Creating and Sustaining Genres in Cultural Products: Co-Evolution of Technology, Organisation and Markets in the Video Games Industry

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Abstract

Genres in cultural or 'creative' industries are important heuristics for innovation: they offer both directions and structure for advance, yet also constrain choices in a path-dependent fashion. The constraining forces may lead to risk-averse conservatism, which is sometimes accused of the increasing phenomenon of sequels and franchises of movies, television programmes, books and video games. This paper analyses patterns of innovation in an established genre and a newly-created genre in video games, namely First Person Shooter (FPS), and Social Games. It draws on case studies of four leading organisations developing games in the two genres. While the study shows significant creative behaviour and thinking in the early stages of the new genre of social games, it also finds tendencies to limit choices rapidly following early success, in order to close and stabilise the path. Conversely, in the mature genre of FPS there is considerable creative thinking and innovation introduced to rejuvenate and sustain interest in mature paths. The paper analyses the types of organisational initiatives, objects, tools and processes that either sustain paths or disembed from them. It integrates the notion of cultural product genre into our understanding of co-evolutionary development of technology, organisation and markets.

Introduction

The central puzzle of path-dependence and path-creation theory has always been the extent to which creative impetus is constrained by inherited structures. In this regard cultural product genres are ideal subjects. They are voluntary structures that have aesthetic and symbolic meanings, associated with product markets. They are powerful instances of creative impulses of artists being moderated consensually. Theory from several fields argues that the basis of creativity is in the recombination of usually disparate ideas, elements or people (Boden, 2004; Leonard and Swap, 1999; Hargadon and Sutton, 1997; Simonton, 2004) and so does not sit comfortably with the notion of localised restraint. Genres nevertheless persist, and thrive, even while new genre paths are created that discredit them and disembed from them. Because of these stark and vivid properties, the dynamics of creativity and constraint played out in cultural product genres may potentially reveal fundamentals that have broader implications for paths theory.

Genres in cultural or 'creative' industries are important heuristics for innovation: they offer both directions and structure for advance, yet also constrain choices in a path-dependent fashion. The constraining forces may lead to risk-averse conservatism, which is sometimes accused of the increasing phenomenon of sequels and franchises of movies, television programmes, books and video games (see Sapsed, Grantham and DeFillippi, 2007). We might expect that organisational behaviour and strategy for established genres would contain little innovation, while for newly-created product market segments innovation would be highly evident. Research on the film industry has characterised new genre creation as product differentiation, rather than innovation (Lampel et al., 2000; Mezias and Mezias, 2000).

This paper analyses the path dynamics and patterns of innovation in an established genre and a newly-created genre in video games, namely First Person Shooter (FPS), and Social Games. It draws on case studies of four leading organisations developing games in the two genres. While the study shows significant creative behaviour and thinking in the early stages of the new genre of social games, it also finds tendencies to limit choices rapidly following early success to stabilise the path. Conversely, in the mature genre of FPS there is considerable creative thinking and innovation introduced to rejuvenate and sustain interest in established franchises and gameplay, even within familiar structures. This is particularly critical in the industry's current phase of developing for next-generation consoles exploiting new technology.

The paper shows the co-evolution of technology and organisation in paths in video games, and integrates the notion of genre into the paths theory discussion. The structure of the paper is as follows: the next section discusses the literature on path-dependence and path-creation, with particular focus on organisational aspects. The next sections discuss technology and the notion of genres in the context of the video games industry. Our empirical work is in the following sections, firstly profiling the company cases, and then discussing themes arising from the empirical analysis with regard to path dependence and path creation in video game genres and where technology and organisation influence these. We then conclude.

Path dependence and path creation

Much of the path dependency literature has been strongly related to technological change, from David's (1985) much-cited study of the persistent QWERTY keyboard through the

economics of technical change and innovation studies classic readings Rosenberg (1994), Dosi (1988), Pavitt (1990), Patel and Pavitt (1997) among others. This work was empirically grounded, showing the stability and predictability of technological paths. It was influenced by, or sympathetic to the evolutionary economics tradition spearheaded by Nelson and Winter (1982), which recognises the difficulties that large organisations have in moving far from established paths quickly.

Despite influencing some important thinking in strategy e.g. the dynamic capabilities approach (Teece and Pisano, 1994) management and organisation scholars have been dissatisfied with the determinism of path-dependency. Fransman (1994; 1999) has emphasised path-*independence*, arguing for a less restrictive passage from *vision* to strategy and realised competence. Sapsed (1999) argued that while technological path-dependency was an empirical fact, considerable strategic scope and flexibility could be exercised by applying technologies to differing product markets. Garud and Karnoe (2001) argue that path-dependency has an inadequate explanation of human agency, or specifically entrepreneurial agency. Garud and Karnoe offer a framework for understanding path-creation, as a complement to path-dependency. Path creation may be enacted by the manipulation of objects, relevance frames and time, such that agency through organisation influences the initiation and development of new paths. Through this 'mindful deviation' entrepreneurs and managers may create new paths, which develop with technology and institutions co-evolving, in a manner consistent with Giddens' (1984) structuration theory.

Garud and Karnoe's framework sheds light on the organisational actions whereby entrepreneurs may disembed from existing paths in order to create new ones. The corollary of this creation and disembedding is that path-*destruction* may also be required (Hirsh and Gillespie, 2001) in the form of discrediting existing paths. Discrediting tactics are, after all, familiar with the protection of existing paths, as alternatives may be squashed to sustain the status quo. Critical evaluation routines, for example, tend to reproduce accepted norms and reject what is discrepant from them (Garud and Rappa, 1994). These effect closure and convergence and stabilise the ascendant path. In the view of these organisation and management scholars, path-dependency is not so much a given inevitability, but very much a social achievement.

And so it is with path-creation. Within the organisation objects of various kinds – tools, images, processes, words and phrases - may be mobilised to convey an array of symbolic meanings that help to infuse and instil the organisation with the possibility and reality of a new path (see Rao and Singh, 2001). Externally, users of new technologies and products may not exist and must be invented. People must be persuaded of the credibility of a consumer or user of the new product and should aspire toward or identify with this new user, as shown by Pinch's (2001) examples of mass market cameras and music synthesisers. Demonstrations and theatrical displays show glimpses of a future world with the new product and serve to persuade and excite the imagination (Lampel, 2001). In these and other ways, organisational practice and form co-evolve with the broader industrial context (Windeler and Sydow, 2001).

The next sections outline our framework on the creation and sustaining of paths in particular product markets- those associated with cultural product *genres*. Specifically our empirical setting is the video games industry, where co-evolution of technology, organisation and genre may be clearly demonstrated. Our purpose is first to analyse the features of a video game, its technology and markets so as to develop the notion of genre and its co-evolutionary

relationship to these other concepts. This sets the stage for the organisational analysis following subsequently. Following the empirical discussion we conclude.

