablets. It took them about six months to bring the game from prototype to launch version, and throughout this process they were clearly focusing on the game as a way to test the market: it was relatively small investment for them happening while they were still taking work-for-hire contracts, and it was mostly thought of as a learning experience. Not only were they trying to figure out what their development pipeline looked like, they were also figuring out how to navigate distribution channels such as Apple's iTunes App Store or the Google Play store. Launching their own game also required them to try to get it showcased in local and international media, and bringing it to game development conferences across Latin America and elsewhere. While the game was not a commercial success, it was useful both to bolster their independent game portfolio, and as a learning experience navigating the distribution side of the game industry.

Another project I was able to follow during that time was a smaller, web-based casual game by a young studio. The game was their third project overall, and the first one they were really committing to for the entire process (the previous ones being mostly experiments in learning how to make games together). The game's development was a slow process as the members of the team figured various technical and design kinks, and figured out how to get the studio running as a legally-established entity. But the game was also largely considered by the team to be an experiment, especially in terms of trying to get a game out to the market through online publishing and to determine whether they could capture the attention of some publisher willing to offset costs. This is another possible exit for indie development: while some games are self-published, others are actually picked up by game publishers towards the later stages of development — meaning the publisher does not actually fund development of the game itself, but comes in at the point where a game is ready to be distributed and marketed. The team working on this game was active in an online community called FGL, which bills itself as "the game industry's marketplace": within FGL, developers are able to license out games to publishers around the world under various agreements

ranging from a full IP transfer to a limited license to run the game within websites or specific contexts. Through FGL, the studio was able to secure a distribution deal for this game with a popular casual games portal in Europe — even though the deal was not large enough in itself to cover the entire cost of development.

The Peripheral Services Model

As described previously in chapter three, there are a number of ancillary industries emerging around the game industry, both globally and within Peru. The Game Developer Conference exhibit floor is populated by companies providing piecemeal services supporting various stages of game development: motion capture and tracking, digital distribution platforms, platform support and services, cloud services, marketing and advertising, user acquisition, analytics and game data tracking, localisation, and so on. This broad spectrum of available services is not available in its entirety in Peru, but rather, some specific opportunities for ancillary and peripheral services are emerging that are helping studios pay their bills and pull together resources to support their game development activities. We previously examined how teaching is becoming one such ancillary industry, and it is perhaps the most frequent option developers turn to when figuring out how to make ends meet at the end of the month.

But studios are also making the most out of the various components of their production process and offering specific piecemeal services to clients. In one of the studios I visited, for example, it was not uncommon for programmers to work on outside projects for some stretch of time, contributing to the coding of a website or an app for a few days or weeks. Similarly, artists would be able to gather additional resources by providing illustration or animation services for digital media or advertising. These piecemeal services are helpful for gathering resources quickly, as demand for these is considerably higher and the market is much better understood. But these can also often lead into trouble when organising a production pipeline, as people in the team can often not be available to work in an internal project because they've been committed to deliver on an external one.

Banking too heavily on this revenue stream can also be detrimental to team mo-

tivation and the creative process, as people can become frustrated by not being able to work on the projects they're actually excited about. So while game studios can patch things quickly by relying on this model, if a studio begins to rely too heavily on peripheral services, then it becomes hard to make the case that it is a game studio at all anymore. This is not an uncommon problem, as some studios over time have gravitated from being heavily interested in games to finding much more lucrative markets doing different sorts of services, and having them self-identify as game studios can be deceptive and even confusing to industry supporters and clients.

The Internal Incubation Model

Perhaps one of the most interesting organisational arrangements emerging for game studios is the possibility of creating a game development division or "spin-off" within an already existing firm, usually a technology company or digital media agency. The existing firm operates as a host incubating what can potentially become a new firm or a successful new division. This mitigates a lot of the early stage risks ventures face by covering many of the basics: a legally-established organisation, an office space to work from, and people capable of managing some of the basic everyday business aspects. This can represent enormous time savings for a new venture, while providing a much stronger footing on which to begin operating.

For studios operating under the internal incubation model, it is not actually necessary for them to spin off the host company after incubation. They might very well turn into a successful and profitable business unit for the host. But internal incubation also means that the host company is assuming most of the risk for keeping the venture operational, and therefore that they are in the position to make most of the decisions regarding design, pipeline, and operations. The team actually in charge of managing the game design process, therefore, does not have complete flexibility to determine what projects they'll be working on, or even how those projects are going to be pitched to potential clients and partners.

It is also not uncommon for people in the game development unit to be pulled to alternative projects from other business units, especially if the other units have a

Model	Description	Pros	Cons	Risk Profile
Work-For-Hire	Developing games (or components) out of client-owned IP	Client funds development, relatively predictable income stream	No profit from successful games, no ownership of IP, limits to advertising, hard to scale	Medium
Advergaming	Developing games for brands or advertising agencies	Client funds development, reduced client acquisition cost, quicker turnover	Increased competition, unsympathetic client base, high expectations, lower rates	Low
Indie Development	Developing own IP and releasing independently or through a publisher	Ownership over IP, receive profit from successful games	Harder access to funding, no buffer from unsuccessful games	High
Peripheral Services	Providing specific services along the game development production chain	Larger client base, little investment requirements	Hard to scale, increased competition, can compromise other projects	Low
Spin-Off	Creating a game development unit within an existing firm	Receive support from company, build on existing talent, access to clients and business functions	Limitations on creativity, time commitments to other projects	Low

Table 5.1: A summary of business models for video game studios in Peru

better track record at generating revenue. The people I've talked to working under this arrangement have reported sometimes not working on game projects at all for long stretches of time because their client and project pipeline was simply not as active as that of other business units. While host companies can have some interest in getting a gaming unit going, their interest might be peripheral or mostly based on expanding their product offerings than on creating a self-sustaining creative game development unit. But even in these cases, operating within these larger companies can provide smaller, less experienced teams with a very helpful launch pad where they can learn a lot about how to run a business, how to reach out to clients, and how to manage projects — knowledge that can be extremely helpful if they decide to spin-off into their own studio in the future.

5.3 Software Industry, Culture Industry, Media Industry

Just what, exactly, is the game industry? While examples of collective production can be found in many other forms of media such as film or television, and one could even argue for print as well, these forms of media tend to have more clearly defined roles and production processes, as well as a clearer sense as to who has a creative role, who has an administrative role, who has a technical role, and so on. In the case of film, for example, while production is very much simultaneously technical and creative, how roles are described and tasks are allocated has become much more streamlined both due to the longer history of the medium, but also because of evolving institutional arrangements such as union negotiations and contractual disputes (Bordwell & Thompson, 2012). This clarity, while not absolute or written in stone, has emerged over time as a best practice refined since the early stages of the medium's development. As a relatively younger industry, and one that has changed substantially in very short periods of time (Zackariasson & Wilson, 2010), the game industry has not had the good fortune of having roles and processes become as clearly defined and standardised as other industries. But this has also happened in part because the game industry sits at the confluence of multiple other industries from which it draws talent, processes, and institutions.

Specific national game industries have grown out of various entanglements with parallel or overlapping industries (Izushi & Aoyama, 2006): the US industry was born out of the early computer science and software development industries; the Japanese industry drew creative talent from the toy and animation industries that were very strong locally; while the UK industry emerged out of more informal arrangements of "bedroom coders" who were later able to build on more established industries such as film. The Peruvian industry tends to be more similar to the UK industry's history because of its more informal and experimental origins, but it has also drawn its influences and its talent pool from other industries as well. And these alignments provide the game industry with various pool of financial, social, and cultural capital.

The influence the media industry has had in the Peruvian context specifically comes from many people in the industry having previously worked with media companies such as advertising firms, from studios targeting local clients for advertising purposes, or from studios actually being created as branches or divisions of previously existing companies such as digital agencies. Many of the local studios that are operating under the internal incubation business model have been created by digital agencies that provide services directly to brands or advertising agencies and are interested in expanding on their available service offerings. These pre-existing arrangements and connections have made it easier for game developers to reach out and have conversations with friends and former colleagues in media companies, and to think about their business model in terms of a media service. This has a bearing, for example, in the way contracts and fees are structured, how development hours are priced and billed, and how value propositions are articulated to clients. For the people who have backgrounds in advertising or media companies, this language comes naturally and provides them with a common negotiating ground with potential clients —- who are themselves probably coming from that same media industry. Studios working under the advergaming, internal incubation, or peripheral services model will often frame their self-understanding from the point of view of a media company.

But video games also exhibit one key difference: they're heavily entangled with technology development, more so than other forms of media, because the very practice of game development is technology development — more specifically, software development. What gets "built" during game development is a codebase, capable of interacting with a library of assets (images, sounds, music, scripts, text, etc.) and composing a game experience out of those assets and the gameplay elements that are defined in the code. Game developers often talk about the "core game loop" when referencing the basic set of interactions that make or break a game. When developers work on their game loop, they're making sure the core experience is properly sustained by the game engine, which is in itself another important, larger piece of code. In their everyday practice, game developers are creating, manipulating, and expressing themselves through code that wasn't there before.

So from this point of view, the game industry is a technology industry — they're creating technologies that, ideally, manage to squeeze the most performance out of the available hardware. Local game studios that self-identify more strongly as a technology or software company tend to make slightly different design decisions: for example, their developers will often speak of their internally developed technologies, and especially their engines, with much more prominence and even pride. Several developers I talked to, for example, spoke highly of how they had included multi-platform or multiplayer capabilities into their engines, or how they considered their technologies to be among their core assets. This affects how the industry markets itself to clients, partners, and possible supporters — for example, for the purposes of attracting investors, or strategic support from the government. Some studios take this positioning very seriously: as the head of one of the studios I talked to said to me, "we do not think of ourselves as a 'digital agency'. We've always spoken of ourselves as a 'technology studio', because that's what we do — we're creating new technologies, whether they're websites, applications, games, or whatever." Being part of the technology industry has an additional importance because it's affiliated with a more sophisticated status, and with images of being at the cutting-edge, of being innovative. Additionally, many of the newer financing mechanisms available from government agencies to support innovation projects are limited specifically to the development of new forms of technology that can be in themselves licensed and commercialised. While a game project does not necessarily fit that description, other tools, such as a game engine, could very well be a right match.[4]

But despite all this, the game industry cannot simply be defined as a technology or software industry, because there's a lot more going on at the same time (O'Donnell, 2012b). As the visual elements and narrative assets from a game are also very important to the final product, and can generate enormous cultural influences, the game industry can also be interpreted as a cultural industry — an intersection where various government agencies and cultural institutions are becoming especially interested

[4]I'll analyse many of these funding mechanisms and opportunities more in detail in the next chapter.

and involved in supporting the industry (Shaw, 2010; Barwick *et al.* , 2011). Despite these potential opportunities, not many of the local developers identified with this self-understanding, perhaps as a reflection of the issues surrounding borderland games where culture is negotiated, described in detail in the previous chapter. The interest in the game industry as cultural industry is coming primarily from government agencies, such as the Ministry of Culture's Office for Audiovisual, Phonographic, and New Media, or the city government of Lima's Office for Cultural Industries, who are both interested in creating development ecosystems that are leveraging the creative potential of games for cultural expression — traditional or otherwise.

The game industry cannot really be reduced into any of these broader categories. It borrows roles and production practices from the media industry, it creates products that have technology at its core, but said products go on to behave more like cultural products than software products. And depending on where people in the industry decide to situate themselves, they're afforded a different set of potential partners, different sources of revenue, and different networks and status considerations. Which is why rather than limiting the interpretive framework to consider how the game industry operates, I prefer to describe it in terms of being a "creative industry", one where people's creativity takes centre stage for the production of specific experiences that are packaged as forms of intellectual property (Henry, 2007). Creative industries such as game development or computer animation exhibit diverse blends of all the industries mentioned above, and while being heavily technical in nature are still generating outputs that are broader than the sum of their technical parts. Rather than creating confusion, Peruvian developers are capitalising on this ambiguity by finding multiple navigational paths into the market, into resources, and into supporters.

5.4 Stepping Out Of The Shadows

On the evening of the first day of the 2014 Game Developer Conference (GDC), I had dinner with two people from a Peruvian game studio at a diner just a couple blocks away from the Moscone Center, the massive convention space where the conference

takes place. We talked for a bit about the conference, what the highlights were, and what we were all planning to go see the next day. The first two days of the conference are packed with talks, panels, and presentations by and for people in the industry describing tools and techniques, game postmortems[5], industry trends, and other topics of interest to people in the game industry. On the third day, the conference's expo floor opens up, with dozens of companies setting up elaborate booths to promote all sorts of products and services.

