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**STICKING TO THEIR GUNS: THE IMPACT OF THE CULTURE AND
ORGANISATIONAL PRACTICES OF VIDEO GAMES STUDIOS ON THE
TECHNOLOGICAL TRAJECTORY OF THE CONSOLE GAMES SECTOR**

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Analyses of path-dependence that consider explicitly the linkages between dynamics present at different levels of analysis are needed to improve current understandings of the evolution of industrial sectors. This paper undertakes such analysis in the Console Games sector, articulating the impact of the innovation activities of video games studios producing complementary inputs on its technological trajectory and dominant design. The recent introduction of a new dominant design in the sector constitutes a natural experiment that indicates the presence of inertias in the innovation behaviours of these agents. These inertias are explored through an in-depth study of 7 UK games studios, which identifies self-reinforcing organisational, management and recruitment practices linked to the culture and values of the communities involved in games development, resulting in cultural homogeneity in both workforce and management positions. This homogeneity favours incremental innovation and obstructs the exploration of alternative dominant designs, thus impacting on the outcomes of market competition, and shaping the sector's technological trajectory

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Abstract

Analyses of path-dependence that consider explicitly the linkages between dynamics present at different levels of analysis are needed to improve current understandings of the evolution of industrial sectors. This paper undertakes such analysis in the Console Games sector, articulating the impact of the innovation activities of video games studios producing complementary inputs on its technological trajectory and dominant design. The recent introduction of a new dominant design in the sector constitutes a natural experiment that indicates the presence of inertias in the innovation behaviours of these agents. These inertias are explored through an in-depth study of 7 UK games studios, which identifies self-reinforcing organisational, management and recruitment practices linked to the culture and values of the communities involved in games development, resulting in cultural homogeneity in workforce and management. This homogeneity favours incremental innovation, obstructing the exploration of alternative dominant designs, impacting on the outcomes of market competition, and shaping the sector's technological trajectory.

1. Introduction

Path dependence can explain organisational and market inertias without the need to assume lack of reflection or irrationality on actors' behaviours. It arises from the necessity to take decisions and the consequential constraints that these decisions might impose as experience and investment make retracing steps or branching to another path costly or prohibitively expensive (David, 1991, Arthur, 1989). These processes have been examined at the level of the individual, the firm, the industrial relationship and, particularly, the sector. The interplay between commitments that create constraints- and hence path-dependent dynamics- at different levels of analysis has been examined less often - it has been argued recently that more explicit analyses of these interlinkages ('cross catalytic-feedbacks') are necessary in order to improve current understandings of the way in which industries and technologies evolve (Sydow et al, 2009).

This paper addresses this gap in the literature by examining the linkage between organisational, relationship and sector-level path-dependencies in the console games sector. It articulates a mechanism through which firm-level actions contribute to the emergence of a dominant design with path dependent features- the decision to produce complementary goods- establish a relationship- that increases the attractiveness of a specific platform versus its competitors. An analysis of established development studios' reaction to the introduction of an alternative dominant design in the consoles market suggests that those decisions are, themselves, subject to inertias that are subsequently examined in an in-depth study of 7 UK games development studios. This analysis leads to the identification of a path-dependent driver for their behaviour- the values and motivations of the communities of practice who work in those firms. These values have been perpetuated from the early days of the sector via development practices and recruitment strategies that induce cultural homogeneity in its workforce and managers, encouraging exploitative innovation that targets the existing dominant design, and hinders exploration of the emergent one, thus weakening it.

In addition to providing an integrated analysis of path-dependence at the firm, relationship and sector level, the paper contributes to a growing body of literature examining the role of social and cultural factors in shaping the direction of technical change in high-technology sectors (Garud and Rappa, 1994, Kaplan and Tripsas). In particular, it provides an important complement to dominant understandings of competition in two-sided markets, which have tended to focus on economic factors such as installed user bases, switching costs and network effects in order to explain the innovation and adoption decisions of co-developers and users (Varian and Shapiro, 1999, Rochet and Tirole, 2003, Shankar and Bayus, 2003).

The paper suggests that studies of path-dependence should incorporate a third possible situation besides those of inertia-driven helplessness, where agents are unable to deviate from a historically determined trajectory, and path-creating actions where they exercise their agency to break away from it (Garud and Karnøe, 2001). This third situation is one where actors exercise their agency to sustain an existing, inefficient path with historically dependent features because they derive non-economical benefits from doing so. This case is exemplified by the behaviours of video games' developers who have decided to support the increasingly unsustainable trajectory of the traditional dominant design in the console games sector, rather than targeting a more affordable, and faster growing platform. This strategy, which might seem path-dependent in the traditional sense- as if they did not have another option-, or even irrational, becomes more tractable when the culture of the community of practice behind it is introduced into the analysis.

Section 2 reviews the relevant literature on technological trajectories, dominant design, path dependence, communities of practice and the emergence and evolution of the video games sector. Section 3 outlines the empirical setting of this paper, discussing technological trajectory and dominant designs in the console games sector, and describing its recent evolution. Section 4 outlines the methodology and data sources for the qualitative stage of the research where the sources of this seemingly anomalous behaviour are examined. Section 5 discusses the findings of the paper, outlines its contributions and limitations, and outlines issues for further research.

2. Literature review

a) Technological trajectories and dominant designs

The concept of technological trajectory was first adopted in the late 1970s to describe and explain different patterns of technical change across industrial sectors (Nelson and Winter 1977, Dosi 1982). The concept has enabled scholars of innovation to examine the logic behind the cumulative processes through which the direction of technological change in a sector is determined (Freeman et al .1982). A sector's technological trajectory is driven by the innovative activities of different actors- including users, manufacturers and suppliers- (Pavitt, 1984, von Hippel 1988), the nature of market

demand and the regime of appropriability over the value generated through innovation.¹

Technological trajectories represent long-term, macro-level patterns of innovation at the sector level. Such trajectories often reflect sustained incremental innovation in which specific technical parameters are stretched, enhanced, or augmented by taking advantage of new scientific or technological knowledge, or experience with process technologies. In some sectors, and particularly in electronics, the long term trajectory obscures a serial process of major innovation in which the performance variable defining the trajectory is addressed using radically different process techniques or architectures. In each of these incidences of major innovation dominant designs emerge after a period of 'ferment' phase that the major and disruptive innovation produces. A dominant design can occur at the level of an entire product (Henderson and Clark 1990, Utterback and Suarez 1993), or at the component level (Abernathy and Utterback, 1978, Anderson and Tushman 1990). It represents a moment of relative stability before change begins again, at first incrementally (Anderson and Tushman 1990), and later through major or radical revision which, after another period of ferment, results in a new dominant design.

Several mechanisms may lead to the emergence of a dominant design. In some cases, this design constitutes the best compromise for addressing a predominant share of market demand - for example between quality and cost- and as such is widely imitated across the sector (Christensen et al 1998). Dominant designs can also emerge as a consequence of economies of scale that favour standardisation (Klepper 1997), or of network effects- as when users purchase a compatible technology, or acquire skills which are only relevant for a given design (David 1985, Arthur 1989).

