Toward a Process Model of IT Adoption Ambidexterity: A Revelatory Case-Study

Completed Research Paper

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**Abstract**

Central to a process of IT adoption is the managerial ability to simultaneously balance the continuous exploring of the technology and its advantages, while also exploiting it. It is this simultaneity that we refer to as IT adoption ambidexterity, and recognize as an area in need of research. Based on prior research on organizational ambidexterity, this study employed a case study to investigate IT adoption at RE/MAX LLC, a global real estate franchise. The question guiding the investigation was: how were the exploration and exploitation activities that contributed to the firm’s IT adoption balanced over time? The study yielded qualitative data to propose a process model of IT adoption ambidexterity, highlighting the capabilities that contribute to ambidexterity at each phase of the adoption. Implications of this model for research and practice are discussed and propositions for future research are offered.

**Keywords:** IT adoption, organizational ambidexterity, exploration and exploitation, dynamic capabilities, case study, real estate industry
Introduction

Given today’s dramatic rapid advances in information technology (IT)—computer hardware, software, and networks—it is essential for companies to understand how to prepare for, and adapt to, an era of ever-smarter machines (Brynjolfsson and McAffee 2012). Moreover, the adoption of a new IT within a firm is not just the identification of the next “hot” technology or a one-time project that can be scripted perfectly in advance, but an ongoing, complex, dynamic process of interweaving the focal IT and organizational elements (Swanson 2012). Thus, executives must continuously evaluate and guide the adoption of the technology over time. We argue that central to this process of IT adoption are two critical imperatives that executives are faced with. On one hand, they must continuously explore the relevance of the technology to their companies’ needs and strategies. On the other, they should be able to exploit the technology, and configure and reconfigure organizational resources to capture new as well as existing opportunities. While each imperative in itself encompasses several challenges, executives are further required to simultaneously balance them, making the adoption process much more complex. It is this simultaneity that is referred as **ambidexterity** which James March (1991) identifies as the balancing of the tensions between the twin requirements of exploration and exploitation activities.

Based on our synthesis of the ambidexterity literature, our interpretation of ambidexterity is that it is not a managerial activity, but it reflects a managerial ability (Smith and Tushman 2005; O’Reilly and Tushman 2008). In the context of an IT adoption, we define ambidexterity as the ability to continuously balance the exploring of the technology to take advantage or overcome deficiencies in the firm (renewal) while also using and exploiting it (refinement). We posit that the role of management is to orchestrate the IT adoption process in a way that the most appropriate balance between exploration and exploitation is achieved to obtain returns from the technology. This calls for studies that are longitudinal in nature—providing the opportunity to examine the dynamics of organizational and technological changes across the adoption phases.

The purpose of this paper, therefore, is to better understand IT adoption ambidexterity—i.e., how firms balance exploration and exploitation activities in the adoption of IT. The research presented here uses as its base an in-depth case study of a global real estate franchise’s efforts in adopting IT to support its associates. This study was conducted at a time when the real estate industry faced high market volatility and technological shifts. The firm was rapidly expanding within the United States and internationally, and was confronted with uncertainties that are typical when embarking on the adoption of new technology. The specific research question that guided the investigation was: how were the exploration and exploitation activities that contributed to the firm’s IT adoption balanced over time?

This study makes three main contributions. First, it enhances the existing research on IT adoption by introducing the concept of IT adoption ambidexterity and showing how a firm balanced exploration and exploitation activities in the process of IT adoption. Based on an analysis of the rich field data and prior research, we propose a **process model of IT adoption ambidexterity**. The model provides a common language and a way of thinking about the synergies arising from the interactive relationship between activities that contribute to ambidexterity at the various phases of the IT adoption. Second, the organizational ambidexterity literature has largely focused on identifying and describing individual factors contributing to ambidexterity. However, as O’Reilly and Tushman (2008, p. 8) note “what is missing is a clear articulation of those specific capabilities that facilitate exploration and exploitation.” Furthermore, prior studies on ambidexterity have mainly followed a static perspective prompting scholars to call for research spanning time, and inclusion of multiple levels of analysis (Raisch et al. 2009). This study responds to the call and represents one of the first in-depth studies to apply ambidexterity focusing on various levels of the organization over time in the context of IT adoption. Third, for practitioners, the findings along with the process model presented in this study provide insights that can be used in explaining, anticipating, adjusting, or evaluating the balance act of managing each phase of IT adoption.

Theoretical Background

**IT adoption and Ambidexterity**

The adoption process of an innovation leading to institutionalization of usage has been conceptualized as a temporal sequence of steps through which a firm passes from initial knowledge of an innovation, to
balancing of exploitation and exploration to achieving sustainable competitive advantage, there is

According to March (1991), exploration corresponds to activities such as innovation and discovering new

IT itself is not fixed, but rather continues to develop over time, with significant organizational

implications. Because technology may always be improved upon, the continued adoption is informative

and adaptive, and business environment changes are also taking place, the IT is itself likely to evolve over

the time period in which it is adopted. Thus, the balancing of the exploration and exploitation activities

that makes the adoption possible is among the areas in need of research.

The conceptual distinction between exploration and exploitation activities has been intensively studied in

various disciplines (Adler et al. 1999, He and Wong 2004) and is a common theme in the strategic


Exploration is defined as activities that increase variation by creating new possibilities in the future.

According to March (1991), exploration corresponds to activities such as innovation and discovering new

opportunities. On the other hand, exploitation is characterized as routine activities that enhance efficiency

discipline at the firm and help develop continuous problem-solving procedures (Smith and Tushman 2005).

Exploration corresponds to improvements in production, efficiency, and implementation. Baum et

al. (2000, p. 768) suggest that exploitation comprises activities that help firms learn from their local

search, selection, and reuse of existing knowledge and routines, whereas exploration is associated with

planned experimentation and activities that go beyond organizational boundaries. Managing exploration

and exploitation simultaneously, however, is not an easy task because each is associated with fundamentally
different organizational architectures, processes, competencies, and logic (Smith and Tushman 2005, Floyd

and Lane 2000). In describing how organizations focus on either exploration or exploitation sequentially,

Duncan (1976) introduced the concept of organizational ambidexterity. Tushman and O'Reilly (1996) define

ambidexterity as the ability of an organization to manage both incremental, continuous improvements and radical, discontinuous challenges at the same time.

