A STUDY OF INNOVATION BASED IT CONVERGENCE AS A STRATEGIC ROADMAP TO BUSINESS PERFORMANCE ACCELERATION FOR HIGH END IT VENDORS: AN INSIGHT TO THE DYNAMIC INTERACTIVE TV MARKET

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Abstract

Even though the technological diffusion and diversification and the associated market divergence and fragmentation have fueled up the global IT market, a significant trend is materialized during the past decade towards the technological convergence. This trend is observed both among companies that operate within the ICT market, where the technology is the business driver, but also among companies operating within different markets, where the technology is just one of the business enablers and attempts have been realized by researchers to study the effected dynamics in both cases.

The aforementioned trend seems to be shaped and encouraged by institutional bodies (The World Bank, EU, National Governments etc.) often leveraging regulation as a master tool, but also by major global field players (commercial vendors, operators, consultancy organizations, banks etc.).

Do diversification and market divergence continue to secure a sustainable competitive advantage in the context of the high – end ICT market or can the convergence of high end technologies empower the process re-engineering to the extend to become the key to the acceleration of the performance of the same businesses? Is innovation the exclusive product of technology diffusion alone or could the technology convergence also found and gear up innovative business services? The Interactive TV market is a typical example of a high-tech, dynamic, innovative IT market where technological divergence seems to compete against technological convergence over the market shares and the business performance consolidation award.

This study is intended to investigate and evaluate the association between IT convergence and business performance acceleration in the context of the high – tech innovative IT market. To serve the interest of the specific study, the dynamic Interactive TV market is going to be used as a typical example of a high-tech, rapidly evolving, intensely diffused and diverged, innovative IT market. Through the insight to the specific market, the contribution of innovation geared technology convergence to the convergence of the various business models operated within the different segments of the same high – tech IT market and the effected business process re-engineering is going to be analyzed. Furthermore, the relation and the dynamics of the associated business network simplification are going to be examined. Are there emerging opportunities for organizations to benefit from were technologies converge? Can organizations use the convergence of their utilized and commercialized technologies as a strategic tool to create and leverage market changes rather than spending resources and lining up to predict and respond to the latter?

Keywords: business performance acceleration, technology convergence, standardization, interactive TV, innovation, business model convergence, business process re-engineering, innovative IT, ICT convergence.

1. INTRODUCTION

At the time we set forth our research, technology convergence is realized and demonstrates a rapid dynamic trend towards a maturity phase (Raja and Singh, 2010). Convergence is already a reality within the ICT and high-tech industries themselves, between them and, last but not least, among them and other industries at multiple levels (Bengtsson and Johansson, 2011; Kim et al, 2010, 2011; Leker and Curran, 2010; Hwang and Yeon, 2011). In this setting, the evolving technology acts as a facilitator and as an enabler at the low and high levels respectively, the emerging business models serve as footprint frameworks and the associated regulation seems to assume a "gear – box" role that is often leveraged to shape and manipulate the dynamics of the above – mentioned dynamics of a "converging world" (Accenture, 2010; S&T Foresight ONSA Government of Canada, 2005; Stazi, 2007). Government - level organizations, global policy – setting institutions and financial pillars of the global economy are proactively involved on that front, forwarding, in many cases, the role of ICT convergence as an economic and regional development tool, put in various scale settings (Raja and Singh, 2010; Matrix 2011; Okuwada 2006; Nuno 2009; Stobbe A. and Just T., 2006; Jussawalla, 1999; Kolko J., 2012[6]).

An important part of this study draws on Frederick Hacklin's work as presented in his book *"Management of Convergence in Innovation. Strategic Capabilities for Value Creation Beyond Blurring Industry Boundaries"*. In his work, Hacklin suggests an empirical definition of convergence as the phenomenon realized at the "intersection of established and clearly defined industry boundaries" which effects dramatic industry boundary instability and erosion, issuing a systematic study of the convergence phenomenon with respects to the innovation dynamics through an evolutionary perspective. He also models, retrospectively and predicatively, a cyclical incurrence of the phenomenon of convergence, with different "high profile" industries intersecting and reacting during the course of each cycle[7]. Accepting Hacklin's broad, evolutionary definition of convergence and his finding, including the associated dynamic – capability based innovation management approach, we intend to study the same phenomenon under a different perspective: the inner – industry business performance perspective.

