

## Chapter 1

### What is a Business Game?

# Historical background and evolution of business games in serious games context

N. Baldissin<sup>1</sup>, A.F. De Toni<sup>2</sup>, F. Nonino<sup>3</sup>

## 1.1 Introduction

---

Teachers look for tools they can use to train their students effectively with the aim of empowering them to deal more easily with complex economic scenarios and to enter the world of work as quickly and as smoothly as possible. Serious games are considered innovative, a new way to increase motivation and active participation in the learning process.

Business games, a specific typology of serious game, combine business simulations and games to support management and entrepreneurial training. A business game provides students with the opportunity to develop decision-making skills and improve confidence in situations of risk and uncertainty through the simulation of management practices across the enterprise in ever more complex real-life contexts. In short, the business game draws its strength from the union of theoretical and practical business aspects relating to strategic and operative management and from the combination of playful and serious training elements.

First introduced over 50 years ago, business games have undergone progressive development and have been regularly improved using the most up-to-date technology. The possibilities for use of business games are

---

<sup>1</sup> The Business Game srl, Udine, Italy

<sup>2</sup> University of Udine, The Business Game srl, Udine, Italy

<sup>3</sup> Sapienza University of Rome, The Business Game srl, Italy

---

numerous; in fact, they can be used in completely different contexts and with different purposes. Since the late eighties, business games have been used extensively in universities and business schools and considered a valid and innovative training methodology capable of attracting students' attention and encouraging them to learn through direct involvement, but they are not only used in academic contexts. The characteristics of the business game, in fact, are proving to be useful and effective for use in companies. The perpetual process of evolution of today's markets requires a continuous upgrading of skills, human resources and the recruitment of individuals who are more familiar with the market jungle in order to maintain a high level of competitiveness.

The teaching methodology of the business game is essentially based on experiential and active learning. Before discussing the fundamental principles of experiential learning (see Chapter 2), it is important to emphasize that a business game is primarily a game. Consequently in this chapter we present the key features of the games and we categorize business games in terms of their evolution and key learning objectives.

## 1.2 Games, serious games and business games

Many scholars and practitioners assert that it is not still clear what a business game is. There is no univocal definition of the term "business game" which can be subject to misinterpretations. As a matter of fact the games used for managerial learning are known by various names: serious management games, business simulation, business simulator, learning environment, management simulator, multi-person computer simulation, micro worlds, digital learning games, etc. Maier and Größler (2000) suggest that this uncertainty can be attributed to various reasons: the different academic backgrounds of the people involved, marketing aspects (some terms sell better than others) and the adoption of terms originally used with other intended meanings.

### 1.2.1 Categorization of business games

Certainly business games belong to a large category of games. The relevant literature classifies business games based on computer technology within the category of digital learning games in turn included in the

broader category of serious games, in particular the digital ones (Figure 1-1).



Figure 1-1: Categorization of business games.

The French sociologist Caillois (1967) defines a game as an activity that is:

- free: the player cannot be forced to play, otherwise the game loses the appeal provided by the fun element;
- limited: limited in space / time by precise constraints set beforehand;
- uncertain: its evolution can neither be given nor can the results be obtained in advance.

Caillois identifies four categories of play: "After examining different possibilities, I am proposing a division into four main rubrics, depending upon whether, in the games under consideration, the role of competition, chance, simulation, or vertigo is dominant. I call these *agôn*, *alea*, *mimicry*, and *ilinx*, respectively . . . One plays football, billiards, or chess (*agôn*); roulette or a lottery (*alea*); pirate, Nero, or Hamlet (*mimicry*); or one produces in oneself, by a rapid whirling or falling movement, a state of dizziness and disorder (*ilinx*)" (Caillois, 2001: 12)

The author asserts that primitive societies (e.g. Australian, American, or African) were ruled equally by masks and possession (i.e. respectively *mimicry* and *ilinx*) while ordered societies (e.g. Incas, Assyrians, Chinese, or Romans) characterised by offices, careers, codes and fixed and hierarchical privileges were ruled by *agôn* and *alea* (i.e. respectively merit and heredity). These two pairs of qualities are therefore very useful in shaping and expressing a culture while the four individual qualities express the type of play and the psychological attitude of the players.

