

Ambidexterity-as-Practice: Understanding the Role of the Manager in IT-Services Projects.

Keywords: Ambidexterity, Project Management, Practice

Abstract

We argue that the literature on ambidexterity, defined here as the simultaneous enactment of exploration and exploitation, does not fully explore the detailed practices by which this may be achieved in practical, complex organisational working structures. This paper presents a qualitative insight into the management of ambidexterity in such an environment, specifically, IT-services projects, using the manager as the unit of analysis. We use this to investigate the idea of *ambidexterity-as-practice*, which has been underexplored.

In particular, we examine the management of intellectual capital (human, social and organisational) to develop a more fine-grained understanding of the micro-foundations of ambidextrous practices. We show that the forms of intellectual capital are entwined with one another and with the processes of exploitation and exploration, and that to conceive of them as separate, as the literature to date has done, is an insufficient theorisation. We posit that this is an area that requires further investigation.

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Introduction

This paper builds on the work of March (1991) who conceived of organisational learning in terms of *exploitation* (refining existing knowledge) and *exploration* (developing new solutions). These can be considered as mutually exclusive if they compete for scarce resources, but an emerging body of scholarly work has shown that they can be simultaneously achieved by an *ambidextrous* organisation.

The terminology of ‘ambidexterity’ has become increasingly frequent in recent years (Raisch et al., 2009), and has been applied in multiple areas of research (Simsek, 2009). Although the generic meaning of ambidexterity is the ability to pursue two different paths simultaneously, there is no consistent definition (Cao et al., 2009; Gupta et al., 2006), and a multitude of interpretations and research agendas within the literature. Achrol (1991) defines it as simultaneous efficiency, innovation and flexibility; Benner and Tushman (2003) consider exploitative and exploratory innovation; Graetz and Smith (2005) argue for controllability and responsiveness; and Sarkees and Hulland (2009) seek both innovation and efficiency. The range of meanings precludes a generic definition that usefully encompasses them all, and we therefore return to the ‘learning’ roots of the subject. We understand and define ambidexterity as the following:

Ambidexterity is the ability to both use and refine existing domain knowledge (exploitation) whilst also creating new knowledge to overcome knowledge deficiencies or absences identified within the execution of the work (exploration).

Three major forms of ambidexterity have been identified. In *temporal* ambidexterity (Tushman and O'Reilly, 1996), exploitation and exploration are separated in time, with the organisation moving from one dominant theme to the other. *Structural* ambidexterity (O'Reilly and Tushman, 2004) requires that these modes are separated, with one organisational unit focusing on exploitation, another on exploration, with both integrated at the senior management level to produce an ambidextrous organisation. In this context, management is a focal point for resolving the tension between the two, and these are generally resolved one level down by creating units with different foci (Raisch and Birkinshaw, 2008). Gibson and Birkinshaw (2004) identify business-unit-level *contextual* ambidexterity using the beneficial choices made by individuals who demonstrate “the behavioural capacity to simultaneously demonstrate alignment and adaptability” (2004:209). The former refers to coherent business activities working towards a common goal, while the latter refers to the capacity to reconfigure those activities as required. There is not necessarily a resource trade-off between the two, which can be considered *orthogonal* (perpendicular to each other) dimensions of learning (Cao et al., 2009; Gupta et al., 2006; Raisch et al., 2009).

However, the literature does not fully account for ambidexterity in more complex forms of organising. The theoretical concept of ‘full’ structural ambidexterity (i.e. separation of exploratory and exploitative elements) is well understood, as is the idea of contextual ambidexterity within a business unit. This does not, though, represent the reality of many organisational forms, which can be significantly more complicated. Benner and Tushman (2003:242) argue for such a lower-level analysis, where “ambidextrous organizations are composed of multiple tightly coupled subunits that are themselves loosely coupled with each other.” Gupta et al. (2006) echo this, pointing out that

exploratory R&D units can work effectively with more exploitative manufacturing and sales groups within an organisation. The studies performed do not seem to have focused on this reality, and this is important, as most practical organisations involve complex, multi-level, evolving structures. Such a context is also difficult to reconcile with a simple model of temporal ambidexterity, as we might expect a micro-level analysis to reveal individual acts of exploitation and exploration occurring continuously. For example, the R&D unit will require standardised administrative processes, and the manufacturing team might trial new techniques alongside standard operations, even though the wider organisation may be in an exploitative or exploratory mode. Lower-level analysis therefore makes the understanding of ambidexterity more challenging. Our investigation sought to better understand the ‘*how*’ of ambidexterity in terms of the underlying micro-mechanisms in such complex organisational forms.

