Innovation Drift:
The influence of digital artefacts on organizing for innovation

This is an Accepted Manuscript of an article forthcoming in "Innovation: Organization & Management”.

Michal Hron
Department of Management, Aarhus University, Aarhus, Denmark
Fuglesangs Allé 4
8210 Aarhus V, Denmark
hron@mgmt.au.dk

Nikolaus Obwegeser
Institute for Digital Technology Management,
Bern University of Applied Sciences, Bern, Switzerland

Sune Dueholm Müller
Department of Management,
Aarhus University, Aarhus, Denmark
Innovation drift: The influence of digital artefacts on organizing for innovation

Abstract

The literature on digital innovation often relies on examples of radical, even paradigm-changing novelties. In order to develop such radical innovations, organizational separation of innovation efforts has been advocated by many as an effective strategy. We have conducted a longitudinal case study of a radical innovation project at a born-digital company. The company established a separate organization to develop radical innovation, but over time, the innovation drifted from radical to incremental. Even keeping the organization separate proved difficult.

In explaining the events in the case study, we follow the argument that new theories of digital innovation can be developed with reference to the specific properties of digital artefacts. We outline how properties like editability and distributability may contribute to innovation drift, i.e., the proclivity of radical innovation ambitions to gradually drift towards more incremental realizations. Due to their nature, digital artefacts can diffuse through the organization and, thus, pose a challenge to the effectiveness of organizational separation as a strategy for innovation.

With this work, we contribute to the literature on digital innovation by responding to calls for research on new theories of digital innovation and the demand for greater appreciation of digital materiality in organizing. We also challenge the prevailing view of digital innovations as radical and aim to open a debate on the possibility and considerations surrounding incremental digital innovations.

Keywords: digital innovation, organizational design, digital artefacts, case study

Introduction

A growing body of literature has investigated digital innovation (Kohli & Melville, 2019) and digital transformation (Vial, 2019), and the question of how to effectively manage digital innovation in practice is on the top of many managers’ agendas (Obwegeser et al., 2020). In both research and practice, digital innovation is often motivated by examples of radical changes to existing products (Baiyere & Hukal, 2020; Gong & Ribiere, 2021; Vial, 2019; Wessel et al., 2020). Commonly discussed examples are how Uber disrupted the taxi business or how Amazon transformed the retail industry. This, in turn, influences the way we talk and think about innovation in a digital context, including the question of how to best organize for digital innovation.

This paper presents a longitudinal single case study of the development of a digital innovation. The case company aimed to pursue radical changes and hoped that the envisioned innovation project would lead to new types of value (Gong & Ribiere, 2021) and an eventual redefinition of its organizational identity (Wessel et al., 2020). To succeed in this radical innovation effort, the firm’s leadership decided to set up a separate team. Partly, this was because the company had
previously experienced the challenge of trying to innovate within its existing organizational structure. Partly, it was justified through widely popularized innovation studies, in which there are many proponents of organizational separation to achieve innovation (Christensen & Raynor, 2013; Duncan, 1976). Organizational separation should provide a space for developing new perspectives, knowledge and framing problems (Gilbert, 2004; Markides, 2013) because the separated organization can escape the competency trap (Liu, 2006) and inertia of the old business (Hannan & Freeman, 1984; Leonard-Barton, 1992).

Even though the case company pursued the innovation project with a separate organization, it did not attain the expected results. Keeping the existing organization separate from the innovation unit turned out to be even more difficult than expected. Eventually, the company’s innovation ambitions drifted from radical innovation and settled on incremental innovation. This ‘unusual incident’ (Katz, 2001) was at odds with the expectations of practitioners, and their understanding of theory. This paper investigates the reasons for this puzzle and provides a possible explanation.

