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## Conference Paper

# Second Life Environment a planning and project platform in Regional Development

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# SECOND LIFE ENVIRONMENT, A PLANNING AND PROJECT PLATFORM IN REGIONAL DEVELOPMENT

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# SECOND LIFE ENVIRONMENT, A PLANNING AND PROJECT PLATFORM IN REGIONAL DEVELOPMENT

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## ABSTRACT

Second Life (SL) is a virtual “world” accessible via the Internet which enables its users, called Residents, to interact with each other through virtual characters, called “avatars”. The residents can explore the SL hypothetical world, and participate in individual and group activities. Most importantly, the SL residents can create trade and develop virtual property and its related services in a theoretical and experimental way. Thus, the SL concept is a three dimensional modeling tool which can be used to model and assess regional developmental solutions.

The SL concept allows a wide range of actors such as individuals, organizations and institutions to analyze projected solutions for their development ideas, schemes and solutions.

Organizations and institutions, being private or public organs, which are concerned with developing their regions can benefit from the capacities embedded in the SL and similar virtual reality tools.

In this paper, we discuss the possibilities and limitations to use SL to develop and test ideas of regional development, without taking the costs and time of real world development and application. We compare the traditional planning with the use of the virtual reality tools looking at various aspects such as time to use, flexibility, future projection, usage in planning stage, usage in execution stage, usage after execution stage, organization, environmental impact and anonymity.

## Keywords

Second life, regional development, virtual, physical, planning, applications

## INTRODUCTION

Informational Technology (IT) has had a large impact on the global society and IT has become the major facilitator of business activities in the world today (Turban et al. 1999), (Tapscott et al 1993) & (Gill 1996). IT is also catalyst of fundamental changes in the structure, operations, and management operations due to enhanced capacities (Turban et al. 1999) & (Dertouzos, 1997). Some of the areas where organizations have gained capabilities is: performing high-speed, high-volume calculations; providing fast, accurate, and inexpensive communication between organizations; storage of easy accessible amount of information and increasing efficiency of the working force (Turban et al. 1999). The capabilities support the following five business objectives: improving productivity, reducing costs, improving decision making, enhancing customer relationships and developing new strategic application (Wreden 1997).

The creation of the Second Life platform is attributed to the advances in information and communication technologies (ICT), in combination with development of more powerful personal computers.

When it comes to interacting with other people through IT platforms and solutions, it is commonly known that a physical meeting gives a better nuanced communication and is lacking through general IT solutions. This is where virtual reality comes in as a possible improvement that could serve as a stronger facilitator to a more effective environment for interaction. The technological development of virtual reality (VR) platforms are expanding and today it is much driven by its users in virtual worlds like "*Second Life*" (SL) or massively multiplayer online role-playing games (MMORPG) like "*World of Warcraft*" (WOW). These "virtual worlds" have evolved with millions of subscribers and the MMORPG "*EVE Online*" can hold 50 000 players interacting on one server at a time. Educators over the world has started using games like WOW as a platform for case studies in higher education, where students gets their character in the game and then interact with other students characters to reach a certain learning goal. The platform SL is even further used within higher education where some universities even have their own regions present in the virtual world itself, with lab environment, libraries, information, and presentation and even conference rooms. Some research conferences have also taken initiatives to establishing meeting platforms with key-note presentations and roundtable discussions fully based on a virtual platform where all researchers can interact with each other without spending time and resources on traveling and living expenses.

Since there are platforms that are openly available for free to use by anyone through readers downloadable from the internet for free, anyone with an internet connection and a fairly modern computer can access and use these virtual technologies. Together with the availability of knowledge and information available through IT and the internet, this gives an exciting opportunity for individuals to establish collaborations, projects and even business with other individuals over the whole world on a shared meeting place.

The mechanisms behind all of this are the invention of the internet and its commercial start from the early 1990s (Abouzeedan 2006).

Dana et al (2002) introduced the new terminology "*Internetisation*" in the emerging IT based economy as the synonym to the word "*Internationalisation*" in the traditional economy. According to the previously mentioned researchers, the term "*Internetisation*" refers to the process of adoption and diffusion of e-business systems and Internet technologies by innovative

entrepreneurs. Referring to the same source, "*Internetisation*" shares some core notions with "*internationalisation*" in accordance with the Uppsala model. The three researchers stated that the stages of "*Internetisation*" are six ones: non-adoption, trial Internet use, reactive Internet trading, active exploration of Internet, integration of operations with the Internet and finally Internet portal development.