We also note that the ambidexterity literature does not focus significantly on managerial practices in terms of understanding this ‘*how*’. We therefore conceive of the subject both as *learning-as-practice* (see Edmondson, 2008) and also in conjunction with the growing literature of *strategy-as-practice*. Jarzabkowski and Spee (2009:70) view strategy-as-practice as “a situated, socially accomplished activity, while strategizing comprises actions, interactions and negotiations of multiple actors and the situated practices that they draw upon in accomplishing that activity.” They consider the research in terms of the *practitioners* (those that ‘do’), *practices* (the way it is done) and *praxis* (the flow of activity by which it is accomplished), and this literature attempts to understand how micro-level actions and phenomena influence macro-level performance and outcomes. This approach is also valuable in studying ambidexterity (i.e. the investigation of *ambidexterity-as-practice*), but as yet has not been part of the agenda within the field.

To better understand the micro-mechanisms of ambidexterity, we draw upon the framework developed by Kang and Snell (2009). This uses the concept of *intellectual capital* (IC) to model an organisation that supports ambidexterity. They argue that organisational knowledge may be broken into subcomponents (see also Swart, 2006) of *human capital* (HC, the knowledge within individuals), *social capital* (SC, the knowledge embedded in relationships) and *organisational capital* (OC, processes, procedures and explicit knowledge). Kang and Snell advocate that each of these has both exploitative and exploratory aspects, as shown in Figure 1. HC can be *specialist* (exploitative) or *generalist* (exploratory). A *cooperative* (exploitative) approach to SC uses dense social networks, for example, established teams with strong ties; whereas an *entrepreneurial* (exploratory) approach uses weaker ties to seek new knowledge (Granovetter, 1973). The SC can be understood in *structural*, *cognitive* and *relational/affective* terms (Kang et al., 2007; Nahapiet and Ghoshal, 1998). OC can be *mechanistic* or *organic* in nature (Burns and Stalker, 1961). Kang and Snell (2009) propose that ambidexterity can be implemented at the organisational level by either a *disciplined extrapolation* or *refined interpolation* model (Figure 1).

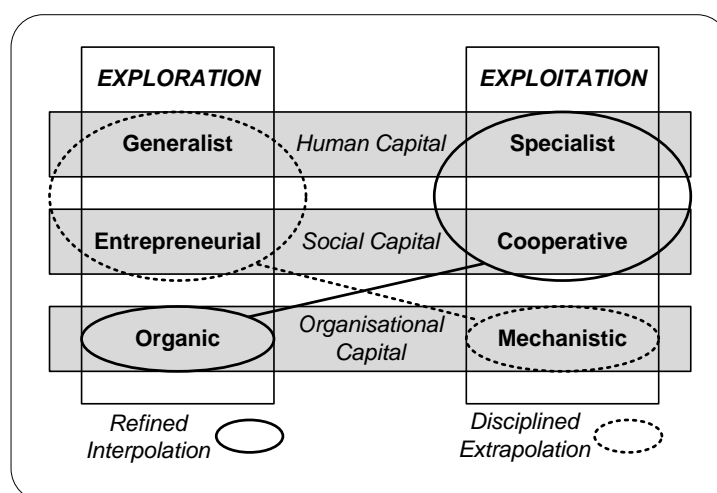


Figure 1: Kang and Snell (2009) Model.

In line with the idea of ambidexterity-as-practice, we view this model and consider the knowledge represented within it through the epistemologies of both *possession* and *practice* (Cook and Brown, 1999). Thus, the management of ambidexterity may be understood not only as the application of *knowledge*, but also of *knowing how to balance both exploitation and exploration*.

We argue that the model of Figure 1 may need to be revised if applied to a complicated organisational structure. In line with the prevailing thinking within the literature, we contend that ambidexterity is an orthogonal construct, not necessarily subject to trade-offs (Cao et al., 2009; Gupta et al., 2006) and suggest that the sub-elements of ambidexterity can also be understood in this manner. Thus both generalist and specialist human capital may be expected, together with a beneficial range of diverse social contacts and relationships (SC) (Tiwana, 2008), and a balance between procedural rigour and flexible innovation (OC). We therefore sought empirical evidence of such an organisation (with all six of the Figure 1 elements) to test these concepts and enhance our understanding of the mechanisms of ambidexterity and the practices by which it is enacted.