Through the business performance glance of the convergence phenomenon dynamics, we intend to examine whether Hacklin's model of the cyclical inter – industry convergence can be further complemented by a recursive inner – industry convergence – divergence succession phenomenon[8] milestoned by the effected business performance outcome. On the basis of the validation of the afore – mentioned integrated model, we plan to study the strategic dimension of the convergence phenomenon and systemize the strategic positioning of an organization within our concluded model.

The extensive research conducted on the modern convergence related scientific, academic and industrial literature, sets the high and low technology industries and, among them, the ICT industry in particular, at the eye of the contemporary industry convergence related discussion(Tiwari, Buse and Herstatt, 2006; Motanga, Bachmann and Magedanz, 2010; Schuurman, Moor, Marez and Evens, 2010; Slot, 2007; Schuurman, Marez and Evens, 2010; Alam and Prasad, 2007; Gutierresz and Perez, 2009; Ciesielska and Li, 2011; Xing, Ye and Kui, 2011; Serrano Orozco, 2012) 9. For the purpose of our study, our selected empirical setting is the rapidly evolving Interactive TV market, as an illustrative and pluralistic example of a high – profile, cutting – edge, intensely dynamic low technology industry, high technology industry and ICT industry intersected market, where both technological divergence and technological convergence have been successive "status quo" or co - existed at distinct periods in the course of the market timeline generating new business models and making previous, established business models obsolete (James J., 2003; Castellacci F., 2006; Hagedoorn

[6] The correlation between broadband availability and economic activity in the US articulated by Kolko (Kolko, 2012) is a typical example of the study of the contribution of ICT convergence to local growth.

[7] Hacklin F. (2008)

[8] The need for horizontal diversification has been identified by Hacklin as the initial response stage effected by the inter – industry knowledge spillover in both his models (cyclical change under rigid vs. changing industry boundaries), Hacklin (2008).

[9] Broadband networking, interactive media, mobile commerce and the digital home are featured as typical examples of contemporary IT convergence – centered activity. Particularly, Alam and Prasad (2007), Perez and Gutierrez (2009) and Ciesielska and Li (2011) have studied the digital home - related convergent technologies whereas Schuurman, Marez and Evens (2010), Slot 2007 and Schuurman, Moor, Marez and Evens (2010) are featuring different segments of the interactive media – related convergent technologies.

J., 199410; Bird A. and Kotha S., 1994; Langohr P., 2003; Braun D., 2004; Palmberg C. and Martikainen O., 2006; Pegels C.C. and Song Y. –I., 2000). How did players manage to survive and secure their business performance in this turbulent business setting? Is convergence an one – way road to business survival and business success in the ICT industry? Was the timely reflex - actions the survivor's sole survival tool or has market survival been a subtle component of strategic divergence against strategic convergence – oriented positioning? Last but not least, have there been cases where market players have actually embedded the convergence – divergence recursion to their strategic roadmap?

2. THEORETICAL FRAMEWORK OF THE RESEARCH

2.1 Technological convergence and technological divergence

Technological convergence was first acknowledged to take place in the context of the Industrial Revolution in England (Rosenberg, 1963)[11]. In that break – through context of systemized resource exploitation and goods production, it was then when the premature machine tools production industry set roots and started to shape boundaries and develop distinct segments. In the course of the following "technological" eras, those segments expanded and consolidated to independent industries that were in turn segmented to new ones though numerous product, innovation and industry lifecycles (Christensen, 2010). The dynamic, boundary – eroding activity that is realized at the intersection of established and clearly defined industry boundaries, is defined by Hacklin as the *phenomenon* of technological convergence (Hacklin, 2008). Lind, had earlier adopted a similar definition, which took its angle mainly on the industry and market restructuring dynamics that took place when and where hitherto separated markets started to merge (Lind, 2004). Both the aforementioned definitions trace back to Nichola Negroponte's early conceptual illustration of media convergence in 1979 as intersecting market / industry circles[12]. Later on, Kim T.-h et al, in the course of a systematic attempt to study the phenomenon of technological convergence through the lenses of various empirical settings and to develop scientific technology convergence evaluation and measurement tools, drew on the plurality of the modern technology convergence definitions (Kim et al. 2010; 2011) and argued about a second, core, "academic" view of convergence in addition to the aforementioned, industry merger principled, prevalent "industrial" one (Sung, Kong and Kim, 2011). According to Kim et al. (Sung, Kong and Kim, 2011), the academic world views technological convergence as a phenomenon of technological innovation that allows room for interaction between dissimilar circles, such as technology, policy, market, services and so on[13], a definition that is closer to Kodama's standpoint on technological convergence as expressed in his study of the techno paradigm shift in the Japanese industry (Kodama, 1991).