The first section of this article is a general introduction followed by a second section that goes through established definitions of IT. The third section defines virtual reality as a concept and then in the fourth section we will discuss regional development. Then in the fifth section we will look at how virtual reality can be a useful environment for regional development, followed by some suggestions on policy implications in the sixth section.

## **IT - PROVIDER OF NEW OPPORTUNITIES**

IT is the technology we use to manipulate information and it is not the information itself. This technology comprises both hardware and the software. The hardware is the physical boxes, wires, keyboards and screens. Everything we see when a computer is turned off is hardware and when the computer is turned on, it follows a series of instructions, which are called "*programs*". The collection of programs, working together to perform a common task like stock control or word-processing is called "*software*" (Hickey 2000).

The Carriage of Goods by Sea Act 1992 provides recent British definition of Information Technology (IT), from the legal view of point. According to that definition, information technology includes any computer or other technology by means of which information or other matter may be recorded or communicated without being reduced to documentary form (Hickey 2000).

Interest and research in global information technology (IT) are relatively recent. Nevertheless, the definition of global IT has evolved and expanded (Palvia et al 2002). Identified three components of global (IT) are identified, information systems and technology that are global in scope, information systems and technology in different cultures and countries, and IT products and services that are built in one country and used in another (Palvia 1998).

### **Management and strategic planning aspects**

IT is the bedrock of the Internet. IT enables information of varying types, such as sound, voices and raw data to be passed over long distances in the twinkling of an eye. There can be no doubt that IT has revolutionized the work place (Hickey 2000). The rapid revolution of SOHO (Small Office Home Office), as a result of the development of mobile computing, has transformed the people work.

The potential benefits that an organization can obtain when it utilizes Information Technology are extensive and includes efficiency gains (e.g. the automation of clerical procedures), increased management effectiveness (e.g. in decision making) and improved business performance (e.g. by entering into strategic alliances with other firms). Technological developments present potential adapters with means to solve problems and create opportunities. The falling costs of computer hardware, software and telecommunications and associated performance improvements have enabled organizations to re-examine the way they conduct business and come up with more

cost-effective practices. An evaluation should, therefore, be made of Information Technology available to the firm by considering their features, benefits and cost (Fink and Kazakoff 1997).

As pointed out by Fink and Kazakoff in the small business domain, IT systems would prove invaluable in tracking customer orders, correspondence, delivery and payments. Al Morgan (1994) expressed his view of point that Information Technology has changed organizations and made them flatter, smaller and faster. According to him, bureaucracy is giving away to entrepreneurialism.

In the Internet market, small business has access to a customer base numbering in millions as well as global population of suppliers. Thus a small business has a greater opportunity to search for products and services that offer them the best value. When a home page is accessed, it is impossible to tell if the firm behind the page is a lone entrepreneur or a large corporation (Sterrett and Shah 1998).

Moore (1993) analyzed the purchase of IT system by different organizations. He found that the majority buys systems to help the organization work faster and smarter. One-fourth put systems in place to meet information needs. Although 93 percent listing accounting and finance as a top function, less than a fifth say bookkeeping was the main purchase objective. According to Moore, owners see information technology as most helpful in meeting hard-line business objectives to improve customer response, understand cash flow, control costs, increase profits and manage resources.

As an example, instant fax and computer communications across borders, second-day package express, cellular phones, and local wireless loop systems have considerable impact on the efficiency of business operations. He pointed out correctly that in today's global economy, even the larger high-technology companies are finding that technical leadership, by itself, is not enough to meet global competition. Most important factor is the ability to deliver a quality product, on time, at a competitive price, anywhere in the world. Today's trend toward quality assurance in manufacturing has evolved from producing 'zero defects' products to achieving total customer satisfaction (Bonk 1996).

The nature of online firms' interaction with customers is also transforming from traditional communication channels such as telephone and mail to electronic mail and web-based forms, from full-service to self-service, and from mass marketing to personalized marketing (Bhattacharjee 2001).

Globalization and information technologies (IT) are radically changing the face of business and organization. IT were being adopted and incorporated into nearly all organizations, which have invested heavily in IT infrastructure for the overall success of their business (Ngai and Wat 2002).