Extant analyses of competition in two-sided markets where complementarities between different parts of a system are particularly important, have shown how the proponents of different ICT system ('platform holders') compete to achieve a 'dominant design' status by building coalitions of suppliers ('complementors') who provide complementary (and compatible) resources that increase the attractiveness of their system for users (Cusumano et al., 1992, Varian and Shapiro, 1999).²

In addition to technology and market forces, there are other factors that determine the shape of a dominant design. Actors often draw on their social networks (Anderson and Tushman 1990) and contacts in order to build system coalitions (Rosenkopf and Tushman 1998). Social, political and organisational features can also explain the emergence of different dominant designs across countries (Chesborough 1999). Some researchers have started to focus on how cultural and cognitive factors influence technology development (Garud and Rappa, 1994)- as when, for example, actors purposefully manipulate others' 'technological frames' in order to influence a technological trajectory (Kaplan and Tripsas, 2008). In the case of emerging markets,

¹ It is important to highlight that firms within Pavitt's taxonomy present technology similarities but are not homogenous groups (Niosi 2000); the taxonomy doesn't differentiate between individual firms and their innovativeness within each class.

² The success of the open-architecture PC (Personal Computer) which followed IBM's efforts to control the interconnection of third party add-in cards and the subsequent marginalisation of Apple's closed standards system in the 1980s is a classical example of this process.

competitors try to define the attributes of quality of the new product, which again influences the eventual shape of the dominant design (Porac et al, 2001).

e) Path dependency and path creation

The direction of technical change is path-dependent, in the sense that past decisions constrain future options, sometimes irrevocably because the costs of 'reversing' or 'switching' is prohibitive. Actors invest in relationship specific assets, develop routines or accumulate capabilities through processes of learning by doing which make them more efficient in the short term (Nelson and Winter, 1982), but create rigidities down the line and obstruct adaptation to shifts in the competitive environment (Sydow et al, 2009). At the systems level, path dependence may amount to lock-in when the accumulation of platform-specific capabilities, network externalities and coordination costs prohibit the adoption of superior alternatives because, given prior commitments and experience with the incumbent technology, the alternatives cannot be produced as effectively (David 1985, Arthur 1989). In the case of dominant designs whose emergence is linked to path-dependent processes such as those that have been described above, a convergence in production models and organisational arrangements between firms might initiate processes of institutional isomorphism hindering change even further (DiMaggio and Powell, 1983).

Recent analysis of entrepreneurial behaviour have emphasised the need to complement understandings of technology evolution as a path-dependent process with a more explicit consideration of 'path creating' behaviours, where actors who are mindful of their position within a historically determined trajectory exercise their agency to deviate or 'break away' from it (Garud and Karnøe, 2001). New paths have to originate with specific actors and growing attention is being paid to the social structures that support such innovation or serve as a barrier to it.

d) Communities of practice

Communities (or networks) of practice are social groups organised around a specific practice, with a shared identity, preferred tools and techniques, language and norms of behaviour (Lave and Wenger, 1990, Seely Brown and Duguid, 1991, Amin and Roberts, 2008). The 'standardisation' of values, languages and tools reduces the scope for disagreement within a given community (Mateos-Garcia and Steinmueller, 2008), and facilitates the accumulation of knowledge that contributes to incremental improvements in the relevant practice and its associated technologies (Powell, 2000). Because they tend to cut across different firms, communities of practice also play an important role in the diffusion of information across and within industrial sectors (Seely Brown and Duguid, 2001).

Communities of practice play an important role in knowledge-based industries, where they influence the direction of technical change of the organisations where they operate through their knowledge accumulation function (Rosenkopf and Tushman, 1998). As they disseminate that knowledge across organisational boundaries (Godoe, 2000), they favour the diffusion of innovations within a sector. Insofar they have homogenised skillsets and values, they can drive processes of institutional isomorphism inside it (DiMaggio and Powell, 1983). This isomorphism increases the efficiency of the labour

market and decreases training costs for firms, but it can also be a source of rigidities, because these communities develop their practices in an incremental- and crucially, path dependent- way, and their recruitment processes can induce homogeneity in participants (Lave and Wenger, 1991, Mateos-Garcia and Steinmueller, 2008). Research on innovation at both the firm and the network level underscore the detrimental effect that excessively rapid socialisation of individuals in their groups can have on modes of exploratory innovation by comparison to more exploitative ones (March, 1991, Uzzi and Spiro, 2005).

Managers face trade-offs in managing the behaviour of communities of practice, not least because of principal-agent problems (Nohria and Gulati, 1996). The goals of the community of practice to which an employee belongs might not be aligned with those of the firm that employs her. The literature has identified many tensions between the aspirations and values of practitioners and managers in regards to the adoption of informal work practices which contravene established processes, and the leakage of valuable information to competitors (Augsdorfer, 2005, Brown and Duguid, 1991, 2001). Community bonds are often stronger than corporate ones- As one manager points out when describing the behaviour of IT professionals in the Silicon Valley: *'There are a lot of people who come to work in the morning believing that they work for Silicon Valley'* (Saxenian, 1994: 34).

b) Communities of developers in the video games sector

The video games sector has its root in the innovative activities of the users of some of the earliest computer systems. The first interactive video game, Space War, was created in 1961 by a member of the Massachusetts Institute of Technology Tech Model Railroad Club in order to demonstrate the capabilities of DEC's PDP-1. Space War was shared freely with other users, who contributed their own improvements to the game (Levy, 1974). These individuals drew on science-fiction, fantasy and military themes popular in their technical milieus (Kendall, 1999, Levy 1974) as the basis for their games.

The evolution of the video games sector in different territories presents country-specific aspects reflecting available capabilities and resources. While in Japan, the sector grew around Nintendo, and drew on a large workforce of animators from the Manga and Anime industries (Aoyama and Izushi, 2003), the UK's game industry was built by a generation of 'bedroom' coders who learned their trade on cheap programmable home computers over the 1980s (Izushi and Aoyama, 2006) and were influenced by science fiction in print and in films and television. In the case of the USA, Atari initially hired talented software programmers in Silicon Valley who preferred to work in a creative sector, rather than for the military (Izushi and Aoyama, 2006). What all these different development territories share is that, almost without exception, video games development studios were started by avid game consumers who, at some point turned their hobby into a professional career (Kushner, 2004).

Video game developers have traditionally maintained a close relationship with the communities of users where they originated. Games studios frequently release tools and engines which enable their users to customise, improve and augment their games, for example by creating new scenarios or 'levels' (Raymond, 2001). Participation in these

modding communities is important gateway into the sector's workforce (Humphreys et al, 2005, Flowers et al, 2008).

