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ANTICIPATORY COMPETENCE BUILDING: TOWARDS A MEASUREMENT MODEL

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Abstract: Identification of resources that will be a source of competitive advantage is not a simple task for today's firms, since many of the characteristics attributed to them can only be intuitively perceived. The available competence frameworks capture the competence requirements for a family of clear and present jobs. In a fast moving business world of new products and technology, companies are grappling with the requirement to generate, acquire and internalize newer competence required for future products. This study examines Anticipatory Competence Building (ACB) as an essential moderator between Technology Competence Obsolescence (TCO) and Organisational Health (OH) in the Information and Communication Technology (ICT) sector. In this paper, we argue that ACB can be developed into a measurement model with five distinct dimensions, namely Competence obsolescence, Future competence, Technology research, Market orientation and Competence renewal. The data is consolidated using the Delphi technique with the opinions of experts from diverse fields within Malaysia. The study ratified an ACB model consisting second order constructs with 17 factors which collectively influence the degree of TCO and OH in an Organization. These factors are itemized to convert the model into a survey based instrument of measure. The model gives practitioners a refreshed look at the current competency framework to be wary about the imminent and essential future competencies.

Keywords: Anticipatory Competence, Organizational Health, Competency, Technology, Obsolescence.

1. INTRODUCTION

The rapidity of technology changes today is pushing the velocity of competence obsolescence in ICT companies beyond limits, flattening the time-to-obsolescence curve faster than ever before. A decade ago, the time-to-obsolescence for web enabled services was 3-5 years, whereas presumably today this period has shrunk to 14-18 months. Today a mobile based innovation may be obsolete within 12 months. The time-to-obsolescence is arguably shorter than the time to innovate a product. The amazingly progressive technology space makes market competition so fierce that the companies, however big or small stand equal chance to win and lose. In the year 2013 alone, we have seen the result of technology obsolescence manifesting itself into collapsing organizations like Nokia, Motorola and Blackberry (formally known as RIM).

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In order to stay alive in the competitive waters, it is essential that companies adjust themselves to the imminent paradigm shifts happening in the realms of technology. Such adjustments can be done only if the companies are able to realign the human capital towards the innovation capacity by anticipating the competence needs of the future. The firm's ability to look into the future and anticipate technology trends will bring about revolutionary changes in the way traditional competency frameworks are built. Such anticipatory competence building efforts will best compensate for obsolescence down the road by creating product ideas beyond their technological capabilities. The anticipatory competence building requires completely non-traditional approach and different way of thinking towards the human capital. In this fast moving world, technological obsolescence is one of the most critical reasons for the 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 and 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. 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). One of the negative signs for ICT companies in their competency deficiency is based on their technological dependence.

Looking at the recent downfall of Nokia, Motorola and Blackberry, the much accomplished ICT firms, it is evident that ACB is a game changing factor for technology companies, however small or big it is. It has been proved by Christensen (1998) that traditional customer inputs can sometimes misguide companies in their product development process. Christensen's theory of disruptive innovation proved right when Nokia imprisoned by its own past success, was more than complacent to calibrate any risk to invest into the unknown territories of the smartphone market, notwithstanding the fact that it had already pioneered the smartphone manufacturing. As the change sweeps in with unprecedented speed, many organizations are turning towards developing the capacity to anticipate

future competencies in order to be battle-ready for the imminent change in the technology space. Such capacity will indeed give organizations real competitive advantage.

The competence requirement for ICT sector is complex and ever growing. A close look at the related competence required to keep the horizon of ICT sector updated against the technological changes happening in the umbrella will reveal this complexity. Often, such competence requirements are firm, domain and industry specific. ICT sector being part of the knowledge industry, needs competence as the only raw material which turns out to be the key driving force behind several important economic activities around the world.

One of the direct and immediate antecedents of such frequent generational changes in technology is competence depletion. 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 three major depletion sources of talent are as under:

- Firm specific competence depletes with the emergence of newer technology.
- When people move companies to find better pastures, collective turnover takes place, creating wide gaps in competence pool.
- When the supply of talent is limited in the market, companies find it difficult to induct competence in required quantity, frequency and speed.