Furthermore each of the four categories can be situated between the two poles of *Paidia* and *Ludus*. "*Paidia consists of the indulgence in and giving free rein to uncontrolled fantasies, free improvisation, and turbulence. Ludus is the inverse tendency which keeps paidia in check by setting up arbitrary rules*" (Groot, 2000: 34). So there is a distinction between game and play. A game is *ludus* while a play is *paidia*. The great majority of serious games belong to the *ludus* pole. "*Such a primary power of improvisation and joy, which I call paidia, is allied to the taste for gratuitous difficulty that I propose to call ludus, in order to encompass the various games to which, without exaggeration, a civilizing quality can be attributed. In fact, they reflect the moral and intellectual values of a culture, as well as contributing to their refinement and development*" (Callois, 2001: 27).

Elgood (1997) highlights that the activities in the games lead to situations in which human actions are characterised by mutual interactions and influenced by the environment. Distinctive features of the game are the typologies of actions developed within it:

- unproductive: actions do not create goods nor wealth and are aimed at entertainment, research and / or training;
- regulated: they are subjected to conventions that suspend ordinary laws and establish a new temporary legislation;
- simulated: awareness of a virtual reality different from real life.

Characterising elements of a game are:

- instruments used in the game (cards, balls, computer, ...);
- rules;
- prerequisites;
- strategies;

- probability: some games are directly influenced by luck whereas others indirectly.

In summary all games have four defining traits: a goal, rules, a feedback system and voluntary participation. The goal is the specific outcome that players have to achieve. Rules place limitations on how players can achieve the goal. The feedback system tells players how close they are to achieving the goal. Voluntary participation requires that everyone who is playing the game knowingly and willingly accepts the goal, the rules, and the feedback (McGonigal, 2011).

*Serious games* are real games, which are applicable both in civil and military contexts. Serious games are full-fledged games, also called functional games or social impact games, whose main goals are solving problems to train, investigate or advertise the users (Abt, 1987); in other words they are games focused in providing the users extra benefits while enjoying (Ekanayake *et al.*, 2011). In digital learning a serious game is all about leveraging the power of computer games to captivate and engage end-users for a specific purpose, such as to develop new knowledge and skills (Corti, 2006).

The fundamental goal of serious games is the enlargement and enrichment of users' skills and competencies so that they may be applied in the real world. The fact that the game takes place in a simulated and protected environment allows the player to make mistakes and to gain an experiential knowledge of the scenario. By playing real-life situations, participants must achieve a goal through the use of specific knowledge and the implementation of strategies. Consequently serious games are games that go beyond entertainment. As already mentioned the information and knowledge learned during the game remain deeply impressed and thus allow the players to refine their skills through learning by doing with the advantage of a simulated risk-free context.

Using serious games for educational purposes is still an innovative practice in secondary schools and universities. Nevertheless they are frequently being employed during training of military and rescue service personnel, in corporate staff education and in health care programs (Klopfer *et al.*, 2009). Sometimes they are used as educational tools in many courses such as civil engineering (Ebner and Holzinger, 2007), history (Watson *et al.*, 2011), medicine, safety, shipping, aeronautics (Rolfe *et al.* Hampson,

2003; Yang *et al.*, 2001) and in business education (Burgess, 1995; Dickinson and Faria, 1996; Faria, 1990).

The problem is that most of the numerous educational games that have been used so far are not as compelling as their entertainment counterparts and have many design flaws, but, most strikingly, the educational content is completely not integrated within the game (Egenfeldt-Nielsen, 2005). Consequently Hartevelde *et al.* (2007) there are three features that need to be taken into account in designing a serious game: pedagogy (learning), game (fun) and reality (validity).

So serious games should be more “gamified” with the purpose of making these games more engaging for the players. *Gamification* is “the use of game design elements in non-game contexts” (Deterding *et al.*, 2011). Furthermore gamification is “the process of using game thinking and game dynamics to engage audiences and solve problems” (Zichermann and Linder, 2013). Some authors (e.g. Lazzaro, 2010; Deterding *et al.*, 2011) shows the equivalence of gamification and fun and the chance to make more fun and appealing what naturally would not. But each gamified application should be designed taking in account three elements: the types of players (Yee, 2006; Kallio *et al.*, 2011), the level of difficulty and the feedback system (McGonigall, 2011).

Moreover the idea of using serious games specifically for education it’s quite old, so the term ‘*Edutainment*’ has been coined since the 1970s to indicate the use of computer games and other funny teaching activities as an almost complete substitute of the traditional lectures. Khine *et al.* (2008) instead enumerated the core attributes of interactive computer games and adaptive use for edutainment.

In Table 1-1 we propose the serious games’ features and what is useful to obtain serious games’ effectiveness for edutainment.

