

Creating the Economy of Virtuality: systemic aspects and educational considerations

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ABSTRACT

This article discuss how an economy of virtuality had been created in Orlando, United States, with the great collaboration of entrepreneurs, creativists and the action of academic institutions like University of Central Florida (UCF). In UCF the Florida Interactive Entertainment Academy – FIEA is an exemplary initiative of education that aims at creating new professionals for the economy of virtuality. Examining the case of Orlando city, would be seen the economic outcomes of the operation of different activities of virtuality: creation of jobs, revenues, tax and improving the quality of life of this community. The research debates the understanding of Economy of Virtuality and as also a educational field. The virtuality can be seen as a technology (a combination of developed hardware and software) and as a psychological experience (values, time/ availability, health, motivation, emotions and education). The article presents the story of virtuality and also a typical pathway in the creation of products in Economy of Virtuality taking the example of Spider-Man and the event Awesome.Con held in Washington D.C. in the period of 3 to 5 June 2016. At Central Florida Research Park (CFRP), there are 146 businesses in 59 buildings (March/2016) generating aproximally 10 thousand jobs operating.

Keywords: Virtuality, Technology, Virtual Reality and Education.

1. AN ECONOMY OF VIRTUALITY

Is Creating an Economy of Virtuality something intentional or non-intentional? According to the Innovation Public Policy, an Economy of Virtuality can be created intentionally.

It is possible to observe that an economy of virtuality was created in Orlando, United States, with the great collaboration of entrepreneurs, creativists as Walt Disney and the action of academic institutions like University of Central Florida (UCF). Entertainment theme parks such as Disney World and Epcot Center were created by Walter Elias "Walt" Disney (1901 - 1966) aiming at bringing fantasy and a great variety of imaginative experiences and entertainment for millions of people.

Examining the case of Orlando city, would be seen the economic outcomes of the operation of different activities of virtuality: creation of jobs, revenues, tax and improving the quality of life of this community.

Concerning the development of this article, some statements and questions are important to be taken into account: 1) What is the understanding of Economy of Virtuality? 2) Why is Virtuality a field of interest for the educational area? 3) Why can Orlando be considered a good example in the creation of an Economy of Virtuality? 4) What findings would be summarized in order to guide the creation of sources for the Economy of Virtuality in other territories? First of all, the

Economy of Virtuality in the field of Innovation Policy discussions can be considered an economic sector or an economic cluster based on entertainment and fantasy.

It is discussed in this article what actions were developed in Orlando City in order to create the referred economy of virtuality and how other countries and Local Innovation Systems would be learning about it and what the role of the education to create the New Economy is.

2. INTRODUCTION OF VIRTUAL REALITY AND THE IMPORTANCE OF THE EDUCATION

Virtuality is a dynamic process that happens between the dialogue of two worlds: the object of virtuality (books, television, videogames, virtual reality, movies and others) and the human being's personal world. According to these conceptions, it is possible to affirm that virtuality is a topic that demands a lot of attention from our time.

The educational field is the natural space to think about virtuality because academic institutions would be considering it in the process to participate in the creation of a new economy and in the collaboration and formation of new professionals and thinkers.

What are the main topics that education needs to focus on and that are crucial to understand virtuality? We want to talk about two dimensions:

- the human experience;
- the technology of virtuality.

The previous topics are fundamental to be considered by an education for virtuality.

3. UNDERSTANDINGS OF VIRTUALITY

Introducing the two understandings about Virtuality as a technology and as a psychological experience:

The technology of virtuality – is a combination of developed hardware and software in order that the experience of virtuality might be provided. Some technologies of virtuality are: games, Virtual Reality (VR), Augmented Reality (AR), Mixed reality (MR) apps or just apps. Microsoft proposes in the following Table a comparison.

	Augmented Reality	Mixed Reality	Virtual Reality
Augments the real world with helpful information	✓	✓ How it's done	
Blends holograms with your real world		✓ How it's done	
Can transport you to a virtual world		✓ How it's done	✓
Replaces the real world			✓

Tab. 1: Comparison of Augmented Reality, Mixed Reality and Virtual Reality

Source: Microsoft (2016).