These three sources collectively create deficiency of competence.

Though there have been several competence based studies undertaken in the ICT sector, the topic of ACB was seldom discussed and evaluated by the academicians and practitioners as well in the recent past. Studies centered on the competence caught momentum in the last few decades after David McClelland (1973) introduced the features of competence. While academicians and practitioners started recognizing the relevance of ACB in the firms, there remains a prevalent confusion on what constitutes the ACB from the competence perspective and how does it differ from the traditional competence approach. In this study, we endeavor to highlight the relevance of ACB in the context of ICT sector and attempt to develop an integrated framework for assessing ACB of firms.

It is based on the review of literature available on competence and also recognizing the theories of resource based view, especially the theory of competitive advantage. With detailed data inputs, the assessment framework may be used to analyze the antecedents and consequences of ACB on various organizational factors. The framework is intended to measure the ability of the organization to anticipate the competence requirement for the future. The motivation behind this research is based on the depleting internal competence in ICT companies due to

the disruptive technology changes facing the industry sector. The impact of such obsolescence is forcing companies to review the human resource strategies to maintain the equilibrium of competence required to stay ahead of competition in the market.

2. LITERATURE REVIEW

While the proponents of the competence framework treated this movement as revolutionary towards the organizational building process (McClelland, 1973, 1994; Lawler, 1994) there were academicians who criticized the validity of the competence approach (Barrett & Depinet, 1991). Notwithstanding the questions raised, the competency approach gained momentum in the last few decades. Competence was introduced as components of performance by McClelland (1973) which explained the clusters of life outcomes.

The essence of competence is that it fairly acknowledges the interaction of technology with people and their skills which fundamentally addresses the firm performance (Scarborough, 1998). According to Lucia & Lepsinger (1999), competency can be defined as a required knowledge, skills and characteristics which are necessary for effectively performing of a role as well as meeting the performance goals of an organization. Lawler (1994) observed it as a collection of the knowledge, skills, and abilities (KSA) that are prerequisites for the high performance on the job. Characteristics like skills, mindsets and thought patterns (Others), which, when used either singularly or in various combinations, result into desired competence (Hofer & Schendell, 1978; Marrelli, 1998; Jackson & Schuler, 2003). In this study 'competence' and 'competency' are used interchangeably as terms of reference.

At individual level, the concept of competence essentially refers to performance (Gabor, Campeanu, Sonea, & Muresan, 2011). Mansfield & Mathews (1985) defined competence as an individual's basic characteristic, which leads to superior performance or efficiency. Rankin (2002) described it as "skills and behaviours that organizations expect from employees when performing work"

The anticipatory competence building is the process of enhancing collective competence of the firm to adjust the skill requirements for the future, effectively anticipating the imminent environmental changes like technology obsolescence. Further, it is the ability of the firm to collectively foresee, analyze and evaluate the future competence landscape to ensure sustainability of the competitive advantage. Technology related competence that the firm possesses now and its commitment to competence development for the future will have a direct impact on the strategy of the firm (Itami & Numagami, 1992). It is evident from the recent case studies of Nokia, Motorola and Blackberry, that firm's readiness and capacity to accurately estimate its future competence requirements will have serious implications on its

profitability, and even on its long-term survival. To be able to implement the business strategy successfully, the firm needs to address the most important question of its workforce competence needs for the future (Huselid, Becker, & Beatty 2005). This question can be answered through multiple resource building approaches by building competence in anticipation of developing, motivating, and retaining the number and mix of employees that will be required at each point in time in the future (Sharp, 2006).

Technical professionals of the ICT organizations are the driving force behind the discovery of newer technologies and channelizing the effort towards building anticipatory competence to create and sustain competitive advantage (Von Glinow, 1988). He further opines that the rapidity of technological changes makes consequent obsolescence of their knowledge and skills, impacting the technical professional's ability to contribute to the organizational effectiveness. In addition to this, according to Kaufman (1974), competence obsolescence leads to low employee morale, restricted career opportunities and limited success possibilities among technical professionals. The study conducted by Goddard and Eccles (2012) on organizational failures enumerates the causal effect of internal factors on failure are as high as 93%. The effects from external environment contribute only 17% to the failure. The lion's share of these failures causes can be controlled internally by building competence, concentrating on the core business and by ensuring constant anticipatory talent pipeline.

