

Absorptive Capacity: Managerial and Intra organizational Antecedents

**Dr. Krishna Balodi*

ABSTRACT

Extant literature reveals rich amplitude of Absorptive Capacity (AC) research and is characterized by diverse theoretical and empirical viewpoints. Today, AC has evolved to become well recognized in management research as a multi-level constructs that has diverse antecedents. The managerial and intra-organizational antecedents of AC form the crux of this research article, and selective-intensive theoretical literature review methodology is adopted to present the findings into a theoretical framework.

Keywords: Absorptive capacity, managerial and Intra-organisational antecedents.

Introduction

Teece et al. (1997) have shown that knowledge is a critical resource for firms to achieve and maintain competitive advantages relative to their rivals and thereby achieve superior performance. In addition, following Knowledge based view, Camisónand Foréz (2010) also studied the impact of AC (comprising of external and internal learning capacities) on firm innovation and its effect on performance. Camison concluded that knowledge sourcing from outside the firm, absorption within the firm, and its exploitation with respect to opportunities have all become critical elements for firm's adaptability and innovation output.

AC has thus become extremely important in management research; however, research on its antecedents is very limited. The research on antecedents of AC has predominantly focused on the analysis of existing knowledge base of the firm. No research has thoroughly evaluated the role of managerial and intra-organizational antecedents. This paper fills this gap in the literature by focusing only on managerial and intra-organizational antecedents of AC. Rest of the draft is organized as follows. The next section provides a brief preview of the conceptual background, definitions, views, and dimensions of AC. The following section sheds light on the managerial and intra-organizational antecedents of AC. The third section contributes a simplified integrating framework of AC followed by the conclusion.

The Concept

Definition—Cohen and Levinthal (1990) defined AC as “the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends” (p. 128). Zahra and George (2002) redefined this definition to state AC “as a set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability” (p. 186). According to

Camisónand Foréz(2010) AC “is the dynamic capacity that allows firms to create value and to gain and sustain a competitive advantage through the management of the external knowledge” (p. 707). Their study further defines AC as the “systematic, dynamic capacity that exists as two subsets of potential and realized absorptive capacities” (p. 709). Potential AC comprises of firms capabilities related to acquiring the knowledge and assimilating it. This measures how firms value, acquire, assimilate new external knowledge. Realized AC consists of firms capabilities related to transforming and applying knowledge. Realized AC encompassed firm's ability to acquire and integrate the external knowledge with the extant knowledge. It also reflects on how this transformed knowledge can be incorporated into processes and systems to improve as well as to create new competencies. Potential and realized absorptive capacities are not employed simultaneously but in succession and are utilized according to market requirements.

Alternatively, a multi-level model of AC formulated by Matusik and Heeley (2005) identifies three levels namely, individual, intra-organizational, and organizational with priority to access and assimilation of external knowledge. Murovec and Puroden (2009) classified AC into science-push AC and demand-pull AC. Science-push AC originates from scientific information that may have developed at universities or research institutes whereas demand-pull AC relies on input from firms value chain partners or customers (Murovec and Prodan,2009).

Methodology

To identify the most pertinent articles several literature-search methods were adopted. First, the key word “absorptive capacity” was searched on Google Scholar. It helped in identifying seminal articles such as Cohen and Leventhal (1990), Jansen et al. (2005), Lane et al. (2006), and Zahra and George (2002). Then EBSCO data base was searched for articles, published in scholarly journals, with “absorptive capacity” in the “title” and “antecedents”

**Professor, IIM Lucknow, UP*

in the "abstract". 21 articles were found and reviewed. Then we undertook selective-intensive search, probing references of 21 articles, to find articles (1) focusing on organizational antecedents of absorptive capacity, (2) referring to the seminal articles, and (3) belonging to either A* and A category of journals (ABDC Rating) only. This triangulation ensured that the present review focused only on papers, published in high quality journals, studying managerial and intra-organizational antecedents of absorptive capacity.