Our conversation soon turned to the booth that, for the first time, Peru would have as a country representation at the GDC, and the importance it would have. Having a country presence at the GDC would be a very important statement towards the entire global industry, a way of staking a claim and making its presence felt. And while any individual studio having their own individual presence at the GDC expo floor remains unattainable for most studios (and given the way the conference operates, perhaps even unnecessary), for many studios to band together and establish a shared presence actually makes a lot more sense, especially since the cost and logistics for securing the floor space were sponsored by PromPerú, the Peruvian tourism and export promotion agency — a level of support that was in itself a first in the industry's history. The Peruvian booth at GDC was not only an important statement from the Peruvian industry to the global game development community, but was also a turning point in the relationship between the industry and the government.

But as we discussed it a couple days before the expo floor opened, the people I was talking to were mildly sceptical about what would be accomplished. The process leading all to the way to securing the support of PromPerú for the booth and getting studios aligned around the project had been long and very frustrating. Even two days before the expo floor opened, there was no clear sense as to who would actually be in charge of manning the booth and talking to visitors, nor any sense as to what the shared discourse would be for all participants. As I ran into other Peruvian developers around GDC, I often heard the same response when asking about what their planning

[5]The postmortem is an established game industry presentation format, where developers talk very openly and candidly about a game they worked on, analysing what they did both right and wrong during development and launch.

was for the booth: nobody really knew who was taking the lead for what was going on.

Of course, what really matters is not really the GDC booth, but rather the GDC booth is just a symptom of a larger, more convoluted process that had begun many months prior, while I was still in Lima, and that continued to develop long after I had left: the establishment of the Video Game Chapter for the Peruvian Software Association (APESOFT), known informally as the CVA. The CVA was the first attempt at getting local game studios around Lima to band together and deal as a group with the many issues that no single studio can realistically address on its own. The intention of the CVA was to create a space to discuss various issues and then act as a group to mobilise whatever institutions or communities were needed in order to start working towards a solution. It was precisely the sort of industry self-organising many government agencies, such as PromPerú, were looking for when deciding whether to provide or refuse support for the industry: such agencies are incapable of fulfilling certain requests when they're submitted by individual companies, but can otherwise be much more helpful when the same request is submitted by a group of companies or a trade group that confers some basic level of institutional capacity and accountability. The CVA therefore created the platform to begin collaborating more fully with agencies such as PromPerú and others, while at the same time creating a channel for increased visibility of all the studios making up the group. Additionally, by establishing a chapter within the Peruvian Software Association, the CVA could benefit from additional connections to other software companies and from the institutional capacity and brand recognition APESOFT already held.

That a group like the CVA could come together was contingent a shift in self-understanding shared by most studios I talked to: they did not perceive each other within the local industry as competition, largely as a result of having most studios in the current generation as oriented towards the export market, or towards indie development. In general, studios have maintained very healthy relationships with one another, and collaborate frequently in putting together activities that benefit the industry and the game development community as a whole — obviously, to varying

Figure 5-1: Setting up the Peruvian country booth at the GDC show floor.

degrees of involvement. The establishment of the local IGDA chapter has contributed to this community building, as membership and leadership of the chapter is made up from people from various local studios. And there's almost universally negative reactions to people who try to act against this community spirit: there's a relatively well-known story shared by people in the local community about an industry outsider who learnt about the fast growing game industry and decided to set up his own company with financial support from a large existing studio in eastern Europe, with a plan to out-spend and out-hire everyone else in the local market. The company made huge investments in hardware and tried to poach away developers from existing studios, mostly without success, and after a few months started sending their first outputs to their parent company. Allegedly, the quality was so bad that they decided to shut down the local company just a few months after that. This story gets circulated between people in the local community, both as an example of how studios and developers can't really expect to be in the industry only because of the financial returns, but also of how the community is capable of self-healing and resisting attempts to tear through its social fabric — something that has been extremely important for

many years, as this community fabric and this network of social relations was for a long time the only thing driving and supporting game development in Peru (as we explored in detail in chapter two).

Largely because studios have adopted this attitude of not seeing each other as competition, then, was it possible to bring together such a group as the CVA. While research on inter-firm collaborations points large benefits for firm participating in these arrangements, the fact remains that collaborations between firms don't always happen in all industries and contexts (Ahuja, 2000). The Peruvian game industry exhibits the combination between the right set of incentives to collaborate, while also having strong enough opportunities for this collaboration to materialise. But despite the community and business value of such a network, studios have only been joining very slowly and in limited numbers — six local studios had officially joined as of April 2014. Because the CVA is a part of APESOFT, the Peruvian Software Association (a larger, pre-existing trade group), there are membership dues that need to be paid in order to become a member, and the cost of such dues are prohibitive to some of the smaller studios. Additionally, for some it is not entirely obvious why game studios should integrate a chapter within a software company trading group — again, because of the larger issues surrounding how the industry self-identifies. Because game studios are not developing software in the traditional sense, nor are they going for the same markets other companies within APESOFT are, the immediate benefits of being part of this larger organisation are not evident. Even for some companies who have paid their membership dues and joined the chapter, the benefits of having this network through APESOFT rather than independently are not entirely clear.

But the GDC booth has nonetheless been a result of this concerted action, stemming from the formation of the CVA — at least inasmuch as securing support from PromPerú for the official delegation. From what people I heard from people in the first couple days in GDC, however, little more had actually been done as a group, and every studio pretty much had their own game plan and strategy towards what is perhaps the single most important game industry event around the world. Two days before the booth opened, it was not clear who would be there to greet visi-

tors, what sort of promotional material would be on display, how games would be showcased, or how the work of having a joint presence would be distributed amongst the seven Peruvian game studios officially making up the delegation. Developers at the conference were unaware of what the booth design would be like, or what sort of facilities or equipment they would have access to during the show. And because of coordination mishaps during the entire process, an application for a government innovation fund to sponsor part of the studios' travel expenses for the conference was not submitted on time, forcing studios to pay for the entirety of their costs of getting to San Francisco and attending the conference. This was at least true for one group of studios — another simultaneous application was submitted by a different group of companies requesting funding for a "technical mission" trip that included visits to GDC and additional technology companies in the Silicon Valley area, and was approved by the same innovation fund. Game studios may not necessarily perceive each other as competition, but that doesn't automatically imply that they're all acting as a happy, supportive community.

On early Wednesday morning, shortly after the expo floor opened up, I stopped by the Peru booth to check it out. There were people from three different studios helping a representative from PromPerú finish set things up. The booth was a flashy red with the Peru country brand logo prominently displaying on the back, and a television next to it looping to videos of both the game studios that were represented, and the tourism and export offerings from PromPerú — an interesting mix between technology and traditional culture that didn't quite make sense. A nicely designed PromPerú brochure handed out to visitors promoted Peru as "A creative country" as follows:

> Why Peru?
>
> Because of its location in the centre of the West Coast of South America, which has made it into the regional hub of the South American basin of the South Pacific.
>
> Because of the immense variety of natural resources, minerals and acces-

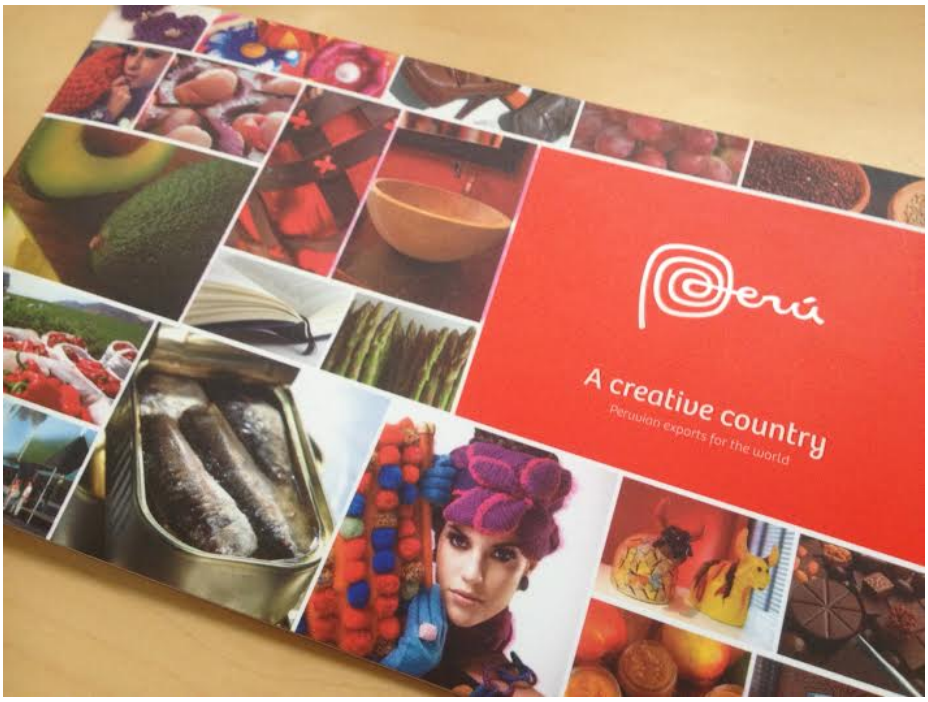

Figure 5-2: Official PromPerú brocuhure promoting Peru as a "creative country".

> sible energy in a land that contains most of the eco-systems and climates that exist on the planet.
>
> Because of its talented and creative human capital, which has inherited its culture from ancestral traditions and which uses resources in a sustainable and responsible manner.
>
> Because of its innovative companies and the notable entrepreneurial spirit of its population. Because of the materials, techniques and use of modern technology as well as the creative abilities of the Peruvian people and the presence of a responsible business sector; all of which guarantee a supply of products and services able to satisfy the most exacting requirements of the international market.

It goes on for a couple more paragraphs before going in detail into Peru's export capacity in sectors such as agribusiness, seafood, garments, jewellery, manufacturing, decorations, and eventually services, where video games are listed as one of the main products next to business process outsourcing, editorial services and cuisine fran-

chises. Understandably, one of the biggest concerns studios had with this country presence was just how generic it felt, and how little it was associated with technology industries and innovation. But as people close to the whole process explained to me, the studios were not actively involved throughout the entire process of securing the floor space or deciding what would be showcased in the booth. It was not about PromPerú arbitrarily deciding it would be relevant to also showcase seafood exports next to video games, but rather that they had no other feedback from studios on the matter. Some studios decided to capitalise on the opportunity and make sure they had at least one representative at the booth at all times during the three days the expo lasted, and for those who did, they had opportunities to engage publishers, media, and other developers in conversation. Others, however, decided to simply leave their promotional material in display while they spent most of their time at the conference presentations. What this disparity in commitment and involvement show is that there was no agreed upon strategy going into the conference for the studios that would be represented, and no systematic coordination with PromPerú, the sponsoring agency, in order to make sure the opportunity would be fully capitalised. And it was decidedly a very important of opportunity: out of the entire show floor, only Peru and Chile were represented with country booths, along with other much more established national game industries such as South Korea, Germany, or the United Kingdom. During the three days the expo was open, Peru's GDC booth got visits from people from Colombia, Mexico, and Guatemala, asking about the government's involvement and wondering to themselves why their own government would not provide them with similar support.

Both the Peru GDC booth and the establishment of the CVA that led the way to it are very good, important things for the local industry. These opportunities for collaboration are important, institutional linkages facilitating the circulation of knowledge and information — even of distributing the costs of research and development among many actors, as other technology industries (such as biotechnology) are doing (Powell *et al.* , 1996). However, they're far from perfect, and they help to illustrate two of the most important challenges the industry has been facing, and continues to face despite

all this progress. The first one is the need for solid institutions that can endure over time and whose stability is not contingent on specific people being in charge of their leadership. The local IGDA chapter is one example, and the CVA is another, of how having institutions people can turn to for information, support, and opportunities, becomes a very important step towards figuring out structural challenges and coming up with creative solutions. It also significantly contributes to one of the biggest issues the industry is still facing, which is raising its public profile and visibility. Having established institutions contributes by providing a sense of continuity and stability that can lower the perception of risk people have of the industry. How PromPerú was willing to support an official representation at GDC is one example of how institutions help mitigate risk, and become an incentive for other institutions and organisations to become supporters. Getting to the point where these institutions are established, however, is very hard, and can be very draining on people who take it upon themselves to provide some form of industry leadership. As multiple people how decided to organise industry events and activities expressed to me, there are not clear incentives and motivations for this mostly altruistic behaviour: "Why am I doing this? We're not getting anything in return and it often fulls like we're pushing this on our own. And at some point it's going to come to the point where we're going to have to stop, and simply concentrate on our own work", one such person told me.