It is appropriate to address this *how* question by attempting to identify the managerial elements (including at the micro-level) that underlie the achievement of ambidexterity, and link these to the organisational outcomes. Following Kang and Snell (2009), we consider an *input-process-output* model (Simsek, 2009) since, from a systematic review of the literature, we find that few studies can be categorised in this manner. This is important, as the ability to accommodate and manage exploitation and exploration is critical to organisational performance and survival, yet to date we do not have a full understanding of the underlying mechanisms regarding how this may be achieved. Intellectual capital therefore represents the *input* to the *process* of ambidexterity, which itself leads to superior organisational performance (Figure 2).

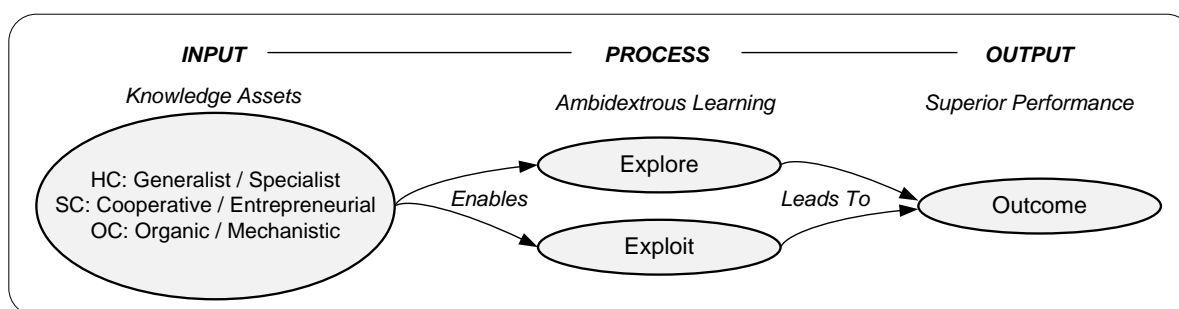


Figure 2: Input-Process-Output Model

Research Context and Method

We chose to investigate the concepts of orthogonal intellectual capital in terms of input-process-output in the context of project management in the IT-services industry, since this requires both structure and process (knowledge refinement - exploitation), together with flexibility for problem-solving (knowledge generation - exploration). All projects are, to some extent, unique, although the degree of novelty can vary considerably, from ‘one-offs’ to similar, recurring, offerings where firms can improve and benefit from “economies of repetition” (Davies and Brady, 2000:932). There is no ‘one-best-way’ to learn, as the benefits and appropriate mechanisms are firm- and situation-dependent (Brady and Davies, 2004), and these circumstances offers significant challenges (Williams, 2008).

The literature shows that the role of management is central to achieving ambidexterity in organisations (Jansen et al., 2008; Lubatkin et al., 2006; Nemanich and Vera, 2009). O’Reilly and Tushman (2008:200) advise that “ambidexterity is a specific capability embodied in senior leadership’s learning and expressed through their ability to reconfigure existing organizational assets and competencies in a repeatable way to adapt to changing circumstances”. We considered the subject of ambidexterity to be particularly relevant for project managers, since this description is appropriate for the role.

The level of analysis was the *project*, and the unit of analysis was the *project manager*, since this individual is responsible for managing the learning orientation of the project activities. The work may require an exploitative orientation if it is similar to previous activities, or an exploratory one for a radical new product development. However, most projects that the case organisation performs have to balance exploitation and exploration since they occupy similar technical domains, but each has its own set of challenges.

Access to a global IT-services organisation was obtained, and participants were requested with at least five years of experience of managing projects (sufficient time to have encountered typical issues and different aspects of the life-cycle, rather than someone new in the position). The terminology was broader than that of solely *project managers*, so that other, wider, positions could inform the research. Sixteen interviews were undertaken (fifteen face-to-face, one by telephone). In total there were 10 project managers, 3 project management office (PMO) managers (generally responsible for overseeing the implementation of PM systems), 2 programme managers (the usual career route for whom is to have previously managed projects) and 1 enterprise

programme office manager. Individual role experience ranged from 5 to over 20 years. The respondents were from a virtual PMO, public sector administration systems, banking, defence infrastructure, defence product development, and a programme manager covering numerous sectors of the Company. The case organisation works with a range of industrial customers, and different areas were used to broaden the generalisability, rather than to focus on too narrow a sector or organisation which might have unique characteristics unrepresentative of the wider profession.

