

IJER © Serials Publications
11(2), July-Dec. 2014: 395-415
ISSN: 0972-9380

Impact of Innovation Capacity and Anticipatory Competence on Organizational Health: A Resource based Study of Nokia, Motorola and Blackberry

Hari A. P. Nair*, Subramaniam Sri Ramalu and Dileep Kumar M.

***Abstract:** Analysts cite several reasons for the decline of Nokia, Motorola & Blackberry which include wrong product strategy, market mis-alignment, improper customer orientation, untimely investment etc. However, looking at from the Resource-Based View (RBV), the researchers identify few catalytic elements, which arguably augmented an unfavorable situation for these companies to be decimated gradually by the quick and the smart in the marketplace. The study was conducted through the analytical research of the literature available on the three companies. From the RBV perspective, the researchers identify Collective Competence Deficiency (CCD) as a common factor in the companies which resulted in decline of the organizational health. The study acknowledges the role of disruptive technology in making internal competence obsolete faster than the usual in Information and Communication Technology sector. The researchers further explore the moderating role of Innovation Capacity (IC) and Anticipatory Competence Building (ACB), in defining the degree of competence deficiency created by the fast changing technology. Through the case studies of Nokia, Motorola and Blackberry and from the content analysis of literature around technology companies, there emerge the measurement models of IC and ACB. Researchers consolidated 7 dimensions and 21 factors for IC and 6 dimensions and 17 factors for ACB. HRD practitioners and scholars should further explore these relationships, especially in the high tech industry sector where the competition drives out established companies from the marketplace for want of innovation and competence, a right mix of vitamins to maintain the Organizational Health (OH).*

***Keywords:** Competence deficiency, innovation capacity, technology obsolescence, organizational health, Nokia, Motorola, Blackberry*

1. INTRODUCTION

The all-pervasive and transcendental power of technology is fast bringing the winds of change across the world, empowering people to connect across borders and access

* Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia, Malaysia, E-mail: harinair_ap@yahoo.co.in

information with the tap of a finger. Technology is no more an option to the common man as it becomes one of the essential survival commodities of life. Such revolutionary changes are reshaping the talent landscape in technology based industries. Morrison, Pietrobelli, & Rabellotti (2008) noted that the world has been witnessing such rapid changes in technology in almost all walks of life. The critical skills required to maintain a particular technology today becomes instantly irrelevant and out of the critical list from the competency framework of those companies, leaving behind a profound gap in skill requirement, as a result of the changed technology environment. Such gaps widens over period of time, critically impacting the Organizational health.

The major aim of this study is to describe the issues related to competence deficiency in technology companies in last five years and to explore from the resource based view, the key reason for the downfall of telecommunication leaders, Nokia, Motorola and Blackberry.

Erstwhile chairman of Microsoft, Bill Gates once said that the average shelf life of any modern technology is 18 months. Competence depletion is a serious concern for technology companies as they grapple with the ever changing talent requirements to keep up with the technology demands. The consequences of the technological changes drastically and directly impact the Information Communication and Technology (ICT) domain more fiercely than any other sector. The Forbes list of World's most valuable brands published in 2014 features eight companies from the ICT sector in the top 25 list with collective annual revenue of \$884.5 billion. Majority of the technology applications are introduced to the world through these companies.

Motorola, Nokia and Research in Motion (RIM) were the three probable companies which could find place in the valuable brands list in 2014, had they managed to stay significant in the market. These ICT giants got washed away in the technological tsunami before even it could realize the speed and fury of the waves. Analysts who studied these companies cited lack of innovation as one of the common main reasons for failure. While discussing about fast occurring changes, Zhou and Li (2012) emphasized the importance of adaption to change by individuals and companies. They further reiterate that failure to adapt changes through the challenging environments will result in companies turning into dinosaurs of the century, and large number of employees turns obsolete due to the lack of skills to compete in the changed business scenario. This exactly has happened to Motorola, Nokia and RIM.

2. RESOURCES BASED VIEW

The field of study of the firm, Resource-Based approach (Resource Based View - RBV), which proposes to enhance the internal attributes of the company as source of sustainable competitive advantage, has been elaborated by Foss (1998). From the perspective of Foss, human resource is the most superior among the business sources

in an organization. Although these concepts have been proposed in the late 1950s, it was only in the mid-1980s that were actually seen as a strategic alternative for companies. Foss and Knudsen (2003), proposed an evolutionary view, which influenced the whole neo-Schumpeterian thought, revaluing the contributions of scholars on competitive advantage thus far. There is a concern to formally define which the resources are, but it is clear that besides the tangible assets already mentioned by Barney (1986), it is also important to consider intangible assets, primarily by its emphasis on technology as an important factor in the company's strategy. In the early 1990s, new studies within the RBV were published. These authors developed the idea of core competence, currently a widespread and somewhat trivialized concept. Despite the wide acceptance of the RBV approach, there is still a great debate on the terms and concepts used over time by different authors. There is still no consensus on what is considered an asset of the firm, because some authors rely on a narrower view, while others consider it a broader concept as done by Collis (1994).

Hamel & Prahalad(1994)included the analysis of the core competencies into the competitive advantage model by identifying the distinct intrinsic competencies which make the organization so different from the rest in the competition. Teece (1998),concerned about the sustainability of competitive advantages based on resources of the firm, proposed the concept of anticipatory competence. The term anticipatory refers to the ability of the firm to foresee the future competences to face changes in technology and business environment. The "dynamic capabilities" are somehow "driving skills", renewing the competitive advantages of firms in dynamic environments. In this article, the terms "competence" and "capacity" are used interchangeably, as synonyms as used by Abbot (2013).

3. COMPETENCE DEFICIENCY DUE TO DISRUPTIVE TECHNOLOGY

Scarce resources and the cumulative nature of technological know-how of the company emphasize the need to define a strategy to expand the content of existing technologies and to access and absorb emerging technologies at minimal cost. For a company operating in ICT sector, technology strategy and the competence development around the anticipated technology is a central pillar of competitive advantage. With this, business strategies and technology become increasingly interdependent, while the formulation of technology strategy shall have to consider internal and external aspects of the firm. This means that companies are not entirely free to define their technology strategies (Fitzpatrick, 2011).