By looking closely at Table 1, it is possible to see the different applications of each technology (VR, AR e MR). Microsoft has invested many financial resources in the creation of some support technology in order to solve issues related to Virtual Reality (VR) and Augmented Reality (AR). One of these technologies is the HoloLens that can be seen in the next picture.



Figure 1: HoloLens
Source: Microsoft (2016).

According to Microsoft (2016), HoloLens embraces Virtual Reality (VR) and augmented reality (AR) to create a new reality — mixed reality (MR). The first immerses you into a simulated world. The second overlays digital information on top of your real world. By understanding your environment, the last one enables holograms to look and sound like they are part of the personal world of someone. The example of the application usage of the HoloLens can be seen in the next picture.



Figure 2: Application of the HoloLens
Source: Microsoft (2016b).

Virtuality as a psychological experience is the experience had when human beings refocus their attention from real world to an imaginary world. The experience of virtuality follows the evolution of man. Since we read the History of Mankind, we are trying and using the experience of changing the consciousness, deriving the attention from the real world to imaginary psychological world. The personal conditions to experience virtuality are:

- Values/ Ethics;
- Time/ Availability;
- Health (sleep, relaxation, mood/cheer);
- Motivation;
- Emotions;
- Education.

The experience of virtuality is the expression of human thinking. For many times, this personal experience has led us to happiness or sadness thoughts related to past experiences.

People may dedicate time to these situations that become so vivid in the present causing behavior change.

The individual remembers the happiest moments and virtualize themselves in a meeting with friends, for instance. In other circumstances, we virtualize ourselves to imagine a solution for a problem. An engineer or an architect uses his imagination to solve a technical problem.

We virtualize ourselves when we study or read a book, thinking of the circumstances beyond what the text presents. We also virtualize ourselves when we watch a soccer game or consuming images or contents of others sports. By presenting these situations, we could affirm that the human being is essentially virtual.

4. THE STORY OF VIRTUALITY

The experience of virtuality follows man evolution. Since we have rescued the History of Mankind we are producing cultural and technological artifacts and also consuming the results as a psychological experience. We are constantly using the experience of changing the consciousness, deriving the attention from the real world to an imaginary psychological one.

If we return in time to Lascaux Caves in southwestern France it is possible to see paintings dated from Paleolithic Time (2,6 million years ago, to the end of the Pleistocene around 10,000 BP).



Figure 3: Inside Lascaux, 1947
Source: Life (2016).

If we make an effort into our imagination, we might be able to describe a scene of paintings that had been appreciated during the time when they were done as well as the current time when we could see these images on the internet or on a visit to France. We can imagine our thoughts (in our psychological virtual world) the scene of animals and human beings in early times.

The human psychological experience is regulated between attention and imagination.

The Lascaux paintings are entertainment, at least, and for anthropologists can be a source of research, a theme for educators interested in telling children and adults the history of art. In all perspectives when we are in contact with the art, we are having a kind of the virtuality experience, sometimes more immersive, sometime less. Since then, The art has been used as an immersive tool for our mind.

Giving a great leap in History we find literature an important resource for virtual technology. *The more we consume literature, the more virtual we are.*

Literature is the basis for what we understand as virtuality. The following Figure shows a visual timeline for the history of events and authors in Literature.



Figure 4: Infographic A great visual timeline chronicling the major literary events, movements, and authors
Source: Educational Technology and Mobile Learning (2016).

Why do we become interested in a movie when it is released on TV? The audience: 1) want to see the plot of the story; 2) we are trying to see what the story has to do with our lives; 3) we want to learn something; 4) we want to identify something helpful to define our own strategies to our lives.

Stories and literature define our humanity. We can see the importance of schools and universities to share knowledge related to literature and create readers that will consume fantasy and sometimes will be interested in becoming professionals as writers, or members of a movie cast, games developers, artists, technologists and others.

