The Wisdom Innovation Model - Adjusting New Insights and Hosting New Perspectives to Human Augmented Reality

Albertina Dias, Mercedes García Ordaz, and Francisco Martínez López

Universidad de Huelva, Facultad de Ciencias Empresariales, GITICE,
Plaza de La Merced, 11, 21071 Huelva, España
albertina.dias@mibook.org, {ordaz,rector}@uhu.es

Abstract. In this paper, the process of constant innovation is analyzed comparing with the various economic eras that humanity has come through and even with the level of countries' development. While technology enables the possible application of knowledge, the level of expertise may be evaluated by the effective outcomes. In this perspective, analyzing the concept of multimedia interactive books and its impact on learning, suggests the importance or need for emotional and knowledge management in a productive way instead of a reproductive type of learning. The aim of this paper is to present the findings of a Delphi research on the challenges of bringing new possible business models, economically efficient and socially effective when exploring new media tools for enhanced learning based on the technology of augmented reality and to adjust new insights and host new perspectives to the forthcoming human augmented reality.

Keywords: multimedia, interactive, augmented reality, technology enhanced learning, business model, innovation, economics, knowledge, web 3.0, future internet, cloud computing, intercommunication, wisdom, societal development.

1 Introduction

The way firms and other non private organizations combine available resources and technology to deliver value by providing more benefits in relation to costs, as perceived by clients and partners, will determine the marketplace for each product and service proposition. But, when it concerns to launch innovations in the market the successful formation of a marketplace, where supply meets demand, shall have a certain dependency on the specific systemic conditions and characteristics of each geographical region no matter how intensive is the popular phenomena of "globalization".

Because of the various themes arising from technology and learning issues' debate, perhaps is too ambitious to draw upon the results of research concrete new business models. Anyhow, the digital imaging accelerated expansion in the various contexts of graphic and audiovisual creation and has led to many major changes, as well as has promoted the development of a growing digital culture, pushing the boundaries of human value and enabling them to perform increasingly complex tasks. If the eighties

M.M. Cruz-Cunha et al. (Eds.): CENTERIS 2011, Part I, CCIS 219, pp. 73–85, 2011.

can be considered as the decade of the introduction and expansion of computer technology, the nineties constitute the early visual experimentation and finding new 'languages' for inter-communication. Thus, based on present and future work one can at least envision the major developers for new tools and services which can trigger an intense interesting debate about its effects on a variety of contexts, from teaching and learning issues to intellectual property rights and governance.

The contextualization of this article requires for a global approach to the emerging issue of Augmented Reality (AR) technology which is a multidisciplinary field of computer science, involving areas like 3D Computer Graphics, Computer Vision and Human-Computer Interaction, dealing with the combination of real-world and computer-generated virtual reality, where computer graphics objects are blended into real video footage in real time. According to Azuma et al. (2001), AR requires the following three characteristics/processes: (a) combine real and virtual environments; (b) interaction in real-time; and (c) registering 3D objects in real environments [1]. Furthermore, and in a more strictly contextualization, it is also relevant the presentation of the Multimedia Interactive Book (miBook[1]) which is a new tool providing a responsive and interactive learning environment which handles with different types of content. miBook may represent a notable instrument for enhanced learning (for individual use or in the classroom) as well as it can represent a great step forward, regarding the enhancement of current digital libraries. Additionally, miBook combines a printed book (or its digital format) with the respective audiobook and its story-related 3D models (as well as 2D graphics), using AR and other multimedia technologies, as frameworks to present and interact with its audio-visual content. Technologically, miBook environment consists of a handheld camera, a personal computer (to generate user's individual AR views), and a physical book. miBooks uses "normal books" with text and pictures on each page and have an additional audio content – the correspondent audiobook.