Research on organizational ambidexterity to date has largely focused on a single attribute at a time to

explain organizational ambidexterity, such as dual structures (Berner and Tushman 2003, Tushman and

O'Reilly 1997), organization contexts that encourage behavioral ambidexterity (Gibson and Birkinshaw

2004), or top management team behavior (Lubatkin et al. 2006, Smith and Tushman 2005, Simsek et al.

2005). As an aggregate, the current research has drawn attention to a set of common features that all

ambidextrous organizations seem to have in balancing exploration and exploitation, including
differentiated organizational structure, strong tight-loose corporate culture, common values across the

firm, and top managers who integrate different units and values across the firm. A conclusion can be
drawn from previous research, however, that there is no consensus about “how” ambidexterity is developed

and managed. As Gupta et al. (2006, p. 697) warn, “Although near consensus exists on the need for

balance [of exploitation and exploration] to achieving sustainable competitive advantage, there is

considerably less clarity on how this balance can be achieved.”

In IS research, organizational ambidexterity has been used in IS research to explain the complementary

and substitute roles of formal and informal controls in outsourced systems development projects (Tiwana

2010), healthcare innovations (Tarafdar and Gordon 2007), the coexistence of agile and traditional

software development approaches (Vinekar et al. 2006), knowledge sharing in long-term relationships

(Im and Rai 2008), typologies of IS strategies (Chen et al. 2010, Leidner et al. 2011, Lo and Leidner 2012),

and the transformation of IS strategy during a merger (Gregory et al. 2012). Due to the lack of empirical

IS research on this topic (Chen et al 2010), however, the question of how ambidexterity is developed,

under which conditions, and why, remains unexplored. This study aims to fill this void by investigating IT

adoption ambidexterity over time by focusing on the balancing of exploration and exploitation activities in
addressing the demands of IT adoption. IT adoption ambidexterity emerges as a dynamic capability, therefore, as a direct consequence of dynamic managerial decision making activities in orchestrating resources (Raisch et al 2009; O’Reilly and Tushman 2008) in the process of IT adoption. The consideration of time allows for a deeper examination of the underlying processes that enable the emergence of organizational ambidexterity, as suggested by Raisch et al. (2009). Indeed, understanding this temporal evolution has been argued to be crucial in explaining all dynamic capabilities (Helfat and Peteraf, 2003). Thus, in this study, we use the dynamic capabilities view of the firm (Teece et al. 1997) in framing IT adoption ambidexterity.

**Dynamic Capabilities and IT Adoption Ambidexterity**

The dynamic capabilities view of the firm (Teece et al. 1997) is an extension of the resource-based view of the firm, explaining how firms can develop their capability to adapt and even capitalize on rapidly changing technological environments. Teece et al. (1997) introduced the dynamic capability concept, acknowledging that as markets and technologies evolve, firms need to adapt and extend existing assets and competencies. They define dynamic capability as “the firm’s ability to integrate, build, and reconfigure internal and external assets and competencies to address rapidly changing environments” (Teece et al. 1997, p. 516). They claim that a firm’s dynamic capabilities are affected and shaped by its processes, assets, and evolutionary path. The use of dynamic capabilities is an iterative process that follows the theme of “learning by doing” (Eisenhardt and Martin 2000, p. 1115; Teece et al. 1997, p. 525).

As the dynamic capabilities view received more attention, some authors began identifying and explaining the mechanisms by which firms’ dynamic capabilities adapt to environmental and technological changes (Helfat 2000; Eisenhardt and Martin 2000; Zollo and Winter 2002). In particular, Teece (2007) developed a framework to describe dynamic capability, categorizing its foundations under three capacities: sensing, seizing, and reconfiguring. Sensing is defined by Teece (2007, p. 1322) as “scanning, creation, learning, and interpretive activity” to explore new technologies and markets. Seizing is the ability of the firm to select and invest on the appropriate products, markets, and technologies that have been identified through sensing activities (Teece 2007, p. 1326). Seizing, therefore, includes making investment decisions and strategic choices on such issues as development activities, improving technological competences, and complementary assets. Reconfiguring is the ability of the firm to “recombine and to reconfigure assets and organizational structures as the enterprise grows, and as markets and technologies change” (Teece 2007, p. 1335). This capability requires managing co-specialization, learning, knowledge management, and corporate governance (Teece 2007). These three fundamental capacities are at the core of a firm’s ability to survive and grow over time, and represent the essence of dynamic capabilities.

Embedded in Teece’s (2007) framework is the idea of a supporting managerial capability to lead that allows sensing, seizing and reconfiguring to take place. Augier and Teece (2009, p. 417) recognizes that “in the dynamic capabilities framework, management plays distinctive roles in selecting and/or developing routines, making investment choices, and in orchestrating non-tradable assets to achieve efficiencies and appropriate returns from innovations.” Prior research has found that top management plays a crucial role in facilitating the team’s ability to perform better (Smith and Tushman 2005), shaping individual behavior (He and Wong 2004), and resolving tensions by creating integrative and synergistic value between exploration and exploitative activities supporting organizational ambidexterity (Jansen et al. 2009). The role of middle and line management in organizational ambidexterity, however, has received less attention than the role of top management. Yet, both of these two management levels have been shown to have an important influence on organization change in technology-driven organizations (e.g., Burgelman and Grove 2007). Andriopoulos and Lewis (2009) argue that more research is needed to address exploitation-exploitation tensions at multiple organizational levels. Thus, in this study, we investigate IT adoption ambidexterity over time by scrutinizing the three components of dynamic capabilities (sensing, seizing, and configuring) and the support capability of leading at the various organizational levels, and how these impact the organization’s ability to maintain the dynamic balance between exploration and exploitation. Our model is shown in Figure 1.
Research Setting and Approach

The exploratory and qualitative nature of the research question (Benbasat et al. 1987)—“how” were the exploration and exploitation activities that contributed to the firm’s IT adoption balanced over time—led us to use an in-depth case study research, or what has been termed “revelatory case” (Yin 1994). The approach allowed us to capture the rich details of the IT adoption and to focus on the dynamic capabilities associated with organizational ambidexterity in a “real-world” setting. Such an approach is appropriate when research necessitates the study of contemporary events, without the need to control variables or subject behavior (Yin 1994).