Our review of the literature so far clearly indicates that all the legacy and modern definitions of technological convergence that are articulated in academic and industry research works and that are cited in public domain dictionaries[14], are plenty and are all either attempts to narrow and refine the "industrial" and "academic" definitions or specialized conceptual interpretations of their combination. It is our belief that Nicholas Negroponte's capture as shaped in Hacklin's work (Hacklin, 2008), vague as it may be, is the definition that manages to encompass the phenomenon of technological convergence at its entirety. The

[10] Chapters 2 and 9 in Hagedoorn (1994) contain an early analysis of the techno - economic effects of the convergence and divergence phenomena in the international IT industry. Bird A. and Kotha S. (1994) attempt a systematic approach of the convergence – divergence debate through the glance of the, top – notch at that time, U.S. and Japanese manufacturing technologies, while ten years later, in 2004, Braun (2004) issues the same study through the perspective of Japan's and Switzerland technology policies.

[11] As cited in Kim et al. [Ed.], 2010.

[12] As cited in Wirtz, 2001 and Appelgren, 2004.

[13] Raj and Periasamy (2011) study the convergence between the enterprise architecture model and the technology of cloud computing whereas Mietzner, Karastoyanova and Leymann (2009) set out an in – depth study of the web service platform and the grid technology. Yovanof and Hazapis (2008) and Shin et al. (2011) profile the pervasive contemporary convergence trend among technologies, services and business models.

[14] The Cambridge Dictionaries Online cite that "If ideas, interests or systems converge, they become more similar to one another". The Concise Oxford English Dictionary describes *Converge* as "come together from different directions as eventually to meet". Wikipedia defines *Converge* as "the coming together of at least two things" and *Convergence* as , among others specialized definitions, "an act of becoming more alike as a relationship progresses".

acknowledged vagueness can be attributed to the complicated dynamic nature of the phenomenon rather than to a weakness of the definition itself. Accurate as they may be within their own lenses, all other definitions focus on specific angle aspects of technological convergence such as the drivers, the realization processes and the effects (Wirtz, 2001)[15] but fail to capture its full picture. A realization of this is also expressed by Yoffie, who positions industry convergence at the point in the industry lifecycle where formerly separated industries come together to give birth to a new industry creating new opportunities and economic ambiguities, while at the same time, he uses the innovation perspective to identify two distinct kinds of the phenomenon[16]. Notwithstanding the completeness of the description, the adopted inclusive definition of technological convergence is also expected to help us deal with one of the research challenges that is the plurality of the interpretations and perspectives of the phenomenon itself.

Technological divergence can be interpreted essentially as being the opposite of technological convergence. Merriam – Webster online dictionary's definition of *Divergence* as a "drawing apart", a "deviation from a course or standard" and the "acquisition of dissimilar characteristics by related organisms in unlike environments"[17], can be, similarly to technological convergence, depicted as a phenomenon evolving in an "industrial" or an "academic" context (Chen and Liu, 2006). The plurality of the definitions, reflections and interpretations of technological convergence and technological divergence is evident in the modern academic and industrial related research (Sung, Kong and Kim, 2011; Lind, 2004) and attests to the scientific interest of both phenomena; however, it is not of the essence for the research set forth hereinafter. Drawing on the aforementioned, inclusive description of both phenomena we shall be examining the dynamics, the associations and the causal relationships that are seeded by the acknowledgment that both technological convergence and technological divergence can be intentful business orientations, at a microscopic or a macroscopic scale.