The second challenge is the need for establishing processes, or forms of institutionalised shared knowledge, as illustrated clearly by both the story of Studio Alpha, and the story of the Peru GDC booth. While there has been and continues to be a lot of value from constant and continuous tinkering and experimentation, there are many areas where studios and the industry as a whole are at a point where they can begin to systematise and better structure many of their process — not only in terms of their game development process, but also in terms of how they arrange collaborations, how they coordinate efforts at large events such as GDC or others, how they raise the industry's public profile, how they influence educational institutions, and so on. At present, there are many different organisations trying many different things around the same problems, at the same time. But a benefit of having institutions is that

many of these efforts can be coordinated to maximise returns and minimise costs. Two key areas where this could have a lot of impact, for example, is in education and training, and public visibility and media outreach, two areas where the industry's efforts have been scattered and uncoordinated, but where having an impact could potentially benefit the industry as a whole into the next generation of game studios.

These are not simple changes, but rather changes that take a lot of effort and coordination. And, especially, they're very unsexy changes: it's not some shiny new technology that will suddenly transform the Peruvian gaming industry into a creative hub in the region. It's rather about updating the social configurations that have been woven around these technologies and these business practices to the point where they can sustain further production, innovation, and growth. This is especially important because the game industry is already reconfiguring itself at the global level around newer trends, and the Peruvian industry needs to be able to adapt itself not to the current, but to the next stage of industry arrangements that is to come over the next few years.

5.5 "Education, Entertainment, Entrepreneurship"

The game industry continues to change at an accelerated pace. As of April 2014, a new generation of consoles has recently been released to the market by big players such as Sony, Microsoft, and Nintendo. Alternative console or platform offerings from challengers such as Ouya or Valve are attempting to break the stronghold on the console market and introduce new, open platforms for developers to play with. And the incumbents are opening up new possibilities for indie developers to become involved with their ecosystems and launch games for their platforms, seeking to capitalise on the indie momentum and attract the most innovative gameplay experiences to their own walled gardens.

Casual and mobile gaming are no longer controversial things, but new business models around these categories, such as the free-to-play model, are emerging as alternative market configurations under which games are designed, delivered, and mar-

keted. Free-to-play games are designed more as services on demand than as cultural commodities, seeking to engage users over the long term and to monetise their gaming interactions as much as possible. On the more hardcore side of things, the return of virtual reality technologies to popularity through such companies as Oculus VR (recently sold to Facebook for $2 billion), and more recently Sony, has reintroduced a wave of excitement about what can be done with these technologies when they both become affordable and their development platforms become open for tinkers and experimenters to play around with.

New technologies and new market configurations will require new business models and organisational arrangements. As it stands, Peruvian game development studios have been able to figure out ways to keep up with industry changes when it comes to technology, and to slowly but decisively catch up in terms of access to new platforms: while a few years back most studios in the market would be working on Flash-based games for the web, diversity has opened up considerably and currently there are studios working on multiple mobile platforms, and at least two local studios beginning to develop games for the Playstation ecosystem. But local studios have not been as successful in adjusting to business and organisational changes, where there is still a lot of improvisation going on, and very little knowledge and learning that is being passed between studios. Because there is no senior generation of studios that can provide guidance, there is a shortage of mentors and counselors in the local industry capable of orienting and advising newer ventures and would-be entrepreneurs, while there is also not a full understanding of how processes and practices from other industries and sectors could be imported and adjusted for the video game industry specifically.

During the Rovio visit to Lima (detailed in chapter three), representatives from the company outlined the process through which Rovio had gone from being a game developer for many years, to totally refocusing their interests and operations after their hit game *Angry Birds*. In their own words, they went from being a gaming studio to becoming an "education, entertainment, and entrepreneurship" company, thinking of their game, now turned into a franchise, as a platform capable of enabling the creativity of others (Jenkins, 2006). *Angry Birds* has since become a transmedia

empire encompassing not only games, but also comic books, animated films, merchandising products, and even theme parks. Rovio turned their game into a successful intellectual property platform out of which new ventures and business models could be developed, but that conceptual transformation also required massive organisational overhauls in order to fully leverage this process of value creation. For many of this larger franchises, successful game development is only the first step towards the establishment of something much larger, capable of traversing multiple media forms and content formats through many countries and regions. In this model, content is a vehicle towards building platforms (Gillespie, 2010) or infrastructures (Larkin, 2013) for future creativity.

These changing arrangements entail both new challenges and new opportunities. As gaming ecosystems become more complex, the need for finely tailored products and services tracking user engagement and providing information relevant to the design process becomes so much more important. Similarly, localisation services that adapt and adjust content for specific locales also become crucial services to make sure a game or its surrounding components are not offensive or distasteful as they circulate around the world, but rather to make sure that the experiences can be similarly meaningful across multiple locations and cultures. And similarly, new opportunities continue to open up for companies to operate within the game development space, even when that space becomes populated with many activities that are not directly related to development.

This does not mean that the Peruvian industry will necessarily head in this direction, but rather just that it needs to be attuned to the changing expectations of the industry and the market as they evolve into the next generation of games. While Peruvian studios have done a very good job of catching and keeping up given the various structural and contextual challenges configuring the industry, for it to be able to grow sustainably over time and provide more opportunities for people and studios to realise their creative visions through games, it needs to be able to transition to anticipating where the market will go and start contributing innovations that are meaningful at a global scale. A big requirement to do that is attaining the capacity

of mobilising processes and institutions larger than the industry itself, and being able to enroll a network of support that not only mitigates risk, but defrays it to the point where the industry can start making larger bets.

6

The Entrepreneurial Republic

In the early 2000s, Peru went through an especially significant political transition. The questionable legitimacy of Alberto Fujimori's regime had begun to shake violently as a series of corruption scandals began to emerge and bring to light the immensity of a criminal apparatus that had taken over the Peruvian state and co-opted most of its institutions. A number of secret video recordings were brought to public attention explicitly showing the mechanisms through which the regime exerted control over legislative and judicial branches of government in order tu further itself in power. The Fujimori regime eventually crumbled in late 2000, opening the way for a democratic transition led by Valentín Paniagua, designated by Congress to assemble a transition cabinet that would purge the government from this massive corruption apparatus and call for new elections within a few months.

The ensuing political campaign became a contest between individuals promising various ways to bring the country out of economic stagnation and political trauma. The contest was ultimately decided between Alejandro Toledo, an economist who had been one of the leaders of the opposition during the final years of the Fujimori regime, and Alan García, who had surprisingly returned to the country and emerged as one of the frontrunners after having virtually collapsed the country during his first presidency in the 1980s — with Toledo emerging victorious in the end.

Games were not indifferent to this contest, nor unaffected by this process. During the 2001 presidential campaign, the Twin Eagles Group (TEG) — whose history

I explored at length in chapter two — released *The King of Peru 2: The Final Mecha* (*KoP2*), the first independently developed game to be locally distributed and marketed[1]. *KoP2* was a fighting game starring the main political personalities of the time — such as Fujimori, Toledo, and García — as playable characters who were duking it out over control of the government. It was meant to be satirical, light-hearted, and to capitalise on the popularity of the political themes being discussed at the time, even if the game itself didn't ultimately seem to advocate for any specific candidate or explicitly address or push any given agenda.

KoP2 is interesting for many reasons — its landmark status as the first locally developed and locally distributed game chief among them. But the game also marks the transition for TEG from being a primarily informal coding group to a more cleanly structured commercial venture. But as we saw in chapter two, this transition was ultimately unsuccessful for TEG for various reasons, and *KoP2* became, in many ways, the end point of one of the early stages in the history of the Peruvian video game industry. The next generation of studio projects would very consciously walk in different directions: clear structures rather than loose assemblages, foreign markets rather than domestic ones, minimise risk rather than maximise exposure. The result of this shift in direction is the industrial configurations explored at length in the previous chapter.

There are additional transitions to underline here. To a large extent, TEG was able to bring together a community of like-minded coders because of an environment that was very tolerable to informality, and very lenient towards regulating the domains where TEG operated — intellectual property, for example. Neoliberal reforms of the 1990s that where supposedly designed to stimulate entrepreneurship and risk-taking in the economy, very much following the policy recommendations of economists such as Hernando De Soto (2005), had terrible effects on loosely-structured ventures such as TEG, which thrived on the possibility spaces created by gaps in regulation or enforcement.

[1]The game was a follow-up and an expansion on the original *The King of Peru*, which shared a similar premise but was smaller in scope and had no plans for commercial distribution.

Even still, these public policy transformations did not kill the industry. And in the renewed institutional arrangements put in place after the democratic transition of the early 2000s, video games have been able not only to carve a niche for themselves in terms of their relationship to government, but also to nurture that relationship by exploiting various key structural advantages and fortuitous opportunities to the point where how the game industry has managed to engage multiple layers of the political apparatus have translated into exceptional forms of support and collaboration than those available for other creative industries. Despite ups and downs, and a considerable amount of pure luck, the game industry has managed to structure the foundations of a very interesting reinterpretation of how creative industries in strongly neoliberal, *laissez faire* institutional arrangements can actually manage to productively engage government agencies and public policy makers. A key to strengthening those relationships have been the emerging institutions the game industry is creating to collect and articulate interests, concerns, and needs in ways that can be productive for the sector as a whole — a process I explored in more detail in the previous chapter.

In this chapter, I want to explore how the Peruvian game industry is reinterpreting how it engages government and public policy in a way that's exceptional from other creative industries in a context where these industries seldom receive major incentives or forms of support. I want to argue that this highlights the opportunities and possibilities for creative communities to develop forms of "insurgent citizenship" (Holston, 2009), where recognition from government and the state is not something that is formally granted but rather a process of negotiation, giving, and taking through which community participants become better engaged citizens — something that is clearly not something that necessarily happens, but rather an interesting possibility of what *can* happen. And I want to explore how governments can play a role in setting up the creative infrastructures and environments that enable these communities to thrive, grow, and contribute both culturally and economically — and perhaps even politically.

I will begin by describing various ways in which the game industry is currently engaging diverse areas and layers of government and public policy, based on data

collected during my fieldwork in Lima. I will then look more specifically at how the Peruvian government is creating incentives and support structures for technology industries in general, closely entangled with globally circulating trends and rhetorics, and how these support structures are or are not relevant to the local video game industry. Following this, I want to consider the infrastructures that enable and drive creative communities, and how diverse layers of government can influence them — and thinking about this both from the local and the regional perspective. Finally, I want to look at how the government itself structures many of its engagements with the game industry in terms of managing risk, and how the local industry has been able to accommodate for these requirements and expectations.

6.1 The Game of Politics

One cold morning in July, I got on a cab and braved rush hour traffic in Lima, heading east towards the Surco district. Lima is a massive city, and while I wasn't going very far, traffic during most of the day has grown to be unmanageable — public transportation investments have been unable to keep up with a city that keeps growing in complexity, just as the country's economic boom in recent years has stimulated an ever-growing number of automobile users. My cab driver that morning was particularly skilful, and he was able to turn what would have otherwise been an hour's drive into a barely-legal fifteen minute run.

The cab was taking me to the Peru Service Summit — an event I mentioned briefly in the previous chapter, organised by the PromPerú, the Peruvian tourism and export promotion agency. The Summit was a gathering of local producers interested in exporting across several key industries, with potential international clients and investors. The highlight of the Summit were its series of business rounds, where producers got to engage directly with prospects for a few minutes, showcasing some of their products, exchanging business cards, and if both skilful and lucky, maybe laying down the groundwork to negotiate a deal afterwards.

As I approached the venue for the event — a custom-made temporary structure

built on the grounds of one of Lima's private country clubs — I began to realise how I was not exactly ready for the event. International businesspeople (an overwhelming majority of which were men) were arriving by the busload, wearing everything from business casual to full dress suit attire, while I was showing up wearing my best *grad student chic*. The security guard at the door when I arrived gave me a quick glance up and down trying to interpret exactly why I was there, but as surprising as it was to both of us, I actually had an invitation: I was there for the video game industry workshop PromPerú had organised as part of the Summit. I flashed my invitation and promptly got pointed in the right direction. The venue had a large central space with lounge areas and LCD screens playing looped videos from PromPerú and the event's participants, and three adjacent larger spaces where conferences and business rounds were taking place.

The video game workshop was taking place in one of such larger spaces. As I arrived, a demo reel from various local game developers was projected in a loop on a screen above the stage, and the room was very slowly filling up — half an hour after the scheduled start people were still arriving and organisers seemed in no rush to get started. The crowd in that space, however, became increasingly diverse: there was a collection of people in business suits, but perhaps just as large a contingent of young people wearing hoodies and graphic t-shirts. The big draw for the video game workshop was the presence of representatives from two of the largest game publishers, Square Enix and Electronic Arts, to speak about the prospects and opportunities for video games in Latin America. They had been especially flown in for the event, with PromPerú covering the costs and local studios having worked at creating and building the relationship. Along with them, several representatives of the local industry were going to be talking about what was happening in the local context as well.