Internet has dramatically reduced the costs of "point to multipoint" communication, making it easier for brokers and other information providers to supply information to their customers. In addition, the relatively low cost of opening a website has made it easier and less costly for those in possession of information to make that information accessible in one well-known (electronic) location. For example, firms, distributing financial information need only have one electronic copy of any document or report on their website that can be downloaded by millions of people

instead of having to publish millions of card copies of such document for distribution by conventional mail (Globerman *et al* 2001).

One area where IT has shown a clear impact is in organizational structure. The advent of the Internet has brought about a new form of business organization, called here *Virtual Instant Global Entrepreneurship* (VIGE). It builds on the existence of particular structures and structured processes on the Internet, that when utilized result in the creation of a firm in the *virtual* world. The resulting firm is global from its inception, offering sales worldwide, with structures or structured processes often facilitating global financial exchanges (e.g. currency movements and conversions) (Katz 2002).

The profound change occurring at the micro-economic level is the demise of the company as the primary unit of competition. Referring to the two researchers, management has long viewed the company as a “black box,” a self-contained unit with clearly defined parameters, within which the various management functions take place. Emphasis has been on *internalizing* value-added functions, to bring them more fully within the control of firm’s management, and on building walls around the firm to help secure the retention of its internal proprietary advantages from competitors. In the new paradigm, however, small and large firms alike are often incapable of acquiring and retaining the control of the full range of value-added function on their own. According to the two researchers, increasingly firms forming collaborative alliances with other firms—even with potential or actual competitors in the same industry (Dana and Wright 2002).

Partnering with other firms through various forms of collaborative arrangements is becoming imperative for SMEs in their internationalization effort. The first reason is the fact that these firms often lack the resources for gradual stages progression into the international arena over time. The second is the need to achieve world-scale efficiencies even if they are not entering world markets, to withstand competition from abroad (Dana and Wright, 2002).

Small firms are benefiting from increasingly mutual interaction due to the possibilities opened by the advances in the IT. These benefits are documents in works including: Bartel (2000), Chetty and Blackenburg-Holm (2000). Coviello and Munro (1995; 1997), Holmlund and Kock (1998), Perrow (1992), Sadler and Chetty (2000), and Welsh *et al* (2000).

The benefits provided by IT can be extended into new areas such as planning and scenario building. Contemporary researchers are foreseeing a transformation of the classical scale economy to a new type of economy due to the impact of the IT. The concept of the “*dispersal*” economy has been introduced as the opposite type of economy to the classical “*scale*” or “*agglomeration*” economy (Polenske 2002; 2001). Her view is that the IT impact has marginalized the restriction that the physical distance has imposed on the firm’s capacity to operate on a larger geographical area. Abouzeedan & Leijon (2004) proposed a new terminology, e-globalisation, to describe the nature of the new economy.

## Educational aspects

One of the new areas where IT is creating new concepts is in the educational forefront with electronic learning. Electronic learning or e-learning is a term that has been adopted by most universities to define courses and programs that are on-line and not on-campus based. This type of education where the students seldom meet face-to-face has sprung from the development of informational technologies, especially since the 1990s with utilization of innovations such as

multimedia computers, internet and the World Wide Web with all its different applications and today's social media.

E-learning and online education has been around for some time now and e-learning and use of communication and information technologies has attracted increasing interest as a way to overcome many of the barriers of "traditional" campus based education. Such barriers include e.g. unavailability of local courses, work-education personal time schedule conflicts, lack of access, non-effective presentation, geographical isolation and demographic as well as economic disadvantage (Huntley and Mather, 1999).

There has also sprung fourth a number of fully Internet-based universities. Some of these new forms of educational institutions have been started as extended projects to existing offline universities while others have been created from the beginning as fully online institutes. Among the last group are *Columbia University*, *Wharton School*, *Temple University* and *University of Phoenix*. The online educational influences meet different ends and some online degree programs, such as the ones offered by Columbia University, have been closed. The online partner of the Wharton School, Caliber filed for bankruptcy (see Smith and Mitry, 2008). Many major schools, such as Temple University (Virtual Temple, Nyvoline) and New York University discontinued their programs (Kyle and Festervand, 2005).

