Administering Information Technology Capabilities in Competitive Global Business by Preventing Replication of Technology Portfolio

Harshit Eric Williams and Birendra Kumar Shah

***Abstract*—Today the world has stirred its way from traditional business outlook to renovating and transforming a new modern world of business; where anything and every unattainable thing is achieved with the help of latest affordable technologies. It is amazing to believe that challenges related to business operation are now being easily managed and much controlled with a specific class of technologies made accessible to them, but this may lead to duplications in technology portfolio of companies which may bring several shortcomings in the smooth flow of business dealing with existing intense competition off which the companies are unaware. To overcome these shortcomings in real time situation and to run the companies without any hindrance; this paper will emphasis on how to handle and administer information technology capabilities; what effective measures to be taken to trim down level of global business competition in technological advancements done by companies; also what types of polices should be adopted for improvement of technology capabilities and lastly, how to preventing the replication done in companies' technology portfolio.**

***Index Terms*—Business operations, replication, shortcomings, technology capabilities & technology portfolio.**

I. Introduction

A. An Overview of IT Capability

In information system (IS) literature, different researchers have conceptualized IT capability from different perspectives. The concept of IT capability has been discussed more frequently in practitioner-based literature than in academic journals. Researchers examine IT capability from multiple perspectives including work design, process transformation, power relationships, and coordination. A review of extant literature reveals a gap in the classification of IT capability (Mulligan, 2002). There exists very little consensus as to what constitutes a firm's IT capability and how it is measured, and there are still no widely accepted definitions of IT capability. [1]

Early explanation of IT capability explored the differences between capabilities and their utilization, identifying critical capabilities as: a lever to lower costs (Ross, Beath, and Goodhue, 1996); a means of building customer and supplier dependency (Bharadwaj 2000); and, an approach to discouraging new rivals and a spur to define new products (Parsons, 1983). The second stream of research used individuals or groups as the units of analysis, examining such issues as the impact of IT on an individual's potential power and influence within an organization through a survey of users of IS (Lee and Robertson, 1989). [1]

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B. Definitions of IT Capability in Existing Literature

1) Clark, Cavanaugh, Brown, and Sambamurthy (1997)

The ability to enhance competitive agility by delivering IT-based products, services, and business applications within short development cycle times; Build a highly skilled, empowered, and energized IS workforce with an entrepreneurial orientation toward leveraging technological knowledge into business applications.[1]

2) Benzie (1997)

The ability to use effectively IT tools and information sources to analyze, process, and present information, and to model, measure, and control external events.[1]

3) Teo and King (1997)

The capabilities of the IS function can be operationalized in terms of general technical expertise and technological leadership in the industry. [1]

4) Feeny and Willcocks (1998 a, b)

The pursuit of high-value-added applications of IT, and to capitalize on the external market's ability to deliver cost-effective IT services.[1]

5) Bharadwaj (2000)

The ability to mobilize, and deploy IT-based resources in combination or co present with other resources and capabilities. [1]

6) Byrd and Turner (2000)

The ability to easily and readily diffuse or support a wide variety of hardware, software, compunctions technologies, data, core applications, skills and competencies, commitments, and values within the technical physical base and the human component of the existing IT infrastructure. [1]

7) Prasad, Ramamurthy, and Naidu (2001)

A firm's ability to use IT to support and enhance its distinctive competencies and skills in other business functions. [1]

8) Grewal, Comer, and Mehta (2001)

An important organizational resource plays a vital role in building sustainable competitive advantages and increasing the firm's capacity. [1]

9) Mulligan (2002)

The highest level of IT capability is enterprise management systems. These systems display elevated levels of IT integration in the form of processing interdependence

and may incorporate elements of task execution and communication but the primary focus of these systems is on knowledge and workflow management [1].

Based on the reviews; the various study have shows that there are five dimensions of IT capability which plays an vital role in building organizations and using effectively the IT tools and information sources to analyze, process, and present information, and to model, measure, and control external events in a best possible manner [1].