Once presentations actually get started, the video game market was painted optimistically in very broad strokes. An opening presentation by Juan José Miranda, founder of local game studio Pariwana Studios (a business unit of Magia Digital, an established digital technology studio in the local market) and vicepresident of the Pe-

Figure 6-1: The video games workshop at the Peru Service Summit, before presentations got started.

ruvian Software Association[2], was highly optimistic about the game industry's history and prospects, claiming over 200 published games that had been locally developed, and over 1000 jobs connected in one way or another to the industry. Later, in similar big picture terms, Electronic Arts's representative Mario Valle spoke highly of the prospects for emerging markets, especially Latin America and Africa, and the growing opportunities for entertainment experiences across multiple devices. He concluded by congratulating the Peruvian government for bringing attention to one of the most highly promising industries.

On a different note, Stephanie Prodanovich, representing Square Enix, had more things to say directly to developers as to how to orient their development process if they wanted to work with a more traditional publisher, and what publishers such as Square Enix were looking for: "we're looking for games that have a 'latin flavour', things highly specific to our culture" — voicing directly a big source of tension for local developers, afraid of being pigeonholed into highly specific cultural narratives.[3] Prodanovich's remarks were much more operational, as was the next presentation by

[2]A few months later, he'd also be elected as president of the Peruvian Software Association.
[3]As examined above in chapter four.

Sol Samaniego from local studio Bamtang Games, who announced the introduction of Sony Computer Entertainment's developer incubation program to Peru, and described how Bamtang had gained its way into the program and the opportunities it offered developers, as well as the technical and operational requirements they needed to fulfill to be eligible.

On the one hand, that this workshop — although nothing was really workshopped during the presentations — took place at all was remarkable in itself, and that PromPerú would agree to provide funding to get international industry representatives to present even more so. Only three other sectors got the same level of treatment at the Summit: BPO (business process outsourcing), book publishers, and information and communication technologies (ICT) infrastructure providers. Not only was the video game industry included for the business round portion of the Summit (implying PromPerú was taking a gamble by showcasing a relatively unknown sector to international clients, essentially bestowing it with a significant share of its social capital and brand power), it was also featured especially through the workshop to give it some exposure as an industry. Because of this, people in the industry were aware that, to a large extent, this was an opportunity to put together a performance towards the government — PromPerú in this case, an especially strategic potential partner in terms of international outreach — showcasing the potentials and opportunities of the industry, and making a clear case not only as to why the video game industry is meaningful, but also how the Peruvian industry specifically is ready to take its operations to the next level. The Summit was an exceptional form of support from the Peruvian government towards a creative industry, but it was also very much a test, a controlled environment for PromPerú's team to better understand just how well organised the game industry was, and how much they were in a position to accomplish. That the industry was able to come together to pull off the content management and relationship building for the event was undoubtedly one of the influencing factor leading PromPerú to agree to fund the country representation at the 2014 Game Developer Conference just a few months later (which we explored in detail in the previous chapter).

On the other hand, the workshop was also an exceptional opportunity for local developers to learn from international publishers, and for the industry members to better understand what exactly it would take for them to get the most value out of an event such as the Summit: in practice, only four or five studios where at the level where they could be showcased during the investment round to engage directly with international clients and deliver on potential commitments. During the workshop's presentations, participants also got to hear the announcement by Sol Samaniego, the manager of Bamtang Games, that Sony was expanding eligibility of their developer incubation program for studios based in Peru. She also went on to outline what the program's requirements and expectations were, a list which included not only a number of technical requirements, but also several organisational requirements for teams to be able to apply[4]. These interactions are especially important when we consider many of the gaps and needs emerging studios face in the local industry, such as the lack of mentoring opportunities or access to information about production and distribution processes. They provide pathways and templates studios can follow or, at the least, take into account as possible routes available to them as members of the local industry.

It is important to understand here that, from the point of view of government, PromPerú was taking a gamble. As we've already seen repeatedly, a social stigma remains attached to games in the public's perception — one that is commonly and easily reactivated and exploited by politicians and the media. Only a year before this was all happening, there was a bill introduced by a congressman that would've made it mandatory to install content filters that would block children from playing violent games in Internet *cabinas* (cybercafés) (El Comercio, 2012). Precisely because there's

[4]A few months later, I was able to expand on these requirements in a conversation with Mike Foster, Sony's developer incubation program representative for Latin America. He explained to me how organisational requirements fit with Sony's strategy to preserve the quality of the Playstation ecosystem: because console development takes longer and is more expensive, studios need to have reached a series of specific milestones in their own evolution before they're ready to commit to the requirements of a console game. A studio's longevity and size, or their legal and tax status, all become flags that allow Sony to evaluate whether a studio is ready for larger, more demanding projects — even if it is impossible to assess beforehand whether said projects will end up being successful.

political capital to be gained from scapegoating games, there's a political risk attached to promoting them. Whenever the government has gotten involved with games in the past, it has been either because of intellectual property issues, or because of content regulation issues such as concerns around portrayals of violence.

While the inclusion of video games in the Peru Service Summit might not by itself signal a larger reversal in the understanding of games at the government level, it is still a remarkable shift from the usual rhetoric and approach government agencies adopt towards creative industries. It is also indicative of other patches of interest spread out across various areas and levels of government that have begun to think about what video games mean for them, and whether they're related to their sphere of influence.

One of such patches is the still relatively new Ministry of Culture,[5] which houses a recently created office for Audiovisual, Phonographic and New Media that I was able to visit at the Ministry's main location, the top floors of a massive 1970s building previously only partly occupied by the National Museum. It was there I learnt about how the office for Audiovisual, Phonographic and New Media is just beginning to think about how it can best support the game development community — decidedly interpreting it as falling within the larger umbrella of the cultural industries. To do so, however, the office is having to navigate around several issues, the first of which remains the systematic lack of resources for cultural promotion: even though culture has been elevated to the rank of a Ministry, it remains gravely underfunded when considering the vast range of cultural and media forms that fall under the Ministry's areas of interest. Yet even disregarding the lack of resources, the office is trying to come up with new creative ways for providing resources to the industry that are different from things they've tried with other cultural industries in the past, avoiding things such as establishing competitions or awards that, while straightforward, have only been mildly successful in actually driving up the amount of activity happening

[5]The Peruvian Ministry of Culture was created in September 2010 to consolidate and strengthen government agencies and activities related to interculturality, cultural heritage, and cultural industries. It consolidated the management and operation of, among others, the National Institute of Culture, the National Library, the National Archives, and the public radio and television stations.

in areas such as film. Relatedly, the third big challenge they're facing is the lack of an understanding for how the sector operates, how large or small it is, and what its specific needs are: the Ministry is much more interested in trying to carve out resources for projects and initiatives that would directly address the structural needs for the industry, rather than providing momentary relief by funding a handful of projects.

Something the Ministry can contribute immediately, however, is clout: having a vested interest in the promotion of cultural expression across new forms of media, the Ministry can declare specific cultural projects as "being in the cultural interest of the Nation" — a category that bears little material weight, but that can be symbolically helpful for diplomatic, international or even promotional purposes. However, this does not mean that *any* game project developed in Peru is automatically eligible for this category: there's an evaluation process that looks at such things as how it addresses or incorporates cultural elements from local or regional traditions — once again, bringing up the tension around borderland games versus culturally agnostic games, discussed in chapter four — as well as reasonable expectations of quality and polish. From a broader point of view, the willingness of the Ministry of Culture to embrace video game projects as being culturally meaningful and "in the cultural interest of the Nation" represents a huge step towards overcoming the heavy stigma games still carry, and while material resources may seem scarce, this level of legitimation can go a long way in contributing to the industry's long term sustainability. The willingness from the Ministry to provide this level of recognition to the game industry can also contribute significantly to getting acknowledgement and support from other areas of government — similar to PromPerú transferring a share of its social capital through events such as the Summit, the Ministry can transact in terms of cultural capital lacking the resources to actually make direct financial investments.

On a different day, I make the trip to Lima's historical downtown area to meet with someone from the office for Cultural Industries within the Lima city government. I arrived here following a recommendation from a developer I interviewed, tipping me off to the city government's nascent interest in considering the game industry and

developing offerings speciic to that target audience. The office for Cultural Industries was located in the upper floors of an old *casona*, the name for traditional colonial houses that remain standing to this day, in this case also housing the newly renovated Municipal Museum. The office for Cultural Industries approach towards the game industry was very similar to the Ministry of Culture's, and their understanding roughly the same: while they had begun to perceive the need to become more involved with video games and the game development community, they didn't have the resources to provide much direct material support, and even more importantly, they were also lacking an understanding of the industry that would enable them to create effective support mechanisms or design public policy.

Instead, they were trying to come up with alternatives, again decidedly from the understanding that games fell under the larger umbrella of the cultural industries — and as such, that successful initiatives that had worked with one industry could reasonably be transposed and translated to work with another one. Their thinking, still in its early stages, was to build on learning and skill building projects that had worked with other creative industries, notably the film industry, to open up spaces for engaging specialised talent around key areas of need the industry had — something that was working successfully around such things as screen-writing or production skills for the film industry. Their expectation was that a similar model could be put in place for the game industry, but again, with the additional obstacle that the office for Cultural Industries did not have a fully built sense of what the key areas of need would be. The office's overarching goal was to provide the support and hand-holding local studios in Lima would need to be able to engage larger international forums to showcase their product, with the South American Cultural Industries Market (MICSUR) being their primary point of reference. The office had already had positive results in connecting local creative ventures to forums such as MICSUR, and their hope was they'd be able to replicate that with games.

These conversations and attitudes broadly encompass the range of interest around video games coming from the government that goes beyond scapegoating and content regulation, and that potentially point towards reduced stigma and larger opportuni-

ties for collaboration — in conversations and interviews, I learnt about at least two other Ministries that were either interested in or already engaging in projects with the game industry. The government's involvement is coming from multiple areas, but mostly clustering around two: strengthening the supply side by providing resources, skills, or acknowledgement; or strengthening the demand side, by providing connections, reach, and exposure. There is no master plan as to how these contributions are made, and there is also no clear assessment from either side — government or industry — as to what's needed and what's prioritary. Along that same line, there's also no consensus as to, exactly, what sort of industry games are: as seen above, some are approaching it from the point of view of the cultural industries and applying similar policies and initiatives to this new media form. As I explained in the previous chapter, this ambiguity can sometimes play to the industry's favour, providing studios with access to different opportunities contingent on how they choose to align themselves.

6.2 Startup Nation

Shortly after I arrived in Lima, I met with Carlos, the head of a local studio, in their office. The studio works under the internal incubation model described in the previous chapter, meaning that it represents one business unit within a larger organisation with different products and services. This organisation in particular is a technology development firm working in various forms of interactive media and software development, and as such they're connected to many different aspects of the local technology industry.

As soon as I arrived for my meeting, Carlos was waiting for me out in the street right in front of his office. He explained to me how he had to deliver some urgent paperwork not far from where we were in Miraflores, that he'd drive us there and we could talk on the way. We got on his car and sped off towards the neighbouring district of San Isidro hoping to beat the traffic in Lima so we could get there before the government agency we were looking for closed up shop for the day. Despite him driving very fast, we couldn't really go much faster than traffic would allow.

Along the way, Carlos began explaining to me how the landscape for the local tech industry had changed significantly in the previous few years. Where previously there had been nothing but scepticism about the prospect of a locally-grown technology industry, government agencies and politicians had slowly begun to change their attitude and grow more amicable to the notion of providing stronger support networks and improved access to resources. What many people were realising, he explained to me, was that the current economic boom couldn't possibly last forever, and that the country's economy needed to diversify in order to become more resilient. As a result of this attitude shift, a number of institutional realignments were taking place in both the public and private sectors, and a battery of new initiatives were being set up with the purpose of strengthening technology-based industries and using new technologies to drive innovation in existing productive sectors.

He was explaining this to me because that was the very reason we were rushing through the streets of Miraflores: his company had put together a proposal to apply for a newly created government fund for innovation projects, and the deadline for applications was only a few minutes away. At stake on us getting there were potentially hundreds of thousands of soles in grant money that would go primarily into research and development.