The results of a Delphi consultation process on miBook's benefits and possible business models has produced the following five major findings, (1) New enhanced learning tools are actually needed and, a set of strategies and recommendations are listed for the development of the miBook's tool, being the most relevant development factors concerned with Structural and Human Capital; (2) the e-book, the audiobook and the miBook tend to be more important and growing in terms of number of users in the near future; (3) Creativity, Realism and Accessibility are the most important benefits for miBook's users during the learning process; (4) Intercommunication and Wisdom are to be of growing importance in near future; and last (5) recommended business strategy for miBook is possibly sustainable when supply is focused on different marketplaces, corresponding to different users' needs: Professional and Business, which are potentially the ideal major developers of the business models for the new media tools.

[1] This research was sponsored by GITICE-Grupo de Investigación de las Tecnologías de la Información y las Comunicaciones en la Empresa, from Universidad de Huelva, Huelva-España (http://www.uhu.es/gitice/), by SbH – Solutions by Heart, Ltd., from Porto Salvo-Portugal (http://www.solutionsbyheart.com or http://www.mibook.org) and by ADETTI – Centro de Investigação em Sistemas e Tecnologias de Informação Avançadas from Instituto Universitário de Lisboa (IUL)-Portugal (http://adetti.pt/).

This article is organized as follows. After the introduction (section 1) concerning the specific results from a Delphi research and the challenges of bringing new possible business models for innovative media, followed by a brief presentation of the miBook, section 2 focuses on a brief literature review on knowledge society and the phenomena of digital divide. Section 3 focuses on governance and innovation networks and on the process of constant innovation compared with the various economic eras that humanity has come through and with the level of countries' development. While expectations on the Web 3.0 are foreseen in a new economic era, here called Wisdom era (section 4), section 5 adjusts some new insights on modeling innovation systems within the structural scenario of collaboration and sharing. Finally (section 6) presents the basis of new possible business models, economically efficient and socially effective when exploring new media tools for enhanced learning based on the technology of augmented reality and lists some conclusions and limitations (section 7) to adjust new insights and host new perspectives to the forthcoming human augmented reality environment in the near future.

2 Digital Divide in the Knowledge Society

The Web environment represents the facility of having a graphical user interface for hypertext navigation with a browser. Under this perspective, the Web may be seen as the "tool"[2] or the part of Internet that allows for easy navigation in the millions of interconnected computers across the all planet. Users send and receive the data files, create, and view or listen to the content based on internet infrastructure. The power of individuals over digital contents keeps on growing as the proliferation of innovative gadgets produced by the Information and Communication Technologies (ICT) industries, the increasing accessibility to the internet and the ability to upload content that affects original contents. Internet technology is underneath this possibility of co-creation where wireless access network and consumers' control increased demanding for new market structures able to provide them more and more value in a extremely competitive and fast scenario. Nevertheless, as recently stated in a critical review: "*Notwithstanding the opportunities created by the spread of digital technologies, the increasingly global reach of the Internet and mobile telecommunication networks and open collaborative models for innovation and learning, there is concern that these developments also are giving rise to new sources of inequality*" [2]. One of the features of the information and knowledge societies is the Digital Divide explained by some local economic structures, ICT policies and insufficient literacy as well as insufficient physical access to computers and connections.

Multimedia digital content, on-line and off-line, is visibly larger and keeps on growing. Looking, for instance, to the success of the collaborative web-based encyclopedia "Wikipedia[3]", it is intuitive that people of all educational levels and cultural backgrounds are keen to use digital media and also in helping to improve a

[2] The Web has been the major developer for the new tools and services along with other multimedia technologies.

[3] A wiki is a website that allows the creation and editing of any number of interlinked web pages via a web browser using a simplified markup language or a WYSIWYG text editor. *Wikipedia: http://en.wikipedia.org retrieved 25/02/2010.*

web-based system. But yet, all of these types of social applications as blogs, audio and video communication through internet technology and based on the e-commerce business models are no longer interesting since the latest features of technologies announced several applications based on the on-line virtual computing systems.