2. Empirical setting: the structure and evolution of the console games sector

a) The console games sector

In 2008, software revenues for the console games sector comprised \$27 Billion, approximately half of overall revenues in games markets (PwC 2008). Differently from other multi-purpose platforms where video games can be consumed, such as PCs or mobile phones, each console platform has standardised hardware. As such, it constitutes a stable development target for game development studios. This also means that consoles have evolved in discrete leaps, where platform holders orchestrate the launch of subsequent 'generations' with improved hardware and graphical performance, support for new media, or modified user interfaces.

The latest (7th) generation of console hardware, introduced between 2005 and 2006 includes three systems: Nintendo's Wii, Microsoft's Xbox360 and Sony's PlayStation 3, each with their own portfolios of compatible games. Competition in the market presents direct and indirect network externalities (Schilling, 2003, Clements and Ohashi, 2004): platform-holders compete for users and complementors (independent video games studios), as it is the content that these produce which makes their systems attractive for users. They try to secure 'exclusives' from developers, or produce them through their in-house studios (Afuah and Grimaldi, 2005, Schilling, 2003). Complementors decide which platforms to target on the basis of the installed user base, levels of competition in the platform and its technological capabilities (Shankar and Bayus, 2003). With increasing frequency, they launch their games across platforms in order to target larger installed user bases (Barton et al, 2007).

b) Dominant designs in the console sector

Console games systems integrate platform hardware, user interface, and games content. The former two components are, with some exceptions, developed and manufactured by platform-owners. Games studios create content that harnesses the capabilities of a platform's hardware, and which is adapted to its user interface. Both activities are tightly interlinked: hardware capabilities and user interface constrain the games that can be developed for a given platform, and impact on development costs.

This paper considers 'games consoles systems' as a technology domain that until its last generation evolved following a technological trajectory instantiated in a set of incrementally improved configurations of hardware, user-interface and content. Platform-holders have changed- some of them, such as Atari and Sega, exited, while there have been new entrants, such as Microsoft. Nonetheless, systems have evolved following a stable path, with allied creative outputs and production models which, when considered collectively, can be meaningfully described as a 'dominant design'.³

³ Evidence of the evolution of the industry suggests that in some cases it was the platform-holders that deviated from this trajectory the ones that eventually had to abandon the market. For example, Panasonic adopted a different business model where console prices were not subsidised for consumers, while SNK produced a system with graphical capabilities ahead of its competitors, but much more expensive for consumers- and developers.

On the hardware side, subsequent console generations have experienced a trajectory of rapid improvement in performance visible when examining the growth in processing power of the chips embedded in the console generations released over the last 15 years. As table 1 shows, although each leap in performance is remarkable, when considered from a historical perspective, a clear pattern is observable: each new generation has represented, for all competing platforms, a leap of an order of magnitude in the processing power available for games developers. The exception to this is Nintendo's 7th generation, which will be examined in detail below. In regards to the user-interface, the path of improvement has also been clearly incremental, and based on a well-established type of game control- the 'gamepad' (see exhibit 1).

If on the platform side, the dominant design has been an increasingly powerful hardware device which is manipulated through a standardised user interface, on the developer side, the increasing costs of development to target that platform have led to the emergence of a dominant type of game, usually referred to as the 'triple A' (Tschang, 2007). Triple A games are heavily promoted, have high levels of graphical polish that exploit improved graphical capabilities, and target well-established genres. They are usually released with the aim of establishing a franchise, where investments in new content and technology can be spread across subsequent sequels (Grantham and Kaplinski, 2005).

c) Triple A as an unsustainable dominant design

Although focussing on established franchises and genres, and undertaking substantial investments on promotion could be expected to reduce the risks of games development targeting the latest generation of hardware, in effect this trend has led to increased levels of competition between very similar 'blockbuster products' launched within tight release windows.

Escalating levels of investment are not only associated to increasing financial risks in video games production- triple A projects also require larger team sizes, which creates project management challenges well known from software engineering (Brooks, 1982). As games have increased in scope and complexity, delays, overshot budgets and quality issues have become more frequent (Sapsed and Mateos-Garcia, 2008).

The escalation in budgets has not been accompanied by corresponding increases in the size of the market: the intensified levels of competition within slow growth market segments has reduced margins, and impacted on the sector's profitability- only 4% of the games that go into production, and 20% of those which are eventually launched, manage to cover their costs (Reisinger, 2008, Brightman, 2008). Video games studios producing 'triple A' games that harness the processing power of the dominant design consoles find themselves in a 'red queen' situation where they need to 'run faster in order to remain in the same place' (Barnett and Hansen, 1996).

d) The Wii as an alternative dominant design

With the launch of its Wii system, Nintendo has introduced an alternative dominant design for the sector. Differently from its competitors in the 7th console generation, the

Wii does not represent a substantial improvement in terms of hardware power (see table 1) or graphical capabilities, as it is not enabled for high definition Television sets. The main difference between the Wii and its competitors is the motion sensitive user interface, which as Exhibit 1 shows, constitutes an important departure from the standard 'gamepad' remote which until then has been dominant until the last console generation.

The launch of the Wii has been explicitly inspired by the 'Blue Ocean Strategy' aimed at creating new markets, instead of competing within established ones (Kim and Mauborgne, 2005). Differently from its competitors, which focus on core 'gamer' audiences that demand highly immersive products within well-established genres such as First Person Shooters or Role-Playing Games (Juul, 2009), Nintendo has targeted demographics so far untapped by the console games sector- particularly women and older people (Aoyama and Izushi, 2007). These differences are reflected in the 'flagship' games that have accompanied the launch of each of the three competing consoles (see table 3).

Nintendo's strategy has paid off in terms of sales (table 3)- as of the end of 2009, the installed base for Nintendo's Wii was almost double that of either of its competitors. Because its system is less technically sophisticated and costly to manufacture than Sony's and Microsoft, Nintendo has also been able to make a profit on each unit sold since its launch (Surette, 2006).

The alternative, less technically sophisticated dominant design introduced by Nintendo requires smaller investments, team sizes and development timescales (table 3) than it is the case with its competitor platforms. This suggests the possibility of a new dominant design on the content side of the games console sector which is more sustainable than the current 'Triple A' game.

e) The studios' reaction

The Wii appears as an attractive development target for games studios: its installed user base is almost double that of either of its competitors, and producing games for it is less costly.⁴ It represents a potential opportunity to escape from the increasingly uneconomical dynamics of competition present in consoles with more advanced technical capabilities.

Yet there is strong evidence suggesting that most established games studios- and particularly independents- studios not owned by any large publishing houses or mass-media conglomerates- have continued targeting the Xbox360 and PS3 instead of the Wii. Outside of Nintendo, there seems to be little appetite for investing in the Wii console- all 10 top-selling games for the Nintendo Wii since its launch have been developed by Nintendo's own studios. By contrast, 6 out of the 10 best selling PlayStation 3 games, and 8 out of the 10 best selling games for the Xbox360 were developed by third parties.⁵

⁴ Although this could be expected to lower barriers to entry for the Wii and increase competition in the platform, past studies have shown that the installed user base variable is a much stronger predictor of studios' decision to target a platform than the presence of competitors (Venkatraman and Lee, 2004).

