Descriptive Capacity in Teams: A Conceptual Framework

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ABSTRACT: There is a growing use of teams in organisations in order to undertake various organisational routines and activities. One of the concepts that can be beneficial to teams is desorptive capacity (DCAP). A review of the literature suggests that DCAP has only been studied at the organisational level. In this paper, we argue that, as with the concept of absorptive capacity (ACAP), DCAP can be usefully conceptualised as a property of sub-units, groups or teams in organisations. Team DCAP is described in terms of processes of preparation, exploration, dissemination, revision, and integration. This paper focuses on DCAP dimensions, DCAP antecedents, and team DCAP outcomes. Implications for management practice and future research directions are outlined.

Keywords: Desorptive capacity, teams, absorptive capacity, organisation, & knowledge.

It is frequently stated that we are currently living in a ‘knowledge society’ (David & Foray, 2002; Innerarity, 2013; Ramaprasad & Sridhar, 2011; Ramezan, 2011). Knowledge, competencies, and associated capacities are increasingly viewed the fundamental drivers of competitive advantage in business (Argote & Ingram, 2000; Teece, 1998). Intense market competition, technological advancement, and rapidly changing customer needs mean that organisations need to continuously import knowledge, learn and innovate in order to survive (Garvin, Edmondson, & Gino, 2008).

One of the concepts that is commonly referred to in the context of explaining how organisations derive competitive advantage from external knowledge is that of absorptive capacity (ACAP) (Lane, Koka, & Pathak, 2006; Volberda, Foss, & Lyles, 2010; Wales, Parida, & Patel, 2013). Cohen and Levinthal (1990, p. 128) defined ACAP as “the ability of a firm to recognise the value of new, external information, assimilate it, and apply it to commercial ends.” Many studies (Cohen & Levinthal, 1989, 1990; Griffith & Sawyer, 2010; Lane et al., 2006; Nemanich, Keller, Vera, & Chin, 2010; Zahra & George, 2002) have highlighted the usefulness and significance of ACAP as a driver of organisational success.

More recently, researchers have also become interested the way in which organisations may benefit from transferring the knowledge and learning they have absorbed. Whereas ACAP describes an organisation’s capacity to import knowledge and exploit it for commercial gain, desorptive
capacity (DCAP) is a construct that has been developed to refer to an organisation’s “ability to externally exploit knowledge” (Lichtenthaler & Lichtenthaler, 2009, p. 1322). It is suggested that the process of DCAP involves identifying external opportunities for knowledge transfer and exploitation, and then transferring the knowledge to a recipient (Lichtenthaler & Lichtenthaler, 2009, 2010). Both ACAP and DCAP may be important for organisations to succeed in a knowledge-based economy (Müller-Seitz, 2012).

Although it has long been asserted that learning and knowledge management concepts such as ACAP (and by extension DCAP) may usefully be viewed as distinct properties of sub-units (e.g. groups, teams) that make up organisations (Szulanski, 1996) it is only recently that researchers have begun to conduct research into such capacities as they arise at the sub-unit level. To date, however, this research has been confined to exploring ACAP at the team level (Backmann, Cordery, & Hoegl, 2014; Cadiz, Sawyer, & Griffith, 2009; Griffith & Sawyer, 2010; Nemanich et al., 2010).

In this paper, we attempt to advance research and theory in this area by making the case for studying DCAP as a property of teams. In doing so, we argue that the capacity of teams to gainfully transfer the knowledge they themselves have absorbed to other teams and organisational units is increasingly important, both for the teams themselves and to the organisations in which they are embedded. We outline a conceptual framework that describes the key elements that might comprise DCAP at the team level, speculate on its likely effects on team outcomes, and also identify some key boundary conditions on its influence.

**DESORPTIVE CAPACITY**

At the level of a firm, DCAP has been described as the “reverse of absorbing” (Lichtenthaler & Lichtenthaler, 2009, p. 1322) and, more specifically, as “an organisation’s ability to identify technology transfer opportunities based on a firm’s outward technology transfer strategy and to facilitate the technology’s application at the recipient” (Lichtenthaler & Lichtenthaler, 2010, p. 158). Two key processes have been identified as contributing to firm-level DCAP (Lichtenthaler & Lichtenthaler, 2009). The first is the capacity to identify opportunities to transfer technological
knowledge, and the second is the capacity to facilitate the transfer of that knowledge in a way that results in its beneficial application by the recipient entity.