Game-Based Learning (GBL) aims to spread the use of games for training purposes. GBL is based on the logic of learning by doing and by acting (*active learning*) and allows the development and evaluation of the theoretical knowledge of individuals, to refine decision-making techniques and to establish an effective approach to team work. Serious game-based learning draws upon the constructivist theory of education. The belief of the Constructivist Learning Theory (CLT) is that the best way to learn is by having the learners construct their own knowledge instead of having someone

construct it for them. Moreover there is the awareness that learning is much easier if lived in the first person rather than passive learning based on lectures and readings.

Table 1-1: Serious games’ features and what is useful to obtain serious games’ effectiveness.

Serious games’ features (Hartevelde <i>et al.</i> , 2007)		What is useful to obtain serious games’ effectiveness (Khine and Shalleh, 2008)	
Main	Detail		
Pedagogy	Reflection		
	Experience		
	Low Resource Demanding		
	Exploration		
	Incremental		
Game	Flow	Creating learner puzzlement	Encouraging collaboration
	Uncertainty	Providing generous choices	
	Interactivity	Capturing learner’s interest	
	Engaging		
	Harmony		
Reality		Anchoring content to reality	

Business games are a significant percentage of serious games, but certainly not the only or the main ones. In fact, as pointed out by Greco *et al.* (2013): “Of more than 2300 serious games described in the “*Serious games classification*” database (<http://seriousgameclassification.com>), 7.2% belong to the “*enterprise market segment*”, while several BGs may also be found in the “*education*”, “*advertising*” and “*state and government*” sectors, which constitute more than 60% of the total”.

Digital learning games (DLGs) belong to the category of serious games and are a particular subset of gaming simulations implemented using software-based or web-based architectures that raise the degree of interaction by creating eye-catching simulated contexts. “*Digital Game Based Learning is precisely about fun and engagement, and the coming together of serious learning and interactive entertainment into a newly emerging and highly exciting medium - Digital learning Games*” (Prensky, 2001). So the digital learning games are serious games with the specific purpose of supporting the user in the achievement of skills and knowledge related to a specific discipline by increasing motivation and active participation in the learning process thanks to the incorporation of educational content into video games.

### 1.2.2 What is a business game?

Sauvé *et al.*, (2007) identified the essential attributes of games and simulations. According to them and to Elgood (1997), BGs can be considered both as digital learning games and as business simulations. Simulation is essentially a case study, but with the participants included (Jones, 1998), but it also means driving system model with suitable inputs and observing the corresponding outputs (Bratley *et al.*, 1987).

In order to properly categorize business games we can consider the words of Greenlaw (1964) in "Trends in Programmed Instruction" (a book published by Gabriel D. Ofiesh and Wesley C. Meierhenry and written for the first annual convention of the National Society for Education program): "A business simulation or game may be defined as a sequential decision-making exercise structured around a model of business operation, in which participants assume the role of managing the simulated operation."

So business games are all the simulations used to support managerial learning through an experience that involves competition and rules in the socio-economic environment.

Nevertheless Greco *et al.* (2013) argues that BGs could have up to two "serious" aims: teaching business topics and or evaluating players' performances. Consequently he concludes that "a business game is a serious game in a business environment that can lead to one or both of the following results: the training of players in business skills (hard and/or soft) or the evaluation of players' performances (quantitatively and/or qualitatively)".

The business games may differ in the number of players, products, markets and levers of intervention (decisions), in the specificity of the organizational framework used, which can be functional or cross-functional, in the number of functional areas to manage or in the role, active or passive, played in the simulation model and in the frequency of decisions.

One or more users, or teams of users, take part in the game assuming the role of managers of a virtual company and should manage different business areas, or in the case of a single functional model, their business area.

Starting from the data and information about the competitive environment described by the simulator and, if available, by the game manual, players, through collaboration with other team members, identify the

most effective strategy for solving problems related to the management of their company or functional area and make their game decisions.

It is essential for players to predict the moves of competitors and to interpret the parameters of the game such as external customer needs (the market) or internal customers (other departments) accurately. Depending on the consistency and validity of the approach and according to the decisions taken in relation to those of the competitors (simulated or managed by other players / teams), the simulator determines the success or failure of the various companies.

After the creation of virtual companies (represented by individuals or teams), the playing process of a business game includes the following fundamental steps:

- Analysis of market information (about the competitive environment and market);
- Taking game decisions within a predetermined time period;
- Display and analysis of results.

This process is cyclical: after analysing the results, the participants take decisions for the next period; the business game triggers a new round of decisions-results and so on until the end of the game.