⁵ http://vgsales.wikia.com/wiki/Best_selling_games_%28seventh_generation%29

Table 4 shows the breakdown of games launches by independent developers featured in the list of top 100 global studios elaborated by Develop, a trade magazine, in 2009. Overall, for each game release for the Wii, these studios have produced almost 8 games targeting the Xbox360 and/or PlayStation 3.⁶ It is important to take into account, when interpreting these figures, that most games that are not produced exclusively for the Wii tend to be 'downgraded' versions originally developed for other platforms (including both next generation consoles and PlayStation 2, the last-generation version of Sony's platform, which has similar graphics and hardware capabilities to the Wii).⁷

e) Explaining an anomalous behaviour

In spite of its mass-market success, and the reduced costs and complexity of developing games for it, the Wii has failed to attract complementary investments from games studios that remain focused on its competitors.

This suggests the existence of inertias in the behaviour of established games studios. These could be linked to the existence of switching costs, that is, past investments in technologies and capabilities that hinder their transition to a new platform. However, the fact that the Nintendo Wii does not constitute, at least in its hardware, a radical departure from consoles in previous generations, makes this unlikely.⁸ Another potential explanation for the observed trend is that the Wii constitutes an architectural innovation that developers have been unable to adopt successfully with their existing capabilities (Henderson and Clark, 1990). Although this is a compelling explanation- the innovation introduced by the Wii is its user interface, which defines the way in which a game is ultimately consumed by users, as table 4 shows, a significant share of studios (more than half in those considered) has not yet tried to release any games for the platform.

An alternative hypothesis for the observed trends is developed in the following section drawing on an in-depth study of the values, practices and behaviours of games studios and communities at the firm-level. This analysis suggests that the cultural values and aspirations of the communities of games developers working in studios, as perpetuated through established organisational and recruitment practices, play a crucial role in shaping their innovation strategies, leading to the trends which are observed at the sector level.

3. Methodology and Data

Data have been collected and analysed across multiple research sites using grounded theory techniques (Strauss and Corbin, 1990). The adoption of this approach is justified by the exploratory nature of the research- With the exception of Tschang (2007) and Cohendet and Simon (2007), there are no other academic studies that have examined in-depth the development practices of video games studios, and the behaviour of their professional communities. The purpose of this research effort is to, following the

⁶ Even when allowing for cross-platform releases targeting both Xbox360 and PlayStation, the ratio is still of approximately 4 to 1.

⁷ These games are usually referred to as 'shovelware' (GWNightmare, 2010).

⁸ Particularly when considering the fact that developers have been able to adapt to significant modifications in chip architectures and larger storage devices in the Wii's competitors

methodological approach postulated in Eisenhardt (1989) and implemented by Uzzi (1995) or Hargadon and Sutton (1997), build a rich understanding of the organisational milieu in question prior to the development of empirically grounded, testable hypotheses addressing the causal relationships between the relevant constructs.

The dataset arises from 33 semi-structured interviews in 7 UK games studios. The studios in the sample have been drawn from a population with capabilities across platforms; namely, consoles (fixed and handheld) and online. The companies have been selected in the first instance as creative exemplars with respect to the development and management of valuable intellectual property- including characters and franchises- across a wide range of games genres. By introducing variation in the sample, the research team has been able to examine development practices, innovation processes and workforce behaviour in different market and technology contexts.

The interviews have been conducted in pairs – two researchers attending every interview- at the studio’s premises between June and October 2008. The interviewees have been selected to represent the important creative functions within the studio – art, design, coding. The research team has also secured inputs from project managers and/or producers, as well as studio personnel with strategic roles and insights, such as managing directors or chief technology officers. Additionally, the research team has had access to internal documents, including organisation charts and product design documents. When relevant, the team has complemented these primary data with secondary sources, including the trade press and other publicly available information.

The data generated have constituted, once transcribed, the starting point in an inductive process involving constant iteration of the concepts and a collapsing of emergent concepts and themes. By this method, the resultant hypotheses and subsequent theory are consistent with – and grounded in – data, both formal and observational (Martin and Turner, 1986). The coding has been undertaken independently by two researchers in order to ensure construct validity, using Nvivo7 qualitative research software.

The emergent findings from the research have been – in half of the cases –subject to additional discussion, validation and augmentation at company workshops held at the researchers’ premises, as well as presentation in two events aimed at games professionals.

In the case of one of the studios, the research team has convened two follow-up idea generation events aimed at addressing some of the issues identified during the studio-level workshops, with the participation of 80 employees. The researchers have adopted a participant observer role in these events, facilitating and contributing to the discussions, and collecting additional data in the shape of diagrams, graphs and idea prototypes.

4. Findings

This section begins with an overview of the composition of the workforce in the examined studios. Afterwards, it describes the 6 themes that have emerged from the systematic analysis of the data generated in the interviews. The themes are classified inside two categories- ‘dimensions of quality’, concerning the motivations and goals of

studios and their workforces, and ‘development practices’, that is, the processes and methodologies through which those goals are realised. Tables 5a and 5b present, for each of the studios in the sample, representative excerpts from the interviews classified inside the emerging themes.⁹

a) Composition of the workforce

The seven studios in the sample are male dominated - only two women have been interviewed during the research. Where women are employed, they are located in administrative or managerial positions. The age of the interviewees ranges from late 20s to early 50s – with some of the personnel being self-described ‘veterans’ with over 30 years in the sector. Nevertheless, there is a general perception that games development is better suited for younger people.

Seventeen interviewees have undertaken university-level courses in a related subject such as programming or fine art. The same number report no industry experience outside of the games sector, having entered development immediately after finishing their education.

b) Development practice: Gaming employees

Although they have not been asked explicitly whether they are gamers, 12 interviewees immediately describe themselves as such, with 4 reporting that they designed their own games prior to becoming professional games developers. Two of the studios make it explicit that they will not consider recruiting ‘non-gamers’, while a third one differentiates between recruiting ‘professional games developers’ with experience in the industry, and hobbyists from mod communities.

The boundary between professional games development and participation in gaming communities is very porous. Games developers play games continuously, for their own enjoyment or in order to research competing products. At the same time, gamers try to gain employment in the sector. ‘Testing’, the lowest paid function in video games development, is one of their main entry points- a passion for video games is the primary qualification required for this position. Three interviewees report having begun their professional career as video games developers in testing.