Knowledge transfer refers to the process in which one organisational entity is influenced by the knowledge, skills, and expertise of another (Argote, Ingram, Levine, & Moreland, 2000; Argote, McEvily, & Reagans, 2003; Lin, 2007), providing a fundamental basis for individuals and groups to learn from each other and to build new knowledge (Murray & Peyrefitte, 2007). Darr and Kurtzberg (2000) argue that knowledge transfer is enacted “when a contributor shares knowledge that is used by an adopter” (p. 29).

Szulanski (1996, 2000) identified four knowledge transfer processes, namely: (a) initiation; (b) implementation; (c) ramp-up; and (d) integration. Szulanski (2000) referred to ‘initiation stickiness’ – the first knowledge transfer phase – to denote challenges in identifying knowledge transfer opportunities and measures to respond to the difficulties in transferring knowledge. The second phase – the implementation process – takes place with the decision to transfer knowledge (Szulanski, 1996, 2000) between the knowledge source and the recipient (Szulanski, 2000). Following the transfer of knowledge to the recipient, the ramp-up process is concerned with identification and resolution of unanticipated problems that may be encountered by the recipient (Szulanski, 2000). The integration stage initiates when the recipient obtains satisfactory outcomes as a result of the transferred knowledge (Szulanski, 1996) and this provides the basis for gradual integration of new knowledge into the recipient entity’s routines (Szulanski, 2000).

**Descriptive Capacity as a Property of Teams**

Why do we need to consider DCAP as a property of organisational teams? There are several reasons. First, in order for organisations to benefit substantially from valuable external knowledge that has been absorbed by one of its sub-units, such as a team, that knowledge typically needs to be transferred more generally throughout an organisation and absorbed into organisational routines. Teams that are able to effectively ‘give up’ what they have learned to other organisational units increase the chances of that knowledge having a transformative effect on performance at the
organisational level. Second, organisations are increasingly comprised of multi-team systems (Tannenbaum, Mathieu, Salas, & Cohen, 2012), and some teams in those systems may have particular responsibility for knowledge sharing. For example, Kirkman, Cordery, Mathieu, Rosen, and Kukenberger (2013) describe the use of organisational communities of practice (team-like knowledge management collectives) to identify valuable sources of operational knowledge, codify them as new best practice operational routines, and disseminate this knowledge to operating teams throughout the organisation. The capacity to effectively transfer that knowledge is a critical requirement of such groups within a multi-team system.

What might team DCAP entail? Based on Szulanski’s (1996, 2000) conceptualisation of knowledge transfer processes, we propose that team DCAP will comprise five team processes that provide teams with the capacity to systematically and effectively exploit exported knowledge: preparation, exploration, dissemination, revision, and integration. These dimensions are at the core of our proposed conceptual framework linking team DCAP to team outcomes, as outlined in Figure 1, and explained in further detail in subsequent sections of this paper,

Components of Team DCAP

Preparation: Preparation involves two sub-phases of identification and evaluation of knowledge. The identification sub-phase refers to locating and selecting the knowledge recipient. Identification of the potential knowledge recipient(s) is critical as it assists the knowledge provider team in examining the readiness, capacity, and knowledge need of the recipient. In addition, it is necessary that the knowledge provider team communicates to the recipient clearly as to what they want to transfer in order to prevent from distortion and misinterpretation of knowledge by the recipient (Tang, Mu, & MacLachlan, 2010). Furthermore, during the identification sub-phase, knowledge about the recipient team can be obtained through informal interaction and socialisation.
Following the identification phase is the evaluation sub-phase. This sub-phase refers to assessing the potential benefits and estimating the associated knowledge transfer costs (Teece, 1977). During this process, the team members collectively make contributions to establish whether to engage in knowledge transfer. Apart from assessing potential benefits and transfer costs, the team jointly estimates the amount of time required during the transfer process. Furthermore, the team also identifies and evaluates appropriate and reasonable methods of transferring knowledge.

**Exploration:** The exploration phase is similar to the ‘search for knowledge’ identified by Hansen et al. (2005). This phase involves collecting knowledge from various team members, which facilitates the dissemination of relevant and valuable knowledge to the recipient. During exploration, the need and likelihood of knowledge transfer (Szulanski, 1996) is examined, and the rationale for knowledge transfer established.

**Dissemination:** Upon successfully identifying the need for transferring knowledge, and evaluation of the potential benefits and costs of the knowledge transfer, the next step is to actively disseminate knowledge to the recipient. The dissemination phase corresponds to Szulanski’s (1996, 2000) ‘implementation’ phase of knowledge transfer.

