IT-FACILITATED INDUSTRIES AND COMPETITIVE SPACES: THE DANCE OF THE ELEPHANTS

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ABSTRACT

Something very interesting is happening in the information-technology (IT) facilitated global economy: companies in industries that were previously quite separate are now rapidly converging on the same competitive spaces. This is resulting in a 'dance of the elephants – firms such as Amazon, Facebook, Google, eBay, Apple and Microsoft, that did not even exist 30 years ago or were a small start-ups and quite agile, have become large and increasingly hobbled in their agility by the sheer size and scope of their products and/or services. The intent of this paper is two- fold: (1) to try to identify the forces behind the convergence of these once largely noncompeting firms (with some obvious exceptions in some segments of their businesses such as Apple and Microsoft in operating systems), and (2) to show how developments in the field of interaction design, and in particular, design thinking are facilitating or hindering this convergence process.

KEYWORDS: Exploration Strategies, Competitive Spaces, IT-intensive Industries, Industry Convergence, Technology Design, Design Thinking

1. INTRODUCTION

Information technology is one of the key enablers of renewed and sustainable economic growth. It has become an essential element of the infrastructure of competitive economies. IT no longer evokes images of supercomputers, or computers for that matter, but rather images of ubiquitous server farms and pervasive computing. The vision of Brynjolfsson and Hitt (Brynjolfsson & Hitt, 2000) has come true: *"As computers become cheaper and more powerful, the business value of computers is limited less by computational capability and more by the ability of managers to invent new processes, procedures and organizational structures that leverage this capability. As complementary innovations continue to develop, the applications of computers will expand well beyond computation for the foreseeable future."* Computational ability is indeed something very few think of these days.

The relation between economic growth of a nation and how close the nation is to the technological frontier was clear for a while. In (Acemoglu, Aghion, & Zilibotti, 2003), the authors have built on this relationship and analyzed a range of issues related to technological progress and economic growth. They conclude that economies that are far from the technological frontier, favor investment-based growth strategies, while closer to the frontier, the value of innovation based strategies increases. Cairncross (Cairncross, 2001) takes a different road, claiming that technology may accomplish one thing globally: it may reduce distances and enable truly global businesses, and ultimately, a true global economy. Technologies are, and will, continually evolve and improve, but they, according to Cairncross, were already at the beginning of this century good enough to enable speculations around their potential to influence whole economies and societies. The world is now networked, at least, physical and fiber-optic cables enabling digital data transmissions have been laid out globally. The digital divide at the very start of the 21st century was no longer based on access to the World Wide Web and, thus, to the information and communication technologies. Yet, some authors have claimed, see (Gurstein, 2003; Warschauer, 2002), that a more sophisticated divide, based on social inclusion and effective use of digital technology is still very real. While that remains true today, we also see a globalised economy finally beginning to emerge.

From our standpoint, we observe that something very interesting is happening in the information-technology (IT) facilitated global economy: companies in industries that were previously quite separate are now rapidly converging on the same competitive spaces.

In this paper, we try to identify the forces behind this convergence of these once largely noncompeting firms. In particular, we discuss the role of design thinking as one factor in this convergence.

Since this work is produced by authors working respectively in the fields of strategy and human-computer interaction, we have encountered many of the problems typical for multidisciplinary research. Multidisciplinary discussions are difficult, and this paper is a testimony to that fact. Our views in this paper are not yet entirely integrated and our discourse and methods are very different. Yet, some new insights have emerged and we hope that they will be of interest to the wider multidisciplinary community.

The paper is structured as follows: in section 2, we present thoughts on how design of technology and design thinking are important for IT-facilitated industries. In section 3, we look into factors that influence long-term success of such industries and provide some examples using large now well-known companies including Apple, Google, Facebook, eBay, Amazon and Microsoft – firms that dominate information, media, knowledge and other digital spaces. In section 4, we consider what happens when micro and macro-economic forces collide within the IT-driven global economy. Finally, we provide our conclusion.