2.2 Legacy and contemporary technological convergence vectors and components

There is a significant trend among the technological convergence related research efforts to kick – off by attempting to identify the vector – industries that are either constituting or catalyzing the phenomenon. Wirtz (Wirtz, 2001) and Appelgren (Appelgren, 2004) refer to Negroponte's original suggestion of a convergence trend among three primary overlapping industry circles: the broadcast and motion pictures industry, the print and publishing industry and the computer industry. In the same vein, Lind has slightly updated Negroponte's early visionary illustration structure profiling the computer, telecom, media and consumer electronics as the prevalent merging industries and also suggests the conformance of the technology convergence phenomenon to the Hype Cycle model[18] (Lind, 2004). Jones (Jones, 2007) and Jin et al. (Jin, Park and Pyon, 2011) adopt a more extroverted view, studying the convergence among the nanotechnology, the biotechnology and the information technology industries whereas Curran and Leker have extended their study to cover the convergence between the nutraceutical and functional foods (NFF) and the IT industries (Curran and Leker, 2001), covering all the components of the NSF (US National Science Foundation) converging technologies report's NBIC (nano – bio – info – cogno) model[19].

2.3 Typologies of convergence

At a microscopic scale, two types of technological convergence are identified in the eye of the phenomenon of technological convergence on the basis of the added user – end functionality value; which can be also identified as the innovation driver: the convergence *in substitutes* and the convergence *in supplements* (Greenstein and Khanna, 1997[20]). Greenstein and Khanna's initial model has been widely

[15] Wirtz (2001) identifies innovation, market evolution (as expressed in the user requirements and standards) and the regulatory regime as technological convergence drivers rather than technological convergence instances.
[16] Yoffie distiguishes two types of industry convergence, the convergence in substitutes and the convergence in complements, on the basis of the intended functionality driver (Yoffie, 1997).
[17] http://www.merriam-webster.com [10.06.2012]
[18] The Hype Cycle model is a model developed by the IT analyst firm Gartner to represent the maturity, adoption and social application of emerging technologies [http://en.wikipedia.org/wiki/Hype_cycle, 28.09.2012]
[19] As cited in the research report issued by the Government of Canada, Science and Technology Foresight Directorate Office [19].
[20] In Yoffie, 1997.

accepted by researchers and has been further elaborated with the introduction of a second *Demand - side* and *Supply - side* technology convergence dimension by Pennings and Punaram (Pennings and Punaram, 2001) which was later on evolved to *Technology - based* convergence versus *Product – based* convergence by Stieglitz (Stieglitz, 2003).

Under a different yet still introverted scope, the European Union presented four levels of convergence: the convergence of technology and network platforms, industry alliances and mergers, convergence in services and markets and convergence in policies and regulations[21] (COM(97)623, 1997). The Swedish government launched a similar approach in 1999, pointing out the four levels of market, electronic appliances, networks and services convergence (SOU 1999:55)[22] whereas, in the same vein, the World Bank (2010) identifies three primary types of technological convergence: service, network and corporate convergence. It becomes clear that at the policy – making level technological convergence is specified by the respective enabling means. According to the authors of this article, the convergence of core technologies remains an integral level of the aforementioned policy – making level taxonomy and a primary means of technological convergence in all cases.

Drawing on the inevitable interaction of the above macroscopic and the microscopic dynamics, recent academic research is also studying the convergence between dissimilar vectors such as regulation and business models, core technologies and services, access network and core technologies, markets and policies and so forth (Sung, Kong and Kim, 2011), adding a third dimension in Stieglitz's two dimensional evolved model of technology – based and product – based convergence (Stieglitz, 2003).

