

# Digitalization and innovation in the real estate sector

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## Abstract

Recently, digitalization has emerged as a main theme in the industry discourse in the real estate sector. In this discourse, some influencers foresee that digitalization poses disruption, even an existential threat, to the traditional actors, which are expected to make “digital transformations” to remain relevant. Others emphasize the potential of digitalization to drive efficiency, sustainability and servitization of the industry. However, the real estate sector is a mature business environment with a low rate of innovation and limited R&D resources, and it is not evident how this traditional sector reacts to the multitude of new predictions and propositions. Based on theories of innovation management, this study investigates real estate owners’ sense-making and strategizing in this area: how do they seek information and prioritize which initiatives to take? Which actions are taken? How are structures for innovation management affected, within firms as well as on the industry level? The results are based on semi-structured interviews conducted with respondents responsible for digital development in large private and public real estate owners in Sweden, as well as with representatives of industry associations. Findings include that real estate firms and industry associations emphasize digitalization-related opportunities to improve efficiency and tenant satisfaction, as well as to create new services and business models. Also, real estate firms perceive that change is needed to remain competitive, and as a response, they have created digitalization strategies, formed new organizational units and recruited new people to lead digitalization efforts. Further, they have established new collaborative relationships to industry networks and competitors.

Keywords: dynamic capabilities, digital transformation, digitalization, real estate management, innovation management.

## **Introduction**

Society of today is increasingly challenged by new requirements arising from urbanization and sustainability. Digitalization is often pictured as a catalyst for sustainable development, where digital information flows are seen as prerequisites for efficient use of resources. In the built environment, digitalization used to be synonymous with the use of building information models (BIM), but more recently technologies, such as sensors-based building monitoring has emerged as an important field (Atkin and Bildsten 2017). Digitalization is further increasingly associated with sharing economy, tenant relationships and social sustainability and companies with a background in other fields approach the real estate sector with new offers based on digital technologies (Baum 2017). Also, in the last couple of years, digitalization has emerged as a main topic in industry magazines, seminars and reports (e.g. Westergren et al. 2017; Fastighetsägarna Stockholm 2018; Kairos Future 2018). Thus, digitalization in the real estate sector is a multifaceted phenomenon with potential impact on a wide range of actors and processes. Here, property owners are strategic decision makers and gatekeepers (Kulatunga et al. 2011).

Real estate owners are generally considered to be slow to take up new technology and new services (Engström and Hedgren 2012), much due to an absence of competition and innovation drivers in a sector where traditional business models have delivered substantial and stable returns for decades (Palm 2015). Due to the development in digitalization, however, they increasingly find themselves exposed to a multitude of challenging predictions and propositions. Thus, more or less all property owners have to decide how to respond to this novel and complex environment.

In this research, we report the result of an interview study primarily targeting large real estate owners, but also industry associations that act as knowledge brokers and change agents in the real estate sector. We investigate the strategies for seeking information, the actions taken and planned, how these were selected, and the experiences. We further discuss how digitalization initiatives relate to existing structures and roles for managing business development and innovation within these companies, and discuss implications for future development.

## **Frame of reference**

In recent years, both academic and industry discourse on digitalization has shaped the understanding of this complex phenomenon. In Gartner's (2017) definition, digitalization is seen as process, where the use of digital technologies may lead to new opportunities and changes in business models. Further, it is suggested that implementation of digital technologies is fundamentally transforming organizations (Yoo et al. 2012) and that these transformation processes should be guided by digital strategies (Bharadwaj et al. 2013; Matt

et al. 2015). Several authors have argued that dynamic capabilities view (Lenka et al. 2017; Yeow et al. 2018), focusing on the ability of an organization to purposefully respond to a changing environment, as well as theories on innovation processes (Nambisan et al. 2017) would be particularly useful to understand digitalization in organizations. In the next section, we review the current understanding of innovation and innovation management in the real estate sector and subsequently relate it to research in dynamic capabilities.