The setting for our research is RE/MAX, a leading real estate franchise firm. The firm has a loose-coupling structure enabling independent brokerages and new franchise owners to tap into a client base by positioning themselves in the local market more quickly than they could do so alone. RE/MAX provides its network of franchisees with a strong brand name, proven business practices, and high-quality support (including training and education, technological infrastructure, and timely market knowledge). The firm’s founder, Dave Liniger, understood that IT was the foundation of doing business in the digital economy, particularly in information-sensitive industries like real estate. Since the late 1980s RE/MAX invested and embarked on IT initiatives that often lead the industry. In 1998 RE/MAX created MainStreet, an internet-based knowledge management system that provides brokers and agents with access to best practices, industry reports, training material, interactive forums, and emerging industry events. This study focuses on the adoption of MainStreet since its inception in 1998.

Our site selection followed Patton’s (1990) advice, “the logic and power of purposeful sampling lies in information-rich cases for study in depth. Information rich cases are those from which one can learn a great deal about issues of central importance for the purpose of the research” (p. 169). At RE/MAX, we gained access to fine-grained, high-quality data about the adoption of MainStreet over time. The contemporary nature of this case meant that extensive documentation was accessible and key actors were available for interviewing. In total, this research study generated a database with approximately 35 hours of recorded interviews, 50 pages of observational notes, 394 pages of transcribed interviews (215,536 words), and over 2,500 pages of secondary documentation.

Data Collection

In accordance with Eisenhardt (1989), we formulated the research problem and reviewed the existing literature on organizational ambidexterity and the dynamic capabilities view of the firm to “specify some potentially important variables,” and avoided “thinking about specific relationships between variables and...
theories as much as possible, especially at the outset of the process” (p. 536). We conducted field research (on-site observation, interviews, and documentation review) over the course of 16 months. The research began with formal meetings with the RE/MAX top management team. These meetings were complemented with the research team visiting the headquarters offices and subsequently conducting face-to-face qualitative interviews. The collection of multiple types of data from different sources provided triangulation and increased the reliability of the study.

Dynamic capabilities literature guided the data collection. Such an approach is recommended by Patton (1990), who argues that an interview guide is useful in focusing the conversations and in creating a descriptive framework for analysis. As is appropriate in qualitative research, theoretical sampling was used (Glaser and Strauss 1967). To ensure that the data came from all levels of RE/MAX, 29 interviews were conducted with individuals who were identified as being involved in the adoption process. These included interviews with top and middle managers at RE/MAX headquarters, owners of RE/MAX affiliates, real estate brokers, real estate agents, IT department personnel, and external consultants (see Table 1 for job designations). Semi-structured interviews were tailored for each person, focusing on the interviewee’s brief history, their perceptions of what happened and why/how decisions and actions were influenced and made, and how conflicts were resolved. The interviews were recorded and transcribed, and additional observations were noted at the time of the interview. To minimize bias and increase the study reliability, we followed the guidance on retrospective interviewing techniques suggested by Golden (1992) and Miller (1997) including: the use of multiple knowledgeable informants; asking informants to recall simple facts or concrete events rather than past opinions or beliefs; ensuring confidentiality, minimizing duration and inconvenience of data collection, and rich explanation of the usefulness of the topic was given. At least two of the researchers were present in the interviews, with one asking questions while the other listened, took notes, and asked for clarification as required. This made it possible for the researchers to discuss each interview in detail and to compare notes and interpretations. At the end of each interview, we asked the subject to suggest other individuals who would be potential sources for understanding the IT adoption.

Written data included both primary sources (annual reports, company archival analyses, organizational charts, strategic information systems documents, and internal correspondence and memos) and secondary sources (real estate industry reports, trade magazines, newspapers, and relevant published books). The researchers also attended a two-day forum of IT users, developers, and technology partners and providers at RE/MAX. Observational notes, which were taken during all of the visits, included numerous references to changes in how people viewed the focal-IT system over time including how concerns shifted, reactions varied, and how perceptions were both similar and diverse. In addition, throughout data collection, we had the advantage of having access to key informants who granted us several interviews.

**Data Analysis**

Given the nature of the process data from this study, we combined several strategies for sense-making, as suggested by Langley (1999), moving back and forth between the data and theoretical conceptualization. First, we followed a narrative strategy involving construction of a detailed story from raw data (Langley 1999, p. 695). Background documents, publicly available information, and transcripts of interviews and meetings were used to create a detailed narrative history of RE/MAX’s MainStreet adoption. Though this strategy is descriptive in nature, it provides a mechanism for condensing the large volume of data and moving toward a more in-depth case study analysis (Eisenhardt, 1989). The narrative created a chain of evidence that allows others to “follow the derivation of any evidence from initial research questions to ultimate case study conclusions” Yin (1994, p. 84), increasing the reliability of the study.

Second, we employed a theoretical template strategy (Langley 1999, pp. 698) by drawing on existing literature on the dynamic capabilities view of the firm and organizational ambidexterity. This step in the analysis involved a variation on qualitative pattern matching between theory and data (see Campbell 1975 and Yin 1994), and allowed us to focus on contextual and process oriented elements as well as the actions of key players associated with the adoption of MainStreet. We followed the open coding and axial coding techniques proposed by Strauss and Corbin (1990). The open coding categorized the data into concepts that were derived from individual and collective actions and from the interaction between business actors and technology that appeared to have influenced the IT adoption. These codes were compared and contrasted with the array of concepts discussed in the literatures on ambidexterity and the dynamic
A Process Model of IT Adoption Ambidexterity