Theoretical Views

Knowledge and innovation are interdependent. Solving problems using knowledge produces innovation while successive waves of innovative efforts lead to creation of new knowledge. Based on the above methodology it was observed that the extant research on AC has been informed by diverse theoretical viewpoints, viz., learning and innovation, knowledge-based approach, and dynamic capabilities view etc. A representative summary of these articles is presented in table 1.

Table 1: Representative Summary of Articles Reviewed

Sl. No.	Author	Empirical or Theoretical	Theoretical Perspectives Adopted	Key Findings
1	Todorova & Durisin (2007)	Theoretical	Managerial Cognition	<ol style="list-style-type: none"> 1. Re-conceptualize the absorptive capacity construct proposed by Zahra and George (2002). 2. Social integration mechanism influences all components of absorptive capacity. 3. Power relationships influence both valuing and exploitation of new knowledge aspects of absorptive capacity. 4. Appropriability regimes and power relationships moderate the relationship between knowledge sources and absorptive capacity.
2	Liu, Ke, Wei, & Hua (2013)	Empirical	Dynamic Capabilities View	<ol style="list-style-type: none"> 1. IT capabilities (i.e., flexible IT infrastructure and IT assimilation), as lower-order capabilities, exert influence on firm performance through higher-order capabilities such as absorptive capacity and supply chain agility. 2. Flexible IT infrastructure and IT assimilation of a firm are both positively related to its absorptive capacity.
3	Chang, Chen, & Lin (2014)	Empirical	Innovation	<ol style="list-style-type: none"> 1. To improve their new product development performance or service innovation performance firms have to enhance their resource commitment, resource flexibility, and absorptive capacity. 2. Resource commitment and resource flexibility are two antecedents of absorptive capacity both manufacturing and service companies.
4	Iyengar, Sweeney & Montealegre (2015)	Empirical	Learning, Knowledge-based view	<ol style="list-style-type: none"> 1. IT use is an important learning mechanism that impacts knowledge transfer effectiveness, and absorptive capacity, and that the influence of IT use on firm performance is completely mediated by absorptive capacity. 2. Higher internal IT use will lead to higher knowledge transfer effectiveness which will in turn lead to higher absorptive capacity.
5	Soo, Tian, Teo, & Cordery (2017)	Empirical	Innovation	<ol style="list-style-type: none"> 1. The results indicate that human capital-enhancing HR, acquisition and developmental HR, have a significant positive effect on a firm's absorptive capacity. 2. Social capital-enhancing HR has a positive effect on absorptive capacity, however, only through egalitarian HR practices. 3. Organization capital-enhancing HR impacts absorptive capacity positively through a firm's effective information systems.

The incorporation of various theories, both conceptually and empirically, has increased the complexity of universe of AC research (Volberda et. al. 2010). Following paragraphs provide brief overviews of major theoretical anchors.

Theories from Learning and Innovation– According to research in this domain, AC comprises of three dimensions namely, recognition, assimilation, and exploitation. This research stream has studied the impact of AC using different levels of analysis including individuals and organizations. The research has found that: AC, a by-product of R&D, is influenced by country level institutional (for e.g., cultural, normative, and regulative) differences, and has a positive impact on innovation (Chang et al., 2014; lyengar et al., 2015; Soo et al., 2017; Volberda et. al. 2010).

Theories from Managerial Cognition – Research related to managerial cognition shows that management's and firm's dominant logics, through its organizational forms, structures, and processes, influence absorptive capacity. Research has highlighted the importance of managers' role in enhancing AC merely by providing information. Studies also illustrate the positive impact of ability and motivation at an individual (managerial) level on AC (Todorova and Durisin, 2007; Volberda et. al. 2010).

Theories from Knowledge-based View – Based on knowledge-based approach, research indicates that a high level of AC positively influences the amount of knowledge created and productivity of its utilization. Research also shows the importance of combinative capabilities, organizational form, and knowledge characteristics on AC and this relevance is increased when is the knowledge is shared (lyengar et al., 2015; Volberda et. al. 2010).