2. DESIGN, DESIGN THINKING AND THE COMPETETIVE ADVANTAGE

By investing in human capital – a term which refers to the knowledge and the competencies of each employee in a comHuman-computer interaction is no longer a field whose main concern is the interaction between a human and a computer, with the goal of making a better fit between the two (Sharp, Rogers, & Preece, 2007). It is no longer simply about humans and computers; it includes interactions with ubiquitous and pervasive technologies. Ubiquitous technologies include all mobile and personal computing, such as tablets and smart phones. Pervasive, embedded sensor, technologies enable interactions with the environment, e.g. smart cards, light and sound sensors etc. Thus, in computer science and engineering, as well as in design-oriented disciplines such as the arts, architecture and the like, the field that is concerned with shaping digital technologies for the use by people, is referred to as interaction design. Interaction design focuses on a broader aspect of interaction, including the design of digital products, services, environments, ecologies and systems. As a discipline, it is relevant for all IT-facilitated companies, although they may differ in how it is applied within the company. For example, how Apple Inc. and Microsoft design their operating systems is in a stark contrast: while Microsoft makes good use of users' feedback and users' experience, Apple is secretive about how their products are tested and improved (Jobs, Press, & Press, 2011).

Personal computers, laptops and mobile devices are no longer novel technologies. People have learned how to operate them and are harnessing the power that these technologies give them. We are all becoming savvy users of digital technologies and to increasing degrees also demanding users. It is now not enough to own a piece of technology, it needs to be "cool" (Culén & Gasparini, 2012; Holtzblatt, 2011). The "cool" was suggested, see (Holtzblatt, Rondeau, & Holtzblatt, 2010), as a driver for design of innovative products. It implies that such innovative products provide great design, great user experience and great opportunities for creative usage. However, with this approach, the technology is placed in the center.

In (Wagner & Compton, 2012), the authors are looking the other way, placing people in the center and asking the question: How can we make people be more creative and innovative? A natural follow up question becomes: can creativity be learned? The later question is answered positively and authors state: *"The DNA of innovators might be considered a set of skills that are essential elements in design thinking"*. Design thinking, see (T. Brown & others, 2008), refers to a way of thinking which requires combination of empathy for the context of a problem, creativity in the generation of insights and solutions to the problem, and capacity to analyze and adapt solutions to the situated context.

Design thinking has recently been connected to the growth of innovation based economy (Tim Brown, 2009), design of leadership (Maeda & Bermont, 2011), knowledge (Rylander, 2009), and to the gain of a competitive advantage (Martin, 2009). The later explicates that in order to become a design thinker one needs a stance, tools and experience that facilitate design thinking. The stance is related to one's worldview and the role one has in it, tools are the mental models used to understand the world and organize thinking, while experience is needed for building of skills and sensitivities. In agreement with (Wagner & Compton, 2012), Martin states that everyone can work on becoming a design thinker, a keen observer and finder of opportunities for design that could help reduce complexities of large, global problems, often referred to as wicked problems. Kolko, see (Kolko & Austin Center for Design, 2012), provides an explicit relationship between design thinking and wicked problems : *"A wicked problem is a social or cultural problem that is difficult or impossible to solve for as many as four reasons: incomplete or contradictory knowledge, the number of people and opinions involved, the large economic burden, and the interconnected nature of these problems with other problems. Poverty is linked with education, nutrition with poverty, the economy with nutrition, and so on. … These problems can be mitigated through the process of design, which is an intellectual approach that emphasizes empathy, abductive reasoning, and rapid prototyping."*

Design thinking is also seen as fundamental for successfully addressing issues of sustainability (Bonn & Fisher, 2011; Dourish, 2010; Spangenberg, Fuad-Luke, & Blincoe, 2010). The sustainable technology design has become one of the major issues in the fields of interaction design. On one hand, one should design innovative technology; on the other hand, much of this activity is actually having negative influences on the environment through rapid prototyping and unnecessary uses of resources, with all the consequences

this may have, needed for design activities. Researchers within interaction design are trying to understand why we keep some things and discard others (Odom, Pierce, Stolterman, & Blevis, 2009), and asking questions such as: do we need all this technology? (Baumer & Silberman, 2011). Clearly, the "for profit" orientation of today's economy is not the best motivator for sustainable design. It is here that creation of more enduring values than profit is of large importance.