Online programs profitability was investigated by Copenhagen Business School (see Pettersson and Heedes, 2000) and Smith and Mitry (2008) who examined the economics of opportunity costs, economies of scale, quality considerations and managerial costs, to try to understand the behavior and quality of competing institutions of online programs. A good example of a successful online educational project is the *Apollo Group* programs that own several for-profit-schools, including the University of Phoenix which is the largest university in America with 300,000 students. This university is also expanding globally in Mexico, Canada, Puerto Rico, China and India (Survey of Higher Education, 2005). A clear advantage of e-learning based education is the possibility to reach out to a broad global group of students.

## Business aspects and electronic commerce

A major application area of IT is the electronic commerce or e-trade. Quoting Alan B. Albarran, in (Albarran and Goff, 2000), pp. 73 "The buying and selling of goods and services via the Internet has escalated into a thriving economic force known as electronic commerce (e-commerce). Initially known as Internet commerce, e-commerce is a phenomenon that is revolutionizing business practices and reshaping traditional means of conducting business. Business and customers use electronic commerce to overcome traditional time and space boundaries in ways not offered by other channels."

There is no statutory definition of the Internet, and no specific British legislation governing its operation with the UK (as of year 2000) (Hickey, 2000). The US has however defined the Internet for the purposes of the Internet Tax Freedom Act. Under s155(6) the Act defined the term 'Internet' as meaning: "The combination of computer facilities and electromagnetic transmission media, and related equipment and software comprising the interconnected worldwide network of computer networks that employ the Transmission Control Protocol/Internet Protocol, or any predecessor or successor protocol, transmit information" (Hickey, 2000, pp. 9).



We will now discuss electronic commerce (EC) systems as an example of a well defined application of IT from which today's virtual worlds have been build from. There are two general issues that emerge in defining EC: the business-to-customer relationship and the business-to-business connection. Much of the popular view of EC, and most of the new articles, focuses on the business-to-customer relationship. This refers to selling or promoting goods and services to individuals, taking orders and even payments, usually over the Internet. Whereas this is a new and not yet fully explored area of EC, most organizations are more concerned about the business-to-business implications of EC (Keen *et al* 2000).

One view that aids in describing the effects of business-to-business EC, suggests that it can exist in three broad states, person to person, person to computer and computer to computer.

Person to person covers activities in the spectrum of e-mail and fax which still leaves the interpretation, deciphering and correction up to the human at either end so that the intent of the message is ensured and an appropriate action is taken. This is done even though the system itself use substantial amounts of technology to receive and deliver their messages and information. This allows for a massive amount of interference and interpretation to exist, but still a successful action or understanding may occur. Increasingly, the Internet has integrated proprietary e-mail systems with external access facilities, so that e-mail-based commerce is one of the fastest growing components in the EC matrix (Ibid).

When it comes to person to computer, everything from the Automated Teller Machine (ATM), an electronic order entry or interacting with an Internet Web page involves the use of templates or preformatted computer-based activity. The result of this application of technology tools is that a computer program corrects entry errors before the information can be submitted, enforcing message entry structure or process for the transaction to continue. This has typically been provided or operated under the auspices of a proprietary device, software program, or network environment, where the control points are provided to the data entry process in the system itself, not by the originator of the data. In the Internet world, this means that the order screen you are provided is totally constructed and controlled by the merchant, not by the customer, and formatting issues are resolved by the human who is imputing data before the data is sent (Ibid).

In the case of tight relationship between a corporation and its trading partners, and where there are few companies in the relationship, then a nonstandard form of electronic data exchange (EDI) has existed and has proven very effective. But with corporations globalizing and centralizing operations at the same time, there has been an increased demand for trading partners to meet recognized EDI standards of both the message structure and the communications process. This is where the computer to computer state comes in and it is growing with fewer and fewer companies that wish to rely on the services of one supplier for their global needs, meaning that the diversity of trading relationships is increasing, and the need for standardized trading has increased accordingly. There are four technical elements to any business-to business EC system, namely: communications, data storage and retrieval, message conversation and application interface (Ibid).