As an evolving concept, convergence encompasses a combination of opportunities and challenges, not only for the ICT industry, but also for regulators, policy makers and society at large. The "digital divide" (the division between those who have access to ICT and are using it effectively, and those who do not) has a real impact on everyday lives that can potentially create further imbalances, especially in the developing world. "Since information and communications technology is increasingly a foundation of our societies and economies, the digital divide means that the information "have-nots" are denied the option to participate in new ICT-based jobs, e-government, ICT-improved healthcare, and ICT-enhanced education (Bridges[4], 2010)". According to Bridges' studies the Real Access (access providing possibility for people to use ICT in such an effective way allowing the improvement of their lives) to ICT is conditioned by three determining factors:

- Insufficient physical access to computers and connections (affordable capacity);
- Insufficient ICT literacy (educational structure and policies);
- Local economic structures and ICT policies.

3 Governance and Innovation Networks

Computer technology has now been around for several decades (since the 1960s) and since the 1970s that the world economy was ready to spawn new leading sectors. For the first time the world experiments a revolution that was not based on the emergence of a natural resource, a new form of energy or a transport cost reduction. The basis of this revolution was an impressive decrease on communication costs and the globalization in the services' sector. The information technology sector mattered not just because they produce valuable equipment, such as computers but also because their impact throughout the economy by developing innovative wider range of associated services sector. Great transformations occur in economic organization and social structures of developed societies. Services' sector increases the proportion in the total output due to the greater importance of labor resource (in quality and in quantity) widening inequalities in income distribution. Businesses had to reorganize and the role of state has to change by intervening through redistributive policies.

In 2000, the Lisbon Agenda was launched calling for the European Union to become the most competitive and dynamic knowledge-based economy in the world, with more and better jobs and greater social cohesion by 2010, which presupposed strong investment in research (source of new knowledge), in education and in training in order to allow all Europeans access to learning and knowledge. That would only be

[4] Bridges.org is an international organization with a mission to promote the effective use of information and communications technology (ICT) in the developing world for meaningful purposes, such as better healthcare, education and self-sustaining economic development. [http://www.bridges.org/publications/85 retrieved 25/02/10].

possible if the active population is formed in information technology, keeping learning throughout life and allowing them to participate actively in society [3], [4].

Innovation is a clouded issue since in 1934, Schumpeter published his pioneering work on the innovation theory – The theory of economic development - where he points out that an innovation is distinct from an invention, arguing that entrepreneurs innovate not only by explaining how to use the inventions but also by introducing new means of production, new products, and new forms of organization. According to the European Commission (EC) "innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relation. The minimum requirement for an innovation is that the product, process, marketing method or organizational method must be new (or significantly improved) to the firm"[5], therefore regarding the production, assimilation and well-succeeded exploitation of novelty in economic and social domains [4], [5].

In general, according to studies in the field of economic growth, only technological progress is capable of causing continued/sustained economic growth. Technological progress is the firms' capacity of innovation and occurs through the changes and/or through the introduction of new goods and new services in society. To this end, new ideas alone are not enough, it is necessary that entrepreneurs are willing to take risks to put them into practice so that they become profitable, it is necessary the creation of appropriate conditions conducive to the emergence of innovation, namely the investment in research and development (R&D). Spending on R&D is distinct from any other investment in other resources because innovations may, potentially, be used by many companies at once therefore increasing continued growth in the level of society.

The evolution of the world economy focuses, after the Agricultural, Industrial and Information eras, on the actual era of Knowledge which is based on three main pillars: knowledge, Innovation and Technology. The first pillar determines economies' performance according to its knowledge level whether if it is in the form of intellectual capital and / or in the process of constant learning; the second pillar, in this order, expresses knowledge through creativity and, in a systemic way, the potential capacity to innovate of societies and; the third pillar, technology as the underlying possibility for increasing productivity.

The role of State shall change whenever transformations (increasing competition and modifications in firms' dimensions and structures) occur in societies because these transformations naturally affect people's behavior and needs. New governance models are needed to address different market conditions brought by innovative processes, products and services.