II. Five Dimensions of IT Capability

The phrase "IT capability" describes different aspects of an organization's base of IT resources. These resources influence and determine the organization's ability to convert IT assets and services into strategic applications, and to mobilize and deploy IT based resources with other resources and capabilities. There are five dimensions of IT capability [2].

IT Infrastructure: This includes physical IT assets in terms of hardware, software and networks (Broadbent & Weill & St. Clair 1999, Keen 1991) on which systems are built. It provides the technical basis for carrying out IT based product and process innovation. Infrastructure also includes the extent to which the assets are integrated (Bharadwaj 2000, Weill & Broadbent 1998) [2].

IT Human Resources: These include technical and managerial skills of IS employees, such as programming, systems analysis, network administration, database management, project management, co-ordination and leadership, interaction with use community and effective management of IS functions (Copeland & McKenny 1988). These skills are highly firm specific and difficult to imitate - hence they serve as a source of competitive advantage. (Keen 1991, Mata & Fuerst & Barney 1995) [2].

IT-related Intangible Resources: Sustained use of IT can lead to the creation of various intangible benefits, which can serve as the basis for additional capabilities. For example, the effective use of CRM systems for tracking customer preferences can increase the customer orientation of the firm (Bharadwaj 2000, Hitt & Brynjolfsson 1996). Similarly, the use of knowledge management technologies can help in knowledge formalization, consolidation and dissemination. This can lead to the creation of inimitable knowledge assets (Quinn & Bailey 1994). IT- enabled sharing of resources can increase the flexibility of different organizational units by eliminating temporal and spatial limitations to communications [2].

IT Coordination: Mulligan (2002) recognizes IT coordination as an independent construct in the measurement of IT capability. Coordination runs the continuum from a low level, in which transaction processing systems within different functions are independent, to a second level, in which data flows across functions, to a third level described by processing interdependence, work flow, and the use of IT for integrated activities such as CRM [2].

IT Governance: Governance describes the authority, control, and audit in the allocation and delivery of IT resources and services. The existence of IT governance systems has been shown to affect firm profitability and strongly influences the value that an organization generates from IT (Weill & Ross 2004) [2].

III. Building "IT Capability"

In Fig. 1, it simply shows that the companies which are looking for innovations and are willing to take risk for their growth, they have to move step-by-step keeping in mind what business need are there and structuring strong "IT capability". It is seen at after ever step that a keen observation is made to understand what types of additions are required to keep the business process moving to achieve set goals.