Theories form Dynamic Capabilities– Research identifies AC as a high-level capability which is in turn supported by other allied capabilities. Research on potential AC highlights the importance of knowledge acquisition and assimilation capabilities. It also indicates how co-ordination capabilities enhance potential AC. Likewise, Realized AC, comprising of knowledge transformation and exploitation, is positively influenced by the presence of sound system and socialization practices (Liu et al., 2013; Volberda et. al. 2010).

Dimensions – The notion of AC is conceptualized as a bi-dimensional construct comprising of potential and realized AC dimensions (Zahra and George, 2002; Camisón and Foréz, 2010). Whereas Potential AC concerns acquisition as well as the integration of knowledge the Realized AC concerns knowledge transformation and application sub-dimensions. The first dimension, knowledge acquisition, represents a firm's adeptness in locating, identifying, valuing, and acquiring

critical external knowledge (Zahra and George 2002). The second dimension, knowledge integration, denotes the absorbing potential of a firm. Assimilation dimension comprises of organizational processes that permit the acquired information to be investigated, processed, deciphered, and internalized (Zahra and George, 2002). The third dimension, transformation, allows a firm to improve the existing system by catalyzing the integration of the newly assimilated information to the existing knowledge base. The transformation can be achieved by the addition of new information, elimination of redundant information, or by the restructuring of the knowledge base (Kogut and Zander, 1992; Van den Bosch et al., 1999). The final dimension, application, allows firms to use the revised information into its processes and routines. This eventually allows firms to improve their operations and enhance their competencies by refining and strengthening prevailing processes and competencies (Zahra and George, 2002).

Antecedents: Managerial and Intra-Organizational Factors

Camisón and Foréz (2010) showed that apart from technological knowledge (Cohen and Levinthal, 1989), managerial factors, organizational practices, new knowledge exploitation, and organizational factors are also indicators of AC. The different managerial factors and organizational practices include age, education, skill, and experience of managers as well as R&D cooperation, industrial benchmarking, manager's involvement in knowledge sharing and participation in training events. The various factors related to new knowledge exploitation are R&D integration, and patent development, etc. Organizational factors include functional competencies emanating from human resources management practices, production know-how, industrial design knowledge, marketing experience, new market knowledge, renewal capability, adaptation capacity, and scientific and technological information exchange.

The different human resource factors associated with AC are the skill level of employees and R&D spending (Zahra and George, 2002). Their study indicates that a firm's previous knowledge forms the basis for initial AC of the firm. As firms gain access to new information through acquisitions, licensing and contractual agreements, alliances, and achieve proficiencies and competencies its AC also matures.

According to Vega-Jurado et al (2008), AC is dependent on organizational factors and structural decisions- formalization, centralization, and social integration mechanisms- in a firm. The organizational factors evaluated in their study were individual skills, tenure served, and R&D orientation. Firm's management practices towards new procedure development and rules

to govern organizational practices were evaluated for the formalization of the firm. The social integration mechanism was assessed using the management techniques employed by the firm to enhance employee participation (Vega-Jurado et al., 2008).

Internal R&D expenditure, external R&D purchases, employee's knowledge, training and experience, cooperation with partners, and adaptation orientation were identified as the antecedents of the AC of a firm by Murovec and Puroden (2009). From an innovation standpoint, firm's AC are influenced by knowledge, relational, and institutional contexts. The knowledge context involves knowledge relatedness and characteristics, the relational context includes cultural relatedness and its interaction with knowledge, and the institutional context comprises of sponsorship and partnership-based linkages (Dougherty and Hardy, 1996; Yeoh, 2009).

According to Kogut and Zander (1993), the combinative capabilities within a firm also affect firm's AC. Interpersonal embeddedness and inter functional linkages, according to them, are the two elements that form the combinative capabilities. The level of constraints faced by behaviors and institutions due to ongoing social relations is a reflection of embeddedness. A high-level social embeddedness of individuals in relationships portrays mutual dependency, cooperation, and trust. Inter-functional linkages on the other hand show the interdependence of activities, across the functions, within an organization. Inter-functional linkages are "tightly coupled" if there is a great deal of independence of the activities of one section of the organization on another and "loosely coupled" if there isn't.