Many researchers have acknowledged the importance of aligning collective competence of the firm with organizational strategy and objectives so that an organization achieves its common goals and long-term future success (Dubois & Rothwell, 2004; Vakola *et al.*, 2007). In addition, organizational core competence is made up of collective competence that can have a profound impact on many products and services and thus provide competitiveness in the marketplace (Green, 1999; Henderson, 2007; King, Fowler, & Zeithaml, 2001). Therefore, it is essential to ensure competence anticipation and efforts towards building up such important future resources.

3. THEORETICAL UNDERPINNING

In this research, competence is addressed at the level of the firm. The firm can be conceptualized in ways that each address a particular set of its characteristics and seek to explain its activities (Grant 1996). These include the neoclassical (or perfect competition) theory of the firm (Alchian & Demsetz 1972), the transaction cost theory (Coase, 1937), the organization theory (Grant 1996), the behavioral theory (Cyert & March 1963), and the evolutionary theory of the firm (Nelson & Winter 1982). Strategic management has brought further contributions to the theory of the firm by seeking to explain firm performance, and perhaps the most significant of these contributions is the resource-based view of the firm (Barney, 1991). The

resource-based view (RBV) is used as a theory of the firm and of Competence deficiency and the consequent Organisational health, and is the framework used in this paper.

There is an integrated view of the competence displayed by various scholars through the resource based literatures, see e.g., Mahoney and Pandian (1992), Foss (1998); Foss and Knudsen (2003). With the idea of Core Competencies, Hamel and Prahalad (1994) introduced a newer approach to the organizational health. They argued that the Core Competencies if identified and nurtured within the organization will fetch clear and sustainable competitive advantage for the firm. With sustainable competitive advantage, a firm can attain progressive performance over a long period in comparison to the competition. The Resource-Based View (R-BV) to system hypothesizes that it is the company's 'core competencies' that give health to the establishment further bolstering economical good fortune. In addition to the introduction of R-BT by Barney (1986), Prahalad and Hamel (1990) discussed R-BV through their core competency model. Amalgamating all the R-BT and R-BV, a detailed discussion on core competencies through the theoretical characteristics of sustainable competitive advantage was initiated by Barney (1991).

Anticipatory Competence Build up Constructs

On a close scrutiny of the available literature on competence revealed five closely linked constructs. These constructs though disparate in the competence studies, when put together make a reasonable model of ACB. The constructs, thus identified are future competence, competence obsolescence, technology research, market orientation and competence renewal. Each of these constructs is explained briefly here.

4.1. Future Competence

In a study of the competence framework published by the Corporate Leadership Council in 2010, the requirement of future competence building is emphasized as part of the suggested model. It is recommended that while creating competency framework, future resource requirements based on the technology changes needs to be included to ensure continuity in competence. The model also suggested inclusion of key leadership competence required for the future. The process of identifying the competence and core employee is also part of the CLC model.

4.2. Competence Obsolescence

It is imperative that when technological redundancy happens, the related competences also become obsolete. The CLC competence model suggests that firms should critically evaluate and identify the technology and functional competence which are likely to be obsolete due to the imminent change in technology. This

identification can give the firm an advantage of tuning such competences keeping in mind the future requirements. Acquisition of such futuristic competence from the market may be difficult due to the non-availability of such updated skills. In such situation, CLC suggests that the firms should be prepared to refresh the entire talent portfolio by building a pool of anticipated skills.