In a critical paper reviewing information society, Mansell (2008) [2], referring the post-War World II period, states that "*Innovations in ICTs provided technologists with new toys. If bigger and better versions could be built, they could be sold to the military-industrial-complex, the richest client for their wares. Economists were looking for a productivity strategy to stimulate growth of new information-related industries.*" In those years, the actual denominated "Traditional Model of Innovation",

[5] `http://ec.europa.eu/enterprise/policies/innovation/glossary/` (retrieved 21/10/09).

talents should work within the companies which, kept innovative discoveries internally and at the same time develop and commercialize them in order to get profits from R&D. Pioneering companies launching innovation were guaranteed successful hence it should always go to market. Adding to this, naturally, patents should be controlled in order to avoid competitors to copy them. The paradigm of "Open Innovation"[6] [6] outlines a new environment for R&D and replaces the traditional logic of the innovation process (closed off from outside ideas and technologies) with a new logic framework process, assuming that firms can and should use external ideas as well as internal ideas, as well as internal and external paths to market, as the firms look to advance their business models.

"*Intellectual capital is recognized as the new economic era's pivotal factor underlying value creation*" [7]. Underneath the logic of competitiveness and profitability in which companies constantly need to operate there is a product (or market) and the need for this product is actually the reason for technology to exist. Companies approach innovation in order to satisfy their customers (companies are driven by market instead of technology-led) and therefore the resources and capabilities needed to do so depend on a complex system wider than just technology or innovation. Adding to this, the increasing mobility of people, goods, and information has driven society into a trend towards cultural uniformity. An educated population is more efficient and this has an influence on the well-being of individuals as they tend to minimize waste, as well as it has a positive impact in the economic health as a whole. However, the effects that education has on the economy are not fully accountable at the time that this type of intangible investment is made. "*Business dynamics of the coming century will by necessity be an integrated and technologically networked global economy, recasting comparative advantages and discriminating pricing for goods and services*" [7]. While this vision calls for a different, renewed understanding of business principles and decision-making processes whilst there will be an increasing demand for intellectual capital resources, a review through some of the principal capabilities is needed to lead firms to success.

Recent understanding of the Web consists in the distinction among the first generation of internet technology - the Web 1.0 - which connected people to networks, the second generation - the Web 2.0 - which connects people with machines and with each other, including blogs and several social networking applications such as photo, video, and bookmark sharing, and finally, the third generation, the so called Web 3.0 *"emerging with better technology and web applications and envisioning the intensification of user's engagement, sharing and co-creation"* [8].

4 Expectations on the Web 3.0

While the Web 1.0, also seen as the *"Information Web"* or as an extension of the off-line media [9], allowed for the global accessibility to static data and information produced by others, centralizing contents' production, the Web 2.0 came with the advent of large volume and cheap storage devices and increasingly adopted

[6] "Open Innovation" is a term promoted by Henry Chesbrough, author of "Open Innovation: The new imperative for creating and profiting from technology", Harvard Business School Publishing: Boston, 2003.

broadband connections, pushing the contents' marketplace into devices that support more open deployment standards. According to Bernal (2010; p. 25) [10] a sub-categorization might be considered, the "Web 2.5 or the Symbiotic Web", defined by a "*current e-commerce model, which relies heavily on the supply of 'free' content, has made individuals and commercial enterprises mutually dependent: enterprises have built business models reliant on a currency of personal data, while individuals expect free access to services supplied by search engines, email systems and social networking sites, and media services such as YouTube and Hulu* [10].

The Web 3.0 shifts towards the possibility of sharing information and knowledge by interacting with others. Contents are no longer centralized and the accessibility is now local, that is to say, if in the Web 2.5 communities are partially out of industries' control, in the Web 3.0 the power shifts from sellers to buyers, definitely increasing market competition. Sellers hoped to replicate the revenues generated by greater efficiency verified during industrialization, as societies became more dependent on services, and they did it again in the Web 1.0 and also in the Web. 2.0, during the Information and Knowledge eras somehow, supporting their strength in the market through the use of Digital Rights Management (DRM). With the growing ICT innovations during the Information and knowledge eras "*policy makers were trying to maintain full employment and growth, and information workers (such as librarians and software engineers) were attempting to increase access to knowledge by crafting better tools for accessing information*" [2].