A video game's technological infrastructure

A video game engine is the software system supporting a video game's operation and development. It provides the underlying technologies and pipelines through which content assets are integrated into a functioning gaming experience both from the point of view of design and implementation (software services to developers 'under the hood' of the game) and of consumption (the game world and interactions presented to the user at the front-end).

A game engine is not an structure which is 'filled with content' in order to create a game, but a technical framework which is customised and adapted in order to create the content, determine how it is portrayed, what are its properties and how it interacts with the player (and vice versa). As it is the case of other software products, the source code underlying a video game is a manifestation of the process, through it was developed, not only its outcome but also its consequence[1].

A video game's genre

a) Definition

A gaming genre is defined by the collection of features that dictate how the user interacts with the video game ('gameplay'), involving symbolic or aesthetic properties that appeal to a specific market segment[2]. In this sense, games inside a genre are close substitutes, and the studios developing them compete for the same market

Although the genre of a video game could be established in terms of the nature of the content it presents (in a similar way to films e.g. racing games, sport games, war games)[3], it is more useful to use a classification based on the key features inside that regulate the player's interaction with the game world[4]. This approach, commonly followed inside the industry, highlights the linkage between a video game's technological architecture and its genre, as determined by the set of features this architecture supports. One of the issues we investigate in this paper is the extent to which the organisational structure and work practices of a studio support the construction and modification of specific architectures, associated to processes of path creation and dependence inside a genre.

The collection of features we are referring to as 'genre' are intrinsically related to the concept of game play, which Adams and Rolling (ibid) define as '*the challenges presented to a player and the actions the player is permitted to take to overcome those challenges*' (p. 14). In our framework, these challenges and actions are embedded in features that regulate the interaction between a player and her environment[5]. The game's user interface (including

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[1] And, as we will argue, the actual shape of the game (e.g. in terms of genre) appears inherently linked to its source code and the organisational processes through which it is developed (Conway (1968)).
[2] Our definition of market segment follows Söllner and Rese (2001) in its implicit inclusion of issues related to the competitive structure inside a genre.
[3] See Mezias and Mezias (2006) for an analysis of the emergence of new genres, defined thematically, in the film industry.
[4] Adams and Rollings (2007).
[5] See Lopes and Kuhnen (2007) for a more detailed conceptual decomposition of a video game from its 'concept' to its 'actions'.

peripheral devices such as joysticks and other bespoke controllers) through which the player acts upon the game world and receives feedback from her actions is an essential element of the game play.

Genres are fluid categories that evolve as processes of technological innovation in the video game industry unfold: improvements in hardware and software make it possible to implement new features which in some cases make it possible for a game to 'break away' from pre-existing categories giving rise to a new genre. For example, the First Person Shooter genre, described in further detail when presenting the empirical setting, was not established until graphics hardware capable of presenting players with 3D environments had been developed (and was available at an affordable price creating a sufficiently large potential audience for games inside the genre).

It is necessary to emphasise that although the emergence of new genres is in many cases associated to technological breakthroughs which enable the implementation of new features, their eventual acceptance and success is determined in the market. The creative and innovative processes in which video game studios engage are guided by perceptions of the preferences of existing audiences, and/or the drive to build new ones, and react to market feedback embedded very importantly (but not only) in sales figures. These processes, in which other actors such as publishers, games press, legislators and game retailers play key roles lead to the progressive institution of quality criteria which influence the competitive (and innovative) dynamics inside a genre's market[6]. The genre construct is therefore analogous to the 'product conceptual systems' presented by Porac et al (2007): it constitutes a socio-cognitive structure in the interface between supply and demand, and defines the 'relevance structures' along which the quality of different products are measured and compared. In the case of games, this is accomplished by establishing which of its features should be assessed and along which parameters.

A game's genre constitutes, a signal through which studios and publishers inform potential customers about its nature, communicating key aspects of the gaming experience. In addition, it defines the essential dimensions of performance over which games can be compared. The genre taxonomy fulfils thus an important communication function by bringing together a game and an audience that demands the kind of features it contains.

b) Genre, architecture and lock-in.

A game engine is built by integrating a collection of components that support, at the front-end, a particular set of features, which define its game play and are integral to its genre. So, inasmuch as genres diverge, the architectures and engines through which they are realised will include heterogeneous components, and require different capabilities in order to be assembled.

Even though games are built using a standard set of tools and skills, these are arranged in diverse ways in order to achieve goals (features) and comply with 'relevance structures' that differ between genres[7]: the genre of a video game will be reflected in the capabilities and

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[6] For example, publishers influence design and development outcomes through the provision of funding and shape demand via marketing. The press fulfils communication and quality assessment functions and regulators try to deter the creation of games of certain types through age ratings etc.

[7] An example of this is the emphasis on level design that we observe in the development of multi-player First Person Shooters (FPSs) compared to other genres, such as, for example, social games. In social games this

processes of the studio developing it, since this effort entails learning a set of skills that are very much genre-specific, and become embedded in practices, processes and organisational configurations[8]. This leads to the emergence of path-dependent dynamics as a studio accumulates knowledge and puts into place practices and processes that support its performance and address some of the common problems faced during development of games inside a particular genre, but might be difficult to modify in case the studio wishes to create a new path. Consequently, we would expect to observe processes of architecture-specific knowledge accumulation, which can be disrupted by innovation in ways analogous to those described in Henderson and Clark (1990)[9].

c) A genre's trajectory

At a particular moment in time a game developed for a certain audience (genre) needs to contain a conventionally established set of features if it is to be considered inside it. Genre classification constitutes an essential element of marketing strategy that informs technological development. Features are implemented through combinations of code, content and user interface which, as we argue above, are genre-specific.

Having pointed out the technological specificity of a genre, an issue that emerges is whether these constructs, understood at a meso-level (i.e. not at the micro-level of the studio which we touched upon in the previous discussion), are characterised by trajectories (Dosi (1982)) with an initial stage of experimentation followed by subsequent stabilisation. In this stabilisation, the capabilities of developers interact with the tastes of the audience through processes analogous to those described by Porac et al. (2007) and Capetta *et al* (2006) in their discussion of product conceptual systems and fashion styles.

If this was the case, we would expect to witness, inside an emerging genre, a transition from an initial period of fluidity with a larger degree of uncertainty about the sort of features that the new audience demands and are implemented, and the eventual establishment of a well-defined set of 'genre conventions' or 'language'. Analysis of anecdotal evidence supports the presence of these dynamics, where stabilisation is brought forward by the commercial success of a game that becomes the genre's 'exemplar' by demonstrating the existence of mass demand for the set of features it contains (and tend to be replicated by new entrants).