Based on recent calls for research, we approached the puzzle with a focus on the digital nature of the innovation effort. Many scholars agree that digital innovation represents a substantially different context than innovation that does not involve digital technologies. In digital innovation, widespread deployment of digital technologies leads to potential ‘implications for extant management theories and assumptions’ (Avital et al., 2019). Thus, a digital innovation context creates demand to develop new innovation theories (Nambisan et al., 2017; Yoo et al., 2012, Hron, 2021) or, at least, provides incentive to revise the established perspectives (Gkeredakis & Constantinides, 2019).

Consequently, in order to investigate the case, we built on prior research that emphasizes the role of the technological artefact (Grover & Lyytinen, 2015; Orlikowski & Iacono, 2001). In particular, we were interested in the relationship between the specific properties of digital artefacts, as highlighted by recent studies, and the organizational arrangements for innovation, i.e., the tension between separation and integration (Christensen & Raynor, 2013). Therefore, we formulated the following exploratory research question: How do the specific properties of digital artefacts influence organizing for innovation?

Our longitudinal case study concerns a born-digital company operating an online marketplace for rental housing. We followed this case for two years and observed how the tensions between radical and incremental, as well as between the separation and integration of digital innovation efforts unfolded in practice. Our findings reveal that properties of digital artefacts may contribute to a phenomenon we term innovation drift, i.e., the proclivity of radical innovation ambitions to gradually drift towards more incremental realizations.

With this study, we follow recent calls for research on digital innovation (Nambisan et al., 2017; Yoo et al., 2010). By problematizing the established literature on organizational separation and integration for innovation, we aim to contribute to the literature on digital innovation and increase our understanding of the practical matters of organizing for digital innovation. We do so by building on prior research that emphasizes the role of the technological artefact (Grover & Lyytinen, 2015; Hron, 2021; Orlikowski & Iacono, 2001). Within the range of options for organizing for digital innovation, we focus on the continuum between radical and incremental
innovation. Our case study documents that, contrary to the views that dominate the discourse on digital innovation (Baiyere & Hukal, 2020; Riemer & Johnston, 2019; Vial, 2019), digital innovation may not always take the form of radical innovation. Companies should give full consideration to both radical and incremental approaches and carefully explore the options between organizational integration and separation.

**Literature background**

*Challenges of radical and incremental digital innovation*

The recent literature on digital innovation employs a range of examples and definitions with an unmistakable bias toward digital innovation as radical innovation. Riemer & Johnston (2019), for instance, tell the story of the digitalization of the music industry as an ‘interpretative discontinuity’ or ‘worldview change.’ Baiyere & Hukal (2020) similarly define a related term—digital disruption—as ‘alteration of a domain-specific paradigm due to the digital attributes of an innovation’ (p. 5482). Gong & Ribiere (2021) pursue a definition of digital transformation as ‘a fundamental change process’ (p.12) that can lead to altered value propositions. Lastly, Wessel et al. (2020) make the distinction between contemporary digital transformation and previous IT-driven organizational change similarly on the grounds that digital transformation employs digital technologies to redefine value propositions as new organizational identities emerge.

Research has long distinguished between more modest incremental innovations and ambitious radical innovations, where radical innovations represent a higher degree of departure from familiar technologies and markets (Ettlie et al., 1984). Although the present-day literature on digital innovation favours debating innovations of the radical kind, this established distinction remains relevant for the context of digital innovation.

Radical innovations present a set of daunting managerial challenges, including the necessity to acquire new knowledge, develop new competencies, and overcome organizational inertia (Cohen & Tripsas, 2018; Hannan & Freeman, 1984). Radical innovation requires stepping outside the territory of familiar knowledge (Liao et al., 2008), well-understood technologies and well-known markets (Gillier & Piat, 2011; McDermott & O’Connor, 2002). A company may find itself in a ‘competency trap’ (Liu, 2006) brought on by organizational rigidities (Leonard-Barton, 1992). Radical innovation may require breaking away from the current understanding of what the product (Norman & Verganti, 2014) or company (Hatch, 2011) is.