Table 1: Sources of the Interviews Conducted

<table>
<thead>
<tr>
<th>Reference</th>
<th>Area/Role</th>
<th>Duration (in Minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VP IT</td>
<td>92</td>
</tr>
<tr>
<td>2</td>
<td>CEO, CFO</td>
<td>75</td>
</tr>
<tr>
<td>3</td>
<td>CFO, SVP IT, VP eBusiness</td>
<td>78</td>
</tr>
<tr>
<td>4</td>
<td>MainStreet Product Manager and MainStreet Product Analyst</td>
<td>65</td>
</tr>
<tr>
<td>5</td>
<td>Web Developer</td>
<td>67</td>
</tr>
<tr>
<td>6</td>
<td>Senior Manager, Application Development</td>
<td>69</td>
</tr>
<tr>
<td>7</td>
<td>Senior Manager, Product Strategy</td>
<td>72</td>
</tr>
<tr>
<td>8</td>
<td>Data analyst</td>
<td>69</td>
</tr>
<tr>
<td>9</td>
<td>VP e-Business</td>
<td>86</td>
</tr>
<tr>
<td>10</td>
<td>MainStreet, Product Manager</td>
<td>81</td>
</tr>
<tr>
<td>11</td>
<td>BDA Consulting</td>
<td>79</td>
</tr>
<tr>
<td>12</td>
<td>Sr. Manager, eCare</td>
<td>72</td>
</tr>
<tr>
<td>13</td>
<td>Director, Production Services, Media &amp; Training</td>
<td>66</td>
</tr>
<tr>
<td>14</td>
<td>Director, RE/MAX University</td>
<td>82</td>
</tr>
<tr>
<td>15</td>
<td>VP Education, Media &amp; Training</td>
<td>68</td>
</tr>
<tr>
<td>16</td>
<td>Senior VP eBusines and Emerging Technologies</td>
<td>85</td>
</tr>
<tr>
<td>17</td>
<td>Executive Director, Membership Services/Contracts,</td>
<td>89</td>
</tr>
<tr>
<td>18</td>
<td>Sr. Manager, Technology Training, eBusiness</td>
<td>77</td>
</tr>
<tr>
<td>20</td>
<td>Broker/Owner Re/max Professionals</td>
<td>75</td>
</tr>
<tr>
<td>21</td>
<td>MainStreet Product Manager</td>
<td>69</td>
</tr>
<tr>
<td>22</td>
<td>Membership Database Manager</td>
<td>62</td>
</tr>
<tr>
<td>23</td>
<td>VP/Regional Director</td>
<td>71</td>
</tr>
<tr>
<td>24</td>
<td>VP/Regional Director Central &amp; Northern Ohio Region</td>
<td>77</td>
</tr>
<tr>
<td>25</td>
<td>VP/Regional Director Carolinas Region</td>
<td>63</td>
</tr>
<tr>
<td>26</td>
<td>Broker/Owner</td>
<td>79</td>
</tr>
<tr>
<td>27</td>
<td>Agent 1</td>
<td>64</td>
</tr>
<tr>
<td>28</td>
<td>Broker Manager/Owner</td>
<td>82</td>
</tr>
<tr>
<td>29</td>
<td>Agent 2</td>
<td>75</td>
</tr>
</tbody>
</table>

capabilities view of the firm. Our interview transcripts were cross-checked to verify that concepts were supported by at least two sources of evidence. As data was coded into categories various theoretical questions, hypotheses, and code summaries arose. A key in this analytical step was the creation of an event listing, a technique that can provide insight into “what led to what, and when” (Miles and Huberman, 1994, p. 110). Then, we created critical incident charts (Miles and Huberman, 1994) depicting the sequence in which critical capabilities emerged. The concepts derived from individual and collective actions and from the interaction between business actors and technology represent our interpretation based on evidence gathered from interviewees. By moving from comparison of incidents within a category, to comparison of incidents with the emerging categories during axial coding, we organized, clustered, and mapped the theoretical components into meta-concepts as shown in Tables 2 and 3. As these concepts became integrated and further data collection did not cause modifications, but rather reinforced already-identified properties, the concepts were deemed theoretically saturated.
Table 2: Concept Code list and Sources

<table>
<thead>
<tr>
<th>Concept Code</th>
<th>Code Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1 – Initiation (contains 4 sub-codes)</td>
<td>Phase when activities are performed in making the decision to introduce a new technology in the organization and getting the initiative started.</td>
<td>Rogers 1983, Mckenney 1994</td>
</tr>
<tr>
<td>Phase 2 – Growth (contains 4 sub-codes)</td>
<td>Phase when the scope of the IT innovation is expanded, prompted by the growing understanding of the IT potential. The IT innovation grows to encompass and exert influence over a broad spectrum of the organization.</td>
<td>Rogers 1983, Mckenney 1994</td>
</tr>
<tr>
<td>Phase 3 – Institutionalization (contains 4 sub-codes)</td>
<td>Phase when the IT innovation becomes routine practice. The IT innovation is embedded in the design of the structures and procedures of the organization.</td>
<td>Rogers 1983, Mckenney 1994</td>
</tr>
<tr>
<td>Exploration Activity</td>
<td>Activities that increase variation by creating new possibilities and opportunities to focus more on the future, such as innovation and discovering new opportunities</td>
<td>March 1991</td>
</tr>
<tr>
<td>Exploitation Activity</td>
<td>Activities that help firms learn from their local search, selection, and reuse of existing knowledge and routines, such as improvements in efficiency and implementation</td>
<td>March 1991</td>
</tr>
<tr>
<td>Ambidexterity</td>
<td>Ability to balance between exploration and exploitation activities</td>
<td>March 1991</td>
</tr>
<tr>
<td>Capability of Leading</td>
<td>Management ability to articulate goals, develop skills, and set routines to sense new opportunities, and then seize them and reconfigure the organization accordingly</td>
<td>Augier and Teece 2009</td>
</tr>
<tr>
<td>Capability of Sensing</td>
<td>Scanning, creating, learning, and interpretative activities</td>
<td>Teece 2007</td>
</tr>
<tr>
<td>Capability of Seizing</td>
<td>Ability of the firm to exploit the appropriate products, markets, and technologies that have been identified through sensing activities</td>
<td>Teece 2007</td>
</tr>
<tr>
<td>Capability of Reconfiguration</td>
<td>Ability of the firm to recombine and to reconfigure assets and organizational structures as the enterprise grows, and as markets and technologies change</td>
<td>Teece 2007</td>
</tr>
</tbody>
</table>

Third, the narrative, incident charts, and theoretical map were reviewed by several contacts at the research site allowing detailed discussions, checking for accuracy, and correcting for inappropriate representations. These materials were also circulated and discussed among academic colleagues, thereby helping to refine original interpretations and providing some external validation to our conclusions. The analysis was iterative and involved moving back and forth among the data, the existing literature, and the concepts that emerged as salient at the research site.