5 The Wisdom Innovation Model

In the Web 1.0, DRM tools helped establishing business models by providing the market opportunity to the contents' providers but in the Web 2.0, although business models previously established by DRM software still support a certain class of business concept coming from the 'Industrial-Information' economic eras both based on traditional and / or Open Innovation models, this transition to the third generation of the Web has started to evidence that possibly, the established business models based on DRM are no longer efficient.

The application of the principles of Open Innovation simply replaced the control of patents for direct or indirect brokering of data and information resources, generating revenues through targeted groups of customers caught in the markets' construction of previous innovative technologies.

"*Patents are increasingly stretched out to cover "ideas" that twenty years ago all scholars would have agreed were unpatentable*" [11]. The reasons pointed out for the enclosure movements defend that the control over exploitation, in general, ensures that resources are efficiently used and that the common use of tangible or intangible capital would lead to unproductive results.

According to Boyle (2003) [11] we are in the middle of a second enclosure movement - "*the enclosure of the intangible commons of the mind,*" and … *there is a danger of overstatement. The very fact that the changes have been so one-sided makes it hard to resist exaggerating their impact*. The vision that "*ideas and facts must always remain in the public domain [12] - is still supposed to be our starting point, it is, however, under attack. The European Database Directive does (and the various*

proposed bills in the United States would) create proprietary rights over compilations of facts, often without even the carefully framed exceptions of the copyright scheme, such as the usefully protean category of fair use [13]".

The environmental adequacy of an innovation system facing the Wisdom Era within the paradigm of the Web 3.0 shall require deep analysis of the presented societal characteristics and surely suggests few additional characteristics bringing a possible important redefinition of the innovation model which we baptized as Wisdom Innovation Model (see Fig.1 below).

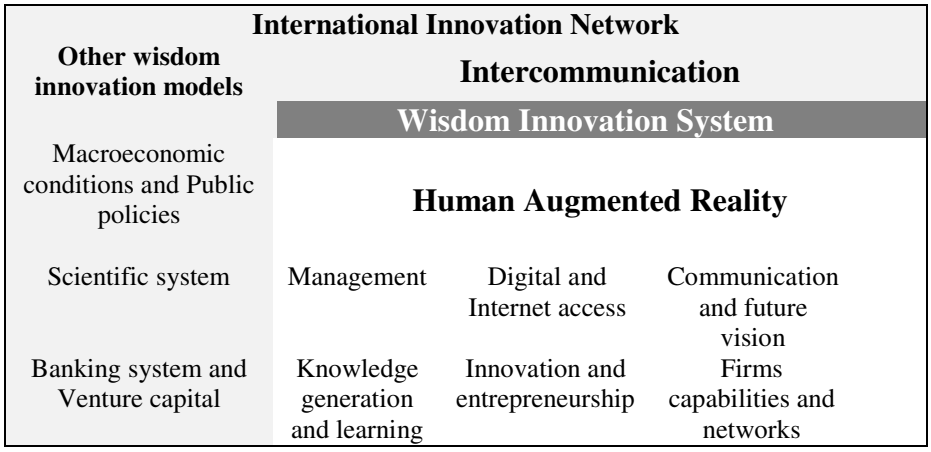

Fig. 1. Wisdom Innovation Model

A more detailed description of this Wisdom Innovation Model (WIN Model) envisions the validity of critical future scenarios based on open services platforms and on the level of societal development and economic growth supported by functional architectures of the next generation of the Internet or, the 'Future Internet' or even the 'Internet of Things', offering higher broadband, interactivity, mobility and personalization features. Citing Kevin Ashton, author of the expression 'Internet of Things', "*Nearly all of the roughly 50 petabytes (a petabyte is 1,024 terabytes) of data available on the Internet were first captured and created by human beings - by typing, pressing a record button, taking a digital picture or scanning a bar code. Conventional diagrams of the Internet include servers and routers and so on, but they leave out the most numerous and important routers of all: people. The problem is, people have limited time, attention and accuracy—all of which means they are not very good at capturing data about things in the real world."*[14].