### **Research on Innovation in Real Estate Sector**

Most research on innovation in the built environment focuses on the construction sector. In this perspective, construction clients are seen as key enablers of innovation since their procurement requirements shape drivers for innovation in projects and supplier organizations (Kulatunga et al. 2011; Gambatese and Hallowell 2011). However, clients are often criticized for being conservative (Engström and Hedgren 2012; Ivory 2005). Many firms and organizations in the construction industry are project-based, which generally implies that they are decentralized and that structures for learning between projects are weak (Dubois and Gadde 2002; Winch 1998). This research is partly relevant also for real estate owners since many of them are engaged in building projects as well as in refurbishment and maintenance.

Another stream of literature, closely related to real estate owners' perspective, concern innovation in facility management (FM). It is often argued that innovation is important for FM organizations (Noor and Pitt 2009), but also in this area innovation seems to be more of one-shot events than continuous activity (Mudrak et al. 2005; Cardellino and Finch 2006). According to a review by Atkin and Bildsten (2017), current research debate primarily relates to incremental development on operational issues, while strategic management of innovations has received less attention. They also note that most of digitalization related research deals with intelligent buildings and communications technology, mainly focusing on BIM, whereas other potentially disruptive technologies, such as Artificial Intelligence or Internet of Things are discussed mainly in the informal media (Atkin and Bildsten 2017).

### **Dynamic Capabilities and Innovation Process of a Firm**

Dynamic capabilities are often seen to be embedded in organizational routines and processes (Eisenhardt and Martin 2000; Winter 2003). While operating routines guide the day-to-day activities of the organization, dynamic capabilities can be understood as second order routines designed to continuously assess and update the operating routines (Nelson and Winter 1982). In particular, an organization's absorptive capacity, or the capability to acquire and process new information for developing new product and services (Cohen and Levinthal 2000; Zahra and George 2002), is considered important. Sense making processes, where individuals interpret and give meanings to events (Weick 1995) are central in this perspective.

Much innovation research is focused on organizations active in high-velocity markets, but several authors, such as Eisenhardt and Martin (2000) and Easterby-Smith et al. (2009) claim

that the theory of dynamic capabilities is useful also for studying more traditional industries as well as the public sector. The real estate sector clearly falls into this category, and the dynamic capabilities perspectives implies that it is the routines and resources to manage innovation that should be in focus. In accordance with the dynamic capabilities view, Tidd et al. (2005) further conceptualize the innovation process in a firm in terms of three phases: search, selection and implementation. They emphasize that the process is by no means always rational or linear and can vary from firm to firm as the context for innovation varies, but also that having a degree of structure and a framework for behavioural routines can help in making sense about the innovation process. Important routines in each phase are (Tidd et al. 2005):

- Search: The firm develops understanding of the search environment and appropriate search strategies.
- Select: The firm prioritizes between the signals from the search phase based on its existing capabilities and the overall business strategy.
- Implement: The firm acquires knowledge resources, executes innovation projects, launches innovative products or services and sustains the innovation.

In this paper, the framework of Tidd et al. (2005) is used to guide the data collection and research approach.

## **Method**

This paper focuses on digitalization in the real estate sector, an area that is currently in rapid development and high on the agenda in industry discourse. Thus, a phenomenon-based research approach is used (Von Krogh et al. 2012), where the overall purpose is to establish a deeper understanding of a specific - often novel - phenomenon. In this approach the selection of research methods and theory is driven by the phenomenon, which means that multiple methods and data sources are often combined (Schwarz and Stensaker 2016). The present study is based on interviews, industry press and reports, and observations and informal conversations at industry seminars.

Interviews were conducted with managers responsible for digital development in eight Swedish large private and public real estate owners. Of these, two were private owners of commercial property such as retail and offices, four were owners of residential buildings (three private and one public), and two were public owners of community service buildings. The real estate owners were selected to represent different categories of property owners in order to gain a holistic overview of the phenomenon. Further, three representatives of real estate industry associations were interviewed. These were selected due to their knowledge and central role in the industry digitalization discourse in Sweden, and are here labelled as knowledge brokers. The interviews took place in fall 2017 and spring 2018, lasted between 45 minutes and 1 hour 45 minutes, and were recorded and transcribed.