The fund his company was applying to is called FINCyT, the National Science and Technology Innovation Fund, which had been only been set up within the previous two yeas and was definitely a novelty for the Peruvian government (FINCyT, 2014). FINCyT was looking to encourage investment into productive innovation projects — research and development projects which could be carried out in the short- and mid-term and would result in the introduction of products and services that could potentially benefit an entire productive sector. This is one of the things that sets FINCyT apart from other forms of funding for projects: FINCyT would not finance such things as a factory expansion, or acquisition of machinery, because these would be changes that would only benefit a single firm, and would only result in the linear expansion of their core business. Instead, FINCyT is looking for the innovations that would transform not only a firm's, but an industry's way of doing business, resulting

in technologies that could be licensed to other companies in the country or the region. FINCyT actually encourages inter-firm collaborations by establishing a tiered model where larger partnership are eligible for larger funding packages: if multiple companies within a sector pair together with one or more local universities, they're eligible for significantly more financing than if they were applying on their own.

Carlos explains all of this to me as he continues to navigate towards the FINCyT office. He also explains how the fund was designed to introduce completely new mechanisms into government funding of RD projects and technology industries. The initial iteration of the fund was set up on a grant from the Inter-American Development Bank (IADB) and was basically driven by the IADB's interest in strengthening the Latin American region's capacity for developing technology industries. After a successful first run, the program was handed over to the Peruvian government, who's been running the application process and providing the funds yearly ever since. The program has also expanded, incorporating new alternatives to the options of projects that are eligible for financing, such as technical missions for industry partnerships to travel abroad and visit their peers in different countries[6].

FINCyT is also different in that it provides companies or partnerships with non-reimbursable grant funds, and while there is an expectation that the funded parties will carry out their project as presented in their proposal, there is an understanding that there's a measure of risk associated to it. Even still, the fund is structured so that financed parties are also assuming a significant share of the risk associated: FINCyT will under no circumstance cover the entirety of the costs for a project, but will only provide funding up to a pre-established share of the total budget (the size of that share is contingent on how many companies are applying to the fund in a partnership) and only up to a maximum amount relative to the type of funding being requested.

But FINCyT is not the only novelty in this landscape. The government has also launched the Competitiveness Research and Development Fund, or FIDECOM,

[6]This was the alternative chosen by the group who secured government funding to attend GDC, mentioned in the previous chapter.

which is focused on bolstering companies' capacity to operate at the international level and is designed to be more accommodating to the needs of small and medium sized companies (Innóvate Perú - FIDECOM, 2014). FIDECOM similarly covers productive innovation projects like FINCyT, but their funding it more closely targeted towards projects that boost productivity and competitiveness, as well as skill-building projects for the training of human resources. FIDECOM covers up to 75% of a project's cost, up to a maximum of about S/.400,000 and a 24-month timeframe.

Carlos managed to get us to the FINCyT office right in time to drop off the paperwork, and as we drove back he was describing for me how this was not only an entirely new situation for the local tech industry, but also an extremely good time to be involved with these initiatives. But he also explained why they weren't designed to be available to everybody: funds such as FINCyT or FIDECOM were not available to early stage ventures, listing as their requirements such things as having been a legally established company for at least a year before applying, and other similar organisational and fiscal requirements. These funds are targeted to established firms interesting in introducing innovations into their existing operations, or to explore the possibility of branching into different markets, but they're not designed to provide seed funding or startup capital for people trying to experiment on their own with new ideas. Carlos explained to me how it was larger companies that were moving in very fast to take advantage of these to improve their processes and products, but smaller companies were either left out or forced to collaborate with larger players if they wanted to apply.

In late 2013, the Peruvian Ministry of Production announced the launch of Startup Perú, an initiative providing seed funding for early stage ventures in technology industries, along with mentoring resources to develop and validate a business plan capable of attracting outside investment — addressing precisely that gap. Startup Perú is modelled on both Startup Chile and Startup Brazil, but unlike those programs, it is only eligible for teams primarily from Peru (Startup Chile is aimed exclusively to foreign teams, while Startup Brazil accepts both). PulsoSocial, a blog covering startups in Latin America, described it as follows:

> The Start-Up Perú initiative is expected to provide support to 200 startups over the next five years by way of seed capital and other services. The expectation is that a large number of these startups will go on to receive capital from private entities to continue growing their businesses. Program organizers also hope to generate more success stories with an impact that is both global and local, improving the standards of innovation in the country.
>
> Though foreigners are welcome to apply to the program, it has clearly been designed to benefit Peruvian citizens and residents most. The majority of a team's members must be from and/or reside in Perú. (Stewart, 2013)

Further still, Startup Peru is branded as a collaboration between the Ministries of Production and Finance, as well as CONCYTEC and FINCYT — an interesting, albeit exceptional instance of collaboration between areas of the Peruvian government. The program, mediated through local startup incubators, provides startups with funding between S/.50,000 and S/.137,000 thousand depending on the type of project applying, and invests at an earlier stage in the process than other funds.

The interesting thing about all these initiatives is how they're part of an emerging trend of similar funds and structures that have become a component of a broader discourse around technology, entrepreneurship and innovation that has become commonplace in Peru and other places around the world over the last few years. As the world fell into recession, national economies collapsed, and unemployment soared, Silicon Valley appeared to be one of the few places remaining in the industrialised world that still had jobs available. The Silicon Valley way of doing things began to be advertised as the path to follow out of the recession, roughly under the belief that "software is eating the world", as articulated by technology founder and venture capitalist Marc Andreessen in a Wall Street Journal essay: that problems in sectors other than technology, such as healthcare or education, were ready for being taken over by technology startups (Andreessen, 2011). As part of this trend, countries around the world — especially in the developing world — are looking for the best

way to jump-start their local technology industries to create their own local versions of Silicon Valley.

But how, exactly, do game studios fit within this grand narrative of technological transformation? In chapter two, I've made the argument that the game industry has evolved out of messy arrangement that did not cleanly fit into the officially-sanctioned narratives of transforming the country through digital technologies — the latest iteration of the technological sublime. This remains partially the case: games are not necessarily the image most people in Peru would associate with their vision for a locally-grown Silicon Valley. And the way these funds are designed would almost seem to reinforce that, as the application requirements for many of these programs simply do not lend themselves well for game studio projects. For example, while funds such as FINCyT or FIDECOM emphasise the development of new technologies that can impact a sector, game projects do not necessarily fit under such description: technologies are developed, but usually as end-user products that do not necessarily reflect back on production processes.

However, this could easily be attributed to the confusing nature in which the game industry is structured as a business operation, where funding turns to flow at the project level rather than at the firm level — which is where these programs are more heavily focused. For game studios to be eligible for these programs, they need to have a clearer vision of how they work as part of the technology industry, and how they can contribute significantly from a technological point of view — for example, thinking about software elements they develop such as game engines, or helper tools, which are the tools that support their development process, and in many cases can turn into the intellectual property that radically differentiates a studio or a local industry from another. Studios have begun to think about these reframings already: in many of the industry meetings I attended, programs such as FINCyT and FIDECOM where mentioned and referenced heavily as opportunities studios should consider exploring. And there's already precedent established of game-related organisations receiving funding from these programs for technical missions to travel abroad.

That these programs exist is highly exceptional. While some very limited forms of

support, especially financial support, are available for such creative industries as books or film, these are very limited in scope and diversity. These industries, despite having been around for a longer time, have not been able to solidify their communities in a way that could more effectively push government for support, nor do their industries grant them the latitude to reinterpret their projects and operations to be more aligned with a different, more promising industry — such as games are able to do with technology. However, the mapping between games and technology and innovation funding programs is not straightforward. But because of its longer history and more engaged community, the game industry could very well leverage these opportunities to strengthen their technological base and provide itself with key intellectual property that could open entirely new lines of business.

6.3 Innovation "Ecosystems"

Technology startups have been able to attract a different level of attention recently because digital technologies have become the new promise of modernity associated to the latest economic boom (as explored in detail in chapter two). Startups have become quite fashionable in international development, with not only Peru, but even more so countries throughout the Latin American region and the rest of the world suddenly competing fiercely to establish their own technology entrepreneurship hubs following as closely as possible the model of Silicon Valley. As an illustration, a sample of initiatives that are popping out throughout the region to pursue the promise of having a Silicon Valley in your own backyard include entrepreneurship communities that have sprung up in recent years, including Lima Valley, Santiago Valley, Montevideo Valley, Palermo Valley (Buenos Aires), the "Brazilian Silicon Valley" (Campinas), Suma Valley (Guadalajara), Bogota Valley, and many others following the same pattern. In the region, governments are displaying different levels of involvement in strengthening these communities, which is in turn also exerting pressure on the Peruvian government to come up with its own proposal to avoid being left behind.

To provide some perspective, we can briefly consider some of the government

initiatives taking place in the context of the Pacific Alliance[7] to promote technology industries (and the game industry specifically as well), as they're being implemented in those contexts that are perhaps most similar to the Peruvian one — especially if we look at what's happening in neighbouring countries such as Chile and Colombia. As with many other things in Peruvian society, Chile often becomes an obligatory point of comparison and, not infrequently, competition. The comparatively healthier and more mature Chilean financial industry (Romaní *et al.* , 2013) has helped drive stronger investments in technology-related industries, as well as helped catapult many local firms to international deals and investments: as a clear example, two of its strongest game development studios have already been acquired by larger foreign firms (Frasca, 2012). Chilean companies have been highly effective at organising themselves and negotiating support and incentives from their government, and games have not been the exception, with the Chilean agency for export promotion, ProChile, funding and helping in the organisation of a national delegation to attend the Game Developer Conference since 2012[8].

Chile's policies regarding the promotion of technology and innovation intend to be far-reaching. Chilean President Sebastián Piñera declared 2013 as the "Year of Innovation", when policies and efforts around the issue would better come together (Gobierno de Chile, 2013). It is a large scale effort to streamline the government's effort to invest in science, technology and innovation through its development financing branch, CORFO, and its science and technology council, CONICYT, as well as to improve resources available for people interested in pursuing advanced studies internationally. The most widely-known effort in this area is the Startup Chile program, which provides seed funding and networking resources for highly promising foreign

[7]The Pacific Alliance is a trade association established in 2012 between Chile, Colombia, Mexico and Peru, with Costa Rica joining as well in 2013. It promotes economic integration by creating a framework for such initiatives as the integrated Latin American stock market encompassing Chile, Colombia, Peru, and soon Mexico, or simplifying procedures for citizens from any of the member states to legally work in the jurisdiction of any other (Perú 21, 2013a). The Pacific Alliance is also the free market alternative to the ALBA bloc promoted primarily by Venezuela, and is similar to MERCOSUR, an integration agreement primarily between countries in the southern cone of Latin America and Brazil.

[8]Chile was also the only other Latin American country, along with Peru, to have country representation within the show floor of the 2014 Game Developer Conference

ventures willing to relocate to Santiago for at least a year. These efforts are not universally celebrated: while Startup Chile is very well regarded internationally, the sentiment I got from various informal conversations with people close to the project or its participants was that the long-term impact from Startup Chile was very low, as entrepreneurs were not staying in Chile beyond their year-long required stay. It was described to me broadly as an initiative that was "coming out of the marketing budget" — that is, as something designed to improve the country's international perception, but not really expecting to generate returns in terms of investment or job creation. Regardless, the Startup Chile has been lauded internationally as a smart approach towards jump-starting a local entrepreneurial community by bringing in talent, connections and ideas, and similar programs are being replicated following the same model across the region — including Peru's own Start-Up Perú program.