In this fast moving world, technological obsolescence is one of the most critical reasons for competence deficiency in technology companies. In the process of choosing a technology, and analyzing the characteristics of the technologies available, it is necessary to analyze its obsolescence (Fitzpatrick, 2011). In the ICT sector, nothing but technology obsolescence is the only constant factor. The obsolescence

caused by the emergence of disruptive technology can make the products unprofitable; for the development of knowledge that enables innovations in production processes; for changes in the economic structure associated with the scale of production; the availability of resources, or a combination of these factors (Clavareau & Labeau, 2009).

According to Tidd & Bessant, (2011), obsolescence sometimes is associated with the age of technology. This concept is more related to the efficiency of a technology and its incompatibility with the social and environmental context. For example, diaspora of disruptive communication technology (2G, 3G, LTE etc.) has made the related technologies obsolete abruptly. To stay compatible with consequent changes, sporadic innovations around the family of technologies need to be galvanized. One of the negative signs of competency deficiency in ICT companies is their technological dependence. The choice of technology is a process that depends on the characteristics of the set of efficient technologies available in the market, economic and social conditions in the country that requires technology, the technological system in use (Wright, 2011). Table 1 explains the related family of competence affected due to the change in any of the ICT technologies (e.g. 3G to LTE) in ICT.

Disruption can actually occur for technical changes incorporated into new technologies which makes them more efficient and productive or also by changes in the economic system. These changes make obsolescence in some circumstances not inherent in the technology itself, but are derived from its relationship to the economic environment or technology package that uses it. According to Pangburn & Sundaresan (2009), the market may demand a product design and quality by individuals who can no longer be satisfied with the obsolete product. The sources of this obsolescence depend on the nature of the product, whether it is an intermediate or final consumer product. Changes in intermediate products of an economic system are due to technological changes in the specific system in use. By contrast, changes in the demand for final consumer products depend on changes in consumer tastes, which are the consequence of changes in the levels and distribution of income, promotion of products and technical changes incorporated into them for fresh purposes. For example, Apple uses proprietary software on its series of devices, which is the primary selling point for the company. The characteristics of ICT industry demands continuous innovation, which resulted in accumulation of patents in companies like Motorola in the last two decades.

4. VISION FOR FUTURE COMPETENCE

Research by Ovum in 2013 estimated that there would be 3.9 billion active mobile phone users around the world in 2014 with an estimated Compounded Annual Growth Rate (CAGR) of 3.4%. The CAGR for the mobile phone users in Asia Pacific region is expected to be at 4.6%. According to the global mobile penetration data, every alternate person on earth uses mobile device to communicate or do business.

Table 1
ICT Competence Umbrella

<i>ICT related Technology Area</i>	<i>Related Competence</i>
Access and software	Access to internet through mobile
Accessories	Phone, computer and device accessories
Advertising	Internet based mobile advertising
Application store/portal	Portal development and content. HTML5
Chip Manufacturing	Smaller sized higher magnitude chips
Cloud applications	Storage, application management, ERP etc.
Communications	Voice, data and IP based communication
Customer Service	Value added services to enhance customer experience
Digital services	Life sciences, banking, business applications etc.
Education	e-learning and content activities
Gaming	Mobile gaming console
Healthcare	Integration of healthcare facilities through internet
Infotainment	Entertainment through mobile applications
Internet	MPLS, IPLC, Broadband, wireless, Bluetooth etc.
Internet Security	Data and device protection
Location-based services	Tracking and proximity marketing
Mobile apps	Host of specific and distinct services
Money	All type money transactions over internet.
Operating Systems	Windows, Android, iOS
Personalization	Customised personal services and user profiles
Phone Hardware	Touch screen, glasses, fibre
Radio equipment	Fem-to-cells, antenna, receivers, decoders, MIMO etc.
Roaming	International alliance, handover etc.
Routers & Switches	Extender, enhancer, booster etc.
Services management	Virtual services, storage, data management etc.
Social networking	Access to profiles, networking and knowledge sharing
TV/video	Multi-screen services, content, recording etc.
Utility services	M2M services like infrastructure as service, SAS etc.
Virtual private network	Spectrum management
Wi-Fi	Last mile connectivity

Ever since Motorola introduced the first commercially viable mobile phone in 1973, the Information and Communication Technology (ICT) has been bringing in sweeping changes to every walk of our lives. For companies in this field, customers have outgrown each year and innovation has become the way of life for these companies. The all-powerful smart phones have taken over the world, collapsing geographical boundaries, making telecommunication instant and easy.

5. CASE OF NOKIA

For Nokia, this century ushered in with lots of hopes and opportunities in the smartphone markets. Led by its Symbian operating system, Nokia's market share grew to insurmountable levels to almost 38% of the worldwide mobile devices market by the year 2009. The impending competition from both low cost device and smart phone areas manifested itself as life threat to Nokia by the end of the decade. While low cost phone manufacturers swept the emerging markets, Smart phones from Apple & Samsung penetrated swiftly through the high end users. The blitzkrieg by the android and IOS gave new dimensions to the mobile operating systems where the innovation and creativity went boundless. With no reaction time available, Nokia could only witness its market share declining drastically over quarters. In the last five years, its overall market share dropped to 3%, according to IDC figures, while accumulated a debt of almost \$ 700 million by 2012, that solved by selling the property of its headquarters in Espoo, Finland.