In conclusion of this section, we point out that some lines between interaction design, design thinking, innovation, leadership, knowledge and values have been established. This presentation is drawn only as a very broad outline, but hopefully it is sufficient to establish design thinking as an emerging factor in considerations of long term health of corporations.

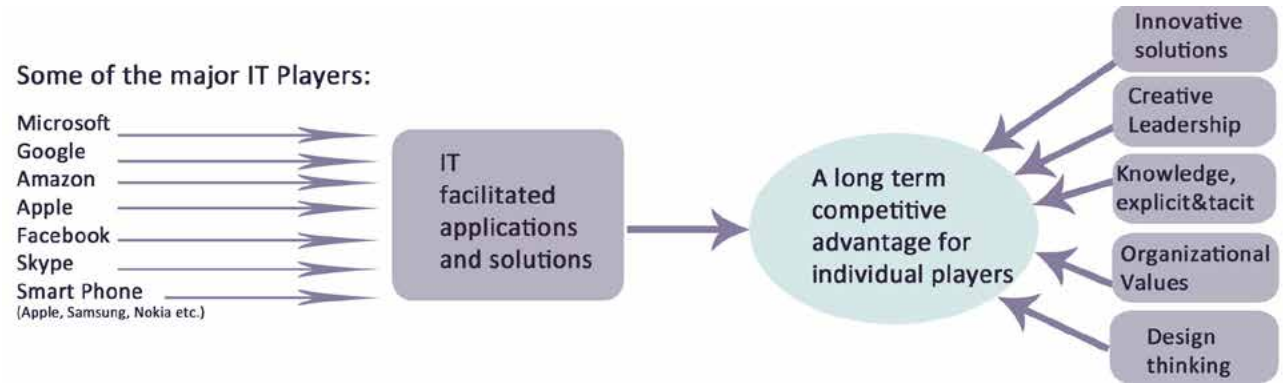
3. FACTORS BEHIND GAINING LONG TERM COMPETETIVE ADVANTAGE

uncertainty in the social and economic environments, increasing globalization and evolution in capability to use digital technologies effectively, it is of importance to consider factors contributing to the long-term health of corporations. Innovation, leadership, knowledge work, vision and values are all known to be factors influencing the long term health and effectiveness of corporations (S. L. Brown & Eisenhardt, 1997; Burgelman, 2002; Kriger & Hanson, 1999; Larwood, Falbe, Kriger, & Miesing, 1995).

Today's most influential IT players are those providing ubiquitous technologies enabling anytime, anywhere access to information and communication. Apple and other smart phone makers e.g. Samsung, HTC, Nokia on one end, operating systems producers e.g. Apple, Microsoft, Google (android) and Google, Skype, Facebook on the other, are examples of IT-companies who are major players.

Based on the discussion presented in Section 2, we propose design thinking as an important new factor for individual players to achieve a long-term competitive advantage. Figure 1 is a diagram showing the factors that are significant in achieving a long-term competitive advantage. The factors are not mutually exclusive; creative leadership may already be using design thinking, innovative solutions may be perceived as an end result of design thinking etc. The list not complete either, but we perceive the five factors provided bellow as the most important ones.