This process of stabilisation is not associated with the emergence of a dominant game design inside the genre, and subsequent improvements in production processes (Abernathy and Utterback (1978)). Instead, it presents dynamics of convergence around a particular set of core features, which mirrors the one presented by Capetta et al (ibid).

d) The interaction between genre and innovativeness

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aspect is irrelevant: the need to ensure, in the case of multi-player FPSs, that levels, weapons and character classes are well balanced requires processes of testing which are undertaken at different stages, and in very different ways from those present in the latter genre, where the emphasis of game testing is on usability.

[8] The need to undertake intensive periods of beta-testing before a multi-player FPS is released requires the creation of specific functions in the developing studio in order to manage these activities, interact with the community undertaking the testing and process and filter feedback.

[9] This framework can explain the dynamics of change in the video game industry brought forward by architectural innovation which disrupts the modus operandi of incumbents with capabilities ill-suited to the development of games inside new emerging genres. This is exemplified by the difficulties faced by actors trying to create games for Nintendo's Wii console, which presents important differences in game play (architecture) from its competition as a consequence of the introduction of its motion-sensitive wii-mote peripheral.

-Feature sets as guideposts for innovation

In the previous discussion we have argued that a mature genre is characterised by a well-defined set of features that a studio needs to implement in the game it is producing in order to target that market. In this sense, the need to fit inside a genre would appear to constrain developers' creativity and innovativeness by restricting the range of features they can implement and the visual style they can adopt in their game. The refusal to do this would place them in an uncertain terrain outside established genres and hinder promotional activities by making it difficult to communicate to the market the nature of the gaming experience they are providing. As Garneau (2007) argues:

> *There are many games on the market and many pieces of news about those many games. If you can't communicate very quickly why your game is worth the interest of the public, the public will just move to the next news story and ignore your game. If players can't easily tell their friends why your game is cool, they won't.*

> *In fact, a concept that's hard to explain may not become a game at all. If you can't explain the idea behind the game clearly, chances are management or publishers won't choose that project because they don't understand it. No matter how good your game idea is, if you can't communicate what makes it good in a simple and compelling way, it won't become a success.*

As we pointed out above, a genre fulfils an essential function of communication that is not only confined to a game's presentation to final consumers but actually spans the whole sector's value chain; for example, the allocation of development resources by game publishers is largely based on the past performance of popular genres and franchises, and this might block access to funding for studios working on innovative games not clearly ascribed to a genre (and for which sale figures are, therefore, impossible to estimate)[10]. The transition to next-generation hardware in consoles and the ensuing increases in development costs, studio sizes and publishing risks has accentuated this kind of conservative trend (Readman and Grantham (2006)).

Convergence and stabilisation should not imply a lack of novelty (an essential competitive factor in cultural markets), which can be introduced through the use of new content (e.g. Intellectual Property, franchises, characters etc.), but a shrinking rate of technological innovation at the feature and game play layers where a game's classification inside a genre hinges.

Nevertheless, we observe that the need to differentiate a product from the competition *inside the genre* leads developers to engage in active processes of innovation beyond the aforementioned use of new content. What is more, we suggest that widespread knowledge about the features that characterise a genre can become a guide for innovative activities by illuminating areas where a company might be able to set its product apart from the competition through 'Unique Selling Point' driven innovation. Inside this new framework, genre is construed not as a static category, or destination for a creative endeavour which

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[10] This illustrates the uncertainties that managers of creative content enterprises have to handle when building their project portfolio (Lampel et al (2006)).

should fulfil a rigid set of criteria in the Aristotelian fashion (Aristoteles (2007)), but as a dynamic starting point for innovative activities which build on the past (not breaking away from established patterns of communication inside a genre) and introduce the novelty which audiences in cultural markets seek. The way to compete in these mature genres is by scanning the market continuously for gaps where innovation can be successfully undertaken, 'pushing its boundaries' from the inside while respecting established conventions. If we conceptualise entrepreneurship as a process of 'mindful deviation' from prevalent trajectories (Garud and Karnoe (2007)), then we could say that it is precisely existing knowledge about the nature of the trajectory (codified in the set of features defining it and the underlying technological principles through which they are implemented) that enables this mindfulness, thus informing innovative activities.

A logical implication of this argument is that in the case of a nascent genre, the absence of a defining set of features, which we would expect to find associated with more open processes of innovation and the presence of a broad range of possible development paths (and competitive strategies) might actually lead to rapid processes of closure around early feature sets. This would be a consequence of uncertainty about the factors that define success, and the areas where a participant can build a unique differentiating path, which speeds up processes of convergence around initially profitable strategies, constraining experimentation and locking participants into conservative paths of evolution.

The Nature of demand

With respect to supply, a genre's feature set appears linked to the technological infrastructure supporting it, which is developed using idiosyncratic capabilities. From the demand side, a genre's specification of an audience with particular characteristics also impacts the innovative dynamics of the market it defines. In other words, the extent to which this audience requires (or is assumed to require) innovative features compared to other attributes of a video game (e.g. up-to-date content in the case of sports games, usability or a polished experience in other areas such as social gaming) will play a critical role in determining the competitive strategies followed by participants in the market. As we said before, the genre's criteria of relevance which emerge in the interface between studios and their audiences informs innovative processes. The gaming press plays a key role in this process of communication between developers and audiences that it is purported to represent[11].

Empirical Sections

Research Approach

In the previous section we have presented 'genre' as an informational construct that codifies complex technological and market processes affecting the innovative and strategic activities of video game studios and publishers, and the purchasing decisions of consumers, In figure 1 we illustrate this framework by situating the genre at the interface between an audience which demands certain features, and the studio which provides them by integrating technology and content resorting to idiosyncratic sets of skills, capabilities and organisation. The evolution of this structure is driven by complex technological, social and market processes: innovation undertaken by both technology actors (e.g. console manufacturers,

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[11] A divergence between the preferences of the press and the audience targeted by a video game developer increases the signal to noise ratio in the market and might lead to the production of that which enjoy high levels of critical acclaim but poor sales.

developers of software and providers of network services) and studios enable the emergence of new features and genres. Simultaneously, the preferences of the audience shape the direction of these innovative paths, and influence the funding decisions adopted by publishers. From a strategic point of view, studios might decide to break away from their existing audiences by entering new genres, but in order to do this they need to engage in processes of organisational re-design, and create or purchase the suitable sets of technologies. In this section we explore empirically two key issues that emerge from our discussion:

- The interdependencies between a game's genre, the technological architecture supporting it and the internal processes and practices adopted by studios: How do organisational processes, tools, objects and socio-cognitive features relate to the nature of innovation and paths?