Communications refer to the use of telecommunications or other methods to transfer electronic data. A key element in the EDI component of EC is the mandatory use of a positive or negative acknowledgment of the receipt of the transaction in an automated fashion. One of the main components of any EC application is also the setup and use of data storage and retrieval or a

mailbox. There is a slight difference in the setup and operation of an EDI mailbox from a typical e-mail box or even a voice-mail system, because an EDI mailbox contains a great deal more control and intelligence than other electronic storage systems. EDI is accomplished through the use of a common, standardized format, through message conversation software sometimes known as translation software. The function of these software packages is the same, to convert data from the structure that exists in one's system to a common, recognized, standard form of data. From this standard structure, a receiver of the data can pass the information through their translator and then read it into their own system without having to modify the base application (Ibid).

No matter whether the base application is a purchase system, order entry, accounts payable or accounts receivable, in order to obtain benefits from the use of EC, the data must effectively flow into or out of the application. If there are re-keying of data at any point, there is an increase in the potential of error, the cost of the effort itself, and the cost of operating many other unnecessary devices, such as printers and keyboards. Using EDI standards can eliminate such potential errors. Although the processes of the application interface may be either part of the translator or the base application, it may require a significant amount of effort to actually integrate the data into the application (Ibid).

In many cases, the discovery of operating problems or idiosyncrasies is flushed out when this is undertaken. This is one of the challenges that emerge when using non-standardized message protocols for business-to-business and again reinforce the concept that successful EC program will gravitate to using established-usually EDI-based-languages to integrate their relative systems with one another (Ibid).

Virtual reality is parallel to this concept since it is built and based around computer to computer interaction.

## **WHAT IS VIRTUAL REALITY?**

### **Background**

Virtual reality is a term that has its origins in philosophy, playwriting, poetry and higher arts rather than in technology. Virtual reality as a term connected to technology has arisen with the advancement of technologies such as computers and is roughly divided into two definitions, technological hardware and/or human experience (Steuer 1995).

The term VR defined through technological hardware is based on the equipment and tools used in VR such as special hardware tools for interacting with the human senses in a non physical environment. Usually the word is reserved for immersive technologies such as head-mounted-displays, small rooms whose walls are covered with screens, rather than simpler computer games such as World of Warcraft or the virtual world called Second Life.

The term VR defined through human experience is based on the perception of one's surroundings as mediated by both automatic and controlled mental processes, regardless if they exist in the physical world or not (Gibson, 1979).

Most current virtual reality environments are primarily visual experiences, displayed either on a computer screen or through special stereoscopic displays, but some simulations include

additional sensory information, such as sound through speakers. Some advanced, haptic systems now include tactile information, generally known as force feedback, in medical and gaming applications.

Michael R. Heim has identified seven different concepts of Virtual Reality: simulation, interaction, artificiality, immersion, telepresence, full-body immersion, and network communication (Heim1994).

The concept of virtual reality has been popularized in Science Fiction by dozens of books, movies and TV shows, especially the 1999 movie *The Matrix*. *The Matrix* features a virtual reality so convincing that its inhabitants are unaware it is not the real world. In one of the movie's most famous scenes, the protagonist is "unplugged" from the Matrix and finds out he is merely one of billions of people living in special pods created by artificial intelligences. In the movie, rather than delivering the virtual reality experience through clumsy goggles or gloves, the sensory signals are sent directly to the user by way of a "brain jack," plugging into the user's occipital lobe. Although *The Matrix* is just a movie, numerous brain researchers have attempted to create devices similar to the brain jack, and it is an advancing technology. When it comes to the Matrix movie it also serves as a useful illustrator on intellectual property versus physical property, which in turn illustrates the connection that a virtual world is fully intellectual in nature.

The possibilities and potential benefits of virtual reality are several and it opens up for future scenarios where people could experience a large portion of real life activities at a very low cost like building virtual empires, spending virtual riches and even enjoying virtual sex. These environments will be a possible environment for people to live their fantasies only bound by the rules set by the virtual world. For business people this will be a possibility to have meetings face-to-face without travelling physically to the other potential business partners. It is also a environment for illustrating and interacting with phenomena like gravity, molecules, sound, biological material etc. in a highly visible illustrative way.