The stronghold of Nokia's hand phone market started weakening by 2010, as the low profile manufacturers from the emerging world started mass production of low cost hand phones for the huge population of low-income groups. At the same time, there emerged the innovative ICT companies like Apple and Samsung with their groundbreaking technology applications on the smartphones, targeting high-end customers. Although Nokia was a pioneer in smartphone market already in the mid-1990s, its failure to anticipate the power of this technology in commercial applications and the dual competition enfiladed Nokia by surprise. The research and development team of Nokia was one of the finest in the ICT sector for decades. The company beheld immense innovation capacity to bring out cutting edge technology solutions in the communication field. However, Nokia's long standing self-orientation created barriers to adapt to the changing commercial technology landscape and the resultant demands from the customer. Anticipating the future competence needs to reshape the product lines in accordance to the changing environment is key to success for technology companies. The strength and competence of people make huge difference to companies in defining competitive advantage, as the innovation capacity is all pervasive and is accessible to all companies, however big or small. A similar dual challenge from low and high end chip manufacturers was experienced by Intel in the late 1990s, however the power of its internal competence allowed the company to quickly re orient to market conditions.

6.1. Innovation Capacity

Singhal (2013) observed that Nokia failed to sustain its technology innovation over the last decade, which eventually attributed to its decline. He further opined that the company did not make wise and timely investments in R&D and people to ensure the internal collective competence is up to date to adjust to the frequent and inevitable technology obsolescence in the ICT arena. Any technology changes in one part of the

ICT eco system can impact several other parts of this inter related system such as operating systems, mobile application space, communication equipment, generations of telecom technology, handphoned hardware, chips and a host of other related areas. When dealing with frequent technology obsolescence, a firm needs to be ready for massive competence upgrade in the core change area and other related areas as well. This explains the reasons for erosion of Nokia's internal competence. Concurrent engineering as explained by Poolton&Ismail (2000), is essential to keep the level of innovation capacity in a firm active over time.

Innovation capacity is the ability to see through future and reengineer products and services accordingly. This involves an element of risk, which needs to be calibrated to take appropriate investment decisions. Nokia, imprisoned by its own past success was more than complacent to calibrate any risk to invest into the unknown territories of smartphone market, notwithstanding the fact that it had already pioneered the smartphone manufacturing. Customer inputs define the central theme of any product strategy which was arguably sidelined by Nokia. It was very quick for the world to jettison the phones with voice-based hardware to transition into an era of smart screens with enormous internet based applications. Improvisation and experimentation need to be continuously enhanced in organizations to explore the untapped potential of internal ideas. The upgrade of technology has not only resulted a sudden depletion of existing hardware engineering skills within Nokia but caused substantial deficiency in the much required software programming competence also. Nor did these newly released phones entice the customer with their futuristic features, but they grossly disappointed the customer with its heavy hardware and an inflexible operating system. In nutshell, the creative potential of Nokia's enormous talent pool remained unexplored during the times when it was most wanted. While Apple and Samsung won over millions of customers through their touch screens and complimentary intuitive applications, Nokia stayed at the starting point continually losing customers to the west and east bound competition. Internet on the tiny screens in the pocket has enabled customers to raise the bar of their expectations. Technology orientation thus, is not only the adaptation of technologies but also the understanding of its business sense in line with customer expectations.

6.2. Lack of Anticipatory Competence Build up

Nokia is a classic example of an Organisation's ability to contribute to a nation's collective competence. The company remained a pride for Finland for many decades. Majority of Finland's technology patents were drawn out of Nokia's R&D teams, which now transitioned out, to Microsoft. This transition sure created an irreversible vacuum in Finland's technology innovation space. Redundant competence can be defined when the results of the work will be in vain. Thus, for example, Nokia's product development for the period 2002-2010 put in € 65 billion, which proved essentially useless sacrifice, because they produced Symbian's mobile expertise,

mobile software design and implementation, which eventually turned over to Microsoft windows. The estimated collective effort put in for building Symbian was 20,000 x 8 (persons x years), or 160,000 person-years were largely in vain.

Nokia's core competence was in hardware design and engineering. As the telecom technology progressed rapidly, the significance of software programs also increased substantially. A host of mobile application software, which were packaged with the new age operating systems, redefined the utility value of mobile phones converting the devices into a smartphones. For a user, the utility value is more important than the physical look and feel of the device. Nokia, for long time underestimated the importance of software applications. A large percentage of Nokia's employee base was hardware engineers. The changing technology environment demanded continuous upgrade of skills to match the newer requirements. Nokia not only failed to anticipate the requirement of software programming experts to enhance the capability of Symbian, but also profoundly missed the growing elements of telecom technology eco system. For example, Nokia instead of innovating the Symbian OS, tried imitating the user interface of android and iOS and rightfully failed to produce any impact in the marketplace. This was the major success factor for Samsung and Apple where Samsung's hardware engineering competence was rightfully supported and complimented by Google's software expertise and in case of Apple, the internal competence pool maintained a healthy mix of hardware and software skills. According to Mueller (2012), the development of Smartphones is equal and parallel to software and services. According to Tero Kuittinen, an analyst from Alekstra, Symbian had already been "obsolete" for years taking into account the needs of touch screen Smartphones. However, since 2005, Nokia hired about 2,000 people to develop MeeGo, a supposedly high-end operating system as a rebirth of Symbian. But the results were disappointing. Without a solid operating system, Nokia has collaborated with Microsoft and concentrated its efforts on its Windows operating system, very marginal in the international market dominated by Samsung (Android) and Apple (iOS).

Nokia's case proves the serious impact of competence deficiency and its consequences on firms and nations. The intensity of competence deficiency can be aggravated multifold by the depletion created by erratic technology obsolescence coupled with collective turnover. The firms can only contain such aggressive changes if and only if they correctly anticipate the impending competence requirements and enhance the internal innovation capacity. For Microsoft's Nadella, brining Nokia out of the intensive care unit in the near future is an ambitious target. However given Microsoft's incredible innovation capacity and the huge collective competence pool, it may be able to turn Nokia around to its golden years of market dominance.