### 1.2.3 Major educational and learning objectives of business games

The correct inclusion of a business game as a training tool can allow the achievement of a wide number of learning outcomes. A review of the 304 business simulation education and learning articles in the journal *Simulation & Gaming* carried out by Faria *et al.* (2009) shows that the five most discussed areas are:

- experience gained through business games;
- the strategy aspects of business games;
- the decision-making experience gained through business games;
- the learning outcomes provided by business games;
- the teamwork experience provided by business games.

Consequently authors deduced that the five major educational and learning objectives of business games are the following:

1. Learning outcomes and objectives;
2. Decision-making skills;
3. Teamwork;
4. Experience gained;
5. Strategy formulation.

In Figure 1-2 we can see an illustration of the five major educational and learning objectives in the last decades by order of rank (from 5 = the most important to 1 the least important). If we compare the 1970s articles to the 2000s ones, we can observe that the objectives of strategy formulation and experience gained have jumped from fifth and fourth places to second and first.

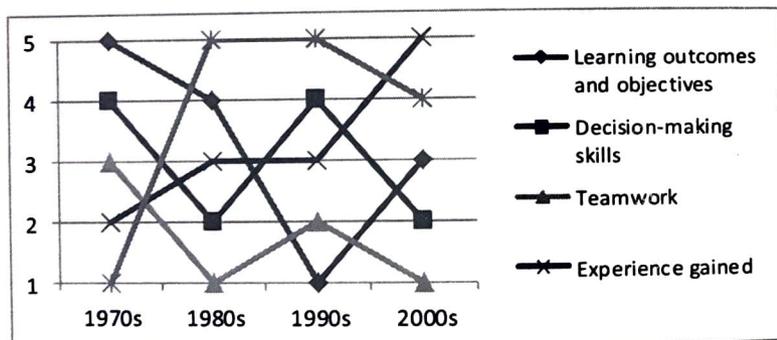


Figure 1-2: Rank order of the five major educational and learning objectives of business games in the last decades (source: Faria et al., 2009).

### 1.3 Brief history and evolution of business games

The origin of the business game can be traced back to the late eighteenth century when the first war games were invented and simulation games gained importance in the teaching of military strategy.

The figure of Marie Birshtein was central to the evolution of war games into business games and according to Wolfe (1993), she was the first to

conceive the idea of a business game in the late twenties and early thirties at the Leningrad Institute of Engineering and Economics. This researcher was able to develop some active methods to train commercial sector workers in preparation for entrepreneurial/managerial positions. The first business game simulated the assembly process at a typewriter factory and was used to train managers in how to handle production problems and during the period from 1932 to 1940, more than 40 similar exercises, simulating the production and distribution processes at a number of different types of businesses, were developed by Birshtein's team (Faria et al., 2009).

So the history of the business game began in the early '20s (Lewis and Maylor, 2006). Subsequently business games were used in business-school courses and the relevant work and manual processing of data was carried out by students in the classroom supervised by an instructor. As reported by Faria (2006): "business simulation games have now been in use for nearly fifty years since the first known use of a business game in a university class at the University of Washington in 1957" (p. 138).

Since the '50s business games have gained increasing importance in managerial education through learning by doing (Bruner, 1961). For instance, in 1955 the Rand Corporation released MONOPOLOGS, an organisational game in which players from the US Air Force had to perform as inventory managers in a simulation of the Air Force supply system (Greco et al., 2013).

This trend has also developed thanks to the passage from hand-scored games to computer-based games in the late 1950s. In 1956 the first BG supported by a computer was developed. The name of the BG used for management seminars was *Top Management Decision Simulation* and the project was sponsored by the AMA - American Management Association (Meier et al., 1969). Since this first automated business game many others have been developed thanks to the relentless development of information technologies that have allowed designers to better adapt them to the characteristics of real markets. The first to follow this trend was the *Business Management Game* developed by Greene and Andlinger for McKinsey & Company in 1957 while the first used in a university course in the same year was the *Top Management Decision Game* at the University of Washington (Faria et al., 2009).

Another milestone in the evolution of the business game came with the creation of the World Wide Web (WWW). In fact, thanks to the progress of information technology, business games had the opportunity to innovate, evolve and spread. Now the business game can be developed using web-based technology and client-server or peer to peer architectures. The vast potential of web-based platforms lies in the strong and immediate possibility of interaction between players and an excellent service provided to the user in terms of accessibility, in addition to the usual benefits that can be achieved by using a generic business game. Consequently, more interactions between business decision variables have been modelled, and with the asynchronous operations of business games more decisions can be undertaken during any simulation competition (Faria *et al.*, 2009).