## Second Life

Second Life is a virtual world developed by Linden Lab, which enables its users called "Residents" to interact with each other through "Avatars". The virtual world is accessible on the internet through a free client program called the "Viewer". Second Life also holds its own internal currency named the Linden Dollar (L\$) which is exchanged using US dollars or other currencies on the LindeX exchange provided by Linden Lab. Residents can explore, meet other residents, socialize, participate in individual or group activities, and create and trade virtual property and services with one another, or travel throughout the world (called the "Grid"). All these activities are done with the three dimensional rendered avatars that has a chosen appearance in a three dimensional environment that resembles the real physical world. There are set limitations in the virtual world, for example how many avatars that could be in a specific area (called "region") at the same time. In second life some features go beyond the rules of the real world today, such as the ability to fly instead of just walking and also the ability to change skin and shape of your avatar just in the same way you change clothes. Animations are also tradable property in Second Life such as movement of the Avatar which comes with a basic set of moves but can learn new moves through trade. This is often required if you want to apply for a job on a club as a dancer or if you want to be hired as a model on a catwalk for a fashion company.

In January 2010, 18 million accounts were registered, although there are no reliable figures for actual long term consistent usage. With a thriving in-world economy that saw over \$360 million USD transacted in 2008, and a broad user base that includes everyone from consumers and educators to medical researchers and large enterprises, Second Life has become one of the largest hubs of user-generated content in the world.

Second life is frequently debated of a computer game or not, where it unlike traditional computer games does not have a designated objective, nor traditional game play mechanics or srules, which in turn makes it as irrelevant to talk about winning or losing in relation to second life as in real life.

## **MMORPG - massively multiplayer online role-playing games**

MMORPG is a genre of computer role-playing games in which a very large number of players interact with one another in a virtual game world.

In 2008, Western consumer spending on subscription MMOGs grew to \$1.4 billion

World of Warcraft, a popular MMORPG, had over 11.5 million subscribers as of December, 2008

Since the interactions between MMORPG players are real, even if the environments are virtual, psychologists and sociologists are able to use MMORPGs as tools for academic research. Sherry Turkle, a clinical psychologist, has conducted interviews with computer users including game-players. Turkle found that many people have expanded their emotional range by exploring the many different roles (including gender identities) that MMORPGs allow a person to explore (Turkle, 1997).

In a study by Zaheer Hussain and Mark D. Griffiths, it was found that just over one in five gamers (21%) said they preferred socializing online to offline. Significantly more male gamers than female gamers said that they found it easier to converse online than offline. It was also found that 57% of gamers had created a character of the opposite gender, and it is suggested that the online female persona has a number of positive social attributes (Hussain, 2008).

In World of Warcraft, a temporary design glitch attracted the attention of psychologists and epidemiologists across North America, when the “Corrupted Blood” disease of a monster began to spread unintentionally—and uncontrollably—into the wider game world. The Center for Disease Control became very interested and contacted the developers to see if they could use the incident as a research model to chart both the progression of a disease, and the potential human response to large-scale epidemic infection.

## **REGIONAL DEVELOPMENT**

Resources needed for IT based regional development projects are scarce in comparison to non-IT based projects.

Regional development is most often associated with challenges like high costs, heavy planning, strong investments, unsure outcomes, much organization and large distances in collaboration. These are dimensions imbedded in the nature of large scale development work where dependencies of relations across borders are necessary. Much of the preparations and planning of developmental project craves a lot of meetings with different actors, both leaders and other

public actors. The investment in modeling and testing of methods are most often expensive, time-consuming and involves a lot of mobilization, production and consummation of physical goods.

Regional development is a wide concept that encompasses various economic and social aspects. There is a clear coupling between the development of the whole national economy and the focus on development of specific regions. There are specific tools to do this analysis such as the entrepreneurial re-cycling model and the entrepreneurial remedy model (Abouzeedan 2010). Enhancing regional development can be achieved through various means. In that incubators play an important role (Hedner 2010). In future regional development it is important to establish a knowledge base for high innovativeness in the region (Etzkowitz and Klofsten 2005).

## **REGIONAL DEVELOPMENT AND VIRTUAL REALITY**

When it comes to small firm management, IT has a clear and profound effect on management activities that used to be time-consuming as well as labor consuming. With the usage of IT tools, activities are taking far less time and effort to be performed. IT is used today in all aspect of business activities such as marketing, sales, purchasing, financial transaction, administration, accounting, communicating etc. and the SMEs are catching up more and more in utilizing the different IT tools that are available.