- The ways in which a genre's trajectory informs the design and development of video games by circumscribing an audience and defining potential evolutionary paths and areas for product differentiation.

We provide evidence from case studies of four studios operating in two different genres (First Person Shooters (FPS) and Social Gaming) to illustrate the nature of the processes we have detailed in the previous section, determine the usefulness of our framework, calibrate the strength and direction of the dependencies we have identified, and assess implications from our research.

Methodology

The case study companies are drawn from a population of independent UK games developers working on a diverse range of platforms including consoles, PCs, handhelds and mobile. The selection criteria were based on a firm's perceived creativity with respect to developing and managing valuable intellectual property such as characters and franchises across the spectrum of game genres.

The dataset arises from a series of semi-structured interviews in each of the sample studios. The interviews were conducted in pairs – two researchers for each studio. The interviewees were selected to represent the important creative functions within the studio – art, design, coding – and additionally, to have sufficient seniority to provide wider insights into the interface between the creative and business processes. Hence the researchers secured inputs from the leads in each of the functions as well as project managers and/or producers. In addition, the dataset contains contributions from studio personnel with strategic roles and insights such as managing directors, chief technology officers, amongst others, as well as evidence from internal documents, such as organisation charts and product design documents, and secondary sources, such as the industry press.

The interviews were recorded and transcribed. The data were searched thematically using key words and phrases agreed according to the theoretical framework incorporating the interplay between genre, technological architecture and paths. The searching was undertaken independently by the researchers and the results compared. The results are indicative and will be subject to additional validation by the participants through follow-up interviews or workshops.

3- Subjects of Analysis: Genres and Studios

a) The First Person Shooter Genre

A First Person Shooter (FPS) is a type of combat video game that presents the player with a First-Person point of the view of a game-world through which she moves facing enemies she must defeat by resorting to a more or less broad arsenal of (projectile weapons. Multi-player FPSs, where all participants are controlled by human players competing online have become increasingly popular in recent years, but in our current discussion we shall focus on single-player FPSs, where the enemies faced by the player are controlled by Artificial Intelligence algorithms that are part of the game engine[12].

Although FPSs have a long lineage that began in the mid-1970s with *Spasim* and *Maze War*, it was not until the early 1990s when the genre was firmly established with the success of id Software's blockbuster *Doom*[13]. In addition to developing an innovative graphics engine that contributed to create a heretofore unknown level of immersion in its gory science-fiction/horror world, id Software also implemented an innovative distribution model based on the free online availability of game samples[14].

Since then, the FPS genre has become extraordinarily popular, and high-profile titles such as *Half Life* or *Halo*, set in Science-Fiction worlds, or the *Call of Duty* franchise, which takes place during the Second World War have sold millions of copies to their 'hardcore gamer' audiences. The emphasis that FPSs place on graphic realism have made some of these games exemplars of the advanced graphical capabilities of new hardware, both in Personal Computers and next-generation consoles (Adams and Rollings, 2006).

A rough list of the key features that define a FPS include a first person perspective of a 3D world, realistic physics and weapons systems and challenging artificial intelligence algorithms governing the behaviour of enemies and allies.

> *Our case studies in the FPS Genre*
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> FPS 1 has traditionally undertaken work-for-hire for publishers, porting video games into new platforms different from those for which they were originally developed. However, as part of a recent process of rebranding, the Studio has shifted its attention towards the development of original Intellectual Property using an off-the-shelf middleware engine. The rebranded studio's first project is a FPS that incorporates several innovations which set it apart from its competition, both in terms of the historical setting where it takes place, as well as game play innovation.
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> FPS 2 is a publisher-owned large studio with long experience in the development of FPS, with several top-selling triple A projects to its name. Some important aspects of

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[12] Anecdotal evidence suggests that multi-player FPSs, i.e., FPSs which incorporate online gaming features, constitute a different genre with an architecture which is designed and developed using new principles and capabilities (e.g. emphasis on play-testing, robustness and community support) irrelevant in the single-player context.

[13] See http://gnomeslair.blogspot.com/2006/12/history-of-fps-pictorial.html for a brief history of the genre, and Kent (2001) for a description of the innovative aspects of Doom's development and distribution.

[14] Doom was also one of the first games to provide multiplayer features, as well as game map creating and editing tools which would lead to the emergence of online communities of gamers who built and re-distributed their own maps, giving rise, in effect, to the mod-making movement.

FPS 2's development strategy include the use of internally created proprietary technologies as key components of its game engine, and an emphasis on realism. FPS 2 prides itself on the expertise of its staff in military related topics.

b) The Social Gaming Genre

By contrast to the FPS genre, the social gaming genre is '*not about the machine or its capabilities, this should be transparent - it is about the experience the player(s) receive*' (Ranyard and Haigh (2007)). Social gaming is a relatively new genre that has reached the mainstream with the success of franchises such as *SingStar, Buzz, Guitar Hero, Dance Dance Revolution and Wii games*[15]. Social games focus on the creation of social experiences through the video game medium, and as such are played by groups of people; for example, SingStar simulates a karaoke where participants try to outdo each other hitting the right notes while singing the songs displayed in the screen, while Buzz recreates a Quiz game with rounds of questions where the players compete with each other. This is an essential feature of social games that sets them apart from FPSs, which are played by a single player, and puts them in the same category as traditional board games and 'party games'.

Social Games also focus on ease-of-use in preference to realism. They attempt to provide players who are not necessarily familiar with conventional video game user interfaces and peripherals such as joysticks and joypads with an accessible experience (Ivan (2007)). This usually entails the design of bespoke controllers such as a dance mat in the case of *Dance Dance Revolution*, a buzzer in *Buzz or* the guitar controller in *Guitar Hero*. In all these cases, the goal is to create games that '*even people who don't like video games are allowed to like*' (Simmons (2007), p. 69).

Our subjects in the Social Gaming Genre

Social 1 is responsible for one of the best-selling franchises in the social gaming genre. Some of the key elements of Social 1's design and development strategy are its focus on usability, enhanced through the provision of a bespoke controller for its games, and an emphasis on the creation of a highly polished final experience for non-gaming audiences. From an internal process point of view, Social 1 has been a pioneer on the implementation of work practices aimed at striking a healthy balance between the delivery of high quality products on time and on budget, and the quality of life of its employees.

Social 2 has been successfully engaged in the 'lifestyle' and social games genre for several years, and has recently undertaken a high-profile rebranding operation that stresses its focus on the creation of games for audiences traditionally neglected by the industry. One of Social 2's current projects constitutes an ambitious effort at establishing a successful franchise in a sub-genre of Social Gaming historically dominated by a very strong incumbent. The incumbent's recent announcement of a new product containing many of the features which originally differentiated Social 2's game has caused a great deal of turmoil in the project.