The interviews were intended to explore the managerial role rather than necessarily the aspects of the particular project(s) they were working on at the time (the intention was not to use the project as a case study). The data collected centred more upon the individual project manager and his/her role and experience rather than the immediate tasks, giving a broader picture. The interviews were semi-structured and looked at human, social and organisational capital, and managing exploitative and exploratory aspects of projects, together with an assessment of the effectiveness. The average duration was around an hour, and all interviews were recorded and fully transcribed for analysis.

Analysis and Findings

Analysis of the interview transcripts was performed using the Nvivo8 software package. The initial coding framework was that of the forms of IC (HC, SC, and OC, each exploitative and exploratory), the processes of exploitation and exploration at the project level, and the project outcome (although the primary investigation centred upon input and process).

Intellectual Capital

It was apparent that all six of the elements within Figure 1 were indeed present. Kang and Snell (2009:68) argue that HC contain specialist and generalist aspects. “Specialists typically have knowledge that is deeper, localized, embedded, and invested within particular knowledge domains. Generalists, on the other hand, tend to be multi-skilled with a more versatile repertoire of capabilities.”

There was strong support from all respondents that managing projects required both aspects. In this context, specialist knowledge can be understood as project management knowledge (skills, qualifications, knowledge of procedures and techniques), technical domain knowledge and/or client knowledge. Generalist knowledge can be understood as previous experience that can be drawn upon, and an understanding of the project within the wider context of business operations, both within the Company and the client.

“It’s quite a wide range of areas that I cover, I would say that there are areas I have a lot of experience in specifically, so in those areas I tick the specialist box, but because of the wide scope of things I’m expected to cover, I am certainly not a specialist in a lot of them. So I couldn’t pigeon-hole myself in either to be honest. A generalist with a specialism in certain areas.”

There is no optimum solution, though, and the project manager’s knowledge and approach should be adapted to the type of project. Respondents agreed that reliance on

explicit knowledge and an exploitative approach is inadequate. The project manager role should arguably not be too specialist in terms of work detail, as this may detract from the process of actually managing, and appropriate support from other technical specialists would be expected. The more senior respondents with greater experience tended to emphasise the importance of the generalist aspect and its role in career success. Experience also aids in knowing how best to utilise project processes, together with what *not* to do. This expertise is best developed through experience and practice, and may be aided by encountering a range of project types, rather than deepening expertise in just one. Epistemologically, the knowledge is heavily embedded in practice, developed through experience and best evaluated through reflection. Sound knowledge of the principles is important, but not sufficient. To progress and develop as a manager, the accumulation of expertise should be augmented with a deeper appreciation of the mechanisms leading to outcomes, although these may be tacit understandings.

The role of social capital was identified as being highly significant in terms of the effectiveness of the project manager and generated the most coding elements from the analysis. Whilst this is not necessarily indicative of value, the responses of the interviewees showed that it was, in their opinions, highly important. Strong relationships were highlighted as crucial in enabling smooth project functioning:

“We work well with the customer, which is very important, and the technical infrastructure guys, things like that, because you know them you can just walk up and chat with them and if you have an issue you can discuss it with them straight away. So I think the social element is really important to getting a good start and keeping it going.”

Numerous facets of social capital emerged from the data, and these can be analysed in terms of the *structural*, *cognitive* and *relational/affective* dimensions of Nahapiet and Ghoshal (1998) and Kang et al. (2007). The structural network can be understood in terms of strong ties (i.e. the project team, with frequent communication) and weak ties (a wide range of occasional contacts) respectively. There was evidence that the managers used both, and that cultivating the wider network was advantageous, although the mechanisms may be serendipitous rather than formal.

“If they come across a snippet of information they think will be relevant to you they will share with you, so that network is very strong.”

The project manager network corresponds well to the ideas of Tiwana (2008) that strong ties should complement ‘bridging’ ties. The PM position is one for which, as might be expected, this configuration is beneficial.

In terms of the cognitive aspects, the role of the manager is that of an integrator, bringing together different knowledge domains (where necessary) whilst keeping an overview of the project. The project manager needs to ensure that relevant information on issues reaches him or her, but knowing all the details is not always necessary. Importantly, this is inherently a social act, and the role of communication was highlighted as being fundamental to effectiveness. All the respondents indicated that their communication style was a balance of formal and informal, with a tendency towards the informal. Co-location was emphasised as most beneficial, but was not always possible, so the communication style had to be adapted to the situation. This was

strongly highlighted in the interviews. As one manager summarised:

“A good PM is probably what I’d call a ‘wide boy’, somebody that can wheel and deal and yes, duck and dive, work in different environments, can talk at the highest levels on that as it were or get down and dirty and talk about the football and have a beer, type thing, because you can transcend all the levels.”