4.3. Technology Research

To alleviate the effect of technology competence obsolescence, Rosen and Jerdee (1985) ideated the need of setting up dedicated technology research team within the firm. Though this approach looks radical, it is an essential talent management strategy for high technology firms. There are many companies in the ICT sector, which nurture in-house technology research teams. Organisational theorists have always struggled to identify the factors that strengthen the ability of the firm to generate business critical ideas. Investment of a considerable amount of money, time & efforts towards technology research is quintessential to strengthen this ability. ICT organizations operate in an interrelated technology Eco system and hence it is important to initiate collaborative technology research within this partner ecosystem.

4.4. Market Orientation

Various market orientation studies have always highlighted the importance of intelligence in making and shaping products and services which are best suited to the consumer. The generation of such market intelligence is fundamental to the anticipation of competence (Kohli and Jaworski, 1990). They further elaborated on the methodological internalization of such intelligence by disseminating such information through the organization. Such market intelligence has profound impact on the development process of products and services.

4.5. Competence Renewal

While most of the competence literature talked about the clear and present requirements of firm level competence, Lawrence and Dyer (1983) were the first ones to introduce the concept of competence renewal based on specific demands of the future. Competence development programs focusing future business developments is one of the important successfactors of the firms (O'Driscoll *et al.*, 2001). Athey and Orth (1999) insisted that while developing such competence programs, it is important to involve a large number of employees in the process. To make the competence dissemination and assessment process efficient, Athey and Orth (1999) suggested implementation of IT systems in the organization.

This study focuses on the interplay among these five dimensions with an operational definition of ACB expressed through a measurement model that can

be used for further field research in this area. The items elaborated under each dimension provide guidance for practicing managers who seek to understand ACB under changing business conditions.

4. NEED OF AN INSTRUMENT

Owing to the limited studies conducted in the anticipatory competence space, there has been scarce efforts towards defining a measurable model of ACB. It is thus imperative that a conceptual development of ACB to be initiated to arrive at a single agreed concept. Studies hitherto touched upon competence from the contemporary views as a resource base for competitive advantage. It is important to measure the diminishing competence due to environmental changes and ensure such depletion is addressed through foresighted competence build up plan. A measure of ACB from a human capital perspective is not sufficiently explained in the previous studies. The instrument for such measurement is absent in the literature. The available measurement instruments for competence are disintegrated and dimension focused. It is thus imperative that a fitting definition of ACB needs to be derived and an appropriate measurement instrument be developed for future use. This study attempts to address this gap by focusing on the antecedents of ACB and developing an empirical assessment model.

5. QUALITATIVE RESEARCH QUESTIONS

1. How do you define Anticipatory competence building (ACB)?
2. What are the factors that closely related to ACB in general?

6. RESEARCH METHODOLOGY

To clear up the confusion prevailing in the concept of ACB and further to develop constructs to arrive at an assessment framework, we followed the qualitative methodology using triangulation. To extend the assessment framework into a measurement model, further quantitative experiments are required with appropriate reliability and validity tests. Such mixed methodology gives a researcher several design choices through the experimentation phase. Studies from the pragmatist school of thought which interlocks both qualitative and quantitative approaches within different phases of the research process will be categorised into mixed methods (Tashakkori & Teddlie, 2008). Mixed methods are equal or superior in comparison to other approaches in research. Like in any research, validity comes from effectiveness, appropriateness and thoroughness with which those methods are applied. Careful consideration is given while checking each evidence rather than applying a set of rules or adherence to an established method (Bazely, 2004).

7.1. Triangulation

Using multiple research methods will give confidence to the researcher on the investigation of the question in hand. Such multipronged approach is referred as triangulation. Most research in social science is one using single method and such research may be handicapped with data accuracy issues. Triangulation methodology is the mode of using more than two research methods in analysing the same piece of research (Mitchell, 1986). Triangulation can be applied at the time of initial research investigation or at the time of data collection (Bums & Grove, 1993). This particular study followed grounded theory, case studies and Delphi as the triangulation methods that to identify and fix the variables and categories in relation to ergonomics.