**Revision:** The revision phase is the ‘ramp-up’ dimension of knowledge transfer identified by Szulanski (1996, 2000). According to Szulanski (2000), teams may confront problems as a result of knowledge transfer for various reasons namely: (a) the knowledge is transferred in a different environment, and therefore the recipient reacts differently; (b) staff have inadequate training; (c) trained staff quit the organisation and/or are unfit for the role; and (d) newly transferred knowledge places substantial impact on the overall systems, procedures, and culture (e.g., shared norms and beliefs) of the organisation. Because of these issues, the team transferring knowledge needs to continually revise and revisit its knowledge transfer strategies to ensure sustainable benefits for both parties (i.e., source and recipient). In the revision phase, the key questions that the knowledge provider team may ask are: was the knowledge transfer a useful exercise? How could the knowledge have been transferred differently, and how should it be enacted in future? And what will be the outcome of the transferred knowledge? Although the knowledge sharing exercise between teams may
not produce equivalent benefits to both parties – that is, for instance Team B (recipient) may acquire more benefits as compared to Team A (knowledge provider), the knowledge sharing exercise provides an opportunity for the knowledge provider to move a step forward in assessing the value of the knowledge they are developing and disseminating.

**Integration:** The integration phase depends on how successful the knowledge transfer exercise is. If the knowledge transfer creates complications or turns out to lack utility, the transferred knowledge may be ignored (Szulanski, 2000) by the recipient. When the recipient does not obtain useful knowledge, the transferred knowledge is deemed to be obsolete, and therefore may not be integrated with the extant knowledge of the team. As during the knowledge sharing process, both parties learn something, whether positive or negative. The knowledge provider team may draw on its experience to enhance the prospective knowledge sharing process based on the lessons learnt from the experience.

*Proposition 1: Team DCAP comprises five elemental processes – preparation, exploration, dissemination, revision, and integration.*

**ANTECEDENTS OF TEAM DCAP**

Following Mathieu, Maynard, Rapp, and Gilson (2008), we consider team DCAP be a ‘blended mediator’ (i.e., a combination of team process and emergent state) influencing effective team knowledge transfer. Szulanski (1996, 2000) referred to four sources of influence on effective knowledge transfer: characteristics of the knowledge itself, its source, recipient, and the transfer context. Szulanski (1996) found that the three most important impediments to knowledge transfer were (1) lack of ACAP of the recipient, (2) causal ambiguity, and (3) arduous relationship between the knowledge provider and the recipient. Based on this, we identify a number of factors that potentially either facilitate or inhibit the development of team DCAP. These are causal ambiguity, recipient motivation, organisational culture, team cohesion, and team boundary characteristics.
Characteristics of Knowledge

Causal ambiguity has been described in the literature in two ways – *linkage ambiguity* and *characteristic ambiguity* (King & Zeithaml, 2001). *Linkage ambiguity* refers to ambiguity in associating competency and competitive advantage (Barney, 1991), whereas *characteristic ambiguity* is innate to the resource (King & Zeithaml, 2001) such as tacitness of knowledge (Szulanski, 1996). According to Reed and Defillippi (1990), tacitness can cause ambiguity in that even the performer of an action may be unaware of the actions and steps he or she has undertaken in performing a task. As such, the causal association between performance and outcome can create ambiguity (Reed & Defillippi, 1990) which influences the transfer of knowledge between the knowledge provider and the recipient. The transfer of tacit knowledge can be challenging (Kirkman, Mathieu, Cordery, Rosen, & Kukenberger, 2011) in that it is hard to define (Szulanski & Winter, 2002), vastly subjective (Sutton, 2001) and if it is not delivered directly and in a natural manner that allows individual team members to choose an appropriate communication mode such as demonstration and discussion (Griffith & Sawyer, 2010). The transfer of explicit knowledge is easier than tacit knowledge because it can be in the form of “manuals, templates, blueprints, and other written methods” (Dhanaraj, Lyles, Steensma, & Tihanyi, 2004, p. 431; Nonaka & Konno, 1998).

*Proposition 2: Causal ambiguity negatively influences team DCAP.*

Characteristics of the knowledge recipient

According to Katz and Allen (1982), there are some teams that are unwilling to acquire knowledge from external sources, and this can be explained in what they called the ‘Not Invented Here’ (NIH) syndrome, which entails that the team has adequate knowledge and expertise in its area and that external knowledge does not generate novel outcomes to the team performance. The reluctance to accept knowledge makes the knowledge transfer a difficult task for the knowledge provider.