According to Jansen et. al. (2005), there are three kinds of combinative capabilities, viz., coordination capabilities, systems capabilities, and socialization capabilities (Lima, 2015). Coordination capabilities comprises of cross-functional decision making (Volberda et. al. 2010). Systems capabilities consist of organizational design elements. Socialization capabilities include connectedness- formal and informal- and socialization tactics. Socialization tactics are comprised of a structural construct (density of linkages) and a cognitive construct (shared social experience) (Volberda et. al. 2010).

Goffe and Jones (1996) have identified organizational culture as one of the major constituent of a firm's internal environment. Gupta and Govindrajana (2000) have also found that organizational culture positively influences the creation and sharing of knowledge. Task orientation, risk taking propensity, cooperation and trust, reward practices, and communication practices have been identified by

Khoja and Maranville (2010) as five cultural elements that are critical to AC. Their study reveals that the higher emphasis on routine work undermines the innovation orientation adversely affecting the AC. In addition, organizations that encourage resource and capability sharing across their business units is found to enhance AC. The knowledge sharing practices will help these firms to build upon the knowledge gained from external sources to assimilate new information and integrate it with existing information.

After an extensive review of literature in various fields, Schmidt (2005) identified a three groups of factors which act as determinants of AC:

- a) R&D Activities – Since Cohen and Levinthal's (1989) study, many scholars have conducted research on R&D related factors such as R&D expenditure or R&D intensity etc. as a measure of AC at the firm level.
- b) Previous knowledge and skills – Experience and previous knowledge assist in the utilization and integration of new knowledge. AC is therefore path dependent. The ability to assimilate new information and integrate it with the existing knowledge enhances when the employees are given education and training. AC of firms is dependent on AC of its employees. Therefore, as the education, training, and experience of employees improve the AC of the firm will correspondingly increase as well. This is further facilitated by the role of gatekeepers, who serve in removing an inter-departmental knowledge sharing barrier and thereby improve a firm's AC.
- c) Organizational design and functional practices – The AC of a firm also hinges on the encouragement provided to cross-department/ functional transfer of knowledge. In addition, the organization design-structure and control system- of the firm, its cross functional communication, and organizational culture also affects the AC of a firm (Daghfous, 2004).

To elaborate, the content can be improved by educating/ training employees on relevant literature/ practices, and the flow of knowledge can be enhanced by forming inter-departmental workgroups, and job rotation (Mahnke et al., 2005; Jones and Craven, 2001). Reward systems and training and developments may also be implemented to accentuate employee learning (Mahnke et al., 2005; Daghfous, 2004). These endeavors can produce significant improvement in the ACs of the individual employees which in turn will result in enhanced AC for the firm.

The three broad groups of determinants identified by Schmidt (2005) are inter-related. They play a complementary role with one another. It is very critical that

firms need to simultaneously develop competencies in all three categories.

Framework

As mentioned previously this paper attempts to explore the managerial and intra-organizational antecedents in

relatively more depth. Towards this end, in the previous sections, this paper reviewed literature on AC antecedents while in this section we synthesize those findings in figure 1.