6. CASE OF MOTOROLA

Motorola had a long and eventful innings of 85 years before it was sold out to Google in 2013. The company championed many groundbreaking innovations like FM radio, TV

tube, Chip design etc and remained a respectable global brand from the US. Motorola as a technology company was a major supplier of military communication equipment world over. Motorola's research lab witnessed landmark inventions, which changed the outlook of the universe. The major telecommunication research milestones from Motorola included the satellite phone, tri-band phone, GPRS, pagers and many more. No other company had such powerful core competence of radio engineering that Motorola held at one point of time. There were conscious efforts from Motorola to give academic focus to research and development. When social network was still in the conceptual stages, Motorola launched its first professional social network, iDEN.

6.1. Quick and the Dead of Innovation

Motorola could not catch up speed with the 3G as its partner carriers never felt the need of upgrading the eco system to the next generation. Motorola was moored into the 2G voice space despite having proven authority in communication technology. Before it could realize and anticipate the future, the new entrants had already grown up into big fishes.

In the US, Motorola held wide range of wireless spectrum at one point of time. Motorola could never anticipate the phenomenal power of spectrum in commercial communication space. It sold out the spectrum and then collaborated with the spectrum carriers to focus more on hand phone manufacturing. However its hand phones could not influence the customers for long except for a handful of versions. In a fast moving ICT industry, time is prime and losing that will put companies into irrecoverable situations, which exactly happened to Motorola. Companies should create continuous learning environment for the employees and customer experiences should be translated into everyday innovations in market place. Stop innovating and you sure cease to exist. Motorola's research process was slow and steady but was not commensurate with the speed with which the external world moved after the turn of the millennium. Innovation capacity in Motorola decelerated considerably and the huge collection of internal competence remained obsolete after the evolution of 3G technology.

6.2. Anticipatory Competence

Motorola attempted to jump into IPTV arena, but failed to make a mark, as the available internal competence was not adequate to carry out the content business. Motorola did not give much attention to anticipatory competence building. Today's customer expects the carrier to deliver integrated mobility instances through the smart phones. Motorola did not understand this concept at the beginning and its propositions were all remained in silos. For Motorola it needed herculean efforts to put together the warring factions of operating system, hardware, mobile applications, and internet and beyond 3G. It required much better understanding of the integrated eco system which was an unknown area for Motorola.

Motorola was shielded from the customers by the carrier operators. For long, the Silicon Valley Company's design strategy was centered around what the carriers wanted to be delivered to the customers. Its enviable research capability and internal competence were not optimally leveraged to bring innovations in hand phones designs. The company was more focused towards designing robust all weather radio equipment, ensuring quality of communication in difficult load and road conditions. When it comes to commercial products for large-scale consumption, Motorola missed out fashion, trends and applications. With its enormous in-house competence trained for six sigma quality and reliability, Motorola initially saw Nokia sweeping away its customers. A wave of innovation followed, first Blackberry making in roads and then Apple and Samsung with their new age smart phones.

According to Deemer, et.al, (2010) Motorola posted a profit of \$ 26 million (18 million euros), or 1 cent per share in 2009, in comparison to a loss of \$ 231 million a year ago. In 2010 Motorola's revenue fell 32 percent to 5.5 billion, compared to the average market forecast of 5.62 billion, according to Reuters Estimates. Motorola failed to adapt the prospective of customers. Its enviable patent portfolio is attractive to other technology companies eager to gain a foothold in the competitive world of smart phones.

Google has succeeded in many things. But the story of its entry into the mobile phone manufacturing is an unmitigated failure (Jackson & Sloane, 2003). The Internet giant announced the sale of Motorola Mobility, the mobile phone division of Motorola to the Chinese multinational, Lenovo. The price: just 23% of what Google paid for it just two and a half years ago.

Motorola, affected by a price war and lack of advanced models, suffered a negative balance from ongoing operations in the quarters of 2006 (Tagliavini & Pigni, 2012). Net sales of the company fell to 8.700 million, from 10.820 million earned in the second quarter of 2006. Motorola has been losing ground to its competitors, such as the market leader, Nokia, and Samsung Electronics, not being able to develop a new model with the same popularity as its star, the Razr phone.

7. CASE OF RESEARCH IN MOTION (RIM)

Blackberry, as it is fondly known in the market, was seen as a true research company with game changing innovations in mobile landscape. RIM ventured into the stronghold of wireless world with consolidated service offerings in hardware, software and airtime services. When it introduced the ground breaking Blackberry phone bundled with the most secured push mail access, the enterprise customers purchased them in bulk to ensure seamless cross functional communication (voice, e-mail and messages) through a credibly secure environment.

RIM initially marketed the BlackBerry as a working tool, which is connected to the internet. Easy navigation options in Blackberry allowed millions of people have access to email, calendar, contacts and messaging on a single device. BlackBerry

continued to release new products aimed at different market segments. For Blackberry, it was literally research in motion for many years until it was caught by surprise by the wondrous world of smart phones with amazing operating systems majorly led by Apple and Samsung. For long, Blackberry remained a revered communication device for corporate executives with its incredible safety features inbuilt.

7.1. Slow Innovation

Blackberry took time to realize the importance of design changes and operating system overhaul. When corporates started allowing configuration of official e-mails on their own devices, the significance of Blackberry suddenly spiraled down. Most of the companies adopted alternate and secured ways to strengthen communication device management within the firewalls of the company. This put an end to Blackberry's monopoly in the enterprise communication management.

Its enterprise push-mail service and messenger were global hits. BlackBerry Messenger was probably the best invention and applied as the best product for the end consumer who has left the company's technology. At one time, it was the answer for millions of people especially in third world countries where SMS were expensive and so became reliable, economical and easy to use service. There was a time when BlackBerry dominated the entire Latin American region where if one does not have a BBM PIN was considered a social qualifier to be included into communities. These messenger communities would be the ones hardly hit by the ill fate of the company. Innovation, stated though as the corner stone of RIM was missing continuously in many of the sequential releases of its umbrella brand Blackberry. While Nokia focused more on Hardware and overlooked the importance of software, Blackberry over focused on software putting enormous efforts towards the enterprise data security. The company did not realize that the customer had already walked ahead with the touchscreen devices and mobile applications where Blackberry was still grappling with its black and white keyboard. It is reported that the US president Obama is still carrying his signature Blackberry device as a symbol of presidential data security. When the new entrants shook the market place with highly innovative devices and integrated applications, RIM tried replicating the features but failed miserably to lose the existing customers to the competition soon.