In many of the conversations I've been having, Colombia was frequently mentioned as the fastest growing game industry in the region, and many people close to Colombian game studios pointed to the strong support they're receiving from the government as helping drive that growth. Most of this support is coming from the Colombian Ministry of Information and Communication Technologies, the entity responsible for coordinating and managing the *Vive Digital* plan, a cross-sector, four-year push to increase Internet adoption and promote the creation of technology-based ventures across the country. One of the main initiatives associated to the *Vive Digital* plan is Apps.co, a roving technology development effort designed to support people in coming up with ideas and projects around new technologies, offering different resources and levels of support based on how mature the idea is and what skills the potential entrepreneur has. Apps.co offers a series of online and in person bootcamps to teach technology skills; ideation workshops to apply those skills into potential project ideas; and then counselling, mentoring and acceleration services for projects that are further along in their development process. (Apps.co, 2013)

Games are also coming under the sphere of influence of the Ministry of Information and Communication Technologies in Colombia, specifically under its Digital Contents area, responsible for "strengthening industry sectors that generate knowl-

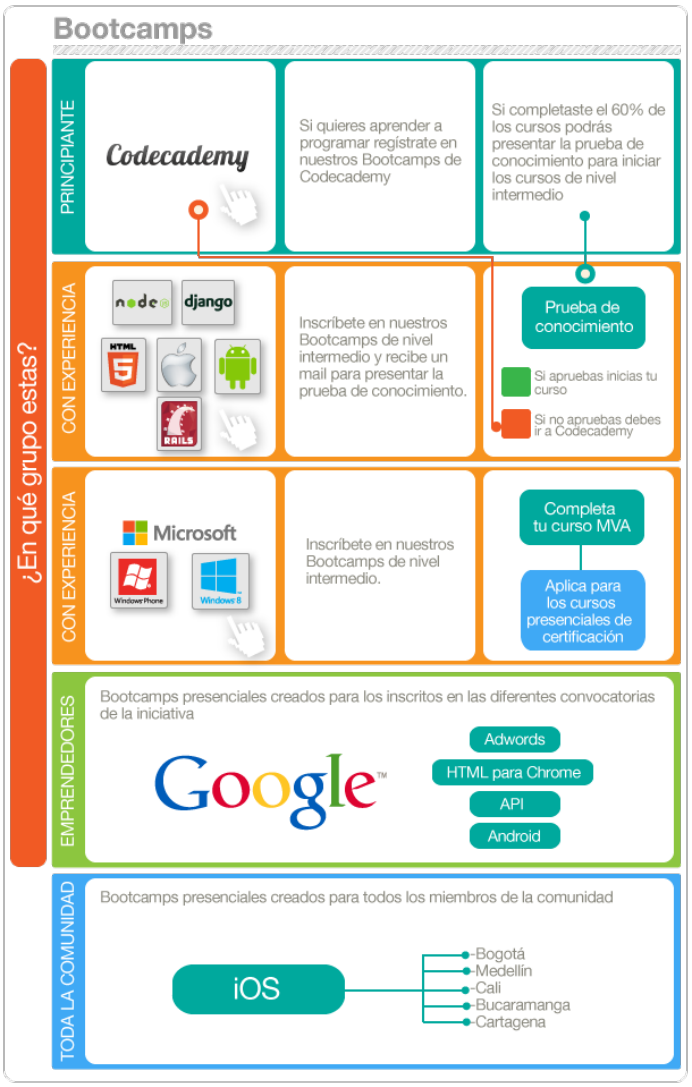

Figure 6-2: Apps.co's technology bootcamps offer different alternatives to acquiring skills based on level of expertise. Image source: Apps.co.

edge and develop new ways of thinking about digital aspects through technology" (MinTIC, 2013a, translation mine). Through a partnership with the Colombian Ministry of Culture they've launched *Crea Digital*, a competition to promote the creation of digital contents and technology appropriation, in which video games have their own award category (with the two other categories being electronic books and interactive media). (MinTIC, 2013b) Additionally, the Ministry has also set up a different partnership with ProExport Colombia — Colombia's export promotion agency — to support the promotion of Colombian game developers at international venues, such as

Country	Number of studios	Population (in millions)	Studios per million population
Argentina	75	41.09	1.83
Brazil	113	198.7	0.57
Chile	30	17.46	1.72
Colombia	62	47.7	1.30
Mexico	93	120.8	0.77
Peru	15	29.99	0.50
Uruguay	12	3.395	3.54

Table 6.1: Number of game studios relative to population size in Latin America. Source: Luna (2014).

the Game Development Conference (GDC) in San Francisco. (Galeano, 2013) In 2013, five Colombian studios travelled to GDC with ProExport Colombia assuming 50% of the costs and assisting them in setting up business meetings and deal negotiations with international clients. (ProExport Colombia, 2013)

The Chilean and Colombian examples illustrate how governments in the Latin American region are becoming involved with technology promotion and supporting new industries by providing access to resources such as skill building, international exposure, or networking. Yet Chile and Colombia have also acknowledged the video game industry as a component of their digital efforts. Peru has been slower to catch up. The Peruvian government is trying to reconcile these two narratives about its technological future: the imported version of startup culture tied to entrepreneurship and technology innovation; and the unexpected, unlikely, and loosely organised construction that is the local game industry, with its own needs and wants. While they fit together in many ways, they also conflict and clash in many others.

What, exactly, is missing from the game industry for it to be a part of the vision of future Peru? While the answer encompasses many things, it can be adequately summarised as "export quality" — a form of international trade pixie dust that's hard to define, but you just know it when you see it.

6.4 "Export Quality"

As we've explored earlier, studios in the Peruvian game industry operate under a range of different business models — even one same studio can have multiple projects pushed

out to the market under different strategies. This can complicate discussions with the government, as it isn't entirely clear how the industry operates, what its needs are, and how it can be supported. From the point of view of export promotion, games don't easily map into any existing categories: they don't really sell as manufactures goods, but they also don't exactly sell strictly as software licenses either. But game studios still are under the constant need to find new clients — either people who will contract work from them as a work-for-hire engagement, or someone who's interested in purchasing one of their games either during or after development. As the local market is still small and potential clients are not fully knowledgeable as to why they would pursue games (for example, in the advertising industry), game studios are much more interested in exploring opportunities abroad.

Getting to those opportunities, however, is a lengthy, costly, and somewhat obscure process. It's not necessarily or automatically true that the pervasiveness of the Internet has made it any simpler or easier to navigate, other than the fact that you can search the web and find a lot of information about it. Yet even armed with all that information, a significant share of the process remains a black box for people outside of international trade, and many obscurities — legal frameworks, taxation policies, exemptions, tariffs, banking procedures, and so on — can be the determining factor in whether a deal succeeds or falls through in the process. Government export promotion agencies, such as PromPerú, ProChile or ProExport Colombia, work towards streamlining the process as much as possible and assisting would-be exporters in getting their products showcased to the international markets, frequently concentrating their efforts on sectors that are considered to be strategic for some reason.

Games have not been a traditional component of their portfolio, as we saw above — at least not in Peru. Shortly after a regular business day was over, I met with Manuel, who is fairly close to the foreign trade industry, and well acquainted with how software and game exports work in the Peruvian context, to better understand why. We met at a nice café near Lima's financial district, in the upscale neighbourhood of San Isidro, and he walked me through how the process for exporting works in traditional industries, and how it's different for sectors such as software and games.

There's a recurring theme that shows up when thinking about software and games — thought of indistinctly as either products or services — and international clients and markets: that of "export quality", how Peru doesn't yet have it, and how that becomes a significant obstacle for the government to get involved. Considering a product or service as having export quality translates into two things: first, it becomes an assurance for the government that the transaction bears a smaller risk that the producer might fail to deliver on commitments. Because government agencies such as PromPerú are basically mediators for the symbolic capital associated with the country as a whole — in other words, because they're basically *brand managers* — they need to be especially careful about who they're vouching for. Second, the label becomes an indicator that the product will be able to attract higher yields because of added value on the production side. Industries that generate higher returns on investment are promoted much more actively by export promotion agencies[9].

The export quality label is a tricky one, however, as it is not clearly defined anywhere, and assessments of quality are necessarily different based on the industry, product, or service. A 2013 International Monetary Fund working paper on measuring export quality in developing economies states that "export quality cannot be directly observed and needs to be estimated. Only unit values (that is, average trade prices for each product category) are observable" (Henn *et al.* , 2013, p. 4) — in other words, if two countries are successfully exporting the same good, the country that is able to command the higher price can reasonably be assumed to be providing a higher quality product. But while this metric works reasonably well for products that are roughly equivalent, it is not so clearly applicable for something as games, where the same game, when sold to a client, will probably not be sold to more than one client (under a work-for-hire model), and games are hard to compare to each other in terms of quality.

From what I'm hearing in conversation, however, there's also more to export qual-

[9]It is worth noting that export quality bears little connection to the value of the product in itself. As the examples in chapter four show, a product's capacity to do well in international markets is not necessarily connected to its authenticity or cultural significance, but rather by its perceived appeal and capacity to scale fast enough to reach international customers.

ity than just end market value. The export quality label applies as much to process as it does to product, even more so when dealing with a production engagement that's likely to take several months, or when providing a service. Export quality for games, therefore, cannot be directly measured in terms of market value; but being labelled as having export quality *does* translate into being able to charge rates above what the local market is paying — both because of the added layer of confidence in the transaction, but also because, as Manuel explains to me, managing the process implies paying for a much higher overhead (in situations where there are no taxation agreements between two countries, a provider might be taxed twice on the profits from a transaction — both on the sending and the receiving end — and can end up paying as much as 60% in profit taxes).

What, then, does being of export quality look like in the game industry? As we talk it over, Manuel is able to narrow it down for me to four factors:

1. A studio that has roughly been around between three and four years. This provides a guarantee of continuity and stability: the risk of partners coming to a disagreement and shutting down the operation is much lower.

2. A studio that has been able to publish roughly between three and four games on their own, and perhaps twice as much if it's been contract work. Having a large portfolio allows a studio to show clients a range of experiences and design concepts, including if, when, and how a studio is applying novel trends and innovating in their developments.

3. Knowing who's on the team and where they're working. Do team members have a solid track record? What are their working practices? Do they have an office? What is their legal relationship to the studio? These are all necessary assurances an international client will be looking for when investing in a company abroad.

4. What the funding situation looks like. Past their fourth year of operation, a studio should've broken even already and should be making some profit, and be aware of who their audience is and what sort of games they're good at making.

These are not, by any means, formal requirements nor unbreakable laws — merely a heuristic to narrow down what the export quality label encompasses. These are, furthermore, quite contestable: a game studio with a smaller number of finished games but able to put together a compelling technology demo, for example, will also have something interesting to show to clients. A distributed team working across many locations might be able to forgo having actual physical facilities if they have consistent quality production and their team has a solid track record. And so on — but it does serve as both an indicator of what international clients are looking for when considering game studios based outside their home country, and a checklist for areas where existing game studios can strengthen their operation in order to make themselves more appealing to the international market (if, of course, they've chosen to work with clients or publishers rather than publishing their games directly to the final consumer).

That job, however, escapes the sphere of influence and interest of export promotion agencies alone: "it is not PromPerú's job to generate supply. PromPerú takes existing offers and pushes them outside." Strengthening and expanding supply is something that requires more of a concerted effort between not only multiple areas of government, but also multiple partners in industry. Colombia, by aggregating sector policies through its Ministry of Information and Communication Technologies, is able to bring together multiple stakeholders strategically and craft alliances that promote supply (by partnering with the Colombian Ministry of Culture) and demand (by partnering with ProExport Colombia). No such arrangement exists on the Peruvian side, where many similar conversations are happening at the same time without them ever overlapping. Manuel tells me: "The Ministry of Production should work with FINCYT, CONCYTEC[10], and PromPerú, all of them together — if these three would start pushing out supply, supply, supply, then PromPerú can take that and push it abroad."

The problem is it can take several years to get there, and Peru's already lagging

[10] *Consejo Nacional de Ciencia y Tecnología* (National Science and Technology Council). The main government agency supporting science and technology research and development in the academic sector through research grants, advanced degree scholarships, etc.

several years behind. Even more so, the process to get those several years' worth of experience is, again, costly and complicated, and not many teams are in a financial position to withstand that, or have the business savvy to pull together a working business model in the first few months of operation, while there's still funding available. This has led most international efforts and deals to be crafted in one-to-one transactions, pursuing leads people find while at conferences such as GDC o Game-Connection, or regional events such as the ADVA in Buenos Aires or SBGames in Sao Paulo. A number of brands and content providers for established entertainment companies — such as Disney, Nickelodeon, or Cartoon Network, just to name a few — are actively on the lookout for new developers to work with to produce content for their games, and local studios can engage them relatively easily and get conversations started. But few studios are at the point right now where they can engage in the large-scale export operations PromPerú would like to see happening.

6.5 Gaming the Entrepreneurial Republic

It has not been my attempt in providing this exploration of the role of government in articulating technology, entrepreneurship and innovation ecosystems, to push forward the claim that it is the government's influence in these ecosystems that will on its own solve the structural challenges and bring about sustainability and growth. Far from it — my intention has been to provide a multi-layered perspective as to how the connection between the game industry and government is shaped by a variety of overlapping factors: industry trends, financial shifts, geopolitical interests, legislative frameworks, administrative procedures, and so on. The Peruvian gaming industry has many challenges, and they cannot be all traced back to a single overarching factor. But in this context, the government does play a very important double role, as it is in a position to be the prime drive enabling growth in certain area through its action, as it can also contribute significantly in others by stepping aside and allowing studios and industry groups the space they need to interact and grow.

But through this examination, I've especially wanted to illustrate how the game

industry has been able to unexpectedly and unintentionally craft their own singular relationship with government, power, and public policy. Because of the many layers that make up the game industry, studios and developers have a lot of latitude available to them to position themselves in engaging government. And this latitude is creating a richer and more diverse collaboration for this specific creative industries than the one others have been able to craft. This by no means implies that the government is somehow favouring the game industry above other sectors, or that the game industry is finding a response to all or even most of their expectations from the government. It does point to internal forms of organisation that have been better able to channel demands and needs, and especially, to provide government agencies with the assurances and the confidence that the industry is capable of delivering on its commitments on multiple fronts. Just as we've seen risk being a driving factor for developers engaging industry, and for studios engaging clients, so is risk an important factor for the industry engaging the government to address many of its structural gaps.