Findings and Discussion

Table 3 summarizes the findings in chronological order “as explanation of the temporal order in which a discrete set of events occurred, based a story or historical narrative” (Huber and Van de Ven 1995, p. vii). This chronology is decomposed into three successive phases—initiation, growth, and institutionalization—which provide a way of structuring the case findings around a certain strategic continuity in the activities within each period, as recommended by Langley (1999). Based on this analysis a process model of IT adoption ambidexterity was developed, and is depicted in Figure 2. The model suggests that synergies arising from the interactive relationship between the three orchestrating foundations of dynamic capabilities identified by Teece (2007) (sensing, seizing, and reconfiguring) and the support capability of
### Concepts

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Capability of Leading: Top Management</td>
<td>&quot;Liniger chose his early explorations and members of the team carefully, knowing how critical it was to get accurate scouting reports of the terrain ahead.&quot; Liniger’s knowledge of the industry was leveraged with Benham’s formal IT training and Graning’s operational experience in managing the IT Users group.</td>
<td>Liniger formalizes the functional structure to house the initiative and provided the needed funding.</td>
<td>Liniger continues to provide the vision and oversee the initiative. &quot;The management vision follows an eagle eyed approach into what are the changes of technology that are going on. We have meetings to assess how any change would impact our membership and, then, how it would impact our recruiting and retention.&quot;</td>
</tr>
<tr>
<td>Capability of Leading: Middle Management</td>
<td></td>
<td>Finds creative ways to roll out MainStreet. &quot;My job was to do marketing communications to our members and run contests to get people to use MainStreet... For example, MainStreet Madness was wrapped around a basketball theme in March. We did an entire campaign to get our members to use it.&quot; At the same time, identifies opportunities. &quot;Technology initiatives, like Design Center and LeadStreet, came from affiliates. We took the idea and made it work for the whole franchise.&quot;</td>
<td>Engages and provides closer communication and coordination with individuals who are involved with MainStreet. &quot;Twice a year ideas are solicited within and outside the company. These suggestions help identify disruptive technologies, new business models, and attractive new markets... Based on these findings, I will then begin to socialize promising ideas among senior executives and broker owners, to determine acceptance.&quot;</td>
</tr>
<tr>
<td>Capability of Leading: Operational Management</td>
<td></td>
<td>Embraces the technology: &quot;Brokers can recruit and retain agents more easily by making available to them technological tools that generate leads and referrals, facilitate network communication, and track listing and sales activities.&quot; Provides new ideas: &quot;We have always said the best ideas come from the field. The ideas start small because the regions have the flexibility. They have fewer people to explain how money is spent.&quot;</td>
<td>&quot;Back then [second phase], when we came up with an idea, we would spend several hours putting a business plan together... Today franchisees want to have involvement, provide input, and have a say in how things get implemented. Very rightfully so, as technology impacts their agents and brokers and they want to be a part of that.&quot;</td>
</tr>
<tr>
<td>Capability of Sensing</td>
<td>The corporate team enacts a shared view by pulling together the collective wisdom from within and across the firm by attending meetings, sharing ideas with other firms, and negotiating with potential technology as well as complementing service providers</td>
<td>To understand further the opportunities that the Internet could bring to the company, the newly formed functional unit devotes part of their planning to evaluating initiatives developed at different RE/MAX affiliates.</td>
<td>Given the strategic importance of the Internet for RE/MAX and its associates, struggles in coordinating with the outsource provider, and the gained experienced, the management team seeks to further integrate its Internet service within the company’s operation.</td>
</tr>
<tr>
<td>Capability of Seizing</td>
<td>Given that lack of expertise and infrastructure, RE/MAX partners with OSS, Inc. to develop, host and manage MainStreet. The technology was to &quot;enhance the communication process—and save everyone time and money—by moving away from phone calls, faxes and express mail.&quot; Every agent has to pay a fee for its use</td>
<td>Clear goals and detailed plans allow partnering with providers of complementary services. RE/MAX removes the technology usage fee. In addition, experimenting, investing in, leveraging, and co-opting resources inside and outside the firm enable to seize the opportunity without locking the firm into an unsuitable investment path.</td>
<td>RE/MAX hires external consultants to insure the development, operation, and maintenance of MainStreet. It acquires specialized technology infrastructure to provide MainStreet services in-house. MainStreet is financed by the franchise itself (not by headquarters) as part of its national advertising fund.</td>
</tr>
<tr>
<td>Capability of Reconfiguring</td>
<td>A corporate team is created separately from daily operation. The team became a forum that examines the characteristics of the Internet solution, reflects on the needs of RE/MAX’s associates, assesses existing practices and cross-functional processes and systems, and plans for the new strategic initiatives.</td>
<td>A member of the corporate team, Kristi Graning, is promoted as the head of Corporate IT to manage MainStreet. Two separate units are created reporting to Corporate IT: the IT Department and eBusiness. &quot;The IT department is more in the execution of the technology. The other one [eBusiness] is looking for the next functionality.&quot;</td>
<td>Liniger makes the decision that &quot;our Senior VP of eBusiness focuses more on emerging technologies.... The IT department was moved to report directly to the RE/MAX COO.&quot; Ad-hoc mechanisms are used to communication and coordination with the technology stakeholders, which in turn balanced exploration and exploitation activities.</td>
</tr>
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### Table 3: Timeline of the Adoption of MainStreet at RE/MAX
The emphasis during this phase is on learning and identifying IT and its strategic potential. The first framework, that have the potential to inform future research (Miles and Huberman, 1994; Stake 1995). theory building from case study research” (p. 545). In addition, we derive propositions, based on our existing literature enhances the internal validity, generality, generalizability, and theoretical level of ambidexterity. Eisenhardt (1989) advocates this approach, noting “Overall, tying the emergent theory to and organizational ambidexterity. In doing so, we aim to enrich our present understanding of IT adoption and organizational ambidexterity during this phase.