4- Strategies for path creation and sustainability.

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[15] All of which have been released after 2003 with the exception of the latest, which came out in 1998.

In this section we present the key issues that have emerged during our interviews, and set them in the context of the conceptual framework elaborated above. We focus on the channels through which the assumptions about markets and technologies embedded in the genre concept shape innovative processes and influence the dynamics of organisational change supporting it (and sustaining an existing path), but are also are modified by them (with the ensuing creation of new paths). The framework presented above accommodates a chorus of discussions pertaining to a broad range of heterogeneous yet complementary issues such as product design and branding, development processes and techniques, human resource management and organisational learning.

a) *Middleware*

Studios face a critical decision regarding whether to create a proprietary game engine using internal resources, or to license one of the third-party middleware solutions available in the market. The latter option constitutes an acquisition of knowledge embedded in technology that supports a company's participation in a new genre: middleware engines enable studios to quickly enter a genre with which they are not familiar. Consequently, such innovations may loosen a firm's path dependency within the sector with respect to genres. This option is particularly attractive in the case of mature genres where the feature sets to be supported by a middleware engines are relatively well established.

In this context, FPS 1's decision to license a highly popular 3rd Party game engine to support its first FPS project facilitated development activities in a genre where the studio lacked specialised expertise and capabilities: the acquisition of these capabilities, embedded in the middleware and the support services provided by its developer reduced the need for the company to engage on the lengthy learning process required to become familiar with the genre's conventions and architecture, and freed resources that were devoted to innovation in other areas (an issue which we examine in (d)).

Although the modularity and customisability of middleware solutions facilitates innovation in specific components, the lower level architectural changes required for to forge a new path are difficult to implement. So although there is capital to be gained from building expertise around the engine, a company might find its future evolution tied up to the development path established by the middleware provider:[16]

> *In fact sometimes you have to look for features that* (they are implementing)
> *so we know not to do it ourselves, and wait for that feature to come on*
> (Lead programmer, FPS 1)

Differently from FPS 1, FPS 2 has a core technology team working on a proprietary engine which enables the company to maximise hardware performance and implement multi-platform development practices. However, it is important to highlight that FPS 2 has released several games in the FPS genre, and its engine embodies this historically acquired expertise. What is more, the decision to engage in in-house engine development was taken in the

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[16] This dependency which might be dangerous, as the controversy surrounding Electronic Art's acquisition of popular middleware developer, Criterion, shows

context of the insufficiently developed middleware market of a few years ago. So, although FPS 2 exerts a larger degree of control over its technology side, it is still operating inside a path from which it might be difficult to deviate there are radical changes in hardware or shifts in the competitive environment that raise the need to implement new features for which the engine is not particularly well suited.[17]

The path followed by Social 2 exemplifies some of the advantages of in-house tool development, and illustrates how the maturity of a genre constrains the range of options available for developers inside it: Social 2 operates in the relatively young social gaming genre, where the market for middleware is less developed than in the FPS area, so it had to build its own core proprietary engine. The knowledge accumulated through this effort made it possible for Social 2 to modify its feature set halfway through development in order to adapt to dramatic changes in the competitive environment in spite of its lack of experience in the genre.

> *So I tried to come up with a system generic enough that it dealt with abstract concepts (…) And then later on in the project, which is about January this year or February this year, we added* (a new major feature)*, which was a huge big surprise to us all. And adding* (that feature) *using the same (…) game engine was a relatively painless process. So that strategy paid off* (Lead programmer, Social 2)

b) *Graphics and photorealism*

Graphics are a feature which has become increasingly important with the transition to next-generation consoles: the enhanced capabilities of new hardware make it possible to reach levels of detail unfeasible in the past, and this has resulted in increasingly high audience expectations regarding the 'look' of new video games. In the context of our framework, the 'graphics' feature has emerged as an essential 'relevance criteria' along which games in a broad range of genres are being judged. The emergence of a convergent 'realistic' design from which any deviation is deemed to be risky is perceived as an important bottleneck to creativity by many of our interviewees, particularly those coming from artistic disciplines.

The importance of Photorealism as a criterion through which the quality of a game is appraised is emphasised in the FPS genre, where its linkage to player immersiveness dates back to the success of id Software's Doom. However, the acknowledgement of this feature as a key element that characterises the genre has created spaces for stylistic innovation for product differentiation such as the one that FPS 1 is currently attempting:

> *We are hoping that will make the difference and people, once they actually play the game, will see a large difference in what they do compared to other games. And that's where you've got to set it down. I do think games*

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[17] This is an area of change to which all actors carrying out video game development find themselves tied: licensing a large and popular middleware engine which can influence the decisions of hardware providers can be seen as a strategy a studio that insures a studio against changes in hardware architecture which might render its proprietary technologies useless.

> *look a bit more similar, apart from a few exceptions* (Lead Programmer,
> FPS 1)

Differently from the FPS genre, the social gaming genre does not present 'photorealism' as an essential feature along which the quality of a video game is judged. For example, the Wii console has succeeded in this market in spite of the fact its graphic performance does not represent a particular improvement in respect to its previous iteration, the Nintendo Gamecube. This absence of clearly established aesthetic criteria with which a game in the genre has to comply has made it possible for studios to adopt more creative styles for the presentation of their video games, inspired by other media such as television or cartoons, and attracted the attention of developers who feel that other genre's obsession with photorealism curtails their creativity.

> *I think, in Europe and in the East, people are more open to things looking good, that don't look real. And they're not as concerned about things looking real. I find that quite attractive. That's one of the reasons I came to the UK to work, as well, actually.*
>
> *(…)*
>
> *"The photo-realism here is (…) superfluous. If I want to see something that looks real I'll watch a movie or I'll look outside, I'll look out the window."* (Lead Artist, Social 1).

c) *Development Methods and pipelines*

The organisational arrangements and processes adopted for the development of a video game depend on its architecture, linked to the selected genre's feature set and game play. In addition, it also reflects areas where a studio might decide to carry out innovative activities for which conventional structures, methods and 'pipelines' for components and tools are not well suited. The practices adopted reflect a studio's specialisation inasmuch they are suited to the development of games in its genre of choice, but also the areas where it is being innovative, and where organisational adaptation is required in order to address risks and uncertainty, or to engage in constant communication across disciplinary boundaries.[18]

This is illustrated by FPS 1's decision to implement, in its new FPS, an innovative feature which makes the game world structures highly modifiable. This decision has impacted its development pipeline, where new stages have been introduced, and has led to the adoption of specific techniques to manage the interdependencies between functions associated to the innovative feature set being developed.