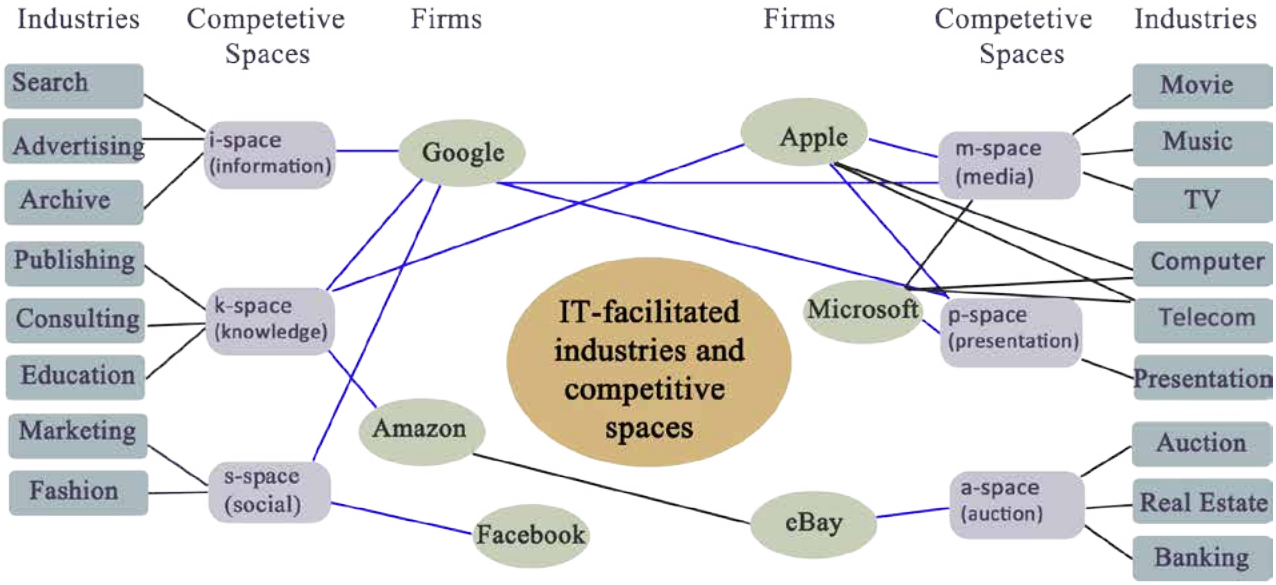
Figure 1: Technology, design thinking and open innovation have become important factors, alongside leadership, knowledge, values and others, in obtaining a long-term business advantage.



Source: Kriger & Culén

Some of these major IT-players, Amazon, Facebook, Google, eBay, Apple and Microsoft, did not even exist 30 years ago or were a small start-ups and quite agile. With time, they become large and increasingly hobbled in their agility by the sheer size and scope of their products and/or services. Until recently, these companies have been largely noncompeting, each dominating some digital environment. For example, Apple and Microsoft were developing operating systems, occupying digital presentation space (p-space). Google, started with search and advertising, thus occupying information space (i-space). Now, through its acquisition of the android operating system, Google is also moving into p-space. Facebook, as the largest social networking site, is now encountering competition from Google and Twitter in the social arena space (s-space). Figure 2 shows some of the salient competitive spaces.

Figure 2: IT-facilitated industries are seeking the competitive advantage by moving into variety of spaces, thus competing in the arenas they do not dominate.