There are some exceptions to this recruitment approach. Studio Social explicitly attempts to recruit employees with creative interests outside of games; for example, musicians and graphic designers. Studio Racing actively seeks to recruit project managers from outside of the sector rather than through internal promotion of experienced developers.

c) Dimensions of quality: creative freedom in narrow domains

All studios give their staff some scope to exercise their creativity- it is argued that a degree of creative freedom is the reason why they are in the sector in the first place. Excessively formalised processes, or overbearing managerial oversight is seen as

⁹ Note that not all relevant themes are addressed for every studio. This is a consequence of the emergent nature of theory development across subsequent iterations of the research process in different empirical settings.

demoralising. By enabling their employees to be creative, studios bring new ideas into their development projects, and encourage peer competition between members of the development teams. As employees incorporate their own ideas into a project, they achieve a feeling of ownership over it, which increases their levels of commitment. It is acknowledged that those individuals who contribute a new idea should also be responsible for its implementation.

But the pool of influences from which developers draw when they exercise their creativity is narrow. When interviewees describe experimentation, or 'trying out new ideas', it is often by comparison to the features or levels of polish of other games within the same genre. Creativity is thus exercised in order to reach the levels of quality of other 'exemplary' games that the developers admire, or in order to introduce a degree of differentiation which will set the game apart from the competition, while appealing to audience within the same genre.

The research team had the opportunity to witness the creative processes of one of the studios at work during an idea-generation workshop held at the university. Although the event was framed with the purpose of generating new 'casual games for non-gaming audiences' concepts, the majority of the ideas that were put forward by different brainstorming groups had Science-fiction, Fantasy or Adventure themes and, without exception, made explicit reference to other successful games in the traditional market.

d) Development practice: unpaid overtime

Differently from other software development activities, the feature set for video games tend not to be clearly defined at the onset of a project- it is always possible to invest more time on polishing the product, or include an extra feature. As these tasks tend not to be scheduled in the initial work-plan for the project, or budgeted for, they frequently require developers to engage in 'crunch' (unpaid overtime).

Crunch is described as an undesirable- albeit necessary- means to achieve quality. Some interviewees refer to it as the unavoidable outcome of working in firm a creative industry where employees are intrinsically motivated to produce the best game that they possibly can. Although some interviewees adopt a cavalier attitude towards crunch, referring to it a 'badge of honour' or a demonstration of their passion for what they do, others complain that it occurs with excessive frequency, because of lack of professionalism, or unwillingness to 'rein-in' the scope of the project.

Studio Social is the exception- this company has implemented an explicit 'no crunch' policy, where developers are asked to work 8 'solid hours' a day, from 9 to 5, without access to the Internet or the constant interruptions to play video games that are frequent in other studios. In exchange, the managers guarantee that there will be 'no crunch'. This studio has implemented a tight development cycle with high levels of redundancy in the schedules, and a realistic scope for every deliverable which enables it to fulfil its objectives on time and budget. The adoption of this strategy is seen not only as a way of increasing the quality of life of the employees, and deliver superior products, but also as a way of attracting talent from outside established gamer communities.

d) Development practices: Management and training

Internal promotion of experienced developers to managerial positions is the norm in the sector. None of the interviewees report having received management training as part of their promotion. When studios have implemented new product development approaches such as 'Agile Programming'- a set of practices that is becoming increasingly popular in the industry-, the managers have taught themselves about its principles in their leisure time. In one of the studios, the implementation of this new development approach without the necessary know-how is reported to have produced catastrophic consequences for a project, and high levels of crunch.

Where training has occurred, it has either been retrospective or external to the studio. One of the interviewees reports having consciously left the games sector in order to acquire some project management experience 'in the real world'. Studio Racing, as highlighted previously, recruits its managers from outside of the video games sector. They have brought into the company formal project management skills and tools such as Prince2 or SixSigma accreditation.

d) Dimensions of quality: realism and authenticity

Interviewees in 5 of the studios report that achieving high levels of realism in the product is an important goal. Realism is achieved through innovation in the techniques with which the graphical capabilities of consoles hardware are exploited, in the design of the game levels, and in the use of historical references and documentation to create content and a believable 'handling' of weapons and vehicles.

Some interviewees- particularly video games artists- show a degree of exhaustion with this emphasis on realism. According to them, the 'photorealism' trend has entered in decreasing returns in terms of the results that can be achieved with available resources, or even meaningfully perceived by users, and constrains their creativity. They nevertheless acknowledge that they strive to achieve the graphical benchmarks of other 'exemplary' games in the market.

Social Studio constitutes an exception in the sample, as the audiences for its products are less demanding in terms of graphical prowess. Artists in this studio try to make their products look 'less gamey', drawing on influences from other creative media, such as television and animation.

e) Dimensions of quality: who is the audience?

Four studios in the sample point out that their focus is on core gaming markets. This is reflected in their testing strategies, which- when present- draw on internal QA teams of seasoned gamers, or on user testing with groups of gamers. By contrast, developers in Social Studio test their games with members of their own families, as well as randomly chosen groups representative of the general- as compared to the 'gamer'- population. Studio Racing describes its latest project as an 'arcade' (instead of 'simulation') racing experience with potential appeal beyond the 'racing genre', although not necessarily extending into wider audiences. The project discussed by Studio Music targets the music games market, which is perceived to include more causal audiences. But even

then, the interviewees point out that their product is focussed on the 'experienced' fringe of this market.

Developers also place great importance on review ratings from the specialist gaming press as an indicator of project success- 4 interviewees indicate that achieving high ratings justifies additional investments in a project, in terms of time and resources at a latter stage of a project, including crunch. Although one interviewee explicitly links these review scores with higher sales, the other three see them as goals in themselves, which when achieved, validate the effort put in the project and increase external esteem for the studio.

Although the interviewees acknowledge the success of Nintendo's Wii console, few of them express interest in producing games for it- they disparage it as 'gimmicky', and as a 'fad'. They do, however, point out that the influx of wider demographics into the gaming market can be beneficial for them, as some of the consumers who get acquainted with games by playing the Wii will eventually demand more immersive experiences.

a) Discussion of results

The picture emerging from the qualitative stage of the research is that of a highly committed and intrinsically motivated workforce, stemming from the fact that most interviewees are avid gamers themselves, and consider working in the sector as a reward in itself.

There are benefits to recruiting from this 'amateur' talent pool. Experienced gamers are 'lead users' ahead of mass-market demand (Von Hippel 1994). By hiring them, studios are able to access 'sticky information' that supports their innovation strategies; for example when their employees test and suggest improvements for the products being developed.

The presence of intrinsic motivations increases employee effort and creative performance as compared to purely monetary rewards (Amabile et al, 1996). The developers' willingness to work unpaid overtime is a manifestation of these intrinsic motivations. It enables studios to increase productivity for a given level of resources, and in some cases, deliver projects without the need to increase team sizes, a source of important managerial challenges in software development (Brooks 1989).