In the following sections, we associate our findings with the existing literature on dynamic capabilities and organizational ambidexterity. In doing so, we aim to enrich our present understanding of IT adoption ambidexterity. Eisenhardt (1989) advocates this approach, noting “Overall, tying the emergent theory to existing literature enhances the internal validity, generality, generalizability, and theoretical level of theory building from case study research” (p. 545). In addition, we derive propositions, based on our framework, that have the potential to inform future research (Miles and Huberman, 1994; Stake 1995).

**Balancing Exploration and Exploitation in the Initiation Phase**

The emphasis during this phase is on learning and identifying IT and its strategic potential. The first condition of the model is a general awareness of a new technology and its perceived potential impact to solve a business need or opportunity of sufficient proportion to capture the attention of a sponsor group. During this phase, a decision maker in a position of responsibility and authority becomes aware of the particular technology and decides to evaluate it further. Her/his primary role at this phase is to foster conditions that will let management capture and exploit the knowledge that already exists inside and outside the firm. In this phase, the experience with technology is limited, so participants are unable to perceive the long-term implication, yet unique insight is an important determinant of the firm's ability to garner rents. Our analysis shows that what contributes to IT adoption ambidexterity during this phase...
includes actively involved top management, as well as specific organizational routines supporting and helping dynamic capability components: sensing, seizing, and reconfiguring.

**Leading.** During this phase, top management is the driving force behind the technological initiative and is actively involved in seeding it. This involves seeking and finding prior experiences with the new technology inside and outside the organization, helping articulate the vision, building the team with the required competencies, setting goals, providing support and resources, and providing the excitement through a stretching intent and trust in people. As our study demonstrates, each of these routines enhances learning by top managers who play a pivotal role in organizational ambidexterity (Lubatkin et al. 2006, Probst et al. 2011).

**Sensing.** The case data show that critical activities during this phase include gaining knowledge from “the field,” devoting time to evaluating past initiatives, and ensuring a steady flow of new ideas and experiences, even if they are imported from outside the organization. At RE/MAX, the corporate team met every day for several months to work specifically on this initiative—it became a large part of a few people’s jobs, instead of a small part of many people’s jobs. The team became a forum that examined the IT characteristics, reflected on the needs of associates, assessed existing practices and cross-functional processes and systems, and planned for the new initiative. The emergence of a distinct vision is also important enabler of the exploratory activities. As summarized in Table 3, top management did not begin with a grand plan of where RE/MAX was heading when the decision was made to investigate the potential of using the Internet within the firm. The corporate team articulated and described the immediate steps that were manageable, and it was this articulation that set a force into action (Oliver, 1997).

**Seizing.** After identifying a potential technological initiative, it is important to seize its potential impact to solve a business need or opportunity. In the initiation phase, critical activities included selecting and investing in the appropriate IT, providing the funding to assess the opportunity, leveraging the firm’s resources, and co-opting resources available outside the firm. At RE/MAX, as the understanding of the IT increased and awareness of the existing resource constraints became clearer, the corporate team realized that it would require far more resources than could be mustered by the firm. The stretch—the misfit between resources, expertise, and aspirations—was an important problem faced by this team in seizing the opportunity. Given that the expertise and skills required by the IT were limited leveraging through outsourcing was an important enabler in seizing the opportunity that this new technology could bring.

**Reconfiguring.** Our analysis suggests that during this phase, having a separate, dedicated corporate team is useful in absorbing knowledge as a unified team at the top of the organization while shielding them from the rest of the organization. It enables the team to simultaneously pursue exploration and exploitation activities, including understanding the characteristics of the new technology, reflecting on the needs of the various stakeholders, assessing existing providers of core and complementary technologies and services, and planning the next steps of the IT adoption process. This concurs with the structural ambidexterity concept (Benner and Tushman 2003, Tushman and O’Reilly 1996). Accordingly,

*Proposition 1:* In the initiation phase, IT adoption ambidexterity is more likely to be achieved when:

a. top management configures a dedicated corporate team with the required competencies and provides them with resources; and

b. the corporate team is in charge of evaluating the new technology while simultaneously detailing the steps in introducing the technology to the firm.

**Balancing Exploration and Exploitation in the Growth Phase**

In this phase, the focus is on growing the IT initiative, typically a prototype or a limited solution, to exert an impact on a reduced domain. If the initiative yields benefits, potentially valuable new resources and capabilities are developed, leaders are encouraged to expand their efforts as suggested by McGrath et al. (1996). Our study suggest that during this phase integrating resources into core activities of the technical solution is crucial in setting clear goals and detailing plans. Given that the knowledge of the strategic value of IT resided only within the corporate team, the focus of this phase is on raising awareness of the IT and the problems that it can solve. Next we discuss how the supporting capability of leading and the dynamic capability components enhance organizational ambidexterity in the growth phase.
**Leading.** During this phase, top management plays an important role in managing the transition from a dedicated corporate team to an operational unit. It is actively involved in positioning the IT within the firm, carefully selecting and assigning the operational leader to guide the initiative, facilitating the knowledge and resource flow to the initiative, and granting subordinates sufficient autonomy to keep exploring new opportunities. At RE/MAX, Liniger’s leadership was crucial in assigning a senior vice president as the leader to guide the initiative and ensure cooperation and support not only from functional units, but also from partner firms supporting the MainStreet initiative. On the other hand, the role of middle managers in this phase is to lead the initiative by crafting an emotionally engaging vision while staying focused on the execution. In this phase, revealed in Table 3, a specialized operational unit is needed to be responsible for finding creative ways to react to challenges, drive change, and find improvements, while designing effective processes and nurturing execution. It requires middle managers to be meticulous in overseeing day-to-day tasks, establishing processes, providing clear targets, addressing problems when they occur, and handling external partners. At the same time, they must monitor new opportunities and generate innovative ideas to improvements the initiative. This implies that middle managers are challenged to not only balance the contradictory exploration and exploitation activities, but also to repeatedly shift their primary attention from one to the other, as required.