An open internet based virtual “world” where all actors can meet, interact, build 3D objects and even create and trade virtual property holds a potential to lessen the problems met in regional development today and serve as a good platform for training. Second Life (SL) is such a virtual world accessible via the internet which enables its users, called Residents, to interact with each other through virtual characters, called “avatars”. The residents can explore the SL hypothetical world, and participate in individual and group activities. Most importantly, they SL residents can create trade and develop virtual property and its related services in a theoretical and experimental way. Thus, the SL concept is a three dimensional modeling tool which can be used to model and assess regional developmental solutions.

Over 2,000 global enterprises, 600 universities, 35 international governments, and several divisions of the U.S. federal government — including the Departments of State, Homeland Security, NOAA, NASA, Army, Navy and Air Force — now exploit Second Life technology to connect with stakeholders around the world, communicate complex ideas, train and collaborate.

In Second Life, the Michelin Group, for example, has an "extremely successful complex training program and interactive simulations for training worldwide employees in Enterprise Architecture.

But we also think that the current technical hurdles and learning curves are putting a damper on adoption. It's a bit like video conferencing systems. If it's not as easy as picking up a phone, then you need something pretty compelling to make it worth spending time on it.

According to U.S. Small Business Administration, small businesses have been a contributing force to the Internet, e-commerce, and information technology, producing more than 70 percent of the new information technology jobs between 1992 and 1996. The Internet, along with affordable telecommunications, has inspired and enabled small businesses to reach wider markets that were only dreamed of a decade ago.

To illustrate differences between the traditional planning used in regional development with the new tools available through the usage of virtual reality, see table 1.

*Table 1. Differences between traditional planning compared to VR tools and models for regional development.*

<b>Aspects</b>	<b>Planning with VR tools</b>	<b>Traditional planning</b>
<b>Costs</b>	Very Cheap	Very expensive
<b>Time to use</b>	Less	More
<b>Flexibility</b>	Very Flexible	Non-flexible
<b>Future projection</b>	Highly feasible	Less feasible
<b>Usage in planning stage</b>	Yes	Yes
<b>Usage in execution stage</b>	Yes	Limited capacity
<b>Usage after execution stage</b>	Yes	No
<b>Organization</b>	Small	Medium-Large
<b>Environmental impact</b>	Less	More
<b>Anonymous</b>	More	Less
<b>Distance to colleagues</b>	No distance at all	Small to very large

When planning and modeling regional development in a traditional manner it is often very resource dependent, costly, time-consuming and requires a strong organization. Often this planning and modeling work could be simplified by a smaller team of IT personnel cunning in VR that could establish flexible reusable models without spending further resources that software and computers. In traditional planning this must be done by developing physical models which is non-flexible and not especially useful after and during the latter part of the execution phase. Also the environmental impact from travelling and developing physical models for testing is much higher than meeting and developing models in VR using software.

Another aspect of using VR like SL is the possibility of being anonymous. This has been used by many developing firms as a tool for market study, where for example a car designer could test out its designs totally anonymous on its potential customers by driving around in SL and get feedback on the design. Such a project is fairly difficult and risky in the real physical world and also much more costly, time-consuming and less flexible to modifications.

The anonymous factor is high in SL and can be adopted on any project. This is also good for testing out a lot of models without giving out what, where or by whom it is going to be implemented in the real world.

## **CONCLUSIONS**

From our discussion above we suggest that the use of VR has a lot of benefits compared to traditional planning. We think that an early approach to understanding the benefits of VR can make it easier to realize and find openings for implementation of available IT tools for complex projects. The time spent on establishing a couple of test cases in VR do not have to be long and the models can be used over and over again, which makes a good investment even better.

When starting a project that has many uncertainties and at the same time craves large resources and manpower, a VR based approach should be strongly considered for at least the early stages of modeling. This is especially to an advantage when changes need to be made, since the VR model is often more flexible than a developed physic model.

## **POLICY IMPLICATIONS**

We suggest that municipalities and counties start utilizing the tools available in virtual reality based worlds like Second Life for planning regional development. The benefits of choosing a platform like Second Life for future projections and modeling is cost efficient, timesaving, flexible and reusable. A first step should be to educate the employees to orient themselves in these environments and then set up case projects between regions to ease understanding and illustrate the benefits in collaboration without geographic boundaries but still meeting face to face.

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