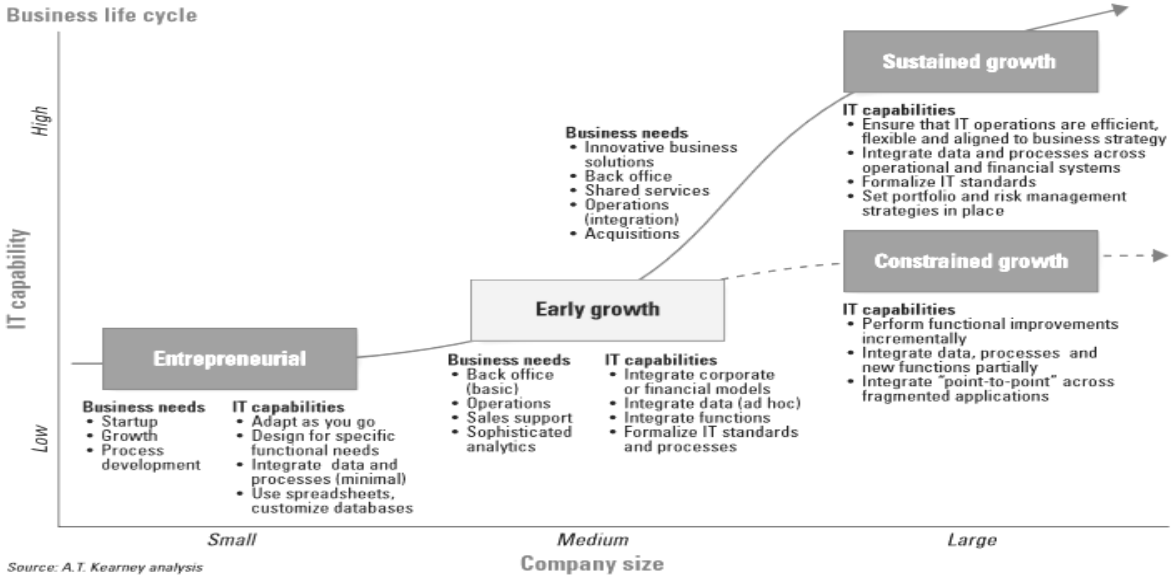

Fig. 1. Information technology is important for business growth and transformation.

Both sustained and constrained growth is seen and then proper strategies are formulated to bring a change in system operations. In sustained growth major emphasis is given on ensuring that IT operations are efficiently, flexibly aligned to

business strategies and also setting portfolio and risk management strategies in place.

In Fig. 2, it simply shows that after having thought about the IT is a vital to business transformation and without extensive monitoring and controlling the business needs it becomes highly essential to understand how to prioritize IT delivers. The above figure explains aligning of business processes, inviting business innovations and delivering capabilities at a right cost is only possible if the environment is properly viewed; here consumer and employees experiences are real input for the development of any organization technically. It is observed that most the big companies are depending upon the good information management supported by effective application which is used to bring changes in businesses and most importantly introducing key drivers to modify the existing technologies in business processes to keep the up-to-date.

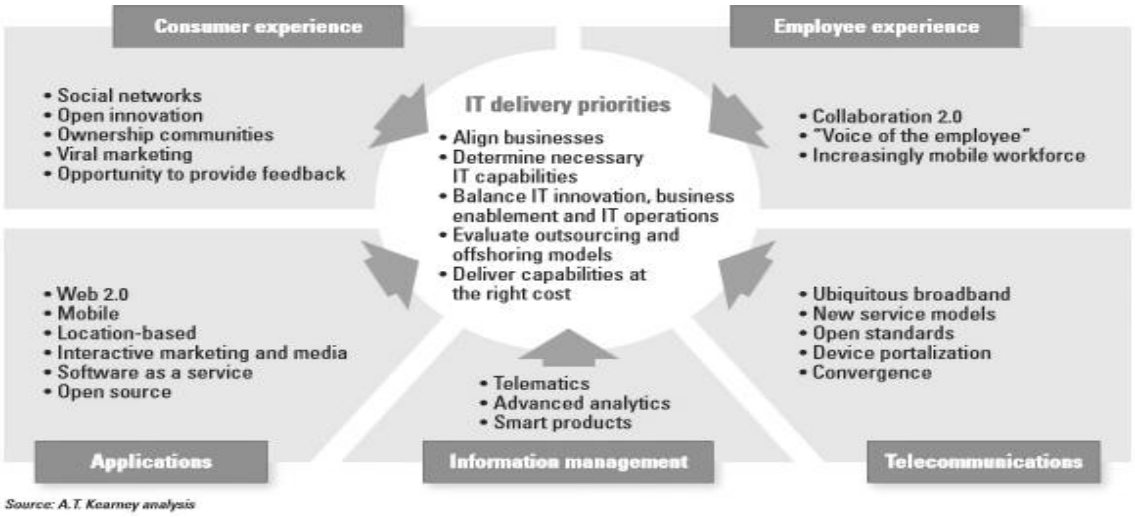

Fig. 2. Elements of today's rapidly envoling technology and IT delivery priorities.

IV. Importance of IT Capabilities

IT capabilities reduces the cost, enables business transformation and driving innovation.