Table 1-2: Phases in the development of Business Gaming.

Phases	Period	Developments
I	1955 to 1963	Creation and growth of hand-scored games
II	1962 to 1968	Creation of mainframe business games and growth of commercially published games
II	1966 to 1985	Period of fastest growth of mainframe games and significant growth in business game complexity
IV	1984 to 2000	Growth of PC-based games and development of decision making aides to accompany business games
V	1998 to present	Growth of business games available on the Internet and run through central servers
VI	2007 to present	Creation of massive multiplayer online business games
VII	2011 to present	App-based business games

Over the last few decades business games (BGs) have found major success in the United States where 97,5% of the AACSB (*Association to Advance Collegiate Schools of Business*) members used them in their bachelor and master degree courses, above all in the marketing and strategic management learning areas. As reported by Faria (2006) marketing simulation games were most typically used in marketing management, strategic marketing, and principles of marketing courses. Furthermore the same happened in the majority of MBA (*Master in Business Administration*) and in

many *post-graduate* courses. In 1998 business simulation games were in use in 1,733 degree awarding universities in the U.S. alone and by 11,836 university business professors at any point in time (Faria, 1998).

Wolfe (1993) and Faria *et al.* (2009) subdivided the evolution of business games respectively into four and five phases. We adapted the phases and added two more phases (Table 1-2).

## 1.4 Taxonomy of business games

Starting from the taxonomy of Maier and Größler (2000) and after studying 110 business games, Baldissin *et al.* (2007) propose 15 classification variables grouped into three dimensions (business simulation model, simulation technology and market & company business model) which can characterise a business game:

### 1<sup>st</sup> dimension: Business Simulation Model

1. Adaptability of the model
2. Behaviour of the model
3. Customization of the model in a new business environment
4. Generality of model in regard to domain
5. Role of the simulation model
6. Type of model's internal relationships
7. Transparency of simulation model

### 2<sup>nd</sup> dimension: Simulation Technology

8. Frequency of decisions
9. Proceeding of time in simulation engine
10. Web technology

### 3<sup>rd</sup> dimension: Market & Company Business Model

11. Business area
12. Management domain
13. Number of users/companies
14. Number of products
15. Number of markets

Table 1-3: Dimensions of the proposed taxonomy (Source: Baldissin et al. 2007).

	Classification variable	Characteristic	Nº	%
Business simulation model	Adaptability of the model	Absent	101	91,8 %
		Average	6	5,5 %
		High	3	2,7 %
	Behaviour of the model	Deterministic	59	53,6 %
		Deterministic / Stochastic	51	46,4 %
	Customization of the model in a new business environment	Present	3	2,7 %
		Absent	107	97,3 %
	Generality of model in regard to domain	Specific	47	42,7 %
		General	63	57,3 %
	Role of the simulation model	Active	23	20,9 %
Passive		87	79,1 %	
Type of model's internal relationships	Quantitative	96	87,3 %	
	Quantitative and Qualitative	14	12,7 %	
Transparency of simulation model	Black-Box	107	97,2 %	
	White (o Transparent) Box	3	2,8 %	
Simulation technology	Frequency of the decisions	Batch processing	102	92,7 %
		Real processing	7	6,4 %
		Only one time	1	0,9 %
Proceeding of time in simulation engine	Batch Processing	100	90,9 %	
	Real-time processing	10	9,1 %	
Web technology	Present	25	22,7 %	
	Absent	85	77,3 %	
Market & Company Business Model	Business area	Marketing and Sales	87	79,1 %
		Production	62	56,3 %
		Procurement	24	21,8 %
		Logistics	28	25,5 %
		Human Resources	34	30,9 %
		Research & Development	22	20,0 %
	Financial and Control		53	48,2 %
	Management domain	Total / Inter-functional	87	79,1 %
		Functional	23	20,9 %
	Number of users/companies	One	23	20,9 %
		More	87	79,1 %
	Number of products	One	18	16,4 %
		More	92	83,6 %
Number of markets	One	72	65,5 %	
	More	38	34,5 %	

In Table 1-3 we summarise the 15 classification variables grouped into three categories (business simulation model, simulation technology and market & company business model), the characteristics, the number and

the percentages of business games which have those characteristics analysed by the authors.