The interview guidelines were based on themes identified in the theoretical framework to define a firm's absorptive capacity (Cohen and Levinthal 2000; Zahra and George 2002) and innovation process (Tidd et al. 2005): strategies and routines for sense-making and seeking information, selection of actions taken and planned, and implementation processes. The interview transcriptions were analysed and classified according to these categories, and thereafter interpreted by both authors individually and jointly. Previous research on innovation and innovation management in the real estate and construction sectors was reviewed, as well as research, industry reports and articles in industry press on digitalization in the real estate sector. In order to understand the context in which the owners operate and the signals they are exposed to, the first author participated in four industry seminars.

## **Findings**

The findings are presented as follows: first, the industry discourse on digitalization is described. Then, interviewees' views on how digitalization is affecting the real estate owners' strategies and organizations are presented. This part is organized according to the three phases of in a firm's innovation process identified by Tidd (2005). Finally, the opinions of the industry knowledge brokers are presented.

### **Context: Industry Discourse**

In the last year or two, abundant industry seminars and media coverage have had digitalization in the real estate sector as a main theme, and several industry reports focusing on this sector have been released (Baum 2017; Westergren et al. 2017; Fastighetsägarna Stockholm 2018; Kairos Future 2018). Topics have covered examples from other industries, reasons and motivations for digitalization, specific technological aspects such as the role of big data in the real estate sector, and threats and opportunities related to new actors entering the sector. Also, companies with a background in other fields approach the real estate sector with new service offerings, and the term PropTech (property technology) has emerged to describe a collection of various smart real estate technologies and platform-based sharing solutions (Baum 2017). The new actors are often technology startup firms and venture capitalists, and some contributors to this discourse claim that such PropTech firms pose an existential risk to real estate firms. For example, at one seminar the metaphor of tsunami was used by one speaker to describe how PropTech firms will eventually disrupt the real estate sector value chain, similar to how Uber and AirBnB have transformed the transportation and hospitality sectors. Comments made during such seminars include views that most traditional real estate managers would be out of business in a few years. Other participants, however, foresee that the implications for the real estate sector will be slower but nonetheless potentially substantial. One presenter used a metaphor of a melting ice cube to demonstrate how real estate owners, unless they find ways to innovate, will slowly lose value to technology firms.

## Innovation Search Strategies

In general, the interviewees were highly aware of the industry discourse on digitalization and said that it had influenced their firms and the industry at large and also raised the sense of urgency in their own work. Since the digitalization agenda is broad and uncertainty is high, the interviewees reported that much effort was spent only on mapping the phenomenon. Regarding search strategies (see Table 1), media cover of digitalization was seen as important, and six of the interviewees explicitly mentioned the role of industry seminars. In general, interviewees had mainly approached their traditional networks within the real estate sector, such as the industry associations and contacts in other real estate firms, when seeking for guidance and input on digitalization, but some had been in contact with new sources of information, such as PropTech companies, consultants and suppliers.

*Table 1: Innovation search strategies*

Question	Examples
Where and how do firms search new information on digitalization?	Seminars: both traditional industry seminars and PropTech seminars Benchmarking in real estate and other industries Industry associations and other sectoral actors Collaboration with consultants, suppliers and PropTech firms Internal workshops, own employees and parent organizations Hiring new talent

Based on this new information acquired, the real estate companies had identified various business opportunities, but interviewees also saw risks in digitalization. For example, new solutions have high uncertainty and there is a risk to invest in technologies that may soon become obsolete. Similar concerns were raised in relation to partners, for example PropTech companies have high risk for bankruptcy in the first years of business. Uncertainty in customer demand for new services was also mentioned, as well as uncertainty related to legal frameworks. Many also shared concerns about data security when investing in new information systems or sharing data with third parties. Most of the interviewees however perceived a need to act somehow, much because they expected that the threat from existing competitors or new entrants would likely grow over time. One interviewee said that the new competition may also be indirect, as for example access to medical services on a smart phone may decrease the need for health care facilities.