In the affective dimension, trust emerged as a critical factor in enabling relationships. In the words of one respondent, *“It’s essential”*. This was not just at the interpersonal level, but also at the inter-organisational level. A strong relationship with the client can significantly aid progress in clarifying requirements and solving problems. This can be particularly difficult in a consortium environment where (otherwise competitor) organisations are trying to work together to deliver a common project. The lack of effective social relationships can seriously hamper progress in such a complicated environment.

In summary, the social nature of these projects came through clearly from all the participants, and drawing on both exploitative and exploratory social capital was important in performing as a manager.

Given that the level of analysis was the *project*, the OC will be considered as *project capital* (PC) to distinguish it from an organisation-level construct. For this PC, there was a widespread view from the respondents that effective project working required both an exploitative framework of processes and structures (mechanistic), together with a flexible approach to accommodate practical issues. This came through clearly from the interviews, and the use of both was evident. This tension indicates the ambidexterity within working practices, such that there is a balance between the operational framework and day-to-day process flexibility.

“At a high level it’s structured, so I’d say it’s more of a framework to operate in. Whereas you’ve got very fluid local processes within that framework, so you have a boundary that is established for you, and you know the limitations of that boundary, but how you operate within it is very fluid.”

Examples of mechanistic exploitation were readily apparent in terms of project processes. These included reporting and documentation requirements and auditing that had been developed over time, learning lessons from other projects, and trying new ideas based on other projects’ experience. This was not always judged as successful, but provided the framework for project operations and ongoing improvements. The organic (exploratory) aspects of project capital also came through:

“Rely on your processes and so on which I think, from past experience, because if you like they are a sort of crutch holding you up and then at some point perhaps you realise, that’s when the innovation comes in and you suddenly realise the scope of your problem and set about fixing it.”

However, although organic PC was identified, it was linked strongly with both the mechanistic PC and the exploit/explore process activities and was difficult to identify as a stand-alone element. This is discussed in more depth, shortly. There was strong consistency in these views, with respondents supporting the idea that both aspects were

required within project management. Although preferences towards more of a mechanistic or organic approach varied, there were no contradictory pieces of evidence arguing strongly for the domination of one over the other. Rather, the role of the PM was to manage the project capital appropriately to ensure the most effective project operation.

Although we can identify both mechanistic and organic PC, considering these as purely ‘inputs’ to an exploit/explore process does not fully explain their value or operation within the input-process-output model. Whilst organisations have project management frameworks, methodologies and so forth, considering the inputs (i.e. ‘the procedure manuals’) as wholly separate from the act of performing projects is inadequate, as will be explored.

To summarise the intellectual capital findings: the model of Kang and Snell (2009) hypothesises two alternative compositions to achieve ambidexterity using HC, SC and OC/PC, utilising a *three-of-six* configuration. Initial coding of the interview responses in this research, however, showed that using the project manager as the unit of analysis, and considering exploitative and exploratory HC, SC and PC, *all six* of these were identified.

Exploitation, Exploration and Ambidexterity

Whilst all six of the elements of Figure 1 were evident from the respondents, evidence of exploitation and exploration processes were more challenging to extract and code successfully. The *input-process-output* research model suggests that the process of exploitation should ideally be distinguished from the inputs to that process. However, the exploitative acts are frequently difficult to differentiate fully from the PC inputs. Nevertheless, specific examples of ‘doing’ were identified. Key coding elements regarding exploitation included the implementation of lessons-learned systems (both within and between projects), and the necessity of change-control systems to capture and document requirement changes through the duration of the project. As the project work progresses, new findings are made or ideas clarified, necessitating a change to the planned deliverables. Exploitative systems in place to enable this to happen are part of the project capital (therefore *input* and *process* are intertwined).

A practical interviewing problem was that the respondents had difficulty identifying details of knowledge refinement as discrete activities. The nature of this type of project management is that much of the day-to-day activity is determined by the tasks and objectives that have to be achieved, and difficult to classify specifically in terms of the constructs discussed.