However, the use of such intrinsically motivated workforce also presents important drawbacks. An acceptance of 'crunch' reduces the need for studios to address the underlying reasons why they systematically fail to deliver on their deadlines, or achieve acceptable levels of quality- because, for example, their innovation strategy is unsustainable. In other occasions, creativity can be, in itself, a source of 'feature creep' leading to crunch (Grantham and Kaplinski, 2005). As the interviews above and secondary data from the sector show, this work practice seems to be in fact institutionalised, in spite of the controversies that it has generated in the past (IGDA, 2004). By decreasing real wages and producing a deterioration in the quality of life of the sector, it might also be discouraging potential new talent which is not as intrinsically motivated as the members of gaming communities.

There is strong evidence supporting this emergent finding about the composition and extraction of the games workforce. Recent surveys show that this workforce is heavily skewed towards the demographics of 'core' gamers. According to a survey of the UK Media Workforce undertaken by Skillset in 2008 the computer games sector has the smallest proportion of female employees of all those considered- 12% as compared to an average of 38% for all sectors (Skillset, 2009). This figure falls in line with the results of the Independent Games Developers Association Diversity Survey of US studios (IGDA, 2005).

The situation is similar in regards to the age of the games sector workforce- an IGDA Quality of Life Survey undertaken in 2004 shows that 34.3% of respondents expected to leave the industry within the next 5 years, and more than half within the next 10 years. These results are also reflected in the aforementioned Skillset survey, which shows that games developers are, on average, much younger than the workforce in other creative industries, and the least likely creative professionals to have dependent children (Skillset, 2009).

Managerial action can help to restrain intrinsically motivated creativity and keep products focussed, reducing the need to crunch. It can also help to bring more diverse talent into the sector. But project managers and producers are, almost without exception, experienced leads promoted on the basis of their technical or creative proficiency. This strategy is aligned with the social dynamics of communities of practice where technical excellence and knowledge of the practice constitute the crucial dimensions of peer respect and reputation, as compared to formal positions within an organisational structure (Levy, 1974, Mateos-Garcia and Steinmueller, 2003). But they lead to homogeneity and the practices that reinforce it, across the sector's managerial structure.

Cultural homogeneity in the workforce leads to the 'introspective tendencies' identified in the data. Studios tend to make 'the games they want to make', with only marginal attention- or even respect for- wider audiences. This impacts on the dominant definition of quality- something that is realistic, visually striking, technically sophisticated and 'cool', and will be respected by other peers and the specialist games press. It also results on the adoption of usability testing practices that assume a high level of user proficiency.

5. Conclusions

a) The micro-level drivers of the console games sector technological evolution

Section 2 has described the historical trajectory of the console games sector, and the emergence of a dominant design where hardware and content are integrated with a production model (and cost structure) which is uneconomical for most participants. In this context, Nintendo's Wii, has emerged as an alternative design with a focus on user interface innovation as compared to exploitation of enhanced hardware capabilities, enabling developers to produce games more inexpensively, and targeting wider audiences. But available evidence shows little developer support for the platform four years after its introduction. This suggests the existence of inertias in the behaviours of

development studios, which have been explored through the in-depth qualitative study of their innovation strategies, resources and processes presented in Section 3.

This analysis has identified several features of games studios which help to explain their persistent focus on established games and more powerful- and expensive to target- platforms. As described above, studios maintain close relationships with communities of core gamers from which they recruit their staff. Although this is beneficial in terms of employee commitment and output, it also precludes access to new perspectives and sources of inspiration. Studies of communities of practice and networks with high barriers to entry and stable relationships, have shown that a low inflow of new, challenging and diverse points of view, inspirations and skillsets can produce rigidities and creative stagnation (Uzzi and Spiro, 2005, March, 1991). As James March points out in his landmark paper on exploration and exploitation in organisational learning,

'Mutual learning leads to convergence between organizational and individual beliefs. The convergence is generally useful both for individuals and for an organization. However, a major threat to the effectiveness of such learning is the possibility that individuals will adjust to an organizational code before the code can learn from them. Relatively slow socialization of new organizational members and moderate turnover sustain variability in individual beliefs, thereby improving organizational and average individual knowledge in the long run' (March, 1991, P. 85)

The homogeneity- and rapid socialisation- that prevail in the games sector's workforce produces several benefits that have been described above. But it also locks games studios into an 'introspective' and self-referential trajectory of improvement along conventional dimensions of quality- graphical polish and 'cool features' in triple A games- instead of encouraging them to explore new genres, or target emerging platform.

Recent data from the sector suggest that these innovation behaviours are constraining the availability of quality content for the Wii, thus reducing the attractiveness of this platform. They also impact on the profitability of the company, by reducing the royalties that it is able to generate through the sale of third-party games (Nintendo, 2009). Insofar the culturally-determined behaviours of studios impact on the competitiveness of alternative dominant designs available in the market, they crucially shape the future evolution of the sector.

b) Contributions

This paper contributes to recent discussions within the path-dependence literature, which have called for more explicit analyses of the inter-connections between path dependent dynamics at the organisational, relationship and sector level (Sydow et al, 2009). It does so by articulating the way in which firm-level recruitment practices and development processes shape the implementation of specific innovation strategies that focus on exploitation of established genres and audiences ('old certainties') at the expense of the exploration of new possibilities. These strategies, when considered at the sector level, inform the decision to target potential dominant designs competing in the market, and shapes the technological trajectory of the sector.

The paper also contributes to an emerging body of literature that examines the role that social, cultural and cognitive factors play in shaping the direction of technical change in industrial sectors, and provides a necessary, perhaps 'softer' complement to the focus on market size and economically driven decision-making that underpins dominant understandings of competition in networked platforms. Insofar culturally (and intrinsically) determined innovation strategies increase the availability of complementary outputs for competing networked platforms, they can have an important impact on market outcomes.

The paper suggests that, in addition to path-dependent behaviours which are constrained by the accumulation of capabilities and switching costs, locking helpless actors into a sub-optimal situation, and path creation behaviours where actors exercise agency in order to break away from a established path and find new optima, it is important to consider a third possibility. In this case, actors exercise agency to sustain a trajectory which on the basis of their own subjective, culturally determined criteria, is preferable. The prevalence of this third kind of behaviour in some sectors with intrinsically motivated workforces- such as the creative industries, or open source communities- could explain the proliferation of small market niches defined along the lines of specific 'genres' or 'production processes', to the dismay of policymakers keen to promote the commercial growth of these industries (Andari et al, 2007).