In order to evaluate the level of realism reached by business games in the last sixty years, Baldissin et al. (2007) selected six classification variables and identified three factors which indicate the *realism* of a BG by intersecting them two at a time:

1. *Market complexity*, considered as the number of products and the number of markets (one or more than one),
2. *Business model flexibility*, considered as the level of adaptability of the model (absent, average or high) and the possibility to customize the model for a new business environment (absent or present)
3. *Complexity of the business environment*, considered as the time proceeding in the simulation engine (real-time or batch processing) and the number of players (one or more than one).

Table 1-4: Market complexity.

Nº of markets	More	11	27
	One		7
		One	More
		Nº of Product	

Table 1-5: Business model flexibility.

Adaptability of the model	High	0	3
	Average	6	0
	Absent	101	0
		Absent	Present
		Customization of the model in a new business environment	

Table 1-6: Complexity of the business environment.

Proceeding of time in simulation engine	Real-time	10	3
	Batch Processing	13	84
		One	More
		Number of users/companies	

The majority of business games have serious limits, mainly in two of the three areas: model flexibility and complexity of the business environment; and these limits reduce their *realism*. As a matter of fact, most of the BGs (see Table 1-4) offer a simulation game in very complex (and consequently realistic) markets with a high number of products and/or high number of customers. Nevertheless with regard to flexibility of the business model, 91,8% of the BGs (see Table 1-5) have a rigid model constrained by fixed parameters, which reduces their adaptability to a real business environment. Finally we found that 99% of these software (Table 1-6) have a significant limitations in the level of business environment complexity due to real-time processing and high number of players. From a technological point of view, the longitudinal analysis of the 110 BGs indicated that the development in the software technology has recently led to the development of an increasing number of real-time processing (10%) or web technology based BGs (25%).

## 1.5 The evolution: Massive Multi-Player Online Role-Playing Business Games and App-based Business Games

---

Three business games, identified using the taxonomy described in section 1.4, allowed us to identify a technological trend and to hypothesise a potential evolution of the BGs. The analysis of the BGs suggested us that MMORPGs (*massively multi-player online role-playing game*) could be the right way to overcome the actual limits in the *realism* of the business games. A MMORPG, more simply a *virtual world*, is an internet-based game that can be accessed by a large number of players at the same time. Players choose a physical self, an avatar, and then spend their time going around in the game world, chatting with others, undertaking various tasks, purchasing, producing, and consuming goods, and generally leading a more or less full, rich, and detailed life there (Castronova, 2003).

The first business game is a web-based game called IndustryPlayer® characterised by the high complexity of its competitive environment. The second business game is named Perfectcompetition®. In these games we find a Virtual World where a high number of players meet and play in real-time obtaining a good level of realism in terms of the business environment.

For instance Perfectcompetition® has two economies, with a day step of 15 and 60 minutes, so the time hasn't a real flow, but is like a batch processing system. In IndustryPlayer® the step time is every 2 minutes, so more realistic but, unfortunately, the flexibility of its model is limited. These two games follow the major trend in the game industry overall, which is the push towards an increasing realism in the virtual game world (Moore *et al.*, 2007). This feature can be found in the so called 'MMORPGs' (*massive multi-player online role-playing game*). The third business game called Innov8 announced in 2007 and developed and released by IBM in 2008 is an interactive business simulator designed to teach the fundamentals of business process management with an advanced 3D user interface where "players go into a virtual business unit to test their hand at ventures such as redesigning a call center, opening a brokerage account, or processing an insurance claim" (McConnon, 2007). In this game the realism of the learning experience is induced by the sophisticated computer graphics and by the pragmatic business simulation model.

Moreover other three MMORPG immerse the players in an economic environment: Business Tycoon Online, Virtonomics and BossInGame. The Virtonomics is an economic internet game which reflects a wide range of interests: laws of real life economy, business and finance. There are a few fields of economy represented in the game which has more than 100 different products and constantly working on increasing these numbers. BossInGame is an online business game where participants manage a virtual company in a simulated environment and competing with other players.

The MMORPGs logic allowed the implementation of real-time BGs for the managerial e-learning, a *massive multiplayer online role-playing business game* (MMORPBG), with a high number of competitors; as the number of competitors increases, the markets would become 'more perfect' and sales levels would even out amongst competitors (no one would have a competitive advantage) (Wellington and Faria, 2006). Furthermore the application of MMORPGs' logic to BGs suggests to implement a game with a virtual environment, supported by a graphic interface, where a user must start as a simple employee and during time can enlarge its tasks and responsibilities becoming a manager, an employer, a CEO or a president of a company. So the player can *have experience* of the different aspects of a firm, both managerial and both entrepreneurial, starting from managing

the simpler tasks to the more complex and strategic ones. If at first sight the main differences from a traditional online business game and this new family concern the massive number of players and the real-time interaction between them, instead a deep analysis highlights that the fundamental aspect is that MMORPGs logic gives to a game the right *level of complexity* and, consequently, the *correct realism*. Besides other benefits can be found in the fostering of the so-called *active learner participation* and of in the *problem-based* and *cooperative* learning which cause a shift from an exploitative learning process to an *explorative* one.