Processes of exploration were also identified. Effective technical prototyping could be used to explore the most appropriate way forward under conditions of uncertainty, and this could be augmented with group problem-solving:

“We had people from the operation, technical people, we had business people from programme level and from project level and we all sat round the table and what could we do to get around this and at the end of the day, we’ve come up with a different approach.”

Although the conception of exploitation and exploration may be understood in terms of March's (1991) ideas, during practical coding these terms were not sufficient to code many of the examples given by the respondents. Whilst end-points of exploitation and exploitation are theoretically well-conceived, there are multiple examples that fall mid-way, or could be understood as both simultaneously. Given the manifold interpretations of the terminology (Lavie et al., 2010), and hence the lack of a formal set of widely-accepted criteria, a rigorous classification is inappropriate. Referring back to our definition (exploitation: 'refining knowledge'; exploration: 'generating new knowledge'), the following quote shows the difficulty in attributing single codes to learning processes, where both exploitation and exploration may be understood:

"I always feel that we miss something at the beginning and it's not so much a learning as oh, another change, we mucked up, we haven't got it right. At the beginning we should have realised that was never going to work and we should have known to go this other path instead, which actually we didn't know at the beginning, and you have to do so much activity before that becomes apparent but you kind of are always wishing or thinking, could I have done something in the beginning to flesh that out so that we would originally have gone down the right path?"

This could be understood solely as exploitation, since the project knowledge is being refined. However, it can also represent knowledge generation. The concepts of exploitation and exploration are *umbrella* concepts, and, in the terms of Suddaby (2010:354), "should be viewed as large buckets or broad concepts loosely defined because this better captures the inherent complexity and messiness of the empirical world we study." This terminology is extensively used and broadly interpreted (Lavie et al., 2010), and to rigorously classify activities would not necessarily aid the research. To formally distinguish between the two may therefore be counterproductive.

This argument may be further expanded by the consideration of incremental changes. One project had experienced thirty thousand change requests, and whilst incremental improvements can generally be understood as exploitation, after thousands of modifications and major (unanticipated) technical and operational changes to the initial requirements, with significant challenges overcome (as occurred on this particular project), it is clear that new project knowledge had also been generated, and hence can be considered as exploration. Putting firm boundaries between these two terms may not be practical. Major and minor changes are a reality for IT-services projects, yet these do not fall easily into an orthogonal view of ambidexterity. To identify high levels of either exploitation or exploration is relatively straightforward, but low levels of either are hard to distinguish and provide significant definitional difficulty and ambiguity. A simple understanding of their co-existence is challenging, and instead it is more insightful to consider an underlying theoretical basis.

How can we better understand this difficulty? Farjoun (2010) contends that stability and change, in terms of exploitation and exploration, should not be considered as a *dualism* where one precludes the other, but as a *duality*, whereby stability may enable change, and change may enable stability. Although Farjoun (2010) looks at the organisational level, these ideas can also be applied to the project manager role. Exploitation and exploration can be identified, but so can their mutual interdependence. The consideration of the constructs as a duality allows an enhanced understanding of

ambidexterity. “Duality suggests instead that stability and change in different units and hierarchical levels may intertwine and depend on common practices and that rather than negating and displacing one another, they can mutually reinforce each other in a process of renewal.” (Farjoun, 2010:218). The duality concept sheds light on the understanding of ambidexterity, and provides a rationale as to why disentangling the concepts is challenging and perhaps counterproductive. The exploitation and exploration constructs can be considered as separate yet intertwined, evolving and interacting over the duration of the project. However, the complex interaction of these two strands (exploitation and exploration) can be extended to the other research model elements as well.

Re-conceiving the management of ambidexterity

Following the findings that the ‘six-box’ exploit/explore HC/SC/PC model was validated and that the duality concept of Farjoun (2010) could further explain the nature of ambidexterity, additional insight was obtained from the interview data. By parallel-coding the data (King, 2004), the interactions between the elements of the research model were investigated further. As with the difficulty of exploitation/exploration above, it was evident that there were strong inter-linkages between the elements, and to conceive of them in isolation was inadequate.

A further coding representation scheme was implemented to identify those links, with coding taken at the level of the sense of the paragraph rather than at the level of the sentence. A simple nomenclature was developed to allow depiction of the multiple forms of interaction possible. This is shown in Table 1, showing the HC, SC, PC and Process (coded ‘X’). Hence an interview section utilising exploitative and exploratory HC, exploitative SC and exploration would be labelled ‘HC-SC1-X2’.