2.4 Global centers of related scientific activity

Even though the phenomenon of the technological convergence and the associated causal relationships and dynamics in the ICT industry and specific segments of the latter have drawn the scientific interest of institutions, organizations and researchers world – wide during the past decade, our study so far, clearly profiles Korea and the Scandinavian countries, as areas with high relevant scientific interest over the same period of time. This can be attributed to the advanced telecommunications industries and markets, a convergence – based business models dominated ICT segment, in those countries. Particularly, the Danish Research Unit for Industrial Dynamics (DRUID) has organized a series of biannual conferences, where it presented, among others[23], a theory on the dynamics between technological divergence, technological convergence and the open innovation paradigm, an empirical analysis of the effects of complementary technological convergence on the existing Schumpeterian industry trajectories and a new framework for a *convergence lifecycle model,* on the basis of the legacy industry and product lifecycle models, where patterns of a convergence – divergence sequence are suggested (Castellacci 2006, Christensen, 2006; Christensen, 2008[a], 2008[b]; Christensen, 2010). Aalborg University's Center for Network Planning has foreseen and attempted to high – level model a converged global ICT infrastructure (Madsen, 2006), while Bengtsson and Johansson (2011)[24] have tried to address the challenges faced by firms in converging industries. Braek and Floch (2005), Steen (2009) and Iden and Methlie (2012) based out in the Norwegian University of Science and Technology, the University of Oslo and the Norwegian School of Economics and Business Administration are examining the drivers of technological convergence in the context of next generation telecommunication markets and services. Still in Scandinavia, Palmberg and Martikainen (2006) and Karvonen and Kassi (2011; 2012)[25] are examining the convergence – divergence dynamics of the domestic telecom industry and are launching a patent – based analysis of technological convergence respectively.

In the Asian region, Korea seems to have the lead on the technological convergence related scientific and academic research. Yeon and Hwang (2011), based at the Korean Electronics and Telecommunications Research Institute, have systemized a digital convergence maturity model. In the same research organization,

[21] As part of an attempt to analyze the developmental gear of IT convergence.
[22] As cited in Lind, 2004.
[23] A full list of the conference papers, working papers and other resources presented by DRUID can be downloaded from the Unit's website: http://www.druid.dk.
[24] Department of Entrepreneurship, Umea School of Business, Umea University, Sweden.
[25] Karvonen and Kassi are based at the Department of Industrial Management of the Lappeenranta Unievrsity of Technology in Finland whereas Palmberg and Martikainen are Associates at the Research Institute of the Finnish Economy.

Bae and Kong (2010), Sung, Kim and Kong (2010; 2011) and Shin, Kim, Ryu and Park (2011), in partnership with domestic Universities, have articulated a qualitative meta – analysis of the convergence activity in the ICT sector, have studied the case of cloud computing as a convergence indicator, have suggested a business model development framework for next generation mobile convergence services and have also used a patent citation analysis to evaluate technological convergence citing Curran and Leker (2010). Hur W. M. from the School of Business Administration of the Pukyong National University of South Korea, in cooperation with Yoo J.J. ad Chung T.L. from Baylor and Iowa State Universities (Hur, Yoo and Chung, 2012) have published the analysis of the convergence products from the consumer perspective, whereas Jin, Park and Pyon (2011), based at domestic Universities, have identified research trends of convergence technology based on the Korean R&D network. Still in Korea, Al-mutawkkil A., Heshmati A. and Hwang J. (2009), Kim D. (2011) and Shin D.H. and Jung J. (2012) have published the results of specialized researches on the convergence dynamics of the telecommunications and broadcasting markets.

However, US, Italy, Spain, China, Australia, Germany and Switzerland – based researches have also shed light to some of the most important theoretical vectors of the technological convergence phenomenon[26]. Among the industry players with relevant work, British Telecom and IBM are also highly ranked, having issued technology convergence related studies, from their respective perspective of interest (Jones, 2007; Harishankar, Holley, High, Sanz, Giesen, Daley, Ibrahim, Antoun, Botros, Hamid and Vaidya , 2010).

3. RESEARCH PROBLEM AND RESEARCH OBJECTIVES

Our in – depth review of the legacy and the contemporary technology convergence and technology divergence literature, our careful identification of distinct trends in the business landscape as well as our study of the historical evolution of both phenomena has stimulated the following questions:

Research Question 1 (Q1): *Are convergence and divergence related to the organization's performance in the ICT sector*? Does the high market segmentation that is associated with the intense diversification threaten to exhaust the market's capacity and therefore compromise the organization's performance? On the other hand, could the same result be effected by extended periods of technological convergence that would drive the market to inertia? What are the other factors that are affecting the convergence – business performance and the divergence – business performance relationships in the technology markets?

Research Question 2 (Q2): Are the phenomena of divergence and convergence bundled in a recursive model within the ICT industry? The results of our research so far clearly indicate a sequential relationship between technological convergence and technological divergence (Hacklin, 2008; Christensen, 2008[a]). Can this sequential relationship, within the ICT industry, build an evolutionary, deterministic, recursive model in the course of the industry and product market lifecycles?