The second technological trend is given by the growth of tablets and smartphone markets and consequently by the growth in the use of the so-called app. In December 2012 IDC predicts that 122.3 million tablets will be sold in 2012, rising to 172.4 million units in 2013 and 282.7 million units in 2016. Apple leads the pack. In 2012 iOS will control 53.8 percent of the tablet market, Android 42.7 percent and Windows 2.9 percent. By 2016, Windows will have made significant gains: iOS share will be 49.7 percent, Android 39.7 percent and Windows 10.3 percent. Moreover In Table 1-7 Comscore depicts the Smartphone market penetration in some of the most important markets.

Table 1-7: Smartphone market penetration (source: Comscore, 2012).

Smartphone market penetration (Q4 2011)							
USA	Canada	Japan	Germany	UK	France	Spain	Italy
41.8%	N/A	17%	37.0%	51.3%	40.0%	51.0%	43.9%

Consequently the business game developers are proposing innovative app-based business games principally inside iOS, Android and Windows markets (respectively iTunes, Google Play and Windows app store). The first examples of app-based business game are the TBG, Stock Market Simulator and Anvestor. The evolution of the app-based business games which are still in their infancy will allow the ubiquitous management education giving the possibility of their use in any place/time. Moreover the typical features of the apps (push notifications, GPS, video and sound, camera, augmented reality, ...) will engage the learners thanks to a more realistic and enhanced management experience.

## References

- Baldissin, N., De Toni, A.F. and Nonino, F. (2007), "Evolution of the management games: Towards the massive multiplayer online role playing game?", *Proceedings of the Learning with Games Conference*, Sophia Antipolis.
- Bratley, P., Fox, B. and Schrage, L. (1987). *A Guide to Simulation* (2nd Edition), New York: Springer-Verlag.
- Bruner, J.S. (1961), "The act of discovery", *Harvard Educational Review*, 31(1): 21–32.
- Caillois, R. (1967), *Les jeux et les hommes. Le masque et le vertige*, Paris: Librairie Gallimard.
- Caillois, R. (2001), *Man, Play and Games*, First Illinois paperback, The Free Press (1st edition in 1958, *Lex jeux et les homes*, Paris: Librairie Gallimard – 1st English translation in 1961, *Man, Play and Games*, New York: The Free Press of Glencoe).
- Castronova, E., (2003), "On Virtual Economies", *Game Studies*, 2(3). Retrived 15 June 2008 from <http://www.gamestudies.org/0302/castronova>.
- Corti, K. (2006) *Game-based Learning: a serious business application*, PIXELearning Limited, available at [http://www.pixelelearning.com/docs/games\\_basedlearning\\_pixelelearning.pdf](http://www.pixelelearning.com/docs/games_basedlearning_pixelelearning.pdf).
- Dickinson, J.R. and Faria, A.J. (1996), "A random-strategy criterion for validity of simulation game participation", in D. Saunders, F. Percival and M. Vartiainen (Eds.), *The simulation and gaming workbook. Games and Simulations to Enhance Quality Learning*, vol. 4. London: Kogan Page
- Ebner, M. and Holzinger, A. (2007), "Successful implementation of user-centered game-based learning in higher education: an example from civil engineering", *Computers & Education*, 49(3): 873–890.
- Egenfeldt-Nielsen, S. (2005), "Beyond Edutainment: Exploring the Educational Potential of Computer Games", *Doctoral dissertation*, IT-University of Copenhagen, Copenhagen, Denmark.
- Elgood, C. (1997), *Handbook of management games and simulations* (6th Edition), Gower Publishing Limited.
- Faria A.J. (1998), "Business Simulation Games: Current Usage Levels – An Update," *Simulation & Gaming*, 29(2): 295-308.
- Faria A.J. (2006), "History, current usage, and learning from marketing simulation games: a detailed literature review", *MMA Fall Educators' Conference*, 138-139.
- Faria, A.J. (1990), "Business simulation games after thirty years: current usage levels in the United States", in J.W. Gentry (Ed.), *Guide to business gaming and experiential learning*, pp. 36–47, London: Nichols/GP.
- Faria, A.J., Hutchinson, D., Wellington W.J. and Gold S. (2009), "Developments in Business Gaming : A Review of the Past 40 Years", *Simulation & Gaming*, 40(4): 464-487.