In articulating the mechanisms through which the incrementally innovative behaviours of video games studios are perpetuated, the paper rings a cautionary note regarding the extent to which corporations should listen, or indeed, hire their users. As Nintendo's CEO states, *'Nintendo has grasped two important notions that have eluded its competitors. The first is, Don't listen to your customers. The hardcore gaming community is extremely vocal -- they blog a lot -- but if Nintendo kept listening to them, hard-core gamers would be the only audience it ever had.'* (quoted in Aoyama and Izushi, (2008)). It also identifies potential action points that can help video games studios to break away from established paths by altering their recruitment and development practices to bring new talent pools into the sector.

c) Limitations and issues for further research

The qualitative analysis presented in this paper has led to the identification of mechanisms that, it is argued, play an important role in shaping the emergence of specific dominant designs in the console games sector. Although the adoption of an in-depth, multi-site qualitative research design is justified by the relatively novelty of the organisational setting under consideration, this approach also limits the extent to which inferences can be reliably drawn between the firm-level findings and the sectoral outcomes. The results of the paper are however amenable to operationalisation into a set of testable hypotheses regarding the causal relationships between firm-level recruitment and development practices, composition of the workforce and type of innovation strategy and target platforms that are adopted.

This paper has not examined in detail the historical factors that influenced the design and launch of past generations of video games consoles. An assumption has been made that such design was informed by studios' demands for increased processing and

graphic power, and storage space, which enabled them to continue improving their games along culturally-established dimensions of quality. Although historical accounts of the evolution of the sector (Kent, 2001) lend support to this assumption, further primary research should contribute to assert its reliability.

The paper has focussed on communities of video games developer as a 'monolithic construct'. However, and as some of the emergent findings suggest, there is a degree of heterogeneity in the aspirations, goals and values of the different disciplines that constitute it. Further analyses of the motivations, behaviours and strategies for coordination between different games development disciplines are likely to produce valuable insights about the management of innovation in games studios, and interdisciplinary project-based organisations more widely.

Appendix: Figures

Exhibit 1: User interfaces across the last three console generations



Figure 1: Evolution of processing power through the last 4 console generations

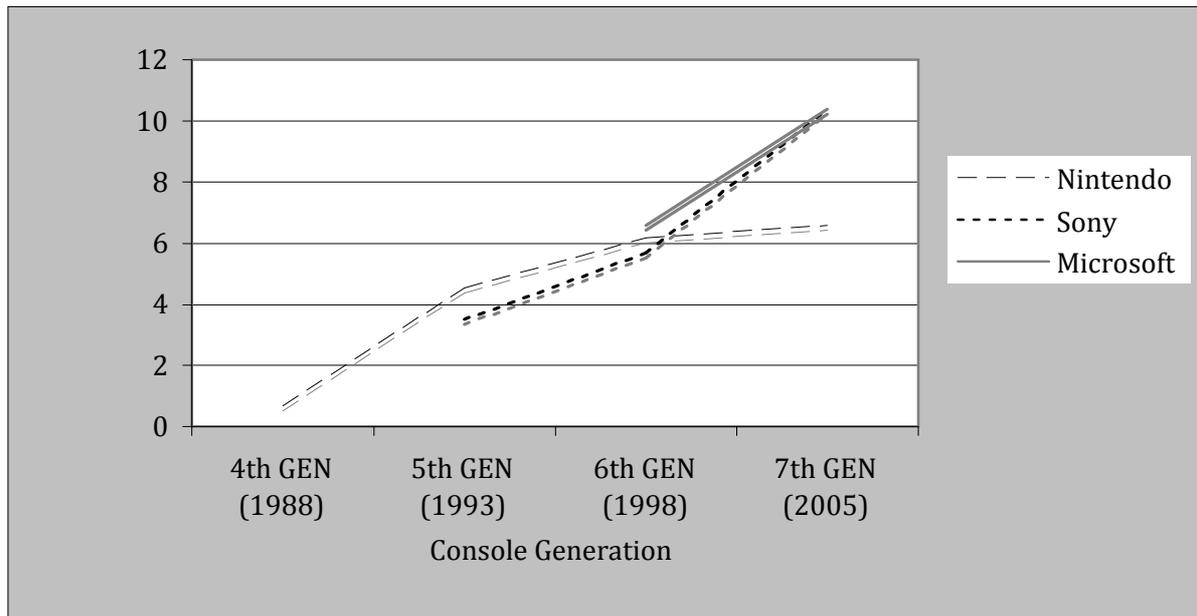


Table 1: Flagship launch titles for Next Generation Consoles

Platform	Game	Age Rating	Brief description
Wii	Wii Sports	All Ages	"Players grab the controller like a racket and swing – the game will register forehands, backhands, volleys, lobs, slices, spin and power depending on how fast the user swings and at what angle. Don't worry about moving around the court to get to the ball – the game automatically moves players into position."
PlayStation 3	Resistance Fall of Man	Mature	"In Resistance: Fall of Man, the U.S. and Britain band together in a last-ditch effort to save Europe and Asia from a horrific scourge. In mere decades, the Chimera - a species of unknown origin propagating a virus that converts other life forms into more Chimera - has overrun Russia and all of Europe."
Xbox360	Gears of War	Mature	"Gears of War thrusts gamers into a deep and harrowing story of humankind's epic battle for survival against the Locust Horde, a nightmarish race of creatures that surface from the bowels of the planet."

Source: games press releases

Table 2: Global sales for Next-Generation Consoles

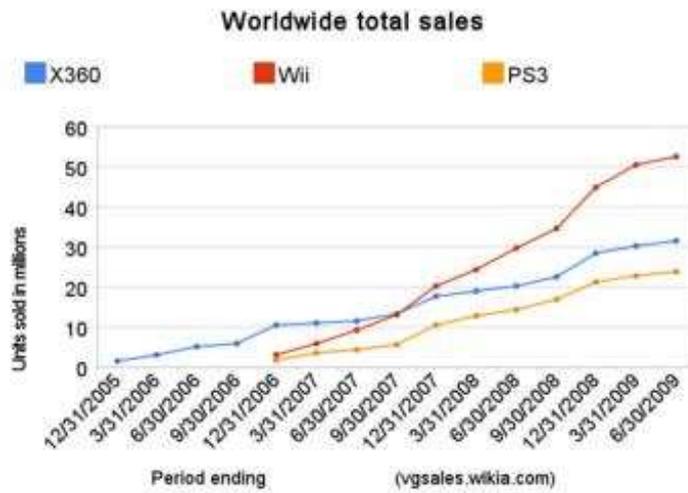


Table 3: Estimated development costs, team size and timescale for next generation video games consoles (2007)

	Microsoft Xbox 360/PS3	Wii
Average development costs	\$4.1M	\$3.3M
Average team size	35-80	25-45
Average development time	18-24	12-18

Source: UKDTI (2007).

Table 4: : Next generation consoles targeted by independent studios in Develop Magazine's top 100 studios for 2009.

Studio	Xbox360 and/or PS3	Wii exclusives	Wii non-exclusives and ports
Rockstar	4	0	1
Epic	3	0	0
Bethesda	4	0	0
Neversoft	10	0	6
Valve	6	0	0
Level 5	3	0	0
Yuke	8	0	4
Insomniac	5	0	0
Criterion	2	0	0
Rockstar San Diego	3	0	1
Krome Studio	4	1	4
Relentless	6	0	0
Rebellion	3	1	2
Bungie	2	0	0
Atlus	6	6	0
Relic	1	0	0
Volition	3	0	0
Gearbox	2	0	1
Funcom	2	0	0
Team 17	1	0	0
Silicon Knights	1	0	0
Grasshopper	2	2	0
Frontier	1	2	1
Totals	82	12	20

Source: Develop Magazine, Studio websites.