[26] The School of Management of the University of Canberra, the Graduate School of Business of the Curtin University of Technology in Perth, Australia have studied the alliance dynamics during the industry life cycle emergence and the potential for ICT – empowered emerging markets (Rice and Galvin, 2006). The Universities of North Dakota, Nebraska – Lincoln, East West Center - Hawaii, the Kellogg School of Management of the Northwestern University and the Open Technology Initiative Division of the New America Foundation in the USA, as well as the US – based World Bank have issued studies on the strategic, the development and the performance implications of the technological convergence phenomenon (Jussawalla, 1999; Menon, 2011; Langohr, 2003; Jeon, Park and Digman, 2008). The University of Finance and Economics and the Audit University of Nanjing in China has applied an input – output analysis to measure the convergence of China's extended ICT industry (Xing, Ye and Kui, 2011). Researchers from the Swiss Federal Institute of Technology and the University of Lausanne in Switzerland, have investigated the evolutionary aspects of the divergence and the technological convergence phenomena in the ICT industry context (Hacklin, Marxt and Fahrni, 2009) and have also narrowed a relevant research in the empirical setting of Switzerland's and Japan's science and technology policies (Braun, 2004). Bores, Saurina and Torres (2003) in the Departments of Economics and Industrial Engineering of the University of Girona attempted a thorough analysis of the strategic perspective of the technological convergence while, in Spain again, Gutierrez and Perez (2009) examined the convergence of emergent technologies for the digital home of the future. Last but not least, a number of German Academic Institutions have articulated study reports on particular contemporary ICT convergence paradigms (Mietzner, Karastoyanova and Leymann, 2009; Tiwari, Buse and Herstatt, 2006; Jarke, 2009; Motanga, Bachmann and Magedanz, 2010), on the structure of the competitive environment of the convergence – oriented telecommunications companies (Wulf J., 2011) and on ICT convergence monitoring tools (Curran and Leker, 2010).

Research Question 3 (Q3): *How should organizations plan their strategic positioning within the divergence - convergence recursive model in the timeline?* On the basis that technological convergence and technological divergence can be intentful business orientations, namely business strategies, is the reactive approach the most strategic way to plan business in the ICT industry in the course of the divergence – convergence recursions or could there be a more proactive approach that would leverage the recursions of the phenomena to the organization's benefit?