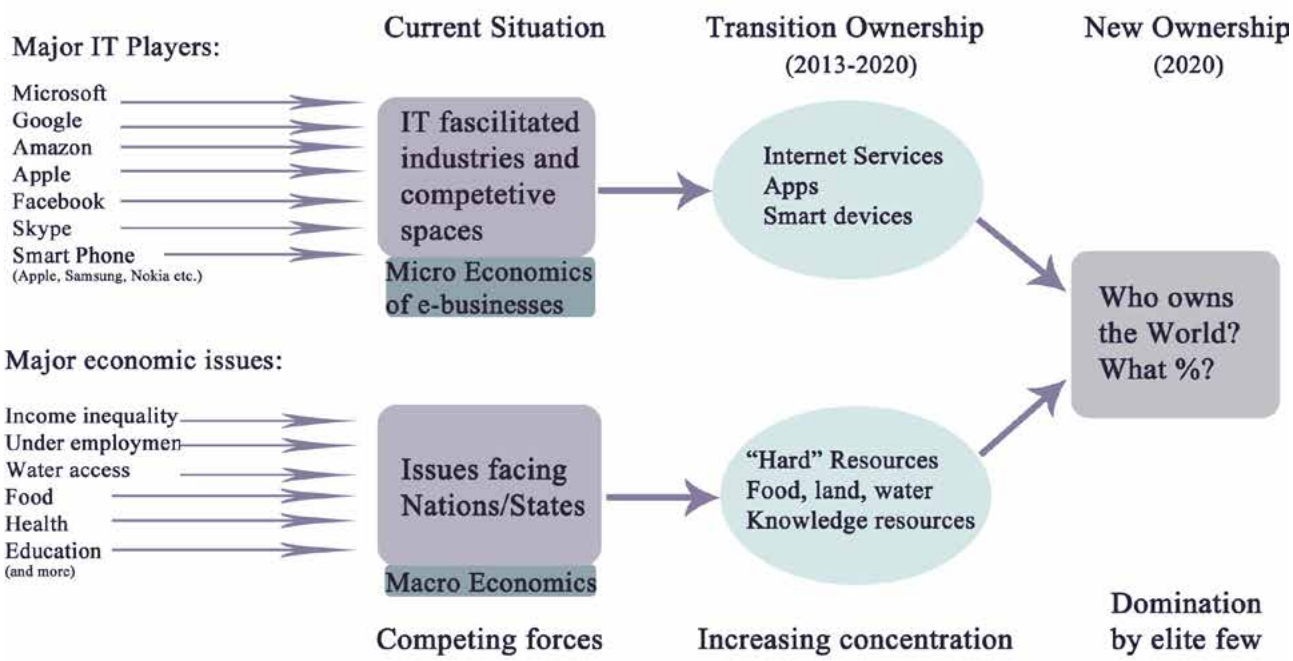
Source: Kriger & Culén

Increasingly we observe a collision taking place between the aforementioned firms and the overall macro-economic forces that are needed to create a healthy global economy. This is evident in the recently stated intention of Facebook, Google and other key IT players to get a smart phone into the hands of every citizen of the world. The financial advantages for Facebook, Google and Apple are obvious. However, there are currently over 4 billion people on the planet who do not have adequate water, shelter or food! To give them smart phones before such basic necessities is to create a potential moral and social tragedy. Some lessons pertinent to this goal of key IT-players could be learned from "one laptop per child" (OLPC) project, see (Kraemer, Dedrick, & Sharma, 2009), where various factors relevant for that project are discussed. Authors state: "The vision is being overwhelmed by the reality of business, politics, logistics, and competing interests worldwide." Further, they note: *"However, it is also clear that the PC industry cannot profitably reach millions of the poorest children, so the OLPC objectives might never be achieved through the commercial market alone."*

Considering the historical development of the IT-facilitated industries and looking at the current situation, we observe currently competing forces among e-businesses at micro-economic level. At the same time, at macro-economic level, large and complex issues such as climate changes and hard resources e.g. water and food compete for attention of states and nations, see Figure 3. In the light of the above, we raise a question of what may happen when macro-economic forces collide with IT-driven world economy.

Micro-economic competitive forces seem to be creating opportunities that are obvious for incumbent IT players such as Google, Amazon, Apple, and Microsoft to invest in and to exploit. What is not so obvious is how the world's riches should be spent to create opportunities for all and for a decent standard of living of for the majority of the people on this planet, whether in the developed or the developing world.

Figure 3: What happens when micro and macro-economics forces collide with the IT-driven world economy?



Source: Kriger & Culén

The moral dilemmas facing the executives and shareholders of the major incumbent IT players, the 'elephants', is enormous. These dilemmas are further exacerbated by the increase of competition and social and technological aspects of 'clockspeed' that are arising on numerous levels of social and technological order. These factors arose in force beginning in the late 1990s but remain even more important to address in today's IT-facilitated global economy (Cairncross, 2001; Christensen, 1997; Gleick, 1999; Nalebuff & Brandenburger, 1996; Veliyath & D'Aveni, 1996).

CONCLUSION

In conclusion, awareness of the increasing convergence of IT industries and their relevance to macro economy is crucial. We believe that design thinking provides a major opportunity to apply original ways to address the social, economic, political, environmental, technological and legal challenges facing the under-classes of the world. Only truly creative out-of-the-box thinking by the 'creative class' will result in the possibility of adequate solutions for the long term of both society and individuals in all spheres.

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