RIM was not the only company offering something in the store (also Palm, one of the firms that have fallen into decline in recent years, had a racing BlackBerry device), but it was the first to do so with a small keyboard, with a screen that allowed read more lines and a master strategy (Abbott, 2013).

7.2. Competence Anticipation

Adaptability is a visible differentiating factor between the companies which survive the odds of the market and the ones not. It is very essential for ICT companies to be

adaptable when technology obsolescence is imminent. As mentioned before, the divisions in the company, accentuated by a very high growth, led to a lack of speed and adaptability that eventually left the company far behind their competitors. In 2009, two years after the launch of iPhone, BlackBerry still was on top of the world of mobile telephony. Its shares were trading high and were reckoned as one of the fastest growing ICT companies in that year. But the company's attempt to reach its competitors with a new touchscreen device (the Storm) was a failure (Abbott, 2013). BlackBerry's problem was not that there was an issue of adaptability, but it adapted late or incorrectly. BlackBerry's initial market focus was corporate and government sector, but was capturing retail consumers as they grew. At the rise of iPhone and Android, RIM lost market initially gradually and then steeply. In a desperate attempt to keep losing customers, the company lost focus, reneged on the fundamental characteristics that stood for (e.g. keyboard) and adapted belatedly incorporating features of its competitors. BlackBerry's attempted touch screen device was seen by the market as a mere copy of the iPhone, rejecting the product instantly. In technology, everything happens so fast. Just over three years ago, BlackBerry was leading the world of Smartphones and now the company is facing towards an uncertain future in the competitive landscape of mobile devices (Ang et.al, 2012). BlackBerry (before RIM) who a few years ago was the undisputed leader in Smartphones and mobile devices with permanent connection to the internet is now in serious trouble: their devices do not totally convince, do not sell enough, have lost a large percentage of share market but above all seem to have ceased to be relevant (Zielińska, & Zieliński, 2013).

BlackBerry had captured the majority of the Smartphone market that preferred to operate with a physical keyboard. Not everyone is ready or interested in virtual keyboards, not everyone finds it easy and there are millions of people interested in the feel of the keys when typing. During the 80s and 90s RIM pioneered the technological innovation in mobile devices leading to many of the features we experience today. Today BlackBerry is deemed as irrelevant, because customer do not experience even 10% of the applications that one can get on Android or iOS on a BlackBerry 10 device. Investment in technology rather than the user experience caused the BlackBerry Smartphone's grow obsolete so fast.

8. DECLINING ORGANISATIONAL HEALTH

By the end of the last decade, Nokia still dominated the market with a whopping 37% share of the 1.1 billion hand phone units worldwide. In India, Nokia enjoyed a massive 54% market share. Its powerful Symbian operating system faced no much competition for a long time until challenged by the Android and iOS from Google and Apple respectively. Nokia was up for a major shock treatment from these new kids on the block. In a short span, by the turn of the decade Nokia's market share in the US was pushed down to less than 10%. Its revenue started declining in all parts of the world. As it was sunset for Symbian operating system by now, Nokia went with

windows, assuming that it will rework the magic in mobile space as it ruled the world with its MS office suit. Lack of competition may be one of the reasons for Nokia to be complacent with Symbian.

One could never imagine that a company like Apple with less than 1% of the hand phone market share could take on a giant-sized Nokia, Motorola and RIM on their horn. Apple was adequately equipped with its incredible innovation capacity and anticipatory competence to shake up the traditional mobile phone market. These three companies witnessed abysmal decline of organizational health by the turn of this decade, which resulted in panic corrective methods like cost reduction, retrenchments, organizational restructuring and several other initiatives across the rank and file in the three companies.

Once globally respected ICT companies, reduced to mere existence by 2013 with the combined global mobile market share of less than 25 percent and their stock prices hit rock bottom. There are some critical comments from analysts on the appointment of a Microsoft executive as Nokia's CEO in 2010. Emergence of smart and quick ICT companies in the developing economy in the beginning of this decade has been closely monitored and discussed by Sánchez *et al.* (2007). Some of the old hands from Nokia acknowledged that the company failed to tap the opportunity in smartphones. Some critics still opine that Nokia could have re focused on its Symbian forte than going with windows. Even by adopting open source like Android OS, there could have been fair chance for Nokia to be in competition.

There was a time when Nokia alone enjoyed more than fifty percent of the global telecom business profit. This probably made the executives of Nokia to think that competition is non-significant and it will be forever. The race in store for Nokia, Motorola and RIM was fast and furious where the technology advanced much faster than the past. When the innovative products from Apple and Samsung delivered compelling value propositions to customers, these three companies were still figuring out a right device strategy. While they engaged the smart phone competition unsuccessfully, its lower end segment in predominant Asian markets was swept away by the likes of Huawei, HTC and Micromax. OH in these companies declined to irrecoverable levels.

9. DISCUSSION

Undoubtedly Nokia, Motorola & RIM once enjoyed dominant positions in the mobile phone market with trend setting technology innovations. Once they have started drifting away from the innovation and failed to anticipate the future, the scoop of its market capitulation was sudden and irrecoverable. The downfall of these incredible corporations would never have occurred in the wildest of a sensible analyst's imagination. As it says the unpredictable situations in a war can only be handled by a troop of well-trained warriors, Organizations can maneuver through such difficult

market conditions, if and only if the resources within are trained and prepared for future.

Though a convincing and strait answer to the failure of the companies discussed here can be attributed to the fierce competition from Google, Apple and Samsung and an army of low end market penetrators, the mystery still remains folded. Nordics fondly remember Nokia as an unquestionably adaptive company fielding successfully through a diversity of products over decades. For many of us it will be surprising to know that Nokia was the first company, which built the prototype of smartphone, including the touchscreen concept. Its massive and sincere R&D efforts remained within the walls of the company as it failed to connect with the market to translate into products and services. Like Nokia was for Finland, RIM was a symbol of national pride for Canada. RIM could transform Blackberry into an influential brand in communication sector.