7.2. Grounded Theory

Grounded Theory as the names suggests is based on ground realities which let a researcher come out with a theoretical framework of an observation with appropriate empirical observations with data support (Martin & Turner, 1986, p. 141). Grounded Theory gives a rigorous, systematic and elaborate model with a flexibility to the researcher to test initial hypothesis. It provides researcher with reasonable freedom to explore the research area and allow issues to emerge (Bryant, 2002; Glaser, 1978, 1992, 1998, 2001). Grounded theory covers the important aspects of research with appropriate coverage on the bias of the researcher, options of appropriate data collection site, the process of data collection, coding and study of the data and finally the results coming out of the data. Coding will be done in three stages through open coding, selective method and theoretical coding. In the first stage a regular comparison is done in open coding, then memo, and distribute results in themes, categories and sub categories. The results of the first stage influences the subsequent theoretical sampling. In the selective coding, the researcher gets a consolidated and saturated core categories. The final core categories are then sorted accordingly, theorised and written down with literature support. The final list of the coding gives a fair clarity on the concepts under study and a theoretical model. With the support of grounded theory methodology, this particular study identified the factors and the themes related to ACB.

7.3. Case Study

In the initial stage, the researchers have conducted three preliminary case studies to explore factors related to ACB. The case studies have supported the research to get a grip on the topic under study with the content. Thus, the first criteria used by the researchers include the short interviews with the senior level employees from different ICT companies in Malaysia and developed short caselets. Through the interviews, short cases have been developed. Case study interviews are often used as part of the initial assessment and arriving at explicit and implicit

variables based on the topic under study. Some of the case study content, which supported the researchers to get some insight into the concept of ACB and allied factors, has come up from case studies among the employees of the ICT companies.

7.3.1. Case 1: Regional Talent Head of a Global Consulting Firm

I have been working with ICT clients in this region over eleven years. Talent management has been an obvious and challenging task for these companies over the years. The fast and ever changing landscape of technology significantly alters the skill requirement for ICT sector. For me, the only solution to manage such situation is to understand the depletion of internal competence due to such environmental changes. The first step in arresting the depletion is to build anticipatory capacity to have a collective organizational aspiration to build and manage competence required for the future. Given the highly competitive environment, companies should attempt to venture into setting up of a technology research team within to better manage the product development portfolio. Investment in such research and development activities will be worthwhile to maintain competitive advantage. Most of my clients are incumbent players in the market and I have seen them losing the ground to entrants with unconventional products and services. While readying the internal competence for innovation building, it is also important for the firms to look into the overall preparedness in technology orientation and experimentation. Employees need to be involved in the anticipatory competence building process. These positive elements will definitely augment the collective competence.

7.3.2. Case 2: Director of an Information Services Company

Our team develops mobile applications for our operator clients in Malaysia. Our application development requires inter-operability across all the operating systems. In my 18 years of product development experience, the past five years have been the most challenging period. We have been witnessing the fast and furious technology changes in telecommunication sector. Our team is currently working on several versions of the Android operating system. Our development team is still grappling with the major updates happened in the telecom technology in 3G and LTE. I have been facing severe skill shortage to manage the customer's expectation in building cutting edge mobile applications. We have been trying to build competence by reevaluating the training and knowledge sharing needs. High level of improvisation in terms of product development process is required for us to keep pace with the new technology products. I try to keep a diversity of upgraded skills in my team to ensure that we are ready for any anticipated technology changes. I am sure the similar challenges are being faced by my counterparts in other organizations as well. Malaysia has a shortage of such domestic technical skills. Moreover, the new technology is usually originated in the west and same is

made available commercially in this region by global companies. In the absence of any training on such technologies, our team finds it difficult to adapt to the new situations emerging frequently. I feel that companies operating in technology sector should continually do the internal assessment of capabilities to ensure they stay focused on the future business requirements. Assessment of competence obsolescence and future competence building is no more an option with the technology companies like ours. Readiness to change is quintessential for the companies today as the climatic changes in the business are so rampant with the impending changes in global economic situations.