5. A TYPICAL PATHWAY IN THE CREATION OF PRODUCTS IN ECONOMY OF VIRTUALITY

Many things, which can be observed as a success on the cinema and on TV, are related to a well-developed story. This happens with The Spetacular Spider-Man that was released as a series of comic books designed by Marvel Comics.



Figure 5: The Spetacular Spider-Man (July, 1968)
Source: Wikia (2016).

Starting as a magazine series The Spetacular Spider-Man also generated a TV Series (ran on ABC from 1967 to 1970) and the movie Spider-Man in 2002, directed by Sam Raimi. Sony Pictures Entertainment released the movie worldwide always with great audiences. Then, the video game "Spider-Man" was developed by Neversoft and launched by Activision for PlayStation consoles in 2000. New versions of the game were updated for PlayStation generations 2, 3 and 4.



Figure 6: The Amazing Spider-Man 2
Source: GameStop (2016).

Spider-Man was also transformed into the one of the main attraction named The Amazing Adventures of Spider-Man at

Island of Adventure of Universal Orlando Resort, an amusement park, as can be seen in the next figure.



Figure 7: Amazing Adventures of Spiderman
Source: DisneyEveyDay.Com (2016).

An example of virtual experience is the App games for smartphones. These games can be downloaded virtually from gadgets and then consumed in the most unexpected places, whether a train or in the toilet.

Another example that shows related pathway to be followed is the “Game of Thrones”. The famous American drama television series created by David Benioff and D. B. Weiss, it is an adaptation of “A Song of Ice and Fire”, George R. R. Martin's series of fantasy novels. The following book of George R. R. Martin is easily available for purchase on Amazon.com or at Barnes and Noble bookstore, among others.

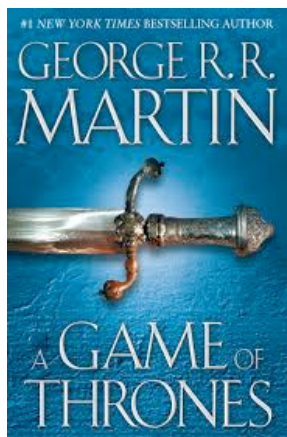


Figure 8: A Game of Thrones (A Song of Ice and Fire #1)
Source: Globe Reader (2016).

Many literary works followed a route from the books to the TV or cinema, being adapted for video games and now expanded to Virtual Reality. All these categories: literature, film, video games, can be understood as expressions of virtuality.

Perhaps one of the most successful creations is Star Wars in which the audience beyond the virtual consumption of the product in the film ends up buying several physical objects as an effort to bring the virtual to the real, making it even more present.

A heating thermometer of the Virtuality of Economy is the Awesome.Con, event held in Washington D.C. in the period of 3 to 5 June 2016. Some photos following.



Figure 9: Event Awesome.Con - Washington D.C. - 3 to 5 June 2016

Another photo in the event Awesome.con, showing panelists discussing different aspects related to comics can be seen below.



Figure 10: Debates in Awesome.Con - Washington D.C. - 3 to 5 June 2016

Next photo registers the great audience that attended the event in Washington D. C..

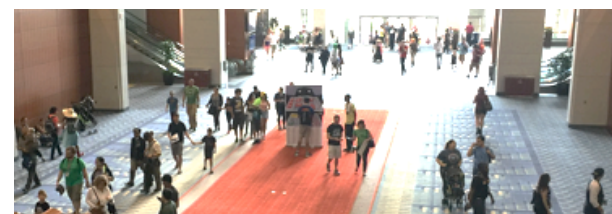


Figure 11: Washington D.C. Convention Center

In the event, Awesome.com, some participants go dressed up with fantasies, as we can see in the next Picture.



Figure 12: Event Awesome.Con - Washington D.C. - 3 to 5 June 2016

The event Awesome.con presented writers, game developers, comic fans, publishers, the more important industries of electronic games and companies that have developed and sold merchandise related to the characters in comics and games.

6. WHY VIRTUALITY IS AN INTEREST OF EDUCATIONAL FIELD

Fundamentally, the competences of acting virtuality were created through education: professors, courses, universities, educational methodologies and approaches. It is possible to see that the jobs in the Economy of Virtuality are well-qualified and well-paid.