> *The Scrum methodology suits the problems of the AI guys and the level designer guys have got at the moment which is basically they have to work together…The level designers need AI functionality set at levels and the AI people levels to be able to test the functionality of the AI. So, they have a very interesting inter-dependency and so basically almost running*

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[18] Challenging usual arrangements based on the creation of functional teams co-ordinated by discipline leads.

them as a separate team. So, we're basically running them as an agile team as well. The other reason of doing it that way is it gives us experience within the actual studio of running an agile methodology using Scrum (Lead Designer FPS 1)

Scrum is a growingly popular organisational approach to programming where a piece of code is developed, tested and released internally in a rapid cycle of iterations aimed at delivering a flexible set of user-defined functionalities[19]. Scrum's focus on co-evolution of code through the interplay between developer and user (also referred to as 'client') contributes to ensure that the software being built addresses the need of users, while simultaneously exposing them to the trade-offs of development (and making it possible to prioritise between features avoiding the 'feature creep' problem that plagues the video game sector).[20] These advantages are particularly relevant for areas of a project where a studio is engaging engage in innovative path-creating activities.

Social 2 has also organised its innovative project in the gaming area using the Scrum methodology, but the need to comply with publisher demands and deliver specific features on a milestone basis, areas where there are doubts about the performance of this methodology, have created problems:

> *I'm not sceptical about* (Scrum's) *ability to produce high quality software over a long period of time. I think that's what it's designed to do (…) Now I always felt that that was a very good approach for that kind of system that its lifetime isn't fixed the way you can keep patching and fixing indeterminably. The difference with a game is that it's an artefact and on a certain day you have to sell it to somebody. And it has to work.* (Lead Programmer, Social 2)

The innovative processes that result in the creation of a new path need to be bounded if a product is to be delivered in time, and methodologies such as Scrum face difficulties when dealing with this.

Studios B and C are highly experienced inside their genres and have put into place processes that enhance cost efficiencies (through, for example, code re-use), predictable development cycles that comply with milestone schedules and have sufficient built-in contingency to enable product polishing, to the detriment of exploration and innovation.

As the lead programmer in FPS 2 points out when discussing one of the practices from the Extreme Programming Paradigm to which Scrum is associated:

> *We don't tend to do pair programming for the run-of-the-mill stuff. 90% of our work is run-of-the-mill really it's quite easy* (Lead Programmer FPS 2)

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[19] Very different from traditional 'waterfall' software development models based on the fulfilment of a set of clearly defined stages ranging from design specification through development and testing.

[20] Feature Creep is the inclusion of new and unplanned features in a game during the development process. In the case of the video game sector this tends to be blamed on market and publisher pressures to include new attractive features outside of the original scope of a project.

Thus studio's focus lies not on the achievement of technological breakthroughs (unnecessary given its games' low levels of interactivity) but on other aspects of the game experience, such as distinctive aesthetics (discussed in (b)) or usability. The studio has developed a set of practices supporting the creation of highly polished, animations in its franchise.

> *So we've got a half-way mark now in (platform) where a character will get built to a certain point, then it'll get rigged separately and the animators can start working with it before it's finished, so we can texture it and do all the next-gen [stuff] to it, like normal mapping, while it's being animated. It might need some tweaks later on...*(Lead artist Social 1).

Although this reflects the studio focus on one of the perceived criteria of relevance in the social gaming genre, where the pressure to implement new features is relatively low (see (d)), the studio's approach, based on routinisation and process efficiency, seems to constrain innovation. This is illustrated by the following quote, which refers to the difficulties faced by the studio when trying to implement features that departed from its well-established technical and development framework:

> *And so these little kind of* (innovative features) *almost that I sort of came up with, which were great and people enjoyed and we managed to make four in the end, but they were a nightmare. They were an absolute nightmare because we just weren't set up for it. It was doing something it wasn't using the engine in the same way that everything up until that point had done, so we had to very quickly so, oh, blimey, well, we can probably make do with four and four will be it, and everyone was very relieved* (Lead Designer, Social 1)

In this regard, FPS 2's approach places a similar emphasis on incremental improvement sustaining the path of a successful FPS franchise. This includes using reliable development methodologies which may constrain developers' creativity.

> *I know other companies are just a complete [unclear]... a completely different way, you know, they just say, let's get everybody in, let's all talk about it, but it's just sort of the way our company works and we don't have that many people at that time to pull them out of the projects and say [ ] 'are we going to do some brainstorming and look for it?', ... it's just the designers that ... that have the free time to do that.* (Level designer FPS 2)

d) Product differentiation

We have mentioned above how the 'genre' construct can constrain a studio's innovativeness by establishing the main set of features that can be implemented in a game; this was exemplified by our discussion on (b), where we alluded to how the emphasis on photorealism as an essential feature of the FPS genre discourages studios from the pursuit of other less conventional visual styles. On the other hand, we can also

think of genre as a framework that provides a structure that channels the exercise of creativity by, for example, illuminating areas where innovation has not been undertaken in the past. This can guide innovative efforts by providing the sort of signals that make deviation 'mindful', i.e., establishing a path from which a studio might decide to deviate in order to differentiate its product from the competition. This understanding of genre as a studio's starting point for its own path, instead of as a final destination to be reached seems to characterise the strategy adopted by FPS 1, whose designer identified, at the onset of the project, a set of features with which most of the competition in the FPS market seem to be complying, and decided to challenge them.

> *We'd had conversations with them where they wanted a war game, but we didn't want to do World War Two, or a modern one, because it's so overdone*
>
> *So with* (Project name) *we came up with two or three different designs and talked about it with a small group of us programmers and artists and really decided (…) where we try and focus in these particular areas. In* (Project name) *those areas now are unique selling points, really. If all else fails in the game, that's really something that we're trying to innovate in and get right*
>
> *So these are the areas that we felt we could improve on and that we would focus more on these kind of innovative areas* (Lead Designer FPS 1)
>
> (Competing franchise games) *were already out, which are really big,* (Competing company)*, massive selling titles, lots of people working on it, developing it, and they had gone for a very, almost like a cinematic… everything is really nice, everything is about great camera work, everything seamlessly fitting together like a movie. Whereas we know that we don't have the huge amount of resources to do something like that, so we have to do something a bit more interesting and quirky, which is why the design ended up in that direction* (Lead Programmer FPS 1).

This strategic behaviour for differentiation inside a populated market informs technology development and organisational design as discussed in (a) and (b).

The presence of a strong incumbent in the social gaming area that constitutes Social 2 target has also made it necessary for the studio to place a strong emphasis on those features that distinguish the product. However, subsequent product announcements by its competitors have led to changes in direction halfway through development, disrupting the project and directing it away from the social gaming genre path inside which it was attempting to fit.