7.3.3. Case 3: Senior Manager of a Telecommunications Company

I manage a team of people who sell technology solutions to our enterprise customers. With the advent of high speed internet, there have been tremendous opportunities for mobile companies to offer innovative products. When we design a product, we keep in mind the best business interest of our customer so that our product can help improve their services. The competition in the mobile product space is intense in Malaysia and our team is facing unprecedented challenges in delivering high tech products. One of the major issues I am facing today is the lack of skill sets required for the new technology space. Global products which are available over the net has increased the awareness of our customers and they demand much more features in our product offerings. We have no other option but to continually experiment and improvise our products. The changing technology arena has also posed us challenges in terms of upgrading skills. Our company is taking all the efforts to train the team in the new technology; however the speed of change in technology makes our skills obsolete overnight. I feel that it is important for technology companies to build competence in anticipation and instill a culture of openness among the working teams. Our sales team could be the feedback providers to understand the latent requirements of our customers so that we can re-design the products accordingly. Keeping all the doors open to the market is the mantra we need to follow. Architecting the finer structure of the Organization demands mindful intervention into the firms' performance by establishing solid improvement infrastructure. I strongly encourage collecting and disseminating market intelligence for our product teams to realign their competence to shape up newer and better products.

7.4. Delphi

One of the methods under triangulation followed in this study was Delphi technique which has provided exploratory insight into the major variables closely knit with the concepts under this study. The Delphi technique suggests a systematic interaction with a panel of experts who are cautiously selected based on their knowledge and experience in the specific subject (Sekaran & Bougie, 2010). The

panel of experts is given a topic for elaboration with a set of questionnaires to answer in multiple rounds. The answers to the questionnaire are consolidated by the researchers and circulated back to the panel for further elaboration, considering the opinion from other members of the panel. The panel members are given chance to iterate the previous opinion based on the newly found information and collective outlook on the topic. The rounds may continue until the researchers stop the same after having convinced that the opinions have converged into an acceptable level of consensus. In the current business research space, Delphi technique is used to forecast long range business plans. The identity of the panel members are usually not revealed among the panel to ensure an independent judgment of the topic of discussion

To conduct this Delphi study, the researchers identified a group of senior professionals who are closely associated with Talent and Organizational development process in Technology and Consulting companies across Malaysia. While identifying such a versatile team, the researchers have ensured maximum possible heterogeneity in terms of gender, industry segments and job roles. The identified panel members are from varied backgrounds like, Heads of HR, Sales Managers, Consultants, Directors, Technical Architects and Academicians. The selected panel included 25 male members (78%) and 7 female members (22%). These experts are well experienced and considered authority in their respective area of operations. Having sufficient breadth and depth of experience in the field, these members were cautiously selected to give an opinion about ACB. Out of the 32 experts approached for this study, 27 of them gave their consent and time to conduct semi-structured interviews with them. Three rounds of interviews with panel members were conducted during the period between December 2013 and May 2014. While the majority of the interview sessions took place face to face at the member's convenience in their respective offices, few sessions were completed over the telephone. Each panel member was briefed by the researchers in detail about the objective and expected outcome from the study. All the conversations were audio recorded and analyzed separately for further details. The procedural steps at each round followed in the Delphi technique were as follows.

7.4.1. Expert Panel Round 1

The first round of the Delphi the researchers set the context with the expert with few open ended questions. Open ended questionnaire helps in acquiring rudimentary facts related to the topic from the point of view of the expert which serves as an initial content sanitation of the topic (Custer, Scarcella, & Stewart, 1999).

The open ended questions posed to the experts in the first round were:

- How do you define Anticipatory competence building (ACB)?

- Which are the latent constructs of ACB?
- Which are the factors constitute the constructs of ACB, contextualising the topic to ICT sector?

At this stage, the panel members' independent ideas and understanding are brainstormed; brain written and their creative thoughts around the topic are triggered by the questions (Cuhls, 2001). They are given time to think through the questions and write down/record the answers before it is collated by the researchers.

7.4.2. Expert Panel Round 2

At this stage, specific factors of agreement and disagreement under each construct are identified and sorted out to bring about a consensus on the relative importance of categories and items (Ludwig, 1994). ACB related dimensions and their respective factors were collected and consolidated in this round for further analysis. This is a foundational stage to derive a closer interface to implementation of ACB as an important variable in Organizational studies by segregating distinct dimensions and arriving at unique and consistent factors of measure. The researchers consolidated and identified 5 distinct dimensions and 24 items under ACB from the aggregated inputs given by the members.