The professionals demand from the universities the knowledge of STEM: Science, Technology, Engineering and Mathematics to developed new professional competences. The courses need to be designed to develop new skills and expertise. We cannot forget the knowledge related to arts and humanities. Many universities have the focus on arts such as another topic.

In New York, The New School presented an important role in the arts, design, media and film technology. It also presented courses in the areas of literature, management, leadership and entrepreneurship. Below, it is be possible to see one of the displays shown at The New School.



Figure 13: The New School

Seen the example of New York, The New School would be possible to say that virtuality is a balance between technology and humanities. In the following topic it is discussed the case of Orlando city as a Local Innovation System.

7. ORLANDO AS A GOOD EXAMPLE IN THE CREATION OF A ECONOMY OF VIRTUALITY

The Florida Interactive Entertainment Academy – FIEA is an exemplary initiative of education that aims at creating new professionals for the economy of virtuality. FIEA is a campus of University of Central Florida (UCF) in Orlando Downtown.



Figure 14: Florida Interactive Entertainment Academy – FIEA

Florida Interactive Entertainment Academy – FIEA is the unique building of the university that stays open 24 hours/day considering different times used by creative people to develop new ideas and concepts to new games.

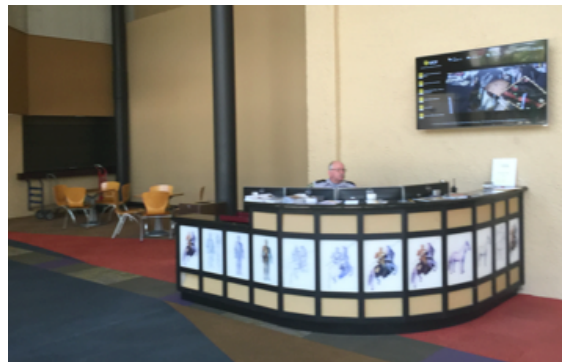


Figure 15: FIEA

The courses at FIEA are based on production, programming and art. In production, the course covers the main skills that a producer needs, including game design, level design, technical design and project management (FIEA: 2016).

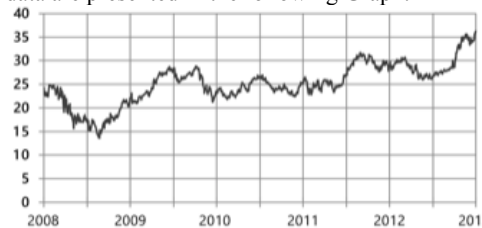
The course of programming presents knowledge related to writing lots of codes. Develop strong C++ skills and learn how to debug, code in optimal game design patterns, and create cross-platform code that works on any game system. (FIEA: 2016).

During the course of arts, the student tells a story with their art and perform. characters. Through a solid foundation in 2d design, 3d modeling, animation and game production, you'll become a versatile artist that can make ideas come to life (FIEA: 2016).

Florida Interactive Entertainment Academy provides opportunities to alumni accelerate startup ideas and entities within the Center For Emerging Media. Co-located in FIEA allows entrepreneurs works in an energetic atmosphere with state-of-the-art facilities and equipment.

8. ECONOMIC CONSIDERATION

Computer Video games have gained much popularity in the late 80's into the early 89's and this momentum does not seem to be slowing anytime soon. Added to this, so are the many spin-offs as regards, gaming consoles, platforms and artifacts to go with each game. Some games have become so popular that they have 'grown' tribes and following that are many people spending their every waking hour to prove themselves the top guru of the latest and the best (ESMERALDAINN: 2016). Some data are presented in the following Graph.



Graph 1: Video Game Tester Jobs and Gaming Industry Evolution

Source: Esmeraldainn.com (2016).

By watching the data of the previous graph it would be possible to perceive a permanent increase of the number of generated jobs to game professionals. National, State Government and Local Innovation Systems had a great attention to increase this New Economy and preparing to have the economic system be more competitive.