**Sensing.** In the growth phase, critical activities include a deep understanding of the technology that is adopted while recognizing new ideas and initiatives that could be incorporated. At RE/MAX during this phase, the operational unit devoted an important part of its planning to evaluate initiatives developed at different affiliates to further understand the opportunities that changes in MainStreet could bring to the firm and its associates. This is in accordance with Burgelman (1988), who, in describing the social learning processes associated with the development of new initiatives, connected the opportunistic action of frontline managers with the vision of top management. It is also in agreement with Chakravarthy’s (1997) advice: “Successful entrepreneurship requires both the willingness to experiment outside a plan and the ability to communicate freely and debate openly the value of the resulting outcome.”

**Seizing.** In seizing opportunities during the growth phase, it is important to ensure that the day-to-day work itself is not neglected in the confusion of adopting the technology. Critical activities include communicating to the rest of the organization why the IT is needed and how the benefits are to be achieved. It is important to make investments in the core technology and complementary assets, and to leverage and co-opt resources inside and outside the firm in order to seize the opportunity without locking the firm into an investment path unsuitable to the context in which the firm is immersed. At RE/MAX the infusion of outside partners and service providers was an important enabler of exploiting the value of MainStreet. This is in accordance with Dosi and Marengo (1992), who found that asset and competency building is affected by the firm’s ability to improve a strategic initiative through learning by doing.

**Reconfiguring.** In the growth phase, the operational unit plays an important role in managing the relationships with the providers of the core and complementary technologies and services, as well as in managing the seemingly contradictory demands of exploiting the technology and continuing to learn and explore modifications and improvements. In addition, this structure enables exploitation by leveraging other unit’s competencies and sharing across the boundaries of business units. At RE/MAX, the growth phase began by creating an operational unit, eBusiness, and its employees were encouraged to take part in both exploitative and explorative tasks. The knowledge about MainStreet was spread quickly and efficiently throughout the organization. The technology was integrated with the rest of the organizational processes, while influencing a broad spectrum of potential users and partners. Accordingly,

Proposition 2: In the **growth phase,** IT adoption ambidexterity is more likely to be achieved when:

a. top management is involved in making the transition of the IT adoption leadership from a dedicated corporate team to an operational unit; and

b. the operational unit is in charge of overseeing day-to-day tasks, establishing processes, providing targets, addressing problems, and handle external partners related to the IT while simultaneously monitoring new opportunities, and generating innovative ideas to improve the technology.
Balancing Exploration and Exploitation in the Institutionalization Phase

As the IT initiative matures and more people become involved, its use begins to fall into patterns. By the institutionalization phase, high degrees of consensus and shared understanding about the benefits of the technology exist, the IT is well disseminated throughout the organization, and learning is relatively complete. Some learning is embedded in the IT itself, and some is embedded in the structures, routines, and prescribed practices. Thus, the focus during this phase is on long-term analysis and planning, and on identifying ways to further improve the technology, searching for complementarities while making the technology even more efficient and cost efficient, and ensuring process quality.

**Leading.** During this phase, top management’s role is to maintain oversight. Even though it is not as actively involved as in the initial phases, top management relies on structural mechanisms to create a sense of accountability and to track progress. As shown in Table 3, given the increased complexity arising from the growth of the IT adoption, middle managers are involved in this phase in establishing processes to stabilize the IT operation and install reliable processes. As complexity grows, middle management builds teams of operational managers with complementary capabilities, including task complementarity (for example, definition and assignment of clear functional roles of the sub-units), expertise complementarity (for example, teams formed by members with distinct levels of training and experience through their various positions and roles), and social complementarities (arising from different skills and personalities of the members of the teams). These complementarities help increase the variety of skills required to explore different options to deliver the IT more efficiently and creatively search for new ways of deriving value. At the same time, middle management requires these capabilities to facilitate cooperation, support efficient decision-making process, and focus everyone on common objectives.

**Sensing.** Since the knowledge is embedded in the organization, sensing activities are driven by the opportunity to recruit employees during this phase, especially those with various stakes in the technology’s continued success, in order to facilitate the circulation of knowledge and support the adoption process. By expanding the sources of relevant knowledge and fostering collaboration and better understanding, the users and ultimately strengthen and fuel adoption. This finding concurs with past research that shows that intra-unit exploitation must be paired with inter-unit boundary spanning to enable the exploration of knowledge (Miller et al. 2007).

**Seizing.** In this phase, the focus is on seizing the opportunity to regulate the day-to-day IT routines, maintain momentum, and drive its ultimate impact on the business—to exploit the current IT understanding and its role in the business. This provides a stimulus to both technology demand and supply, with the result that the rate of assimilation increases further, a consequence of a positive feedback loop (Bikchandani et al. 1992). At RE/MAX, this phase signaled the strategic importance attributed to MainStreet and the attention paid to meet their users’ needs. Based on needs, a specialized technological infrastructure was acquired. This is in alignment with resource-based view research on IS suggesting that how firms leverage investments to create unique IT resources and skills determines a firm’s overall effectiveness (Clemons 1991). In addition, to further integrate the IT system and the business, it is critical during this phase to stabilize the business model (including the sources of funding to sustain and grow the IT). This can help direct a firm’s evolutionary path as suggested by Teece et al. (1997).

**Reconfiguring.** No business unit in an organization has all the internal capabilities necessary for a successful IT adoption, especially when it is making rapid technological advances (Powell et al. 1996, p. 117). This creates a demand for specific knowledge and the resources of other business units in organizations (Lavie and Rosenkopf 2006). In the institutionalization phase, the operational business unit that led the IT adoption in the growth phase naturally outgrows its ability to exclusively use its employees to interpret, integrate, and engage in coherent exploration and exploitation activities. Cooperation in shared IT activities, the transfer of employees, and the establishment of cross-unit committees are examples of structural mechanisms that leverage the expertise of individuals and continuously keep knowledge circulating. This also helps keep the technology from becoming outdated and to consider how the future can or may be different from the past. The simultaneous pursuit of exploitation and exploration in this phase is consistent with the contextual ambidexterity concept (Gibson and Birkinshaw 2004, Im and Rai 2008). Contextual ambidexterity refers to a set of mechanisms within the organization that facilitate and encourage organizational units and employees to do contradictory tasks at the same time (Gibson and Birkinshaw 2004). Accordingly,
Proposition 3: In the institutionalization phase, IT adoption ambidexterity is more likely to be achieved when:

a. top and middle-management maintains oversight of the IT by establishing structural mechanisms (such as cross-unit committees or employee transfers) to create a sense of accountability and track progress throughout the firm; and

b. the established structural mechanism are used to cooperate in sharing IT activities across functional areas while keeping the technology from becoming outdated and considering how the future can or may be different from the past.