7.4.3. Expert Panel Round 3

In this final round, a pre-finalized list of ACB categories and their first order constructs with appropriate items were presented to the panelists. The panelists were requested to review the list to make any amendments to their opinions given in the second round. Thematic apperception and itemization of the categories were made in this round. There were a total of 24 items identified in the second round. Upon further independent evaluation of these items by the panel, 7 items were identified as redundant or out of context by the panel. These items were removed from the list to form a final approved list of 17 items. All the dimensions and categories identified in the second round were approved by the panel and retained in the model. Through this consensus-oriented method, a final list of first order latent constructs of ACB and their reflective factors were identified and approved by the panel. This research study thus developed a model that defines ACB and the related dimensions and factors. The details of the analysis are incorporated in the discussion part.

The first dimension of the ACB construct discussed by the panel members was Future competence. While most of the panel members agreed upon the items of futuristic competence model, leader's demonstrating competence required for success and competence identification exercise, only 7 members found core employee identification as a requirement for future competence. As such due to

Table 1
Delphi Table on ACB

<i>Dimension</i>	<i>Factor</i>	<i>Number of experts</i>	<i>% of experts</i>	<i>Item Status</i>
Future competence	Futuristic competence model	21	78%	
	Leaders demonstrate key competence required for future	21	78%	
	Identification of core employees	7	26%	Dropped
	Competence identification exercise	23	85%	
Competence obsolescence	Technology competence obsolescence	21	78%	
	Acquisition of new competence	20	74%	
	Technical and functional competence refresh	20	74%	
Technology research	Setting up of small research team in the company	23	85%	
	Updated centralised competence bank	19	70%	
	Investment in technology research	19	70%	
	Collaborative research with partner echo system	24	89%	
Market orientation	Generation of market intelligence	27	100%	
	Dissemination of market intelligence	20	74%	
	Response to market intelligence	23	85%	
Competence Renewal	Anticipate specific competence demand	19	70%	
	Competence development programs	25	93%	
	Employee's involvement in competence modelling process	21	78%	
	IT systems in competence distribution process	21	78%	

low endorsement, this item was dropped from the list of items. The dimension of Competence obsolescence was one of most discussed area throughout the panel discussion period. Acquisition of new competence to keep pace with the technical and functional obsolescence was considered important by the panel members. Functional competence refresh was approved by 85% of the members. Under technology research dimension, panel members approved four items. Majority of the members felt that deploying a research and development team is very important to keep up the momentum of competence anticipation. All the four items of the technology research dimension (85%, 70%, 70% & 89%) were retained by the panel. Under the dimension Market orientation, all the members unanimously agreed that generation, dissemination and response to market intelligence is highly desirable to improve collective competence. All the four items in the Competence renewal were found to be relevant by the panel and hence retained all of them.

7. DISCUSSION

This research study focused on developing an integrated measurement model for ACB with clearly defined dimensions, which were hitherto observed and measured as independent items as explained in the literature from previous studies. Opinions of industry and academic experts who are closely associated with Organizational studies were collected to construct the ACB assessment model. As observed and identified by the panel members through a Delphi exercise over six months, there exist 17 measurable factors, which form the bricks and stones of the ACB model. The model developed in this study is also greatly supported by the resource based theory conceived and elaborated by a range of scholars.

When a firm delivers all its committed targets to the stakeholders, it is said to have performed well. There are several key indicators to rightfully measure performance through Net Profit after Tax, Return on Capital Employed (ROCE), dividend to shareholders, market capitalization etc. To sustain health over a period of time in the business space, an organization needs to continually realign with market realities, quickly renew its internal energy sources and execute with precision, more importantly faster than its closest competition. The essential elements of ACB are different according to the business context the Organization operates in. However, the fundamental Organizational capabilities like future competence building, identifying competence obsolescence, internal technology research, market orientation, competence renewal etc. mediate the strength and direction of competence deficiency to alter the organizational health substantially. Global competition has given much required emphasis to the competitive advantage by recognizing differentiating factors in all markets. The changing technology landscape has empowered the customer to move closer to the product and thus demanding value added services in the product line. This ongoing customer demand along with the depleting internal competence is causing strongest of the companies to lose ground and diminish competitive advantage.