Table 1: Identification - Parallel Coding Structure

HC:	HC1 - Exploit	HC2 - Explore	HC - Exploit and Explore
SC:	SC1 - Exploit	SC2 - Explore	SC - Exploit and Explore
PC:	PC1 - Exploit	PC2 - Explore	PC - Exploit and Explore
X	X1 - Exploit Process	X2 - Explore Process	X - Exploit and Explore
Op	Op - Output		

A total of 48 different combinations were identified, with 181 instances in the interviews (note that, for example, exploitative and exploratory human capital are not identified as an interaction in the same way, only interactions between different high-level constructs, such as SC and PC). It should be highlighted that the coding performed involved an element of subjectivity, and although we attempted to ensure consistency, the interpretivist nature of the work means that other researchers may generate different results. This was exacerbated by the difficulty of assigning codes given the broad definitions of each of the constructs. The use of ‘umbrella’ concepts resulted in challenges in attributing specific codes in practical application. This has been discussed in terms of exploitation and exploration, but was also applicable to the intellectual capital elements.

Whilst it is not intended that the number of sources and references is directly linked to significance, there are some common themes that emerged. PC1-X1, identified in 13

interviews with 30 references, was by far the most prevalent, with PC-X having 8 and 14 respectively.

“We had a process where the customer would come to us with a suggestion, shall we say and then we would cost that one up and then it would go to the change board and then they would make a decision. To cost up the estimate it would be anything from 2 hours to a day’s work. What we were finding was that the customer was asking for an awful lot of changes, but not many were getting approved so we were spending a lot of time on unapproved work. And so, we escalated this and the customer agreed that there would be a process in place where the idea got approved first, then estimated and then they decided to do the work.”

This indicates the difficulty of distinguishing between the *input* of organisational capital and the enacting of the *process*, as discussed previously. By considering the tools brought to the project and the use of those in practice, it is clear that considering one aspect without the other limits our understanding, and highlights the epistemology of *ambidexterity-as-practice*.

As an example of the coding method, consider a quote categorised as HC1-PC1:

“I think the approach I like is to have the detailed process, but it’s like a library, just go in and say, yes, I want this, this and this, I’m not going to take every book off the shelf, I just know for these circumstances I need X-Y-Z and that’s the approach I prefer.... but you’ve got to have the required knowledge, experience, to know that you just want this, this and this. You can’t just walk in off the street and say I’ll have A-B-C, when you actually want X, Y and Z.”

This shows that the utilisation of project processes by the manager is not simply the adoption of standard procedures as defined by the Company (PC1), but that practical choice is also determined by the manager’s experience of their utilisation (HC1). The inputs of HC1 and PC1 are therefore combined to create a unique set of conditions (another manager may approach the problem from a different perspective and history), and parallel-coding highlights this. This may aid in the understanding of the management of ambidexterity – the creation of, and response to, a variety of evolving strategic conditions that demand complex interaction.

Figure 3 shows the interconnections represented by the parallel-coding with five or more references, in a visual format. As can be seen, this is a complicated diagram, revealing the difficulty of comprehending the operational mechanisms identified. This is intended solely as a representation of the different coding forms showing the most prevalent mechanisms. The nature of the parallel-coding scheme means that this is possible, and shows the practical complexity of trying to comprehend the enactment of ambidexterity.