> *So I think* (their game) *could appeal to people as being something they haven't got the ability to do anywhere else. And also we've got a more complex* (controller) *which is good and bad in equal measures, it's something that we still wanted to fight against for quite a long time because we thought it would be too complicated for the player. But as*

time has gone on I've come to the conclusion that that's become one of our strong things as well because had we just had (an easier to use controller)*, I think we'd be even closer to* (competing product) *So what we can potentially position ourselves to be now is a sort of advanced game, almost say to people 'well you're think you're good at* (competing game) *then how about trying this which is even one step higher'.* (Lead Designer Social 2).

These approaches are quite different from those in FPS 2 that is engaged in the continuation of a successful FPS franchise with an emphasis on path sustaining development processes of gradual improvement in genre-specific areas, instead of differentiation from the competition.:

> *Incremental, yeah, definitely... the original* (Franchise name) *was the first kind of big game I worked with* (managing director)*, [it] was a really good game. It wasn't really polished because we didn't have the time to polish it, but it sold very well; and then we kind of like expanded... on that.... There's no point rewriting something that works.... if it's selling well you may as well crack on with it* (Lead designer FPS 2)

FPS 2 concentrates on the improvement of those core features that characterise the FPS genre, such as a photorealistic visual style and weapons system. It builds on the expertise of the military enthusiasts in its staff (an issue discussed in (g)). They pay attention to similar incremental innovations being implemented by competitors. Some members of Studio show frustration with their typecasting in the FPS genre and make reference to an innovative project in a promising new area that had to be cancelled because of lack of publisher interest.

> *... there is so much money involved in making... a next-gen game that people really, really do play it safe, and I ... regret that, really, because there's no... room for really original[ideas] out there.... By and large, all the ideas we tend to do, or have done, might be versions of what all the games are doing... so that's ... sad, but that's just the way it goes, it's just the market ...you've got to have a roof over you, ...* (Lead artist FPS 2).

So, in the case of FPS 2,

e) *Construction of the audience*

We have already mentioned the way in which genres define (and are defined by) audiences with which the studios and publishers engage or in the cases of innovative genres, try to create. The construction of the audience as characterised by specific traits and demands certain types of features informing design and development strategies, particularly in emerging genres where conventional feature sets are more imprecisely defined and the pressure from competitors is less intense.

We observe this kind of process more clearly in the case of Social 1, who has become highly successful in the social gaming area through the development of a TV-inspired franchise played which includes a bespoke controller designed with the aim of making the gaming experience as accessible - '*non-gamey*' - as possible. Social 1 has managed to establish a new path supported by a well-developed set of practices and processes that focus on high production values and usability, selling millions of copies of games. On the downside, the adoption of a highly modular technical architecture reduces the scope for innovation, as the difficult experience it had implementing new features described in (c) shows. It appears that in addition to the limitations imposed by its technological framework, the company's perception of its audience as averse to change discourages innovative behaviours, at least from the technical point of view:

> *Some of* (the innovative features)*, though, seemed like they were okay when we played them in flash, but once we got them into the game, it's not so much they weren't fun, but they weren't as clear as we had hoped they would be...* (Lead Artist Social 1)

The need to cater for what is perceived to be a mass non-gamer casual audience directs the path of the franchise away from advanced features and modifications in game play towards other areas such as camera-work and user-interface, and appears to foster certain practices such as usability testing early in development.

In addition to the adoption of promotional strategies targeted at the non-gamer market, the implementation of practices that emphasise usability and the resort to a graphical language in line with television and cartoons experiences, the bespoke controllers designed for social games have embedded in them many of the assumptions that studios make about their audiences. They reduce barriers to participation, but might also constrain future development paths as a consequence of their limited functionality. In some cases, such as that of Social 2, they might introduce undesired dependencies with external parties (such as third-party equipment manufacturers) that might impact development processes negatively.

In contrast to what we observe in the area of social gaming, developers of FPSs seem to be engaging with an audience of 'hardcore gamers' who demand more innovative features, and this aspiration forces the studios to follow more ambitious path-creating activities. This seems to be the case particularly with FPS 1, which, as we discussed in (d), has tried to appeal to players tired of the feature clichés in the FPS genre. This approach seems to be very different from that observed in Social 2, who have the key goal of replicating the clichés from non-game media in order to create an experience which their audiences feel familiar and comfortable. Our interviewees in Social 2 also showed similar intentions regarding the aesthetic language of their game.

f)   Studio Brand

Studio branding is becoming important strategy both from the point of view of attracting the attention of audiences in the genres a company targets, and also personnel with the right attitudes and skills (an issue in which we focus in further detail below). In this sense, the establishment of a particular identity for a studio constitutes another effort towards the creation of a path inside a genre. Moreover, in

the case of FPS 1, which had in the past concentrated on work for hire for publishers, the creation of a new path based on the development of new Intellectual Property.

In this context, the case of Social 2 seems particularly interesting inasmuch its brand has been designed with the goal of making constitutive the audience. Additionally, the branding serves to focus the studio's creative and developmental efforts.

> *Even when I started the studio wanted to make games for non gamers, so that has always been there. But it has helped as it has made it more public visible, so I assume when we launch our game it's going to totally fit into that, if we manage to make a computer game that doesn't look like a computer game. 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.* (Lead Artist Social 2).

g)   *Studio expertise and work practices*

Our discussion about the impact of a genre's technical architecture on a studio's organisation applies not only to formal processes for development, but to human resources and hiring practices, as well as its general development philosophy. In this context, it is interesting to contrast the approaches of the FPS studios. FPS 2 - which is admittedly constituted of 'hardcore gamers' with military interests – adopts a regimented approach to development mirroring the subject matter of the FPS games they develop. On the other hand, Social 1 has enforced a strict policy of 'no crunch' in order to strike the right balance between staff work and quality of life. This is reflected in the studio's successful performance in the social gaming area:

> *One of our programmers was saying, 'I don't really know what to do when I go home though', and he was sad. But- and maybe this is because we are making social games- 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.* (Social 1 director)

The emphasis on hiring staff that are not hardcore gamers and have good communication skills can also be construed to support the sort of development practices that Social 1 has put in place in order to create its games:

> *Human communication tends to get neglected by our computer-based industries. I think it's often because of the personalities of the people that are involved. That's how they are accustomed to working or behaving. But it's a bit easier with the artists, because they're not necessarily from an IT or programming background where you do just sit on your own rigging machine and if you don't want to talk to people, you might not have to. And I certainly discourage that sort of behaviour from the artists. I mean, I probably wouldn't even hire someone who couldn't talk to people. If someone was that reclusive and that unable to communicate outside of email, I probably wouldn't hire them. That's a personal way I'd build a team* (Social 1 Lead Artist)

> *I think it's hard to get the right kind of artist... A lot of games are just really good at drawing cars or guns, but we don't do any of that and, to be honest, the kind of people that would work well in (Social 1 might not work very well in EA, and vice versa, you know, because... we're not game obsessed* (Social 1 director).