Implications and Conclusion

In this study, we examine IT adoption ambidexterity through a revelatory case study at RE/MAX. The research question that guided the investigation was: how were the exploration and exploitation activities that contributed to the firm’s IT adoption balanced over time? The study shows that the IT adoption ambidexterity was realized through an ongoing process of understanding the institutional context, clear leadership at all levels, and the ability to sense, seize, and reconfigure in each phase of the adoption. Furthermore, we observed different dynamics associated with the balancing of exploration and exploitation activities at each phase of the IT adoption process. The study shows that IT adoption ambidexterity does not occur in random fashion, but as a deliberate approach to exploration and exploitation activities that uses supporting and dynamic capabilities to address new opportunities. When done explicitly, it involves deliberate investment and promotes organizational learning that results in a repeatable process that has been characterized as the firms’ ability “to learn how to learn” (Danneels 2002). While some of the routines that contributed to IT adoption ambidexterity at RE/MAX were deliberate and intended, others evolved as learning and capability accumulation took place. The model reveals a sequence of phases that takes place along the road to technology adoption.

One of the limitations of the findings may be the fact that it is based on a path that unfolded at one specific organization and thus, it might have a limited scope for generalization, at least in a traditional sense. In this study, we sought generalizations from thick descriptions of the theoretical concepts, specific implications, and rich insights, as recommended by Lee and Baskerville (2003), Walsham (1993), and Klein and Myer (1999). By clarifying the context and understanding the underlying principles that contributed to IT adoption ambidexterity at RE/MAX, others may adapt these insights and principles to a different context, and the proposed process model and formulated propositions can serve as the basis for further investigations.

For researchers, this study complements the existing research on IT adoption by showing how a firm balanced exploration and exploitation activities throughout its IT adoption process. The contribution of this research is in the development of a process model of IT adoption ambidexterity that adds a dynamic perspective, allowing a disparate set of activities to be tied together into a more coherent model that can serve as the basis for further investigation. The study is also significant in that it represents one of the first in-depth case studies on ambidexterity in the context of IT adoption. Furthermore, this study suggests the need for future research to move from the reasonably well-developed understanding of individual capabilities contributing to ambidexterity (Zahra et al. 2006, Kale and Singh 2007) toward an understanding of interdependencies between multiple capabilities contributing to ambidexterity. For example, some authors suggest that structural separation is necessary as each exploration and exploitation activity is completely different (Benner and Tushman 2003, Raisch et al. 2009), while others recommend that contextual ambidexterity brings about an environment in which every employee can decide whether to conduct exploration or exploitation (Gibson and Birkinshaw 2004). At RE/MAX, we view both structural and contextual ambidexterity as complementary options, but each contributes at different phases of the technology adoption process.

While this study should encourage and assist the pursuit of a more holistic understanding of IT adoption ambidexterity, no claim is made that the concepts contributing to balancing exploration and exploitation activities in the IT adoption process presented in this paper are exhaustive. Further research is clearly needed in order to test the applicability of the model and propositions in other contexts. IT adoption ambidexterity at different firms may require a different set of capabilities, resources, and actions. As our understanding grows, we may learn when (i.e., at what phase in the IT adoption) specific activities will be
most effective. For example, contextual ambidexterity may be counterproductive in an initiation phase when the firm lacks a clear vision of the IT’s potential. This point may question some of the traditional factors identified to contribute to ambidexterity. Future studies can examine, for instance, what organizational routines enable firms to reduce time in sensing opportunities (using, for example, intensive training, global benchmarking, specialized team-based structures, and experience from the past), seizing them (for example, through leveraging and co-opting resources, experimenting, and integrating firm-specific activities), or reconfiguring and shaping intangible and tangible assets of the firm (by gaining internal and external commitment through special communication processes, or by investing in complementary infrastructure). Researchers might also conduct comparative studies across firms, industries, or countries to uncover how IT adoption ambidexterity may be enabled or inhibited by different contextual factors. This suggests historical, cross-sector, or cross-cultural research designs.

For practitioners, this study provides useful insights into how to balance exploration and exploitation activities that contribute to the adoption of IT over time. Of course, nearly every business environment today is pressuring firms to explore a new IT, while exploiting its use. With business activities of all types increasingly dependent on a strong IT foundation, firms find themselves struggling to keep pace with constant technological advances. Over the last half century, managers have faced one wave of IT innovation after another, each promising to change the way firms do business. Few executives want to be in the position of being left behind, risking the competitive survival of the firm. They want their firms to adapt not just to survive, but also to gain competitive advantage. Yet, just jumping on an innovation’s bandwagon without understanding the unique circumstances of the firm is irresponsible and risky. Executives need to decide not just whether to join others in embracing a new IT, but more importantly how to keep renewing and refining it over time.

IT adoption is not a one-time project, but an ongoing process. Although the value of the IT innovation cannot be sustained indefinitely, its value can be extended for the benefit of those using it in concert with substantial learning by doing throughout the adoption process. The RE/MAX case underscores the need for managers to simultaneously conduct exploration and exploitation activities using existing firm’s resources and capabilities in the pursuit of strategic objectives. It suggests balancing exploration and exploitation activities according to the distinct phase of the IT adoption process, instead of thinking about its adoption process a “one approach fits all.” The study reveals the importance of understanding the broader context within which this technology is sought, and identifies specific dynamic and supporting capabilities that contribute to ambidexterity at each phase of the adoption process. Appreciating the nuances of these capabilities, along with the process model of IT adoption ambidexterity presented in Figure 2, can be used—either ex ante or ex post—to explain, anticipate, adjust, or evaluate the balancing act of managing a technology adoption.

References