- Greco, M., Baldissin, N. and Nonino, F. (2013), "An Exploratory Taxonomy of Business Games", *Simulation & Gaming*, In Press.
- Greenlaw, P.S., Herron, L.W. and Rawdon, R.H. (1964), *Business Simulation in Industrial and University Education*, New York: Prentice-Hall.
- Groot, L. (2000), "Roger Caillois, Games of Chance and the Superstar", *Diogenes: An International Review of Philosophy and Humanistic Studies*, 48/2 (190): 33-42.
- Harteveld, C., Guimarães, R., Mayer, I. and Bidarra R., 2007, "Balancing Pedagogy, Game and Reality Components Within a Unique Serious Game for Training Levee Inspection", *Lecture Notes in Computer Science*, 4469: 128-139, Berlin, Heidelberg: Springer-Verlag
- Jones, K. (1998), "Simulations: Reading for action". *Simulation & Gaming*, 29: 326-327.
- Kallio, K.P., Mäyrä, F. and Kaipainen, K. (2011), "At Least Nine Ways to Play: Approaching Gamer Mentalities", *Games and Culture*, 6(4): 327-353.
- Khine, M.S. and Shalleh, M. (2008), "Core attributes of interactive computer games and adaptive use for edutainment", in Z. Pan et al. (Eds.), *Transactions on edutainment*, pp. 191-205, Berlin, Heidelberg: Springer-Verlag.
- Klopfer, E., Osterweil, S., Groff, J. and Haas, J. (2009), *The instructional power of digital games, social networking, simulations and how teachers can leverage them*, The Education Arcade, Boston: Massachusetts Institute of Technology
- Lewis, M.A. and Maylor, H.R. (2006), "Game playing and operations management education", *International Journal of Production Economics*, 105: 134-149.
- Maier, F.H. and Größler, A. (2000), "What Are We Talking About: A Taxonomy for Computer Simulations to Support Learning", *System Dynamics Review*, 16(2): 135-148.
- McConnon, A. (2007), "IBMs Management Games", *Business Week Online*, 18. Retrieved June 15, 2007 from [www.businessweek.com](http://www.businessweek.com).
- Meier, R.C., Newell, W.T. and Pazer, H.L. (1969), *Simulation in business and economics*. Englewood Cliffs, New Jersey: Prentice Hall.
- Moore, R., Ducheneaut, N. and Nickell, E. (2007), "Doing Virtually Nothing: Awareness and Accountability in Massively Multiplayer Online Worlds". *Computer Supported Cooperative Work*, 16: 265-305.
- Ofiesh, G.D. and Meierhenry W.C. (eds.) (1964), *Trends in Programmed Instruction: Papers from the First Annual Convention of the National Society for Programmed Instruction*, Department of Audiovisual instruction, National Education Association of the United States (from 2000 copyright of Information Age Publishing Inc.).
- Prensky, M. (2001), "The Digital Game-Based Learning Revolution" in *Digital Game-Based Learning*, McGraw-Hill.
- Rolfe, J.M. and Hampson, B.P. (2003), "Flight simulation – viability versus liability issues of accuracy, data and validation", *Aeronautical Journal*, 107(1076): 631-635.
- Sauvé, L., Renaud, L., Kaufman, D. and Marquis, J.S. (2007). Distinguishing between games and simulations: A systematic review. *Educational Technology & Society*, 10(3): 247-256.
- Watson, W.R., Mong, J. C. and Harris, C.A. (2011), "A case study of the in-class use of a video game for teaching high school history", *Computers & Education*, 56(2): 466-474.
- Wolfe, J. (1993), "A History of Business Teaching Games in English-Speaking and Post-Socialist Countries: The Origination and Diffusion of a Management Education and Development Technology", *Simulation & Gaming*, 24(4): 446-463.
- Yang, S.H., Yang, L. and He, C.H. (2001), "Improve safety of industrial processes using dynamic operator training simulators", *Process Safety and Environmental Protection*, 79(6): 329-338.
- Yee, N. (2006), "Motivations for play in online games", *Cyberpsychology & Behavior*, 9: 772-775.
- Zichermann, G. and Linder, J. (2013), *The Gamification Revolution: How Leaders Leverage Game Mechanics to Crush the Competition*, McGraw Hill.