## Innovation Selection

Despite that many interviewees felt that the process of digitalization was only in the beginning, and that there is much talk and less action, all real estate firms had initiated actions related to digitalization (see Table 2). As interviewees represent different sectors, there was considerable variation in the types of initiatives taken. This illustrates that many aspects of digitalization are highly contingent on type of property and business context.

Some firms prioritized fairly classic and technical aspects, such as information technology-based property management systems and investments in smart building technologies, while

others had developed new service offerings to existing and new customers. Also, two interviewees said that the roles had switched in procurement of telecom services, as before they had to pay for the provision of cables, while today they can charge the telecom provider for the access to customers. This indicates that firms are in the process of developing new business models based on their existing customer relationships.

However, the implementation of these digitalization initiatives had not been without struggles. Most interviewees said that they lacked resources or capabilities to work on digitalization activities and that it was hard to find new talents or capable partners to work with. They also found it difficult to manage change within their organizations, mostly due to a conservative business environment.

*Table 2: Innovation selection*

Question	Examples
Which digitalization initiatives have been selected?	Smart building technologies (f.e. sensors and energy optimization systems) ICT-based property management systems Smart locks and keys (f.e. smart phone key application) Customer service software (f.e. websites, chatbot, mobile apps) Virtual reality classes for real estate sales process e-learning systems Artificial intelligence-based tenant matchmaking service New digitalization-enabled service concepts Customer tracking system in retail stores, e-commerce solutions

**Implementation: Impact on Innovation Strategies, Processes and Structures**

Further, implementation of new initiatives had required changes in the real estate organizations (see table 3 for summary), and all interviewees had recognized some organizational changes in structures, processes or roles in their firms. Almost everyone saw new demands and more workload on business development functions. Digitalization in several cases had led to increased resources for development in the firms. However, resources are still limited, and consequently the companies can only undertake a small number of projects in parallel.

*Table 3: Implementation: Impact of digitalization on real estate firms*

Question	Examples
How has digitalization impacted firms' structures and processes?	<ul style="list-style-type: none"> <li>Higher workload for IT departments and development functions</li> <li>New business development roles, teams and functions</li> <li>Developed digitalization strategies</li> <li>Increased innovation search activities</li> <li>Increased training activities</li> <li>Cross-functional development</li> <li>Customer orientation (f.e. customer journey)</li> <li>New roles for property managers</li> <li>Established a "digital transformation lab"</li> </ul>
How has digitalization impacted firms' collaborations?	<ul style="list-style-type: none"> <li>New collaboration projects with industry actors</li> <li>Increased collaboration with employees (f.e. workshops)</li> <li>New collaboration projects with existing suppliers and consultants</li> <li>New collaborations with PropTech startups</li> <li>New collaboration projects with owners and related stakeholders</li> <li>Increased collaboration with competitors</li> <li>Participation in regional development projects</li> <li>Interest towards academic research collaboration</li> </ul>

All interviewees saw that their own role had changed due to higher focus on digitalization activities, and three of them stated that the IT department had new responsibilities. Some had chosen a mainstreaming strategy, where digitalization was seen as "normal business development with a twist". Others had established specific units focusing on digitalization, and some hired new personnel from within and outside of the sector to lead digitalization activities.

Work on digitalization in many cases had created new collaborations and relationships. Digitalization strategies were often developed in cross-functional teams. Many interviewees reported that technology-related projects had previously been done in isolated projects, but that digitalization work had brought new structure to such activities. One firm had set up a "digital transformation lab" that collaborates with other business areas and serves as a joint development platform. In one case, the role of a property manager had developed into one of a community manager, as the firm had invested in communication platform, where tenants could interact with each other's and the facility owner. Several firms had sought for new collaborations with consultants and industry associations, and one interviewee said that they had never before included customers in development activities.