In this envisioned world of services, where there is greater intangibility (it is more and more difficult to find a single product which is not provided along with an intangible service), often, suppliers and customers will ask to be fully integrated in terms of what is really needed and where should be needed. The concept and basis of

the 'Flexisecurity[7]' [15] concerning the labour market and the social security in Europe should represent very well that the same need is urging for any market, e.g. companies will be more flexible, being closer to their target markets in order to maintain their inter-temporal value chain to provide efficiently more value added to their customers. This introduces the need for permanent intercommunication between customers and suppliers which may reduce the tension between mass production (cost effectiveness) and customization (matching customer's needs). The possibilities of co-creation of newly and value-added services are not based in single knowledge anymore: technological environment already provides the sharing of wisdom in an open structure provided by the Web 3.0.

The natural intercommunication attitude creates the space and accelerates the chances for wisdom to flourish and contribute to societal development in the sense that knowledge stands for a self internal construction while wisdom can only be achieved by sharing knowledge and collaborating with other's knowledge. The importance of both external and internal knowledge resources along with the general idea that the creation of efficient business models may sometimes be more important than to generate innovations, but rather important than business / marketing is value creation through promoting Creativity, Realism and Accessibility to knowledge thus allowing the construction of a wisdom based society.

A 'better' business model is better because among other direct effective (and positive) characteristics, it does not imply inefficiencies and, in particular when speaking about knowledge, a 'better' business model should not lock the door of knowledge to anyone in society. The value creation capable of higher productivity relies on different market rules based on a collaborative concept of governance possibly based on the nature and implications of the Fifth Estate'[8] [16], enabled by networked individuals and the consequent reconfiguration of access to information, knowledge and wisdom interactivity.

6 HAR - Human Augmented Reality

Behind this Web 3.0 it is hidden the possible success of making more efficient use of own ideas along with the possibility of collaborating with external parties and sharing knowledge in a growing level of interaction and collaboration. Along with this advent, virtualization is rapidly transforming the information technology state-of-art and changing the way people compute.

Computer hardware designed to run on a single operating system have come to an end, more than ever, the Web and other open standards are demanded by users who

---

[7] Flexisecurity is defined by Viebrock/Clasen (2009: 306) as a "*…carefully balanced combination of flexibility, where it matters for job creation, and protection, where it is needed for social security...*". [15].

[8] "*The rise of the press, radio, television and other mass media has enabled the development of an independent institution: the 'Fourth State'. … The growing use of the Internet and related digital technologies is creating a space for networking individuals in ways that enable a new source of accountability in government, politics and other sectors: the emerging 'Fifth State'* [16]".

already have their own portable data. The Web 3.0 started many recent positive developments in the field of virtual and augmented reality platforms.

AR has gained a great deal of attention since 2005 but the success of AR as a technology for the "Augmented Learning" still depends on factors that are largely out of the hands of its creators. For the entertainment industry and marketing / advertising companies AR has already proved to be successful and quite profitable, as for instance in the entertainment and marketing industries.

The biggest challenge for AR is now on mobile devices like smartphones or tablets with hardware robust enough to handle AR applications. Mobile AR will possibly represent the major technology that will shape content markets in 2020. This understanding opens the door for many new product opportunities that provide value to demanding customers of the future. Web 3.0 comes with a new distribution model proposal where this time; intermediaries play an important role as collaborative partners. The Web 3.0 shall provide an adequate answer to this demanding environment characterized by a different type of technological relation with mankind: "Human Augmented Reality" or HAR, potentially driving the world to a new economic era of "Wisdom".

Thus, it shall be critical to answer the question: how innovation should be delivered to consumers? Using the economy to bring about a modern society requires the fast adoption of an overall education and training program for all ages at all levels. For this kind of society to become real it shall be necessary to change "structures" in what it concerns to innovative business models capable of greater efficiency and more valuable outcomes comprising real societal development.