9.1. Innovation Capacity is Key

Innovation is no more an option for technology companies as the customers expect them to innovate constantly. Inadequate innovation capacity and lack of anticipation of the future landed Nokia into fatal levels of organizational health. According Frohman (1985), technological innovation can “make or break profitability,” while Maidique & Patch (1982) stated that technological innovation is a “vital force in the competitive environment of the modern firm.” The challenges of the new millennium tend to further reinforce the importance of the technological aspect. Globalization, the reduction in life cycle of products and processes and technological convergence promote an ever-changing competition that companies are exposed to. The current competitive landscape makes companies coexist with increasingly complex organizational environments. This puts pressure on administrators to develop a set of skills to deal with the multiple variables that affect the strategic choices of firms (Ashington & Hardy, 2009).

Keeping the scholastic references on the importance of IC in technology based firms in context of the resource based view, the three case studies here reveal the below factors influencing the dimensions of *Innovation Capacity(IC)*.

9.1.1 Concurrent engineering: Poolton and Ismail (2000) explained that when members of cross functional teams engender a common objective for products, appreciate and encourage other’s view point, there emerges the real intrinsic capacity for innovation.

9.1.2 Customer research: While the idea of real life conversations between customer and the sales team was mentioned by Walker et al, (2002), they suggested deploying product designers with each customer domain to understand the finer aspects of market requirements. Leonard and Rayport (1997) further elaborated on customer centric designs developed out of the empathy from close interactions.

9.1.3 Improvisation: An organization which can still think even in the midst of action can really bring about sensible innovation capacity to the teams (Irby, 1992). Bjurwill (1993) argued that reading the customer needs and reaching out to the market are important parallel activities. Moorman and Miner (1998) further supported this point adding that improvisation is all about reducing the time gap between product planning and implementation.

9.1.4 Experimentation: An environment where rigidity of rules and procedures prevail cannot espouse innovation and experimentation, as per researchers in concurrent engineering (Poolton & Ismail, 2000). Freemantle (1999) believes that breaking rules and questioning the conventional wisdom are the harbingers of IC in an organization.

9.1.5 Creative Potential: Canfield and Miller (1998) while examining the IC of teams found that to develop a creative and committed workforce, it is essential for the managers to nurture interpersonal relationships which amplify team spirit. Tang (1999) in his Inventory of Organizational Innovativeness (IOI) model mentioned about resource and time requirement for generating business relevant ideas. With cross reference to the IOI model, Amabile & Grykiewicz (1989) further elaborated the IC with the requirement of diversely skilled workgroups and appropriate reward and recognition for creativity and innovation.

9.1.6 Technology orientation: According to Gobeli and Brown (1994), a firm's IC can be directly measured through the number of remarkable innovations the company rolled out in a specific period of time. To do this, they argue that it is important for companies to anticipate the potential of emerging technologies. Supporting this view point, Slade (2009) opined that a technology oriented firm will always be on the lookout for newer technologies and the smarter ones even acquire technology in advance of needs.

9.1.7 Competence management: The IOI model developed by Tang (1999) suggests that competence management is essential part of the IC and to do it so effectively it is imperative that organizations build up intellectual capital with upgraded skills and knowledge. Optimizing such intellectual capital is also very important to stay ahead in the market. Possibly Motorola with its immense intellectual capital failed to optimize it at appropriate time.

Table 2 gives a consolidated view of the IC with its dimensions and factors identified by various scholars in the context of technology companies.

At the center of these choices, increasingly clearly, it is to define an agenda of skills that allow the competitive insertion of the company, which almost always corresponds to a certain level of technological and innovative capabilities. Furthermore, the results of the innovative effort come to depend not only on the technological capacity (specific technical skills) of the firm, but also their organizational skills (internally Company) and relational (in relations between firms).

Table 2
Dimensions and Factors of Innovation Capacity

<i>Dimension</i>	<i>Factors</i>
Concurrent Engineering	New products as shared vision of teams Cross functional teams on a common thread
Customer Research	Real life conversations with the customers A product designer with each customer domain Empathic designs for customers
Improvisation	Able to think even in the midst of action Closer time gap between planning and implementation. Reading the customer needs and reacting out to the market
Experimentation	Relaxed rules and procedures Break rules and to abandon conventional routine
Creative Potential	Nurturing the relationship within teams Allocate adequate time and resources for ideas Diversely skilled work groups Reward and recognize creativity on the spot
Technology Orientation	Encourage remarkable innovations Anticipate the potential of new technologies Acquire technology in advance of needs Constantly thinking of new technology
Competency Management	Build-up intellectual capital Upgrade knowledge and skills Sharing and disseminating information Managing intellectual assets

9.2. Anticipate Future Competence Landscape

Identification of resources that will be a source of competitive advantage is not a simple task, since many of the characteristics attributed to them can only intuitively perceived. As a general definition, a valuable resource to contribute to the production of something that customer wants at a price they are willing to pay. Furthermore, the feature only provides a real competitive advantage if singular and hard to imitate. The approach of the firm based on the competencies leads to the understanding that the innovation effort of course implies not only technological expertise but also organizational skills (internally firms) and relational (in relations between firms). It is important to explain what is meant here by technological, organizational and relational skills (Clavareau & Labeau, 2009).

The technological capability includes both the existence of specific technical skills as technical skills of a more general character, associated with the ability to identify and implement innovations. In turn, the core competence of the firm depends on the internal capabilities of the firm to generate, acquire and internalize new knowledge.

These should lead to products, processes or applications that are unique to the firm, not necessarily for the market. Organizational and relational skills also make up the skill set for identifying and implementing innovation. It refers to the company's ability to make the existing knowledge effective for new processes, products or applications, contributing to their results. However, the notion of competencies is very rich and appropriate for understanding the dynamics of innovation in an environment focused on learning and knowledge creation; it seems that it is still problematic to accurately identify the skills in business management (Deemer, 2010).