Table 5a: Excerpts from the qualitative analysis

Studio	Development practice: Gaming Employees	Development practice: Unpaid overtime	Development Practice: management & skills
Studio War1		I then got so sick of working with [...] that I actually rejoined the games industry. They only work nine until five; they're really lazy.	I think it has become increasingly necessary to...specialise in certain things and it's the same with any other profession really, where you have to keep updating your skills and if you don't update your skills you...fall by the wayside...
Studio Portable	I've always played games, from when I was nine years old I started out...just with a home computer, doing it as a hobby, at the age of 13... I'd obviously been playing games for a few years before that.	I'd rather work late, personally, and respond to those things as they come in...For example, the guys in Japan start work about midnight UK time and they finish by seven in the morning. So it's good to make sure if we can get something out on that very same day, we get an extra day test on it...	I've never worked on a game that's had a solid design from start to finish. It doesn't happen. We've got a lot of talented guys, which I would say is quite unusual, in my experience, to have so many talented guys in one place. So the bar is quite high...
Studio Music	I've got an X Box, quite happy with that as well, but because I'm in the industry...obviously I'm quite passionate about these games.	I felt like there was a big wave through the industry where suddenly working all the hours God sends wasn't quite as acceptable as it used to be... but I think we're so bad as an industry in coordinating ourselves. It's still the Wild West and anything goes.	...so it transitions from a working document for me, then a working document to me and management to work out what we're going to do, and then becomes a working document for us and the publisher...But it quickly transitions to a library...rather than a real fleshy document.
Studio Racing	I'm not a passionate gamer. I actually wouldn't hire anybody from a games company [for production functions]; as a preference I would take them from other sectors.	Our biggest coders who had the biggest bugs were still fighting through it for 45 hours a week.	You have to temper that down to remain focused on what's core about your game, because if you don't, you end up getting very distracted, and you don't get quality on anything.
Studio Social	I don't want a lot of people on the edge working for us. The industry has suffered from making games for itself. Geeks making games for geeks, to be unkind.	We're very lucky here because it's been said right from the start that, no, it [crunch] won't happen.	...we're a small company and we haven't got to that stage yet where we're kind of trying to find jobs for people and having to fit in middle management all over the place.
Studio Mod	Since we started we have recruited 40-60 people, 90% of which came from the community with no prior experience in the video game industry. This worked really good until this year. But now that we have to ship our first AAA game we have realised we need people with a greater level of industry experience.		As an ex-mod making team we have less professionalism and efficiency when it comes to that side of development (deliver on milestones etc.) but on the other hand we have more passion than the average game developer.
Studio War2	I don't think we'd employ someone who's not a gamer.	Because why let the game go out and work 9 to 5, you could do, and your bogeyman come back, and maybe not have that lovely light glow, or that lovely...feature in it, or those nice effects...which will give it another 5% in review? Or give it another 10% in review? That's what you want.	...generally the process should be: a design document is drawn up, that's then passed around. ... we'll have a meeting to discuss it, any reviews are made to the document...That might then go to the person who would actually code it up...[w]e then...rejig the document [and work from that]...the design, the document actually does affect the current design, rather than the ideal, which is what it obviously starts off as.

Table 5b: Excerpts from the qualitative analysis

Studio	Dimensions of quality: Creative empowerment	Dimensions of quality: the audience	Dimensions of quality: Authenticity & Realism
&Studio War 1	...my experience is creative people don't work at their best when they have managers who really crack the whip and shout at people. I think that's probably true in any environment but I think particularly creatives just don't respond to that.	I've found it necessary, really, for most staff on the team to play games...you are really required to think about what other games are doing and what direction they're moving in and where the public are spending their money, in what genres and things like that.	...we've spent two days up there taking high detailed photographs of all the weapons and their functionality, loading, reloading, and firing. And we hired 12 original World War One costumes from a costumier in London with all the kit items...helmets, boots, the whole lot.
Studio Portable	I do think it's vital, and whenever it's missing, for whatever reason, sometimes some of the crew will do a job that isn't very creative, just because of necessity, and we try and make sure that's for as short a time as possible.	Well, obviously the QA guys are really hardcore gamers...to want to sit there and test games all day. So basically it's input on design in terms of games they've seen or the games or ideas we've got, original ideas.	...a lot of people were leaving it alone or going bust...it was extremely hard to make a living...we haven't been part of that arms race, and we shall see what happens.
Studio Music	That is the best and most interesting part of the project when you're coming up with the creative stuff. You have to get into it and lose your perspective.	My hope now is to just make it feel a bit more like a music video, and a bit less of a barrier for a non-gamer.	Our game is very stylised, even though we're trying to make it realistic. It's not about stylised or not, it's about what fits the game...if we had a game which was really suited to a stylised approach I would be more than happy to do it. I'm more bored of...gamey looking games.
Studio Racing	But...now we're hopefully going to work on a game that is going to get really good reviews, and hopefully sell really well. But I think the fundamental thing was...were not afraid to try things out, even though it might not work.	And then we go into another [user] test...put the two graphs side-by-side, you can immediately see the spikes. It's a far more graphical way, you can really show people what progression's being made and you can't argue with it basically.	We also had this challenge to make ourselves the most beautiful game in the world and we've done that.
Studio Social	...it's an organic process within a structure, so there's always time to experiment, and try new things...but they know they only have two days to do it, so they can't be that creative.	...they very sensibly made a point of hiring all sorts of different nationalities so it was kind of like our own little secret internal QA team... they were all sat there and they were great...but since getting rid of them... there are all sorts of mistakes...things that just don't make sense.	I think, in Europe and in the East, people are more open to things looking good, that don't look real...I think people will always be trying to do that [realism] because it's hard, and it ties into a lot of people's desire to be groundbreaking.
Studio Mod	Few people join the video game industry because they want to become millionaires, you usually do it because I work in an office surrounded by action figures and aliens and stuff listening to heavy metal, which is way cooler than working in an IT office.	You can only really sustain your integrity inside the community if you are not seen to sell out. The minute you do that you lose that core group of fans...It depends on your objective...maybe when I'm 40-50 I will be more interested in the financial side of things	
Studio War 2	There is always more that you can add, and because it's such a creative process, everyone wants to make it as good as they possibly can.	[W]e get a lot...of gamers in from the street and say, look, play our game ...[W]e get their feedback and say, what do you think of the controls; are they responsive enough? What do you think of the characters, do they look good enough? What do you think of the weapons...do you enjoy firing them...?	We got to fire an AK47 and a M16 and...we recorded the sound of the weapons. How you reload the weapon... for the animators to see so they can animate it properly.

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