A product is measured by the benefit(s) that satisfy the need of a consumer. On the other side, this benefit(s) is represented by the quantity of money or other items of value that the consumer is willing to pay.

Some innovative products or services come exclusively with the Internet but other products, like books, music, movies or any other type of multimedia contents for example, simply use new distribution channels, often adding unique technology-enabled services. The web-based business model is a method by which the organization sustains itself profitably, in the long term, using ICT in order to deliver its value proposition to stakeholders and clients.

An open attitude of sharing knowledge and teaching - knowledge from inside to exterior or wisdom attitude - enhances the chances of discovery and co-creation. Also commercial innovations have this potential capability. miBook's proposal, concerning digital / virtual content, suggests this HAR relation creating more value through promoting Creativity, Realism and Accessibility. Although business innovators face incentives to limit the access of competitors to their innovations and therefore preventing others from gaining access to their discoveries, AR technology opens the door for this authoring tool – miBook - in order to facilitate co-creation and promote knowledge sharing. The most relevant theoretical arguments for cooperation among companies comprise the sum of principal practical benefits: reducing costs of technological development or market entry; to achieve economies of scale in

production, and; to reduce development time and facilitate faster marketing new products [17].

Once there appears to be consensual that new enhanced learning tools are needed and, that digital contents (in particular, e-books, audiobooks and miBooks) tend to be more important and have greater number of users, further and faster development of miBook should have strategic interest for both producers and users.

In order to be able to create more value to users, a Wisdom (Knowledge and Emotional management) environment and Intercommunication among interested parties will be critical for this enhanced tool to be validated and wider disseminated. Naturally, learners always look for the most efficient tools to access contents achieve their learning objectives which has been identified by miBook users' experience; also the Delphi survey identifies potential structural and human factors in miBook's proposal in order to achieve greater learning efficiency. The suggested business strategy by the Delphi panel includes two major developers of business models for miBook: Professional and Business.

The educational scenario in 2014 envisions the inclusion of new enhanced learning tools constructed under structural and human needs, in order to answer demanding learners of the Wisdom era.

The science of enhancing a live experience with virtual components and information breaks with the paradigm between tangible and intangible by presenting no borderline between physical and non-physical. After all, AR suggests no separation at all between state and process, questions the pre-conception of a clear divorce between real and virtual or between mind and body.

7 Discussion, Conclusions and Future Work

For the success of AR technological applications in the educational scenario an attempt has to be made, reviewing the challenges faced by the contents' industry since the web companies started to produce open source platforms of information and knowledge and offering the possibility of social intercommunication and collaboration. But the most valuable contents are still not easy to access in the most efficient way. Although miBook has proved to be successful as a prototype for edutainment[9] by providing several types of multimedia contents and at the same time providing the possibility of co-creation and of interaction in real time, reshaping reality with virtual creativity, its high workload production and therefore very expensive one still represents a major limitation.

When considering the business model trends on ICT services, Cloud Computing[10] and specifically the cloud models Software as a Service (SaaS), Platform as a Service

[9] Edutainment tool stands for educational and entertainment purposes' tool.

[10] "*Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.*" `http://csrc.nist.gov/publications/drafts/800-146/Draft-NIST-SP800-146.pdf` retrieved in 28/05/2011.

(PaaS) and Infrastructure as a Service (IaaS)[11] [18], could save much of the major investment, for instance on the Intellectual Property Rights (IPR) and on the production of 3D animation and special effects which requires a large amount of computer processing. This should be easily accomplished within the construction of structural conditions (e.g. contents' industry cluster), not to mention the already known advantages in the field of the music and other type of similar audio contents.

Summarizing, future work perhaps should consist in strengthening effective technological development coupled with appropriate industry cluster as well as policy development, critical to the evolutionary stages of miBook. The use of cloud computing shall allow the miBook's production in a dramatically reduced time in a processing open platform compatible with the work.