Though competency framework is fundamental pre requisite in the talent strategy of Organizations, Anticipatory Competence Building (ACB) is a fairly newer concept which is being evaluated as a survival kit for technology companies. From the available discussions around this concept and from the case studies discussed here, the researchers have consolidated the below dimensions of ACB.

9.2.1 Future competence: The research studies by Corporate Leadership Council (CLC) suggest that future competencies, key competencies and right competencies are required to be identified and developed by the Organization.

9.2.2 Competence obsolescence: According to CLC report, identification of competencies includes the essence of segregating the obsolete ones due to technology changes. Obsolete competencies if not removed will burden the Organization with unnecessary effort and time on development process.

9.2.3 Technology research: Rosen and Jerdee (1985) acknowledged that setting up core research teams in the Organization can help improve the competence upgrade process. Investment in technology research in collaboration with the partner eco system can also give fillip to the ACB process.

9.2.4 Market orientation: Intelligence from the market is the key ingredient in shaping products for the customer. Smart companies develop an effective process to generate this market intelligence and use it timely and prudently to respond with appropriate product portfolio changes (Jaworski & Kohli, 1993).

9.2.5 Competence renewal: Lawrence and Dyer (1983) defined competence renewal as the continuous learning of specific customer demands from the market in anticipation. Such anticipation enables a firm to rearrange the competence to balance out differentiation and integration of products accordingly.

9.2.6 Participatory competence building: Success of competence building for future largely depends on the overall participation of the Organization in the process. HRD team should ensure involvement of all employees in this exercise supported by latest IT systems (Athey and Orth, 1999).

From the above discussions and content references, the suggested dimensions and factors of Anticipatory Competence Building are consolidated in Table 3.

Table 3
Dimensions and Factors of Anticipatory Competence Building

<i>Dimension</i>	<i>Factors</i>
Future Competence	Competencies required for future business Leaders possess and demonstrate key competencies required for success
Competency Obsolescence	Competency identification exercise to surface the right competencies Identify obsolete competencies with technological changes Identify critical competency requirements Identify important competencies for future success
Technology Research	Setting up of small research team in the company Individuals continuously update their technical competencies Investment in technology research Collaborative research with partner echo system
Market Orientation	Generation of market intelligence Dissemination of market intelligence Response to market intelligence
Competence Renewal	Continuously learn the specific demands in anticipation Conscious organisational arrangements to balance differentiation and integration
Participatory Competency Building	Involvement of large group of employees in competency modelling process Use of latest IT systems in competency distribution and assessment process

One of the important components of ICT companies, especially the mobile device manufacturers, is the ability to create and deploy proprietary software such as operating systems and native mobile applications. These systems and applications are kept so unique and exclusive that the customers are forced to buy and maintain them for a seamless operation of the devices. For example, Apple's flagships mobile products are designed to work only through their proprietary operating system. The skills and competence required to keep the industry warm is enormous and ever changing. When Motorola was split in two parts for sale, the overall valuation of the patents put together was more than that of the engineering arm of the company. Under the umbrella of related technologies, ICT companies have significant challenge in anticipating, consolidating and building the competence requirements and maintaining the same in relation to the frequent changes in technology. This requires firms to develop and maintain complex competence management process to sustain the competitive advantage. For high technology organisations, innovation is no more an option but an essential survival kit. A quick tour to the competence library of the largest ICT organizations will show that each of them possesses unique and core competence which are hard to imitate and at the same time difficult to replace. Anticipating such future competence requirement in view of the emerging technologies is a significant challenge facing by the technology organisations.

11. CONCLUSION

The case studies and content analysis together present IC as a moderating variable in the relationship between competence deficiency and OH. Researchers here identified seven dimensions and 21 factors influencing the IC. Further, the researchers examined the moderating effect of ACB on the path between competence deficiency and OH and suggest six dimensions and seventeen factors to form ACB.

Motorola, Nokia & RIM, all of them had clear competitive advantage over their contemporary rivals over a period of time when shelf-life of technology was much longer in comparison to the current state of affairs. Motorola, Nokia & RIM also favored to adopt the best technology for their customers. Fast emergence of newer technologies created a domino effect in the ICT market, creating challenging demands from the customers on innovative products with embedded technologies. These three companies evidently were late to realize the importance of anticipating and building relevant future competence and augmenting the internal skill on collective innovation based on the changing technological environment. The vacuum thus created in these companies grew exponentially, depreciating their internal competence, which resulted in decelerating organizational health. These three case studies present us the reasons of their failure from the RBV perspective. They symbolize the imminent clarion calls to the HR managers of technology companies to keep the collective competence immune to depletion and depreciation.

Reference

- Abbott, J. (2013), *Downfall*. Hachette Digital, Inc.
- Amabile, T. M., & Gryskiewicz, N. D. (1989), The Creative Environment Scales: Work Environment Inventory. *Creativity Research Journal*, 2, 231-253.
- Ang, P. H., Tekwani, S., & Wang, G. (2012), Shutting Down the Mobile Phone and the Downfall of Nepalese Society, Economy and Politics. *Pacific Affairs*, 85(3), 547-561.
- Ashington, N., Hardy, V. (2009), *Accessible Information and Communication Technologies Benefits to Business and Society*, (Retrieved: <http://www.onevoiceict.org/sites/default/files/Accessible%20ICT%20-%20Benefits%20to%20Business%20and%20Society.pdf>)
- Athey, T. R., & Orth, M. S. (1999), Emerging Competency Methods for the Future. *Human Resource Management*, 38(3), 215-225.
- Barba-Sánchez, V., Martínez-Ruiz, M. D. P., & Jiménez-Zarco, A. I., (2007). *Drivers, Benefits and Challenges of ICT Adoption by Small and Medium Sized Enterprises (SMEs): A Literature Review*, Retrieved: http://businessperspectives.org/journals_free/ppm/2014/PPM_EN_2007_01_Barba-Sanchez.pdf
- Barney, J. B. (1986), Strategic Factor Markets: Expectations, Luck, and Business Strategy. *Management Science*, 32(10), 1231-41.
- Bjurwill, C. (1993), Read and react: the football formula. *Perceptual and motor skills*, 76(3c), 1383-1386.