IT leaders must participate actively in strategic planning and look day-today execution. This will shape up the IT capabilities in a better way.

IT capabilities either had to help the company capture new customers or improve services of existing customers.

An IT capability helps in identifying the business needs; most importantly in time of new business transition.

V. Objectives of Study

To study how to handle and administer technology capabilities

To identify the effective measures which can be taken to trim down level of global business competition in technological advancement done by companies?

To identity type of polices should be adopted for improvement of technology capabilities in organizations.

To study how to preventing the replication done in companies' technology portfolio.

VI. Research Methodology

Descriptive research has been conducted to study how to handle and administer technology capabilities; effective measures ought to be taken for technological advancements and preventing the replication in technology portfolio.

The sampling technique which was used is convenience sampling.

The data has been collected from the sources mentioned below:

1) Annual reports
2) Websites
3) Articles

VII. Findings and Analysis

A. How to Handle and Administer Technology Capabilities

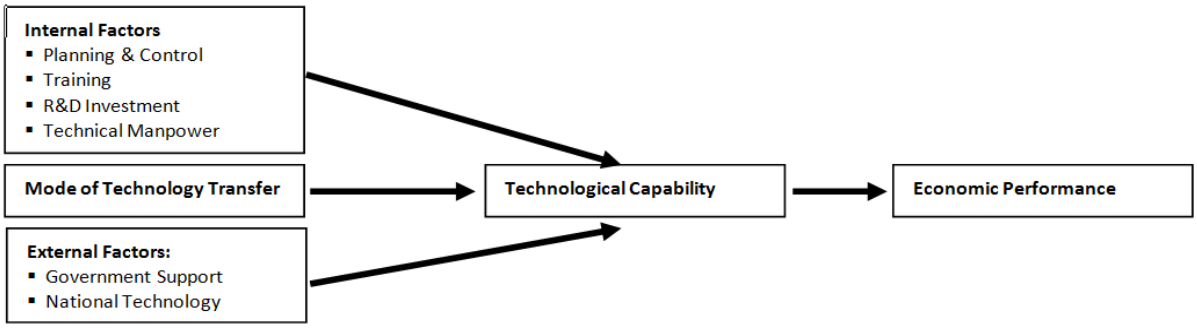

Fig. 3. Administering and controlling technology capabilities.

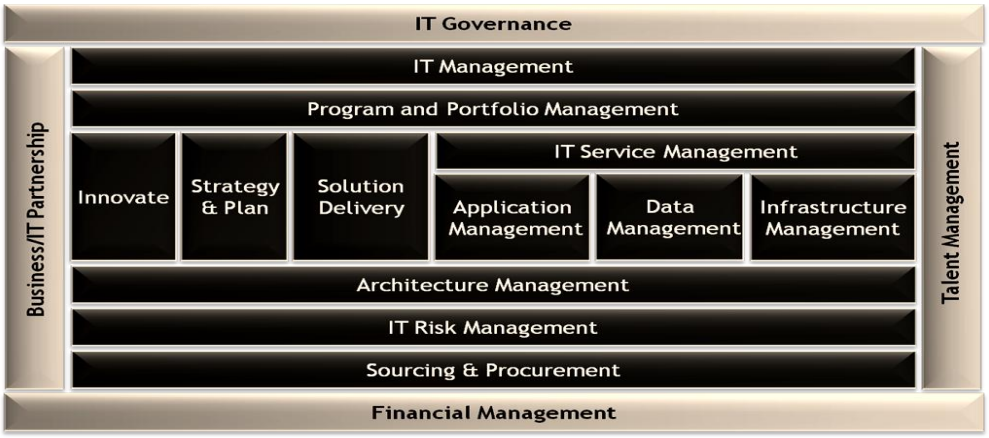

Fig. 4. The IT renaissance capability framework.