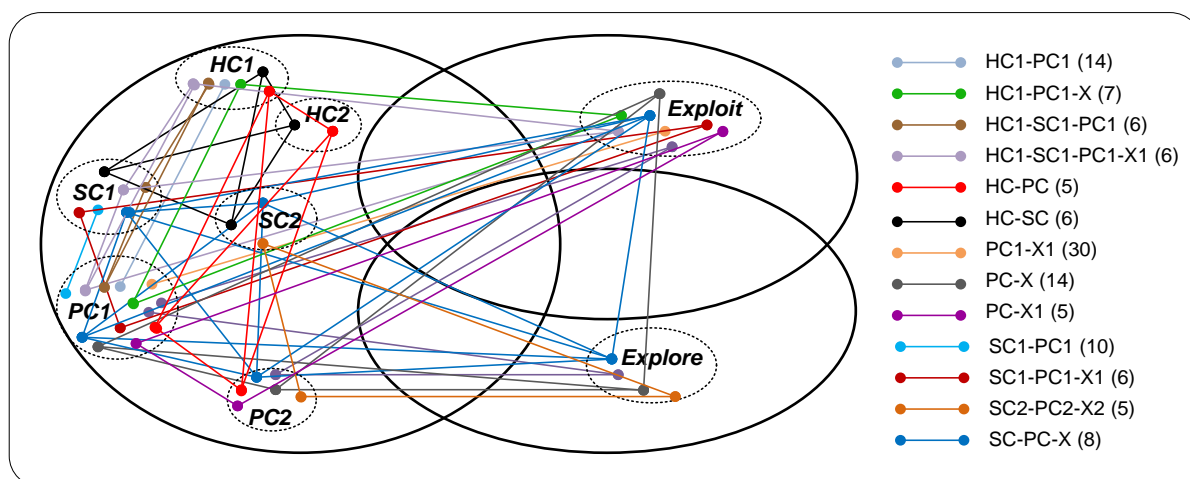


Figure 3: Representation of Linkages with 5 or More References

The evidence indicates that there are many inter-linkages between the constructs in the research model that can be considered in understanding the practices of ambidexterity. This provides a different approach to the subject, since the literature to date has conceptualised ambidexterity primarily at the group- or firm-level where the human, social and organisational capital can be understood as (notionally) separate, although co-existing, constructs (Kang and Snell, 2009; Subramaniam and Youndt, 2005; Youndt et al., 2004). Clearly they are inter-related in practice, yet whilst it is beneficial to consider intellectual capital in terms of its subcomponents to better understand the mechanisms, their interaction at the individual practice-level is not a well understood phenomenon.

The results indicate that to consider an input-process-output model is an insufficient theorisation of ambidexterity. Assessing at the level of the individual project manager shows that the consideration of the constructs as separate, as was the case with the research model development, does not account for the rich interactions in practice. There is significant interaction not only of the IC *input* elements, but also *input* with *process* (Figure 3). The practices are far from straightforward, and there were also four instances of HC-SC-PC-X, thereby linking *all* of the elements in Figure 3. So although the argument shows that all 6 intellectual capital elements can be identified in the activities of project managers, this additionally highlights that none exist in isolation, and each is connected (in some way) to other elements to achieve some aspect of the work. We must therefore consider not just the existence and contribution of each element, but also its operation within a constellation of other elements.

Conclusions and Recommendations

This paper offers an addition to theory by considering ambidexterity in terms of intellectual capital and proposing that in a complex organisational environment, IC subcomponents (specifically human, social and organisational/project capital) can be considered as co-existing and interdependent, each with orthogonal exploitative and exploratory facets. This is shown via semi-structured interviews with experienced practitioners responsible for managing projects.

Although the existing literature highlights the role of the top management team in resolving the tensions of structural ambidexterity, there is little qualitative research looking at the micro-foundations and the individual's role in managing ambidexterity within a project, i.e. a complex network of coupled units. The interview data showed that the inputs that create an ambidextrous project/organisation (human, social and organisational/project) capital are interconnected with the ambidextrous processes themselves and also that the two processes of exploitation and exploration are strongly interwoven. This provides a far richer and more intricate picture of the managerial and contextual mechanisms and practices by which ambidexterity may be achieved. At the micro-level, ambidexterity is not necessarily driven by the wider organisation, but is more dependent upon the task. The exploitative/exploratory learning orientation at the project level may be orchestrated by the manager, but this orchestration is both subtle and complicated. This draws upon IC, especially social and organisational processes, and the ability to do this explains the extent of ambidexterity at the project level.

We contend that this research builds a clearer understanding of the mechanisms of ambidexterity, further developing the 'how' of the subject. We have looked into how we may understand *ambidexterity-as-practice*, and the findings indicate that this can be considered along the same lines as *strategy-as-practice*, so this may open up another valuable area of research for both scholars and practitioners. The findings indicated the importance of the epistemology of practice (Cook and Brown, 1999), which has not been a significant factor within the ambidexterity literature to date. Specifically, building on Kang and Snell (2009), we find that ambidextrous managerial practices involve utilising specialist *and* generalist human capital, cooperative *and* entrepreneurial social capital and mechanistic *and* organic project capital.

A limitation of the work is that it is based on a small number of interviews within the case organisation, and wider applicability is unclear. However, we believe that this study provides a platform from which to understand better how ambidexterity is effectively enabled within organisations. Subsequent research might examine projects and project organisations longitudinally, thereby showing a clearer picture of their evolution. This may aid in understanding how ambidexterity can be used to overcome the unexpected issues that occur in projects, and how the complexity of both the work and the organisation may be addressed by an appropriate balance of exploitation and exploration to achieve the desired project outcomes.

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