### **Views of Knowledge Brokers**

The knowledge brokers from the industry associations perceived the work done on digitalization in real estate sector to be of great importance. At the same time, they had concerns that real estate firms were doing work on digitalization as tick box exercises without fully committing to development initiatives. In their view, some firms initiate digitalization activities without really understanding why and how certain projects would add value in their specific context. They suggested that once firms gain maturity in working on digitalization,

they may become better at focusing on the right initiatives. However, they also emphasized that access to sufficient resources and capabilities may limit opportunities. It may be impossible for real estate companies to independently develop new business models, as only the monetary investment may be over their budgets. Thus, disruption may come from PropTech startup firms or more established technology companies that have resources and capability to invest in digital technologies, such as big data platforms.

## Discussion

The interviews showed that digitalization is high on the agenda for all interviewed firms. The interviewees recognized various opportunities and threats, and all firms had taken actions in the field of digitalization. The findings clearly show that developing digitalization strategies in real estate firms is a sense-making process, and as an outcome new organizational roles, strategies and structures had been formed. These added resources for innovation search, selection and implementation activities can lead to better absorptive capacity on both firm level and in the real estate and construction industry at large (Cohen and Levinthal 2000), and that is a key determinant for future development in this area.

On the other hand, the interviews show that currently most real estate firms have limited resources for business development, and most interviewees have struggled with project delivery and change management in their digitalization projects. Limited resources may imply that digitalization initiatives crowd out resources from other types of development work. Also, the interviewed knowledge brokers raise a general concern for the quality of the digitalization activities, since firms may take initiatives in this area mainly for marketing and legitimacy reasons and lack commitment to fully engage in development work. Thus, questions arise whether real estate firms can execute innovative digitalization projects in this conservative business environment and if they are able to sustain already launched products and services. Another risk is that existing cognitive and organizational barriers may lead to innovation search strategies that focus only on current business contexts and thus lead to status-quo decisions (Engström and Hedgren 2012; Tidd et al. 2005), but this said, digitalization has raised the awareness about the risks of focusing exclusively on the current business models.

Further, the interviewees reported that as a part of their innovation process the real estate firms had engaged with various information sources and established new relationships to competitors, suppliers and customers. The role of industry knowledge brokers seems crucial to complement lack of firm resources and facilitate knowledge sharing in this field. As questions in digitalization seem to cross departmental, organizational and industry sectoral boundaries, digitalization affects the collaborations in the industry at large. On the other hand, digitalization enables new forms of indirect competition that may spur from established technology firms and PropTech startup companies.

## Conclusion

Digitalization has recently emerged as a central theme in real estate sector discourse, and often presented as holding both opportunities and threats to real estate owners. However, it is still unclear how actors in this traditional industry will act in this new environment. This research has investigated real estate owners' search strategies and sensemaking in the field of digitalization, as well as their prioritization of actions and implementation processes. Based on dynamic capabilities view, the impact on existing routines, resources and relationships for enabling innovation is discussed.

The findings indicate that development within digitalization has spurred innovation activities within the real estate sector. Initiatives in digitalization have contributed added resources in development functions and also better utilization of firm's existing capabilities through cross-functional and inter-organizational projects and strategy development. This development may potentially have wider implications in raising the level of absorptive capacity for further learning and innovation in the real estate sector. Further, digitalization may act as a catalyst for new relationships and networks, which may potentially have spin-offs in many areas.

This research demonstrates that digitalization in the real estate sector has much broader meaning than previously discussed in literature, which has mostly focused on certain digital technologies, such as BIM (Atkin and Bildsten 2017). As digitalization challenges both real estate firms and other actors in the sector, we suggest that future research should take a dynamic ecosystem perspective. For example, the role of knowledge brokers deserves further attention. Also, any significant organizational and societal change process motivates longitudinal research.

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