*Proposition 3: Perceived lack of motivation of recipient negatively influences team DCAP.*
**Characteristics of the Organisational Context**

The level of intra-organisational knowledge exchange depends on an organisational context that is conducive to collaboration, cohesion, growth and development (Szulanski, 1996). Organisational culture is embedded in values, norms, and practices of an organisation (De Long & Fahey, 2000). Organisations need to promote a culture that promotes close collaborative relationships between the knowledge provider and the recipient. Hansen et al. (2005) found that knowledge hoarding may partially be due to perceived competition between the knowledge providers and recipients, and the level of competition varies from group to group. Hence, we propose that organisational contexts that emphasise flexibility and discretion over stability and control (Hartnell, Ou, & Kinicki, 2011), and which also encourage collaboration over competition will facilitate DCAP at the team level.

*Proposition 4: An organisational culture that emphasises flexibility and discretion positively influences team DCAP.*

*Proposition 5: Competition between the knowledge provider team and the recipient team negatively influences team DCAP.*

**Team characteristics**

Team cohesion is the feeling of team members’ desirability towards one another (Lott, 1961). Teams with low cohesion (an input that arises during team DCAP) are less likely to engage in knowledge sharing within the team (Mathieu et al., 2008), and we suggest that this can also result in poor knowledge transfer out of a team. Hence, a high level of cohesion between team members is likely to positively influence team DCAP.

*Proposition 6: Low cohesion within the knowledge provider team negatively influences team DCAP.*

Teams differ in terms of the extent to which their membership is fixed or dynamic (Mathieu, Tannenbaum, Donsbach, & Alliger, 2014). The key features of a team that contribute to desorbing knowledge are openness and flexible boundaries. For instance, communities of practice (CoP) can be
considered as a group of people that have open and flexible boundaries in terms of sharing knowledge.

*Proposition 7: Open and flexible membership boundaries within a team moderate the team DCAP-team outcome relationship, such that the more open and flexible the team boundaries, the easier the knowledge transfer.*

**TEAM DCAP OUTCOMES**

The ultimate outcome of team DCAP is a single unified piece of synergised knowledge that can be acquired, assimilated, transformed and exploited by the recipient team. The literature reviewed here suggests that team DCAP outcomes are primarily concentrated on generating extrinsic, intrinsic, and operational outcomes.

**Extrinsic Outcomes**

Research on the notion of knowledge transfer has primarily focused on extrinsic and intrinsic motivational factors (Bock, Zmud, Kim, & Lee, 2005; Lin, 2007; Osterloh & Frey, 2000; Wasko & Faraj, 2005). Extrinsic motivators refer to any external factors that influence performance, such as an organisational promise of reward or incentive to employees (Amabile, 1993; Daniel & Esser, 1980; Lin, 2007; Osterloh & Frey, 2000), and gratitude, recognition and promotion (Hendriks, 1999). In the context of teams, teams are encouraged to share knowledge because the organisation has an objective to achieve, and to attain the goal, the organisation introduces financial rewards or incentives, and/or promises a promotion. The key motive behind the extrinsic motivation is the acquisition of reward and prevention of retribution (Kowal & Fortier, 1999). The other extrinsic motivator of knowledge transfer is reciprocity which refers to the expectation that the other team also shares knowledge that may be valuable (Hendriks, 1999).

**Intrinsic Outcomes**

Individuals are intrinsically motivated to undertake the activity because they enjoy doing it, are interested in it, get a feeling of satisfaction from performing it, and because it challenges their
ability (Amabile, 1993). Similarly, teams that engage in knowledge sharing may find that activity rewarding in and of itself, resulting in satisfaction, learning and engagement with the team task (Wasko & Faraj, 2005).

**Operational Outcomes**

In addition to from extrinsic and intrinsic outcomes, team DCAP generates operational outcomes for the knowledge provider team which, in turn, may enhance team DCAP performance. For instance, team DCAP provides the basis for testing the applicability of transferred knowledge and checking errors, as well as assisting the knowledge provider team in retaining valuable knowledge. In addition, team DCAP generates enhanced performance and innovativeness (van Wijk, Jansen, & Lyles, 2008). Although the DCAP may benefit the recipient more than the knowledge provider team, nonetheless, this paper mainly focuses on the outcomes that recipient team achieves as a result of the knowledge transfer.