Despite the game industry's success so far in circumventing obstacles, figuring out solutions and implementing infrastructures on its own, it has grown to the point in its evolution where it needs to address its larger challenges if it is to continue to grow to its next level. Up until now, the problems game studios were facing had been solvable on an individual basis through some creative tinkering. But the larger problems affecting all game studios cannot be successfully tackled by any individual one: issues such as education, risk perception, stigma, or access to funding, for example, require a concerted effort to change. And in many cases, the solution also inevitably passes through some government office or agency intervening in the process. Successful engagement of government, then, stands as one of the main assets the industry as a whole needs to build.

Turning towards the government is neither the problem nor the solution. Perhaps on account of a better economic climate, or on account of international pressure, maybe the foundational architecture on which the game industry is built can begin to change, as it has timidly begun to do so already.

7

Conclusions: A Perfect Storm

If you have managed to get this far, my dear reader, I am most thankful and, to be honest, more than a bit surprised. Getting this far has taken us from Cambridge to Lima, back a hundred and fifty years, across railroad tracks and half-built highways, up the Andes and down the Amazon river, back to the city streets and the gridlock, through make-do office spaces, government offices, fancy hotel halls, a fair share of cafés and more than a few bars, college campuses, back through multiple airports, out to San Francisco, into multiple festivals and conferences, and finally back to Cambridge in the springtime, with the sun beginning to timidly come out again and my South American sensitivity to the weather no longer telling me I'm about to die every couple minutes or so. You can't really explore something like a peripheral game industry from a single location, but rather, if you adhere to the notion of following games through society — wherever that may take you — you inevitably end up with a convoluted map of activities across multiple geographical, virtual, and cultural sites (Marcus, 1995; Gusterson, 1997). Additionally, you also end up with a whole bunch of frequent-flyer miles.

This whole journey has provided me with the information to answer multiple questions specific to the Peruvian game industry — where it came from, how it is organised, how it fits into the broader global game industry — as well as related to how creative industries operate in such peripheral places as Peru, not exactly at the top of the list when it comes to technology innovation and new media production.

But as I begin to tie the loose ends of this research project, I'm also beginning to indulge myself in trying to answer a rather more philosophical question: where does change come from?

This is a big question, and one that I cannot possibly try to answer in only a few paragraphs. But one that I've been attempting to address all through this work. Change is a fundamental problem in Latin America, where we've been attempting to achieve it on many levels, in many ways, over many, many years, with only mildly satisfactory results. We're very much aware of the need to change things: political systems, educational systems, healthcare systems, economic systems, and so on. We're just not quite sure about how to go about doing that, exactly. So how to generate lasting, impactful, sustainable change is one of the most important problems facing contemporary Latin American societies. Of course, new technologies are one of the most promising sources of change, but more often than not, they've been little understood, inadequately designed, and poorly implemented to address the problems they were expected to solve.

In Peru, it has often been the case that change has tended to come from the outside: the *Conquista* was an externally driven process, and so was the process of Independence led by outside forces from the south and the north that needed to consolidate independence throughout the region to guarantee their stability (Bonilla & Spalding, 1972). Throughout the republican period, change has also tended to come from the outside, with economic booms driven more by the lucky coincidence of having something international markets happen to want at specific moments in time than by the efforts of local entrepreneurs or creators. Perhaps unsurprisingly, many of these outside-driven processes of change have not only been unsustainable overtime, but have also ended up making something of a mess out of what was supposed to be changed to begin with.

So my over-arching intention through this entire process has been to showcase a different form of creating change through technology, that is articulated not from the outside, but from the interests and objectives of communities of creators. In concluding this journey, I want to evaluate this process of change and transformation

from three different perspectives: firstly, from the point of view of the future of the Peruvian game industry, and how, in my evaluation, various actors can mobilise to accelerate their process of growth and strengthen their institutional basis to become a more sustainable and scalable industry. Secondly, from the point of view of how creative communities can introduce diversity and complexity into otherwise relatively simple economies, creating new opportunities for growth and innovation that could potentially strengthen an economy's resilience. And thirdly, from the point of view of how technologies are understood and introduced into contexts such as Peru, and how the evolution of the gaming industry provides a blueprint for more sustainable, healthy relationships to technology based on adaptation rather than obscurity.

7.1 Too Small to Fail

As for the game industry itself, one of my chief interests in pursuing this research was not only to understand the industry, but also to be able to identify the core challenges it was facing and, ideally, whether there were any opportunities to address those challenges and accelerate the growth of the industry. To that effect, I've come up with a series of recommendations for the game industry as a whole as to things that, in my analysis, need to happen in the next few months or years for the industry to really take off and consolidate itself as a productive, growing creative industry within the Peruvian and Latin American economies. These are nine ideas based on the challenges I've identified from my research and are grouped into three core pillars actors in the industry need to pay attention to: building a critical mass of developers and studios, increasing the quality of their production and process and engaging international markets, and raising the industry's visibility and public profile in the local context.

Critical Mass

While the industry has experienced sustained growth over the last few years, it still does not have enough critical mass to really become a driving force of the local

technology industry. Further still, the limits to how much talent is available and willing to work in game development is one of the main limiting factors to how much the industry can grow overall. Building a critical mass of new developers and new studios is therefore an important part of strengthening the industry and providing a pipeline of new talent capable of sustaining new growth in the future.

Strengthen industry touch points. Initial points of contact with the industry, such as game jams and IGDA events, not only need to continue but grow in size and scope, and can become a very important venue for existing studios to introduce themselves to new audiences and showcase their work. During the 2014 Global Game Jam, a satellite site was active in the city of Arequipa, south of Lima, where some of the only universities in Peru teaching Computer Science are located and where a new community of game developers is now coming together. The GGJ is a great opportunity not only to begin to engage sites outside of Lima, but also to think about the event as an intake process, setting up mechanisms to welcome and incorporate newcomers into the community and encourage them to remain engaged with the game development world.

Build thematic clusters in collaboration with government. In order to boost local demand and increase the number of finished projects, the industry could work together with various government sectors to set up themed collaboration projects, where a number of activities or design interventions built on games could be developed. For example, thematic clusters could be developed around such themes as education, health, tourism, culture, or environmental awareness, by partnering with the corresponding Ministry for each sector. This type of engagement would be mutually beneficial, providing participating studios with a very specific expertise and the opportunity to develop and ship finished products they can promote as part of their portfolio. At the same time, it increases the touch points and opportunities to collaborate with government sectors.

Explore migratory incentives and collaborations through the Pacific Alliance. The Pacific Alliance, a trade block recently established by the governments of

Chile, Colombia, Costa Rica, Mexico, and Peru, is eliminating barriers to trade and work for citizens from any of these countries in any of the other countries within the Alliance (Perú 21, 2013a). This is beginning to open new opportunities for studios from these countries to collaborate in larger projects, or to hire developers from other countries temporarily or permanently as a boost to local capacity. Similarly, an active industry policy could coordinate with government in order to encourage immigration from high qualified technology developers and researchers who could very quickly provide support for the local technology capacity, or even support the creation of new university programs and research centres.

Export Quality

While the technical quality of Peruvian game studios is pretty high, the industry would certainly benefit from developing clear, consistent production and distribution processes. As we explored in chapter five, studios are still mostly experimenting with the business processes governing their production, and as described in chapter six, international clients and publishers are looking not only for high quality products, but also high quality processes when choosing who to partner for projects. Closer attention to process provides partners with a guarantee of repeatable quality results, which investors are looking for a important markers in an industry that is otherwise overwhelmingly uncertain.

Strengthen local institutions. Local institutions are extremely important for the overall health and sustainability of the industry, especially the local IGDA chapter and the CVA, which are each fulfilling different and equally important roles. However developers and studios choose to collaborate to address some of the bigger issues affecting them, it is very important that these institutions continue to operate transparently and legitimately, and that they become spaces for developers and studios to share information about what's working and what isn't so that the community benefits as a whole. Strong local institutions can

also provide mechanisms for developers to quickly reposition themselves after failed projects, or studios to identify collaboration partners to tackle projects where they need additional capacity.

Develop local and international mentoring networks. Because studios in the local industry are relatively young, they've thus far been unable to turn into useful resources in terms of mentoring newer ventures coming into the industry. Not only will this change eventually, but mentoring networks should be actively promoted, ideally through the existing institutions mentioned above. Building these local mentoring networks will strengthen the opportunities for newer ventures but will also give existing studios direct access to new projects, talent pools and potential collaborators. Ideally, the industry can also begin systematically engaging international mentors to provide business advise and counselling to local studios, either through direct engagements or through group activities.

Build regional partnerships for larger projects. Because capacity for studios across the region is limited, larger and more complex projects can be tackled through the collaboration of multiple studios across the Latin American region. Especially when working through the Pacific Alliance, described above, there might be the potential to leverage further government support and resources to become pilots cases and ambassador projects to what can be accomplished through trade networks such as this one.

Visibility

Raising the industry's public profile is extremely important to reduce the generalised perception of risk (described in chapter five) that is affecting how much the industry can look for resources such as funding or talent. While the industry has managed to grow sustainably over many years despite keeping a very low public profile, there is definitely a limit to how much it can continue to operate in this fashion. Game developers are not known for being very interested in maintaining public personas, but coordinated efforts across many studios can help improve the public perception of

the industry and of games in general, while enlisting the help of a support network of partners that will be very necessary to drive the industry to its next stage in growth.

Industry-wide media strategy. Through institutions such as the CVA, studios can coordinate strategies for media outreach that do not became burdens any one studio needs to carry. Because there are many issues that need to be positioned and addressed through various media, studios can share their marketing resources and work towards unified campaigns that will have significantly greater impact than they would achieve by working alone, while at the same time still working to position their individual work.

Establish recurring industry check-ins with government and media. To progressively change the perception of games and the game industry, studios could work together to organise periodic check-ins with members of the media and government to highlight results and projects members of the industry are developing. These check-in events could be useful not only to capture feedback from potential partners and supporters, but also to make visible all the work studios are doing and the various opportunities for investors, partners and students in the game industry.

Industry research. There has been very little research done on the game industry in Peru, from any perspective, but slowly that is starting to change, as more university students are beginning to focus on game-related topics for their thesis and other research. But resources are still very limited and there are very few scholars and researchers in the local context who are experienced in this sort of work. Strengthening industry research, both commercial and academic, will provide industry with ongoing data points to evaluate how they're doing as an industry, and how their market and community are evolving and changing over time. Strengthening ties between industry and academia would help provide a direct line of communication to new research and to industry trends that might otherwise be invisible to studios immersed in the development process.

7.2 Creative Communities and Economic Complexity

Through this work, I've attempted to show that not only is there an existing and growing video game industry in Peru, but also that this industry grew out of the creative objectives of its members and largely out of non-commercial interests in its early stages. For the purposes of statistical or economic measurement, this industry has been largely invisible, and it has received very little support from the government or from outside investors. The primary currency people have invested has been social, as people have invested significant amounts of time over many years in order to learn, teach, experiment, and develop games often with no other intention than to see the product realised.

But inadvertently, people in the industry were also doing something extraordinary: they were introducing new skills into an economy that weren't there before they started. And while they were doing it entirely for creative, non-commercial reasons, the skills they developed are not circumscribed to only non-commercial projects.

The Peruvian game industry is an illustration of how informal creative communities — groups of people coming together based on a shared interest of pursuing some specific creative practice — can contribute to the economic complexity of a city or a country. Work on economic complexity interprets the outputs of an economy not in terms of raw materials but in terms of the skills that are necessary in order to produce a commodity (Hausmann & Hidalgo, 2011a,b). Because one skill can be required for the production of many different things, the more skills available within an economy, the larger the number of possible permutations and products that economy can produce. By the same measure, the more diverse the pool of skills available, the better an economy can react to sudden changes in market demand, re-purposing workers from areas with smaller demand to areas with larger demand that roughly require the same skills. Complex economies — that is, economies that have a more diverse pool of skills available — therefore have an easier time experimenting with product innovations because there are more permutations they can build on, while also being

more resilient because there are more ways in which they can allocate their existing pool of abilities.

One of the biggest challenges for less complex economies is catching up to their more complex peers. For the production of more complex products, it will always be simple for firms to invest in those economies where skills are already available. That means more complex products are in general produced by a smaller number of economies, while less complex products are produced by a larger number — meaning they entail much higher competition, and a race to the bottom in terms of wages over who gets to attract the largest investment. For less complex economies to catch up, they need to invest significantly more resources in skill introduction and skill development, through education programs and infrastructure investments that can often be extremely costly and offer no guaranteed returns in the short term. At the same time, while less complex economies are trying to catch up, more complex economies continue to innovate and introduce new skills and combining them into new products.