The first dimension of ACB in this study is Future competence. Anticipation of future competence has been touched upon as a significant contributor to ACB in the some of the recent competence framework studies. The same dimension was confirmed through the case studies and grounded theory and was selected as an antecedent to ACB by the expert panel members as well. Competence obsolescence as a dimension to ACB was one of the much discussed areas by the panel members. Most of the competence literature outlines obsolescence of the competence as an imminent consequence of technology obsolescence. Since most of the panel members were from the ICT background, Technology research, Market orientation and Competence renewal were discussed thread bear by the panel members throughout the Delphi exercise. In the first round, the concept Technology research was concurrently taken up by many several members and supported by most of the rest. Anticipating emerging technologies, importance of market

intelligence, employee's involvement in competence building etc. were a few of the key words picked up and retained in the factor sheet by the researchers during the sessions. Identification of core employees was dropped from the list as most of the members found it to be redundant with other constructs in the ongoing research. When five panel members raised the topic of research team within the firm in the first round, there were varied and distributed reaction from the rest of the members in the second round. Competency obsolescence measurement as a whole was agreed upon as an important requirement for ACB. There was a convergence of opinion when discussed about the competence development programs and acquisition of new competence.

8. IMPLICATIONS

Through the journeys of profitable Organizations, it has been empirically proven that the depletion of collective competence negatively impacts in intrinsic health of the Organizations. In this study, the researchers have attempted to clear the ambiguity around the ACB concept by integrating the hitherto disparate constructs. The researchers, through a six months long, rigorous interactive sessions, contacted experts from the Industry and Academic fields to collect, collate and aggregate opinions to deduct reasonable inferences to develop an integrated ACB assessment model. The model thus developed can be converted into an instrument to measure ACB from a holistic perspective covering all the dimensions of organisational competence management. The model harmoniously interlocks the undisputed concepts of technology obsolescence, market research and orientation. The researchers believe that this model can serve as a ready reckoner for those practitioners who are concerned about their firms depleting competence in context of the changing technology environment and the resultant impact of it on their Organization's health. The model will have a positive influence on Technology Organizations where the waves of change sweep in at unprecedented speed. Barring the traditional resource based competence assessment models developed by range of scholars to measure current competence requirements, no established instrument is available at capability level today for Organizations to measure the ACB.

9. CONCLUSION

This qualitative study throws light to the ACB dimensions and further establishes the factors influencing ACB, leading to the development of an integrated assessment model. Despite the fact that a few firms have understood the significance of measuring ACB, they mostly do not know precisely what to measure, because of an absence of understanding of what constitutes a set of ACB dimensions. By proposing, creating, and validating a multi-dimensional, operational measure of the ACB, and by showing its viability in enhancing

organizational performance, the present study gives practitioners a handy instrument for assessing the extensiveness of their current IC initiatives. The experts, while interacting through the Delphi technique expressed a uniform opinion regarding the ACB dimensions and its factors. These experts were chosen based on their vast and varied experience in Organizational development activities in Malaysia and outside. This, we believe is a significant contribution to the body of knowledge. The model can further be expanded into a customizable, evidence-based instrument to measure ACB, which we are sanguine that will be a considerable contribution to the industry. This study is theoretical in nature, and the constructs of assessment model developed was compiled through an elaborate literature analysis. The constructs thus developed were further validated through a qualitative triangulation method to further build up into an assessment model. Empirical validation of this assessment model is required to further ratify the generalisability of the model. The model's predictive power can be examined by researchers by administering the model in various technology organisations from the ICT sector. Further, such results may be compared with the existing assessment models to yield additional insights.

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