In Fig. 3, it simply shows that technology capabilities can only be handled if internal and external factors are properly monitored; there has to be a balance between the internal and external factors. It means that planning, control and investment on research and development should be done on regular basis so that the companies can compete with other existing market players. Therefore, to have over all smooth functioning governmental support and ICT approval are required to have a complete control over the process of business. The combination of three makes good strategies for effective technological capabilities which enhance the economic performance.

Adapted from COBIT, ITIL, CMMI, PMBOK, OPM3, ISO, People CMM and other frameworks

In Fig. 4, it simply shows that after having understood about the internal and external factors which influences better functioning of technology capabilities. In the above figure it shows how business function with the help of program and portfolio management; each and every department is depended on IT service management will keeps updating about application, data and infrastructure management.

It is important for organizations to follow the steps of innovating process, strategically planning and get the best solution delivered. This is only possible if the organization is able to identify how much amount of risk is there and how it can be minimized. IT risk management team must always have a current update about changing scenarios and risk pertaining to business. This figure gives a clear picture that how the organization should work for improving its technology capabilities.

B. Effective Measures Which Can Be Taken to Trim down Level of Global Business Competition in Technological Advancements: [1]

It's important for companies to closely monitor the competition in respect of service rendered to their clients.

Investment of capital must be done in view of upgrading the machineries use for the production and also providing sophistication in existing product.

It becomes very essential when it comes to hiring a skilled and trained person for handling new advance equipments.

In case of new business process the company must have some back plan ready with them so as to avoid chances data loss or any new challenges related to technological advancement.

It should be the responsibility of senior staff to have a check on tactical operation running smoothly and are in transit.

The company must look from the prospect of consumer behavior that their taste and preferences keep on changing; but some may stick or are resistant to change in that case the companies will have to follow the taste not the technological advancements in the existing product.

Keeping in view of government policies related to environmental issues user friendly product must be manufactured and the technologies.

Encouraging those technology which can generate output but without emersion of heat which is harmful for environment. Example solar panel conserves the energy, rain water harvest restoration of clean and drinkable water, waste converting into a byproduct.

Companies which know about their internal operation but may not be aware what is going on in external environment; so in this case they must look for business review and reports which may help them to take prioritized decisions.

New opportunities must be taped within the framework of business operation.

Decision of managers must have a command and confidence to take up new challenges which may open doors for new opportunities.

Management should be flexible enough to invite new innovative ideas which can change life of many.

There has to be a cordial relationship among the employees; only then the organization goals and objective can be easily accomplished.

Lastly, the companies must always work on improvement of their service and updating technology to cater their customers in much better way.

C. Types of Polices Adopted for Improvement of Technology Capabilities in Organizations

1) Science and technology 2003 [5], [6]

These points were adhered:

To ensure food, agricultural, nutritional, environmental, water, health and energy security of the people on a sustainable basis.

To mount a direct and sustained effort on the alleviation of poverty, enhancing livelihood security, removal of hunger and malnutrition, reduction of drudgery and regional imbalances, both rural and urban, and generation of employment, by using scientific and technological capabilities along with our traditional knowledge pool.

To vigorously foster scientific research in universities and other academic, scientific and engineering institutions; and attract the brightest young person's to careers in science and technology, by conveying a sense of excitement concerning the advancing frontiers, and by creating suitable employment opportunities for them.

To promote the empowerment of women in all science and technology activities and ensure their full and equal participation.

To provide necessary autonomy and freedom of functioning for all academic and R&D institutions so that an ambience for truly creative work is encouraged, while ensuring at the same time that the science and technology enterprise in the country is fully committed to its social responsibilities and commitments.

To use the full potential of modern science and technology to protect, preserve, evaluate, update, add value to, and utilize the extensive knowledge acquired over the long civilization experience of India.

To accomplish national strategic and security-related objectives, by using the latest advances in science and technology.

To encourage research and innovation in areas of relevance for the economy and society, particularly by promoting close and productive interaction between private and public institutions in science and technology.