- Canfield, J. & Miller, J. (1998), *Heart at Work: Stories and Strategies for Building Self-esteem and Re-awakening the Soul at Work*, McGraw-Hill, Crawfordsville, IN.
- Clavareau, J., & Labeau, P. E. (2009), Maintenance and Replacement Policies under Technological Obsolescence. *Reliability Engineering & System Safety*, 94(2), 370-381.
- Collis, D. J. (1994), Research Note: How Valuable are Organizational Capabilities? *Strategic Management Journal* 15, 143-52.
- David, W. (2011), A Framework for the Ethical Impact Assessment of Information Technology, *Ethics and Information Technology*, 13(3) 199-226.
- Deemer, P., & Benefield, G. ((2010), *The Scrum Primer: An Introduction to Agile Project Management with Scrum*.
- Deemer, P., Benefield, G., Larman, C., & Vodde, B. (2010), *The Scrum Primer*. Available at: <http://assets.scrumtraininginstitute.com/downloads/1/scrumprimer121.Pdf>, 1285931497.
- Dorothy, L., & Rayport, J. F. (1997), Spark Innovation through Empathic Design. *Harvard Business Review* 75, 102-15.
- Fitzpatrick, K. (2011), *Planned Obsolescence: Publishing, Technology, and the Future of the Academy*. NYU Press.
- Foss, N. J. (1998), Technology and Strategy: Explorations in the Resource-Based Perspective. *Foss NJ, Robertson PR (eds)*. Routledge, London.
- Foss, N. J., & Knudsen, C. (2003), The Resource-Based Tangle: Towards a Sustainable Explanation of Competitive Advantage. *Thorbjorn Managerial and Decision Economics*, 6, 4-29.
- Freemantle, D. (1999), *What Customers Like About You; Adding Emotional Value*. Nicholas Brealey Publishing, London.
- Frohman, A. L. (1985). Putting Technology into Strategic Planning. *California Management Review*, 27(2), 48-59.
- Gobeli, D. H., & Brown, W. B. (1994), Technological Innovation Strategies. *Engineering Management Journal*, 6(1), 17-24.
- Hamel, G., & Prahalad, C. K. (1994), *Competing for the Future*, Harvard Business School Press, Boston, MA.
- Irby, D. M. (1992), How Attending Physicians Make Instructional Decisions when Conducting Teaching Rounds. *Academy Medicine*, 67, 630-637.
- Jackson, M., & Sloane, A. (2003), *Modelling Information and Communication Technology in Business*. Data Retrieved: http://kulino.ninehub.com/file.php/1/jurnal_dan_Artikel_Ilmiyah/Sistem_Informasi/Modelling_information.pd
- Jaworski, B. J., & Kohli, A. K. (1993), Market Orientation: Antecedents and Consequences. *The Journal of Marketing*, 53-70.
- Lawrence, P. R., & Dyer, D. (1983), *Renewing American Industry*. New York: Free Press.
- Maidique, M. A., & Patch, P. (1982), Corporate Strategy and Technological Policy. *Readings in the Management of Innovation*, 273, 285.
- Moorman, C., & Miner, A. S. (1998), Organizational Improvisation and Organizational Memory. *Academy of Management Review*, 23(4), 698-723.

- Morrison, A., Pietrobelli, C., & Rabellotti, R. (2008), Global Value Chains and Technological Capabilities: A Framework to Study Learning and Innovation in Developing Countries. *Oxford Development Studies*, 36(1), 39-58.
- Mueller, M. L. (2012), From Telecommunications Policy to Internet Governance. *Telecommunications Policy*, 36(6), 449-450.
- Pangburn, M. S., & Sundaresan, S. (2009), Capacity Decisions for High-tech Products with Obsolescence. *European Journal of Operational Research*, 197(1), 102-111.
- Poolton, J., & Ismail, H. (2000), New Developments in Innovation. *Journal of Managerial Psychology*, 15(8), 795-811.
- Rosen, B., & Jerdee, T. H. (1985), Older Employees: New Roles for Valued Resources. *Homewood, IL: Dow Jones-Irwin*.
- Singhal, A. (2013), *India's Communication Revolution: From Bullock Carts to Cyber Marts*.
- Slade, G. (2009), *Made to Break: Technology and Obsolescence in America*. *Harvard University Press*.
- Tagliavini, M, Pigni, F. (2012), *Empirically Testing the Impact of ICT on business Performance within SMEs*, Data Retrieved: http://www.academia.edu/1212821/Empirically_testing_the_impact_of_ICT_on_business_performance_within_SMEs (Retrieved on 18th February 2014).
- Tang, H. K. (1999), An Inventory of Organizational Innovativeness, *Technovation*, 19, 41-51.
- Teece, D. J. (1998), Capturing Value from Knowledge Assets: The New Economy, Markets for Know-how and Intangible Assets. *California Management Review*, 40(3), 55-79.
- Tidd, J., & Bessant, J. (2011), *Managing Innovation: Integrating Technological, Market and Organizational Change*. *John Wiley & Sons*.
- Walker, R. H., Craig-Lees, M., Hecker, R., & Francis, H. (2002), Technology-enabled Service Delivery: An Investigation of Reasons Affecting Customer Adoption and Rejection. *International Journal of Service Industry Management*, 13(1), 91-106.
- Zhou, K. Z., & Li, C. B. (2012), How Knowledge Affects Radical Innovation: Knowledge Base, Market Knowledge Acquisition, and Internal Knowledge Sharing. *Strategic Management Journal*, 33(9), 1090-1102.
- Zielińska, A., & Zieliński, K. (2013), Mobile Telecommunication Systems Changed the Electronic Communications and ICT Market. *Journal of Telecommunications & Information Technology*.