9. THE ECONOMY OF VIRTUALITY AS A SYSTEM

What are the systemic implications related to creation of an economy of virtuality? It is possible to perceive a lot of systemic implications related with creation of an Economy of Virtuality. The economy of Virtuality is created with support of different agents.

In Orlando it is possible to see the existence of different actors that contributes to creation of the economy of virtuality. One of these actors is the Central Florida Research Park (CFRP).

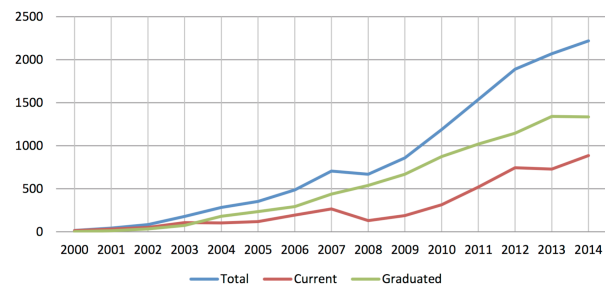


Figure 16: Office of Central Florida Research Park (CFRP)

At Central Florida Research Park (CFRP), there are 146 businesses in 59 buildings (March/2016) generating approximately 10 thousand jobs operating. Some companies are related to what is been called Economy of Virtuality:

- AVT Simulation - is an industry leader in simulation training and simulation systems;
- Quantum 3D - Develops high quality computers that generate graphics. Provides software, products and services in the areas of real-time 3D visualization, 3D geometric;
- GameSim - provides Products and Services for Entertainment, Modeling & Simulation, and Geospatial Industries;
- Bohemia Interactive - is an independent game development studio, known for the Arma series, DayZ, Take On Mars, Ylands, and more.

Some of these companies would also receive support from Business Incubation Program of the University of Central Florida (UCF BIP). The following graphic shows the generated jobs by the companies and clients from the businesses incubator in UCF.



Graph 2: Generated jobs by the companies clients from the businesses incubator UCF
Source: UCF BIP (2016).

The Business Incubation Program of University of Central Florida (UCF) graduated 121 companies. UCF Business Incubation Program (UCF BIP) started in 1999, and help more than 250 companies in early stage. The initiative contributes in more than US\$ 1,5 billions in local economy.

University of Central Florida (UCF) is operating in some cities in the central Florida region. The UCF Business Incubation Program (UCF BIP):

- Apopka,
- Daytona Beach International Airport,
- Headquarters,
- Kissimmee,
- Orlando,
- Photonics UCF Campus,
- Winter Springs.

UCF Business Incubation Program (UCF BIP) in your location in the Central Florida Research Park (CFRP) can be seen in the next picture.



Figure 17: Business Incubator of UCF in Central Florida Research Florida.

UCF Business Incubation Program (UCF BIP) and Central Florida Research Park (CFRP) are considered important initiatives to encourage the creation of new businesses in the area of what is been called as the Economy of Virtuality.

10. FINAL CONSIDERATIONS: A SYSTEMIC PERSPECTIVE

In a systemic perspective the entertainment technological economic sector, it has been updated in terms of new technologies in hardware and software that supports the power of provide virtual experiences. This perspective brings movement to industries and providers for services, products and technologies based in different countries and continents. Would it be possible to conceive a quadripolar systemic frame of mutual implications between Education and Virtuality as the consideration given?

- Education of Virtuality: The Universities role (Technology and Humanities).
- Education in Virtuality: How the Virtuality would be educative.
- Virtuality of Education: How is been encouraged the Imagination.
- Virtuality in Education: Distance Learning.

Considering the mutual implications between Education and Virtuality would possible affirm the importance of the education focused on aspects related with philosophic and technical aspects of virtuality which is the main tool of our

time as the strongest plague presenting positive and negative applications. So, it is necessary to be educated! Observing all the discussion presented in this article it is possible perceived that all examples are almost all based in American companies. Other countries as Brazil must reflect and think about if it is necessary to develop new competences, to participate in the Economy of Virtuality and see opportunities in this scenario. This article presents its relevance when presents some guidelines related to the Economy of Virtuality.

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