Finally, it is important to consider the main critical factors of innovation success in the context of networked citizens, involving customers as co-creators on equal grounds with the main suppliers. Furthermore, faster development of HAR is emerging everyday applied in a variety of practical life circumstances, and miBook as well as other similar tools, based not only on AR technology but also synergetic linked with other source technologies, should be critical for the strategic interest for both producers and users.

References

1. Azuma, R., Baillot, Y., Behringer, R., Feiner, S., Julier, S., MacIntyre, B.: Recent advances in augmented reality. IEEE Computer Graphics and Applications 21(6), 34–47 (2001)
2. Mansell, R.: The Life and Times of The Information Society: A Critical Review. In: Fifth Anniversary Conference of the Department of Media and Communications, 'Media, Communication & Humanity', London School of Economics and Political Science (2008)
3. Commission of the European Communities (CEC).: Working together for growth and jobs. A new start for the Lisbon Strategy. COM 24, Brussels (2005a)
4. Commission of the European Communities (CEC).: State Aid Action Plan. Less and better targeted state aid: a roadmap for state aid reform. COM 107 final, Brussels (2005b)

[11] In the cloud Software as a Service (SaaS) model "*the capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a Web browser (e.g., Web-based email).*", in the cloud Platform as a Service (PaaS) "*the capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or -acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.",* and in the cloud Infrastructure as a Service (IaaS) *"the capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. … In any of this cloud computing models the consumer does not manage or control the underlying cloud infrastructure but has control over the deployed applications..."*. [18] `http://csrc.nist.gov/publications/drafts/800-146/Draft-NIST-SP800-146.pdf` retrieved in 28/05/2011.

5. Commission of the European Communities (CEC).: Implementing the Community Lisbon Program: More research and Innovation investing for the growth and employment. A common approach. COM 488 final, Brussels (2005c)
6. Chesbrough, H.W.: The era of open innovation. MIT Sloan Management Review 44(3), 35–41 (2003)
7. Singh, I., Zahn, W.M.: Determinants of intellectual capital disclosure in prospectuses of initial public offerings. Accounting and Business Research 38(5), 409–431 (2008)
8. Strauss, J., Raymond, F.: E-Marketing, 5/E. University of Nevada at Reno and Ohio University. Prentice Hall, Englewood Cliffs (2009)
9. Smith, G.: Web 3.0: 'Vague, but Exciting'. Brandweek 50(24), AM19 (2009)
10. Bernal, P.A.: Web 2.5: The Symbiotic Web. International Review of Law, Computers & Technology 24(1), 25–37 (2010)
11. Boyle, J.: The Second Enclosure Movement and The Construction of the Public Domain (2003), http://creativecommons.org/licenses/by-sa/1.0
12. Benkler, Y.: Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain, 74 N.Y.U.L. REV. 354, 361, 424 (1999)
13. Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the Legal Protection of Databases, O.J (L 77) 20 (1996), http://europa.eu.int/ISPO/infosoc/legreg/docs/969ec.html
14. Ashton, K.: That 'Internet of Things' Thing - In the real world, things matter more than ideas. RFID Journal (2009), http://www.rfidjournal.com/article/view/4986
15. Viebrock, E., Clasen, J.: Flexicurity and welfare reform: a review. Socio-Economic Revue 7(2), 305–331 (2009)
16. Dutton, W.H.: The Fifth Estate – Democratic social accountability through the emerging network of networks. In: Nixon, P.G., Koutrakou, V.N., Rawal, R. (eds.) Understanding E-Government in Europe, pp. 3–5. Routledge, New York (2010)
17. Tidd, J., Bessant, J.: Managing Innovation – Integrating Technological, Market and Organizational Change, 4th edn., pp. 439–505. John Wiley & Sons Ltd., England (2009)
18. Badger, L., Grance, T., Patt-Corner, R., Voas, J.: DRAFT Cloud Computing Synopsis and Recommendations - Recommendations of the National Institute of Standards and Technology. NIST Special Publication 800-146, U.S. Department of Commerce, Computer Security Division, Information Technology Laboratory. Gaithersburg, MD 20899-8930 (2011)