The practices adopted by Social 1 support its performance in the social gaming path by favouring communication between disciplines and attracting staff with broad-range of interests reflecting the studio's style and spirit[21].

The evidence suggests that the sort of work practices and recruitment policies adopted by the studios we have analysed support performance in their current genres. This kind of specialisation might, if taken to its extreme, and particularly when the staff are hardcore gamers themselves, lead to the emergence of tunnel vision dynamics where the studio loses sight of its audience and starts developing games 'for itself'.

Conclusions

Our discussion of video game technology confirms the strong path-dependencies that exist with technical investments and decisions. There is of course managerial choice associated with technology, such as the decision to use 3rd party middleware, however the consequences of such decisions will involve irreversibilities and the limiting of choice thereafter. The architecture of the product will determine a large proportion of the organisational arrangements for game development. However we have argued in the paper that the architecture itself is greatly influenced by genre.

Genres in video games are at core a collection of features that dictate how the game is played and that have symbolic and aesthetic meanings, associated with particular product markets. When developers choose to produce a product within a genre this has implications for the types of innovation paths that may be followed, as they are expectations of users that must be met. In this sense genre is a voluntarily-adopted set of constraints on creativity. As video games are a rapidly cost-inflating product to produce, a degree of risk-averseness often dictates that developers stick with genres, and typically characters and franchises that have been successful in the past. Genres vary as to how much innovation is possible and in which directions. For example, in FPS, photorealism in graphics is extremely important and significant ongoing effort is placed on tools, research and person-hours to achieve and advance this authenticity. In other genres such as social games, photorealism is not so important. Similarly there is pressure for new innovative features of gameplay within the FPS genre, which keeps the path fresh, while the users of social games are less 'hardcore', more casual and less interested in investing time in learning new gameplay.

Organisationally this has implications for projects- in social games a winning formula has been quickly established with Social1's franchise. Individual developers as intrinsically-

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[21] It is a similar case with some of the staff working in Social2, who are also interested in the subject matter of the current game being developed.

driven creative professionals have a tendency to want to express themselves and create features, but the process efficiency and 'template' of the game restricts this creativity. We have shown in the case of Social1 a powerful closure on the path even in the early stages of genres- this is a form of '*closure by process*' to add to Pinch and Bijker's (1987) *redefinition of the problem* and *rhetorical closure*. This stabilisation is helpful in persuading clients not only that projects will be delivered, but also that the genre is cohesive and durable. It is part of the signalling/demonstration that Lampel (2001) refers to. Project management tools and methods are as much about dazzling public relations as process discipline (Sapolsky, 1972).

New genres can become 'mature beyond their years'. However this degree of conservatism in the new genre is not so much the case with Social2 who are trying to stretch the genre to some extent- away from the simple-to-use ethos. This is a core feature and suggests a merging of genres and time will tell if this is a successful strategy. Certainly even the hardcore developers in the industry are increasingly trying to incorporate simpler, easy-access gameplay into products to broaden their appeal. There may be junctures ahead where genre paths will merge, or at least slip roads may separate and join other rival paths. The chase for new revenues may prove sufficient motivation for this deviation, although currently the guaranteed revenues of the hardcore market provide enough incentive to maintain its integrity.

There is considerable path-sustaining organisational behaviour, as well as path-creating in the new genre of social games. There is "nothing real" in the new genre, to use Garud and Karnoe's language, and path closure and stabilisation is a way to assert reality to sceptical clients and audiences. Time, as Garud and Karnoe identify is a crucial dimension to manipulate, is short for many organisations in the creative industries, which tend to be small and project-dependent. Slack resources for experimentation and research and development in the classical sense are available. This also explains why major innovations do not frequently occur among software developers, yet creativity nevertheless can be found.

We have shown examples of path-sustaining behaviour in the established genre of FPS. Active rejuvenation of existing paths may be observed in 'cool' new features and elements of gameplay. Studio FPS2 has internalised the genre to the detriment of new initiatives, this is not through inertia, as new ideas are apparent in the organisation, but they are not pursued because of a pragmatic business perspective. This does not mean that there is no advance in the rate of innovation- FPS2 continually tries to push the limits of the state-of-the-art console platforms on greater photo-realism and authentic content, and faster game play allowed by greater processing power. FPS1 is taking a different approach; attempting new paths within the genre, such as destructible environments, perhaps because the organisation itself is new to the genre and does not have the same audience expectations to maintain. This illustrates that what is a mature path at the meso level of the genre, may be a new path organisationally. FPS1 is using new organisation practice to disembed from existing structures by experimenting with Scrum with the AI part of the game architecture. Similarly, Social2 is implementing Scrum to disembed and to announce a new direction.

In addition to Garud and Karnoe's 'mindful deviation', organisational processes and objects may be used for mindful stabilisation of both new and mature paths. For example, the use of particular artefacts, such as laminated mood boards displaying montages of images ensure convergence of quality and style in FPS2, as they strive for photorealism and artistic quality. Other forms of objects include the brand of the organisation, which is manipulated for public relations and internal symbolic uses. Social2 has rebranded with an image of a typical user of

a social game- female, and as such a stark departure from the traditional hardcore gamer. Similarly Social1's website declares that the company 'will never make" a shooting or racing game. These statements and symbols serve to disembed the organisation's people from traditional expectations in the industry. They support the recruiting policy that signals that the company wants people that do not think and behave according to established paths. Policies of 'no-crunch' working and work/life balance are consistent with the sensibilities of the social gaming genre, which is intended to appeal to families as well as socialising singles. These are all disembedding organisational signals and practices and illustrate the co-evolution of organisation with genre.

In Figures 1 and 2 we represent the core concepts and integrate genre with other important co-evolutionary drivers of paths. Genres within games in some cases correspond to genres in other cultural and creative industries: action/adventure, mysteries, quizzes, fantasy etc. although the interaction with the user will not be so distinguishing in the case of say, novels or films. However we believe the emphasis on a core set of features that define a particular genre is true in other creative sectors, and the choice of genre and its development sheds light on the creativity-constraint tension in paths theory, because of its symbolic and voluntary character. This raises the issue of the general applicability of the concept. Genres are spoken about in product markets that involve aesthetics, rather than function. We do not talk about genres of agricultural equipment or soap powder, although the marketing and advertising of these products will certainly involve thinking in these terms, and perhaps also the experience of their consumption. The notion of genre may be of use to thinking and practice in the area of service delivery and experiential goods, in addition to the cultural industries.

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