Extant literature on digital innovation makes scarce use of the distinction between radical and incremental innovation; thus, it offers limited insights into managing the options offered by the continuum between radical and incremental innovations. At the same time, numerous voices have articulated a need to revisit existing innovation management principles in the context of digital innovation (Avital et al., 2019; Nambisan et al., 2017; Yoo et al., 2010).

To answer this call for action, this study focuses on what lies at the core of digital innovation, i.e., the digital artefact. Digital innovation (as opposed to traditional innovation) is accomplished by ‘carrying out of new combinations of digital and physical components’ (Yoo et al., 2010). Thus, the novelty of digital innovation can be traced back to the specific properties of the artefacts being recombined. Some of these artefacts are material (Henfridsson et al., 2018) while others are digital
The non-material digital artefacts, in particular, are characterized by a range of properties that influence digital innovation efforts and their outcomes.

**Digital artefacts**

Digital artefacts have been conceptualized in various ways in extant literature on digital innovation. They can be seen as a resource to be recombined (Henfridsson et al., 2018), capital to be extended (Woodard et al., 2013), or a system with layered modularity (Yoo et al., 2010). In this study, we are concerned with digital artefacts that are primarily non-material, i.e. we follow Hui’s understanding of digital artefacts as objects that ‘take shape on a screen or hide in the back end of a computer program, composed of data and metadata regulated by structures or schemas’ (Hui, 2016). Archetypical examples of such digital artefacts are ‘computer bugs,’ a profile on a social media website (Ekbia, 2009), or data more broadly (Hui, 2012).

The specific properties of such digital artefacts have been the subject of several recent theoretical works (Baskerville et al., 2019; Ekbia, 2009; Runde & Faulkner, 2019). Kallinikos et al. (2013) offer a high-level summary of this literature and propose three main properties of digital artefacts: *editability/interactivity, openness/reprogrammability, and distributiveness* (Table 1).

**Table 1: Properties of digital artefacts following Kallinikos et al. (2013)**

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
<th>References</th>
<th>Potentiality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Editability/interactivity</strong></td>
<td>Artefacts can be changed by rearranging or adding elements</td>
<td>(Ekbia, 2009)</td>
<td>Can enable contingent actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Ciborra &amp; Willcocks, 2006)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Openness and reprogrammability</strong></td>
<td>Artefacts can be accessed and modified by other digital artefacts or human actors</td>
<td>(Garud et al., 2008)</td>
<td>Can enable generativity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Faulkner &amp; Runde, 2009)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Distributability</strong></td>
<td>Artefacts can be dispersed across multiple organizations, possibly via information infrastructures</td>
<td>(Y. Yoo et al., 2012)</td>
<td>Can facilitate convergence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Kallinikos et al., 2010)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Ekbia, 2009)</td>
<td></td>
</tr>
</tbody>
</table>

*Editability/interactivity* Individuals can change the technology according to knowledge, norms, and rules (Orlikowski, 2000). Digital artefacts enable different actions depending on the context, by adapting to the environment, and by being used according to local needs (Faulkner & Runde, 2009). In other words, the same artefact can serve different purposes to different groups by being locally adapted and combined.
Openness and reprogramability Digital artefacts enable generativity, i.e. they can be combined to generate new solutions (Nambisan et al., 2017; Eck et al., 2015; Zittrain, 2008) and form extensible software platforms (Tiwana et al., 2010). Consequently, they can also be seen as intentionally unfinished (Garud et al., 2008), precisely because they are perpetually in the making.

Distributability Digital artefacts can freely ‘diffuse throughout the institutional fabric’ (Kallinikos et al., 2010) and be implemented across work processes and, thereby modify or extend them. The materiality of digital artefacts reflects and stems from their ability to configure networks (Ekbia, 2009). Digital artefacts are, therefore, essentially inseparable from the associated networks of actors. In other words, they are inseparable from organizing. As a result of their ability to freely diffuse across organizations and be combined with other artefacts, they can facilitate a degree of convergence of product categories and traditional industries (Yoo et al., 2012).