Managerial Antecedents –For all firms, its AC is a

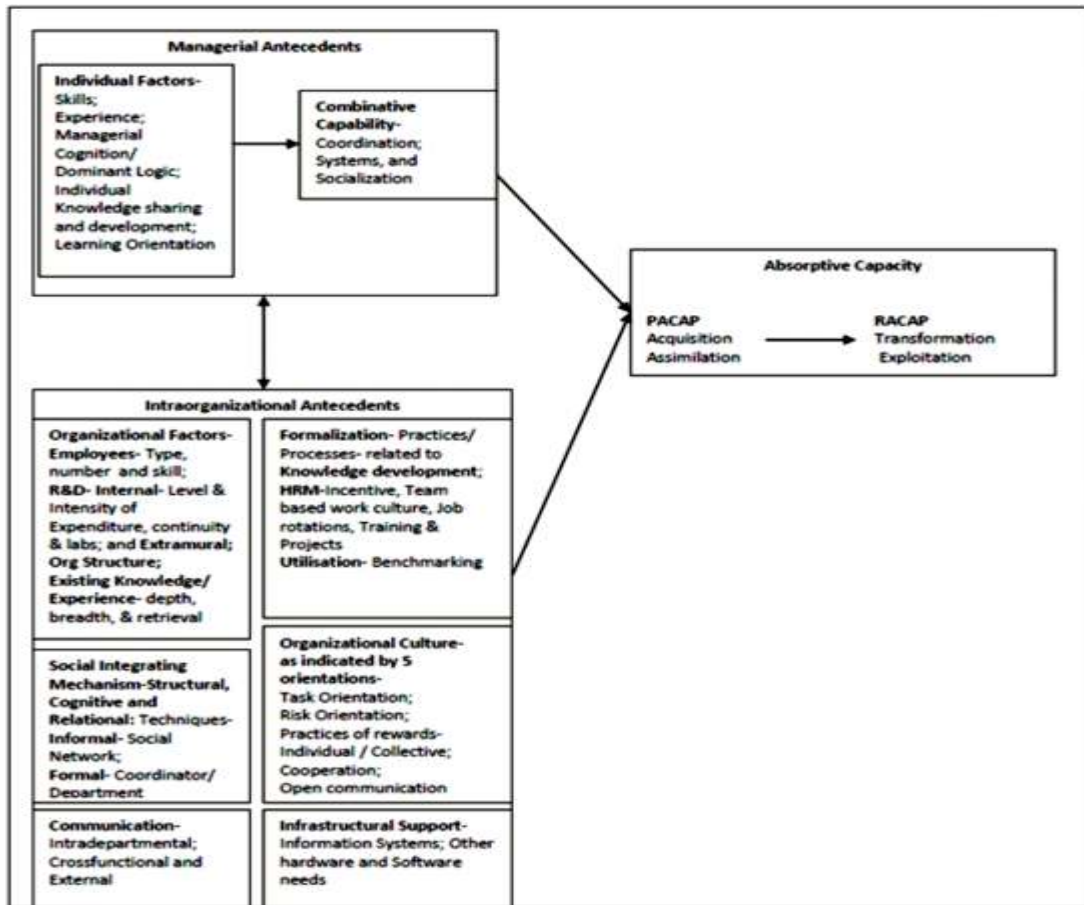


Figure 1: Managerial and Intra-Organization Antecedents of AC

reflection of more than any individual's capability or AC (Cohen and Levinthal 1990). The education, background, experience, and cognition of managers affect their worldview and attitudes (Augier and Teece 2009) which in turn affect managerial and organizational capability to establish or update the level of knowledge in organization. Relevant managerial and organizational factors also include internal communication, meetings, transfers, specialization, autonomy, gatekeeping and/ or cross-functional interactions (Volberda et. al. 2010).

Intra-organizational Antecedents–An organization is a structural arrangement of group of individuals. As a structured group these individuals evaluate, integrate, and utilize the collective knowledge of the structure. Various organizational design decisions influence the AC differently (Van den Bosch et al. 1999). Internal informal

social connections are no less important (Dhanaraj et al., 2004). Based on the literature review above, the following framework of managerial and intra-organizational antecedents emerges.

Conclusion

AC is a multi-level construct which has been heavily researched from multiple theoretical viewpoints. It has multiple antecedents. This paper identifies managerial and intra-organizational antecedents of AC framework in relatively more depth. The managerial antecedents of AC comprise of individual factors and combinative capabilities. The intra-organizational antecedent consists of organizational design, incentive and control structure, informal social connections, inter-departmental communication, and organizational culture. However, this

research is limited to two types of antecedents and is confined to a theoretical outlook. Future research can focus on supplementing this research with the addition of inter-organizational antecedents and other exogenous determinants to create a more elaborate model of AC antecedents. Empirical research may also be undertaken to refine the findings of this study.

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