Testing the applicability of new knowledge is a key achievement in that it provides the knowledge provider with the opportunity to realise the use, value, and significance of the transferred knowledge. The transferred knowledge that turns out to be beneficial further serves as the feedback which encourages the knowledge provider team to create valuable knowledge for future endeavours. It strengthens the learning loop which reinforces team learning. Besides testing the applicability of the knowledge, team DCAP provides the opportunity to find out the likelihood of error of the transferred knowledge. According to Kogut and Zander (1992, p. 395), “investments in new knowledge often have a characteristic of trial-and error learning, much like buying options on future opportunities.” However, this is only possible when the knowledge provider team and the recipient team have effective communication and transparent processes where the recipient team reports errors in the transferred knowledge to the knowledge provider team.

Lessons that the knowledge provider team learns from the knowledge transfer exercise can form the basis of performance improvement and innovativeness. Performance improvement is an outcome of the knowledge transfer by the knowledge provider team in that the knowledge provider
team can reflect on the lessons the team learns during the knowledge transfer process. The lessons can include insight from the knowledge provider team members as well as insight and feedback from the recipient. The combination of acquired lessons can assist the knowledge provider team in defining and refining future team DCAP endeavours. Hence, performance improvement can result in team innovativeness and vice versa.

Innovativeness measures the extent of novelty of an innovation (Garcia & Calantone, 2002) within a team such as a product or service. Team innovation on the other hand is the adoption and implementation of valuable new ideas, processes and/or procedures (M. A. West & Farr, 1990) which is grounded on team members’ creativity – team’s unique and valuable knowledge (Amabile, Conti, Coon, Lazenby, & Herron, 1996). Team creativity is the first phase in what Hülsheger, Anderson, and Salgado (2009) refer to as the ‘idea generation’ phase. To move a step further, the notion of innovation has recently shifted and can be discussed in the context of open innovation and closed innovation. Chesbrough (2003, 2004) states that closed innovation refers to the old fashioned perspective on innovation which views that innovation is effective and sustainable when it is controlled.

Chesbrough (2003) labels the new perspective on innovation as ‘open innovation’ denoting that valuable knowledge can come internally and externally, and can go to market from inside or outside the organisation. “Open innovation models stress the importance of using a broad range of knowledge sources for a firm’s innovation and invention activities, including customers, rivals, academics, and firms in unrelated industries” (J. West & Gallagher, 2006, p. 319). Chesbrough and Brunswicker (2013) classify open innovation as follows: inbound open innovation refers to the innovation where knowledge flows inside organisation from external sources, whereas outbound open innovation refers to the flow of knowledge from inside to outside organisation. Based on Chesbrough and Brunswicker’s (2013) classification of open innovation, team DCAP can generate an outbound open innovation.

In the context of teams, valuable knowledge can be transferred outside the team through a systematic approach (i.e., team DCAP), and can be learnt during the knowledge transfer process and
from the knowledge recipient. The notion of outbound open innovation underlying team DCAP assists teams to systematically transfer valuable knowledge to the recipient in order to generate profit. The adoption of open innovation construct primarily aims to augment growth (Chesbrough & Crowther, 2006) facilitating the development of new opportunities i.e., acquisition of new valuable knowledge, and new business opportunities for teams.

Proposition 8: Knowledge transfer for knowledge provider has intrinsic, extrinsic, and operational outcomes.

CONCLUSIONS AND FUTURE RESEARCH DIRECTIONS

This paper has outlined a team DCAP conceptual framework, the core of which comprises five DCAP processes/emergent states (i.e., preparation, exploration, dissemination, revision, and integration). A number of propositions to guide research into the effects of, and boundary conditions applying to, team DCAP are also derived from this framework.

Given that team DCAP is a novel concept, this paper makes a number of recommendations for future research. First, there is a need for empirical study to develop reliable and valid measures of the concept of team DCAP as described in this paper. Second, field research needs to be conducted to test the propositions derived from this paper. Both ethnographic and quantitative research studies are needed to explore fully the ways in which teams develop the capacity to export effectively the knowledge they themselves have absorbed, assimilated and exploited for their own effectiveness. Future research might also examine the role played by key individuals (e.g. idea champions, resistors) in both provider and recipient teams.

On a practical level, research into desorption at the team level is likely to be of significant benefit to those who have responsibility for knowledge management in organisations, as well as those with direct responsibility for teams engaged in knowledge sharing. Understanding how teams can be encouraged to help other parts of the organisation capitalise on the knowledge they themselves have managed to absorb is an important aspect of becoming a learning organisation.
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Figure 1 Team DCAP Model