The game industry in Peru has managed to circumvent all of that — or, at least, they've managed to circumvent the enormous skill gap in the Peruvian economy that, through strictly economic motivations, would've taken several years, if at all, to close. If it came to strictly economic motivations, firms in the local economy would've had not financial reason to invest in developing the infrastructure required to introduce video game development skills. But because the transactions were creatively motivated and socially driven, individuals coming together into this creative community were able and willing to assume a much higher risk. Because people's decisions were not structured by short-term cost/benefit analysis, they could afford to take as long as they wanted simply understanding how technologies and development processes operated. And because they had no motivation to limit access to that knowledge, they would then go on to share what they had learnt with other people joining their creative community. The result may be considered economically inefficient, but it created a social fabric that sustained the community through its early years and into the emergence of a new industry that would've otherwise not been able to come together

at all.

What creative communities such as the Peruvian game industry are doing tends to fly below the radar for most economic indicators, but this sort of potential opens up a lot of possible opportunities for creative communities operating in similar fashion in Peru and other developing economies. Creative communities are essentially operating as very low cost research and development communities were individuals are assuming the burden of the cost and risks are mitigated by circulating knowledge and information freely with other members of the community. They're becoming networks of creative labs motivated by social rather than economic objectives, but the outputs of their work inevitably are also introducing skills that are relevant to an economy. But because their work flies under the radar of economic indicators, and because there is little understanding of its impact from a public policy perspective, there's very little work being done in creating support structures that will bridge the social transactions into creative industries that put those acquired skills into use within the economy. If creative communities are prototyping products, services, and business models at a low cost, funded primarily by social transactions, then developing economies could build on those platforms to create new creative industries at a significantly lower cost than it would take them to set up traditional infrastructures and systems to create new industries, such as by investing in building technology clusters (Porter, 1998).

There are two things we might want to especially pay attention to based on this examination. The first one is that our public policy instruments are not really well targeted towards supporting the work of these creative communities. In our example, we've seen both how various public policies negatively affected the work of the early video game development community, and later how the industry has had to grow on its own for a long time without any significant support from government agencies. Creative communities are operating in rather grey areas between commercial and non-commercial production, exploring whether specific creative pursuits are even viable at all before committing to launching startups or thinking about sustainable businesses. Along the way, they tend to set up their own alternative infrastructures for production, distribution, learning, or community building whenever they find ex-

isting traditional infrastructures to be lacking, inadequate, or unresponsive. More often than note, they're operating in a space between the formal and the informal; sometimes, this can go as far as grey areas between the legal and the illegal — not because they're bent on staying within that space, but mostly because they're still trying to figure things out and regulatory frameworks are often not aligned with that exploration. But public policy instruments can be helpful not to much in narrowing down the space for creativity, but rather in providing exit or growth strategies for communities and groups that want to formalise and pursue different sorts of opportunities, whether strictly creative or moving into the commercial. Rather than forcing these communities to conform to existing institutional arrangements, public policy can instead be designed in terms of the organic evolutionary process these communities are going through, seeking to provide incentives, informations, and resources at every stage of the process to help more communities grow through their entire lifecycle — and from an economic point of view, to accelerate that growth so that creative innovations and skills can be brought to market at a much faster rate.

The second thing to pay attention to is the importance of doing research on these creative communities. Based on my experience, because of the way these communities tend to fly under the radar and be almost invisible except to people who know them very closely, it is various forms of qualitative research that have the strongest potential to uncover existing networks, map how they operate, understand their challenges, and then attempt to propose solutions and innovations that can help those communities grow. It is not about making all or even most creative communities turn into productive industries, but rather, it is about acknowledging the creative objectives of the people and groups making up these communities, and helping them understand how to develop a sustainable practice out of their creative interest. People who make games in Peru are passionate about making games, and my intention has never been about pushing them towards building bigger companies. Rather, it is about securing for creative producers the opportunities to continue to engage in the activity they enjoy so much, and to expand the access to these same opportunities to as many people as are interested in them. Working with these creative communities and figuring

out their various infrastructures, processes, and expectations, is partly an exercise in qualitative research and partly an exercise in design thinking — figuring out how systems can be articulated or improved.

There is a third interesting thing for us to pay attention to, but that one falls under a different category: how the way these communities are engaging with technology and media practices is providing an interesting blueprint for societies, especially in developing nations, to rethink the way their engaging with technology more broadly.

7.3 A New Socio-Technical Contract

I've made three arguments regarding the technological history of Peru: that economic booms resulting from increased commodity exports have tended to be associated with large-scale technology implementations; that these implementations were conceived as capable of solving many of the nation's long-standing social and cultural issues; and that these implementations ultimately failed both as technologies and as visions because they were poorly understood deployments of technologies as black boxes — that is, they treated technologies simply as tools that could be inserted into social systems, and by virtue of their operation social conditions would be transformed into predictable outputs. Following Leo Marx Marx (2000), I've described these processes as instantiations of the technological sublime, or the idea that technology can by itself generate a qualitative transformation of the social state of affairs.

The way the Peruvian game industry has articulated its relationship with technology, however, has been significantly different. Video games were never a part of any officially-sanctioned interpretation or vision of the nation's technological future — rather, quite to the contrary, games have tended to be questioned as valuable by people in government and the media. Without access to major sources of information about how to develop games, people in the early community had to resort to forms of reverse engineering to construct an increasingly more elaborate understanding of how the technology operated, in order to be able to replicate techniques and practices they were able to identify and isolate from commercial games they were able to

intervene. The result was that developers had a much more detailed understanding of the operation of the technologies they were using, and how they could manipulate them to fulfill their creative objectives. Technology, in this way, ceased to be an outside force simply exerting unexplainable influences on society, to become an agent of change that could be understood, configured, and influenced. The relationship with technology game developers constructed was, therefore, much more symmetrical and fulfilling than the relationship between people and other forms of massively-deployed technology.

Which is not to say that those forms of massively-deployed technology had no impact whatsoever. In fact, they have one key advantage completely inaccessible to the game industry: the possibility of reaching a scale of nationwide transformation in a relatively small amount of time. But the singular promises of the technology-driven transformations ultimately went unrealised, and whatever impact remained did not occur at the scale and scope that was originally envisioned. The transformations were ultimately unsustainable, as they relied heavily on foreign sources of capital, technology, or talent that. Theses technologies — the railroad, the highway, import substitution industrialisation, or digital technologies — were outside forces both in that they were literally brought from outside the country and relied on that foreign connection for sustainability, and in that they were not adopted and appropriated locally in ways that would've made their deployment the opportunity to create local technology circuits capable of maintaining, transforming, and expanding them. To try and frame it in actor-network theory terms (Latour, 2005), the networks these technologies represented were never fully articulated with the networks that were already present, rendering them inaccessible to local understanding and manipulation.

On the other hand, game development emerged originally as a practice of appropriation, of taking existing products and customising them to a different creative objective. The process of adoption was much slower and much more limited in scope, but for those who went through that process, the results were that much more meaningful. Furthermore, the process of reverse engineering the technologies of gaming were not solely limited to constructing an understanding of the technical layer, but

also of the social and organisational layers governing production and distribution. All of these layers were built on imperfect understandings, but even still they provided enough of a foundation to be able to crack and code games, and they were built together into a model that could be perfected over time as new evidence became available. Failing to have access to specific, authoritative accounts of how these technologies operated — technically and socially — trial and error learning was the only remaining recourse. But indirectly, this form of experimental learning was precisely the sort of informal training in science and engineering developers would need in order to establish the basic practices of technology and game development.

From my point of view, and having talked to multiple game developers and observed their practice over several months, the value of this experience relies in a less naive understanding of how technologies operate and how they function as globally distributed messy assemblages: people in the game development industry have some sense, even if imperfect, of how games are circulated globally and how those circuits are affected by commercial, political, cultural, and technical interests. And for those venturing into creating their own studios, their also getting a first-hand experience of what it means to set up a company, make long term plans, coordinate teams, and so on. The process of getting involved with the technology and the industry is a process of radical demystification through direct experience, and it is this same process of demystification that I believe sets up a very interesting basis on which to re-frame how Peruvian society establishes a relationship with technology.

The challenge, of course, is how to take this demystifying, re-contextualising experience of technology to a large enough scale that it actually becomes the basis for a new socio-technical contract — a new shared understanding of the way in which we incorporate technologies into society. Rather than think about how to get as many people as possible involved in the development of video games, it is more important to think about how would it be possible to broaden access to creative and learning opportunities through creative communities, under the assumption that these opportunities provide people with hands-on experiential learning leading to a more holistic, integrated relationship with technology. Even from the game development point of

view, the possibility of increasing the opportunities for young people to engage in guided, collaborative game design experiences can become the foundation for broader conversations about how we work with and connect to technology. Beyond game design, many other forms of maker experiences across media and technology can be designed in such a way that participants are not simply taught how to use a specific tool, but rather are guided through the experience of understanding how tools work, how they can be modified and adapted, and how to reverse engineer the knowledge of how to create meaningful experiences with said technologies — a process ultimately more meaningful and impactful than just the knowledge of how to operate a device or piece of software.

These experiences are also important because they can contribute to the building of technologically-minded forms of citizenship that are becoming increasingly relevant in contemporary society, such as scientific and information citizenship — forms of understanding political engagement as directly connected to an individual's capacity to systematically process and analyse scientific and technical information. And my observation of game developers in Peru did provide indicators of this form of engagement: through their engagement with the making of games, developers became more politically engaged individuals within their own creative communities, adopting leadership roles and in general being mindful and aware of the status and well-being of the community as a whole, but also more politically engaged citizens more broadly. Driving their interests forward became the mechanism through which game developers become more interested, informed, and connected with how various political issues unfolded that directly affected them, ranging from politicians' statements regarding things such as game violence and regulation to government initiatives related to supporting new technologies and innovation. Because of their creative practice, they became more interested in these broader issues, and through institutions such as the local IGDA chapter or the CVA, they were able to being exerting influence into larger structures and institutions in order to achieve some form of change.

It is not simply that rethinking our socio-technical contract is meaningful because it will make our deployments of technology more sustainable and impactful. What's

at stake in how we structure our relationship with technology is the capacity of individuals and organisations to successfully engage government as political relations become increasingly entangled in layers of media, technology, and information.

7.4 Game Over

Alas, my dear reader, the time has come for us to part. It's been a long journey, and there is little more I can possibly add to this story.

Actually, that is not true — there is a lot more I wanted to say. I wanted to further explore the critique of how neoliberal policies are enormous obstacles to the emergence of technology and creative industries. I wanted to explore in much more detail the historical instantiations of the technological sublime and how they each unfolded. I wanted to say a lot more about the gender politics of the Peruvian video game industry, and how the industry needs to pay more attention to including women and creating more inclusive work environments, and I wanted to tell the story of women who had not only found their way into the industry, but managed to secure important roles and leadership positions amongst their peers. I wanted to pay a lot more attention to things going on outside of Lima, and to the potential games can have for introducing technology and design thinking into rural and remote areas. I wanted to document in detail the history of video game production in Peru, and to map what technologies had been used, what platforms had been chosen, and how studio production had evolved over time. I wanted to go more into detail about technical choices, how tools were chosen and how code was wrote and shared. I wanted to talk more about the infrastructure of the city, and how it can enable or disable creative possibilities by affecting transaction costs and risk calculations. And I wanted to figure out more creative ways in which I could just share some of the gossip, because as it usually happens with a qualitative study, there just happens to be a lot of gossip.

But in the service of a coherent argument, there were many things that had to be left behind in the editing room floor. And I really hope what's left has been able to

shed some light into the practices of an otherwise entirely invisible industry. I do not expect to have identified, much less fixed, all the issues and challenges of the Peruvian game industry, nor do I pretend to have figured out exactly how creative industries are important to the growth of developing economies. My main goal throughout this all has been to attempt to get us to think differently about a series of issues through the lens of games: to think differently about technology, about history, about the developing world, about creativity, about entrepreneurship, about innovation, and especially about games.

These are all quite messy things, and it has been my intention to straighten them up as much as possible for the purpose of analysis. It might well be the case that, inevitably, the analysis of messy things can only be messy in itself. Just as well, this should only be the beginning of many steps towards a better understanding of how people around the world are taking these fascinating digital things, making sense out of them, and responding by making their own, in an ongoing conversation across history, geography, culture, and media. But what we need to make sure we pay attention to is that we keep that conversation as open and as diverse as possible, and that we continue to figure out ways to include more and more people into the game — however messy it might get.

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