To promote international science and technology cooperation towards achieving the goals of national development and security, and make it a key element of our international relations.

To integrate scientific knowledge with insights from other disciplines, and ensure fullest involvement of scientists and technologists in national governance so that the spirit and methods of scientific enquiry permeate deeply into all areas of public policy making.

2) Science, technology and innovation policy 2013 [5], [6]

Especially the policy will focus on:

Prioritizing critical R&D areas like agriculture, telecommunication, energy, water management, health and drug discovery, material, environment climate variability and change.

Promoting interdisciplinary research including traditional knowledge.

Fostering delivery and use in the society of innovations in the strategic sector with civilian application potential.

Promoting mechanism such as "small idea - small money" and "risk idea fund" support innovation incubation.

Establishing of fund for innovation for social inclusion.

Leveraging traditional knowledge through model science for find solution to national challenges.

Supporting science, technology and innovation driven entrepreneurship with viable and highly scalable business models.

Investing in young investors and entrepreneurs through education, training and mentoring.

D. How to Prevent the Replication Done in Companies' Technology Portfolios

1) Resolving and preventing duplicate data: [1]

To resolve duplicate data, you either edit it or you delete it.

Edit a duplicate record if it actually represents a distinct entity – for example, a customer for whom there is no other record – and has become a duplicate of some other record by some error, perhaps erroneous input.

Delete a duplicate record if it does not represent some other entity; that is, there is another record for the same entity that you prefer to use.

In some cases, you will delete one duplicate and edit the other, because neither record is completely accurate. If you want to delete from a table that is related to other tables, you might need to enable cascade deletes for some of the relationships.

To help prevent duplicate data, consider the following:

Make sure that each of your tables has a primary key.

If there are fields that are not part of a primary key but must contain unique values, create unique indexes for those fields.

Consider creating forms for data input, and using list boxes on those forms to make finding existing values easier

VIII. Conclusion

Many IT organizations are so busy fixing today's issues and keeping up with change that they have no time to build capabilities need for tomorrow- a critical shortcoming when the goal is adding value to the business. Further, they are often stuck in operational and thus poorly positioned for the innovation required in today's economy. To move beyond troubleshooting and actively plan for the future, IT has to close the gap between the need and ability to deliver.[3] It is observed that to handle and administer technology capabilities every companies is suppose to identify their business need and this will capsulate many problems relating to unforeseen events happening in business process stages.

I firmly, believe that it is important for companies to closely monitor the competition in respect of service rendered to their clients and also investment of capital must be done in view of upgrading the machineries use for the production and also providing sophistication in existing product. The company must look from the prospect of consumer behavior that their taste and preferences keep on changing; but some may stick or are resistant to change in that case the companies will have to follow the taste not the technological advancements in the existing product. It very much essential to closely monitor the competition level by companies; the policies adopted for improvement of technology capabilities are full potential of modern science and technology to protect, preserve, evaluate, update, add value to, and utilize the extensive knowledge acquired over the long civilization experience of India with an aim of encourage research and innovation in areas of relevance for the economy and society.

It's important to make prevention for the replication done in companies' technology portfolio which will help the businesses to run smoothly and more efficiently without much botheration, if considerable care is taken at the time of preparing process system. The basic objective is to reduce time spend on unnecessary activities related to structuring the new processes which is already existing in the business operation.

Therefore, efforts have been put to elucidate how to

administer information technology capabilities in competitive global business environment with prevent replication done in companies' technology portfolio.

IX. Suggestion

If the Technology Capability that you need is not already in the model, add it by creating a new instance of the Technology Capability class, as follows: [7]

Give the capability a name and description.

Specify the Technology Domain that this capability belongs to by picking it from the list or creating a new one if no suitable domain exists.

Add or define any sub-capabilities that are contained in this one.

Capture any relevant technology objectives.

Capture any relevant information which relates to improving business needs.

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