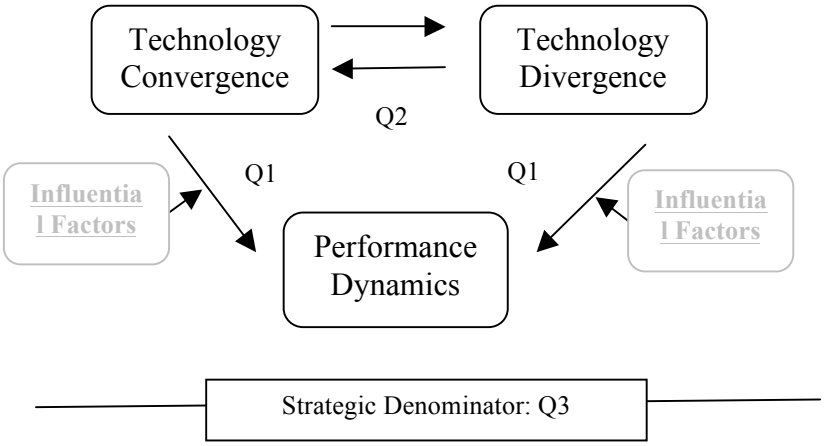

Figure 1. The research variables

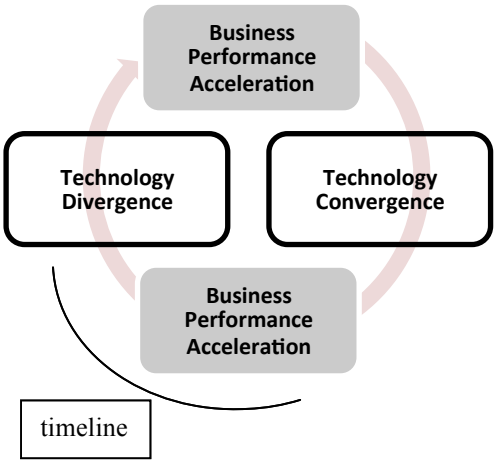

Figure 2. The scientific problem

4. CONCLUSIONS – FURTHER STEPS

In an attempt to methodize the scientific approaches to the phenomena of technological convergence and divergence it becomes clear that there is a significant amount of literature dedicated to the developmental[27], the evolutionary[28], the innovational[29], the strategic[30] and the regulatory[31] perspective of the phenomenon of technological convergence primarily and technological divergence in relation to the former. Efforts to establish evaluation metrics and frameworks so that the phenomena can be monitored and assessed through

[27] Kolko (2012), Jussawalla (1999), Hagedoorn (1994), James (2003), Braun (2004), Menon (2012), Kim (2011),
[28] Hacklin et al. (2009), Christensen (2006, 2008[b]), Stieglitz (2003).
[29] Hacklin (2008), Matrix (2011), Wirtz (2001).
[30] Hacklin (2008), Bores, Saurina and Torres (2003), Tiwari, Buse and Herstatt (2006), Palmberg and Martikainen (2006), Jeon, Park and Digman (2008), Greenstein and Khanna (1997), Pennings and Puranam (2001), Wirtz (2001), Wirtz et al. (2007).
[31] Matrix (2011), Singh and Raja (2010), Stazi (2007), European Commission (1997).

the course of their various stages and so that their results can be quantified and studied are also indicative of the progress of the related research activity to an early maturity phase[32]. Whereas there exists broad literature acknowledgment of technological convergence as an opportunity for business innovation and repetitive references to the effected business strategy implications, the association between the phenomena of technological convergence and divergence and business performance management needs additional exploratory, explanatory and rationalization research since it appears as a rarely systemized and modeled subject.

4.1 The research design

Similarly to relevant studies (Hacklin, 2008), the methodology of constructivist grounded theory is planned to be deployed as the most appropriate approach to the challenge of combining existing theoretical vectors to build a new theoretical model that shall address our research questions and that shall depict and interpret the recursions of the identified and described technological convergence and technological divergence phenomena and their interacting internal and external processes (Glazer and Strauss, 1967; Strauss and Corbin, 1994; Morse, 1994; Schwandt, 1994; Charmaz, 2006; Egan 2002). The empirical setting of the interactive TV market has been selected as a typical case of a high - velocity, mature, convergence – wise, IT business landscape (Slot, 2007; Matrix, 2011; Stobbe and Just, 2006; Schuurman et al., 2010,2011; European Commission, 1997, Appelgren, 2004; Iden J. and Methlie; Kim, 2011; Menon, 2011; Wulf, 2011; Shin et al., 2011; Shin and Jung, 2012; Tadayoni, Henten and Skouby, 2008; Sterling, O' Brien and Bennett, 2009; Shvartsman; Chen and Watanabe, 2006; Turina et al., 2009; Prario, 2007; Zhang and Zhang, 2010; Kung et al., 1999), where the original Negroponte's converging industry circles yet overlap [33] fueling convergence trends among mature and emerging products, technologies, markets and business models (Hacklin, 2008; Hacklin et al., 2009; Yoffie, 1997; Bores, Saurina and Torres, 2003; Stieglitz, 2003; Sung, Kong and Kim, 2011; Gutierrez and Perez, 2009; Motanga, Bachmann and Magedanz, 2010; Tiwari, Buse and Herstatt, 2006; Tranchita et al., 2010; Motanga, Bachmann and Magedanz, 2010; Al – mutawkkil, Heshmati and Hwang, 2009). In this context, data shall be collected from multiple industrial case studies and literature and shall be coded and compared to induce the theoretical model that can be thereafter projected to the technology industry as a whole (Stake, 1994; Huberman and Miles, 1994; Yin, 2008; Jones and Alony, 2011)[34]. The particular research methodology and design have also been intently selected to address the challenges of the complexity of the involved theoretical grounds, the diffusion of the associated terms and definitions and the variations in the various scholar's perspectives that are inherent to the nature of the investigated socio – economic phenomena of technological convergence and technological divergence (Charmaz, 2006).

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[33] As cited in Wirtz, 2001 and Appelgren, 2004.

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