It is only by considering digital artefacts as a class of objects by itself—different from natural objects (e.g., trees) or man-made tools like hammers—that we can truly understand their dynamics. The most recent literature on digital artefacts highlights their interconnectedness with organizational phenomena. The relational view, developed by Hui (2012, 16), is one example. Similarly the notion of quasi-objects (Ekbia, 2009; Lange et al., 2019) and evidence that digital artefacts are constitutive of reality (Baskerville et al., 2019) direct our attention to how digital artefacts influence the organizational realities with which they are entangled.

Organizing for (digital) innovation
The challenge of organizing for innovation is a longstanding and central topic of academic discourse (Andriopoulos & Lewis, 2009). Innovation challenges organizations to simultaneously address existing organizational objectives together with new objectives introduced by innovation (Müller et al., 2019; Tushman & O’Reilly, 2012). The approaches to organizationally addressing the challenge of competing objectives can be mapped on a continuum that ranges from decoupling innovation efforts from the organization entirely on the one end, to integrating the innovation within existing organizational structures on the other end. Both approaches to organizing for innovation have been extensively researched (Benner & Tushman, 2015).

Structural separation of innovation
Separating radical innovation efforts may be effective because it allows for a new set of routines to be developed, independent of the parent organization (Duncan, 1976). This is well captured in the so-called SkunkWorks approach, defined as ‘enriched environment that is intended to help a small group of individuals design a new idea by escaping routine organizational procedures’ (Rogers, 2003). Organizationally separated innovation units bear names such as corporate accelerators (Bauer et al., 2016) and incubators (Becker & Gassmann, 2006). Companies may also acquire start-ups or develop spin-offs as means of structurally separating innovation (Burgelman, 1991; Lassen et al., 2006).

The key downside to organizational separation, however, is that separated innovation units cannot easily draw on existing resources, and they may be hard to integrate at a later point in time. Synergistic effects between old and new units are also hard to reap: ‘By launching a spinoff, a company often creates conditions that make future integration very difficult. For enduring success, incumbent companies are better off creating a group that is—or will eventually be—integrated
within their organizations’ (Iansiti et al., 2003, p. 58). Establishing a separate unit has been argued to be particularly advantageous when the task is exploring new technology (Utterback, 1994) or facing disruptive innovation (Christensen & Raynor, 2013). Separated digital innovation units have, thus, become a popular and widespread practice (Fuchs et al., 2019). They can be found under names such as ‘digital hubs’ (Obwegeser et al., 2020) and ‘digital innovation labs’ (Hund et al., 2019). Digital technologies can provide additional impetus for engaging in such activities (Joshi et al., 2019).

Organizationally integrated innovation

On the other end of the continuum, integrating innovation efforts within the existing structures of the organization offers not only distinct benefits, but also drawbacks. Integration enables the capitalization of existing resources, which may be necessary, especially in the early phases of innovation. Integration also supports the systematic extension of existing offerings (Hess et al., 2016). However, when innovation is developed within the same organizational structure, relying on existing resources and capabilities may hamper the innovation effort when core capabilities manifest as rigidities (Leonard-Barton, 1992); therefore, breaking free from the ‘trap’ of existing knowledge can be difficult (Liao et al., 2008; Liu, 2006). Part of the literature explores the notion of contextual ambidexterity, which denotes the ability to simultaneously attain old and emerging objectives (Gibson & Birkinshaw, 2004), thereby circumventing limitations such as rigidities. Radical innovation can be accommodated within existing, albeit constantly shifting, organizational structures (Brown & Eisenhardt, 1997), e.g., by drawing on knowledge across boundaries (Le Masson et al., 2010, p. 113; Takeuchi & Nonaka, 1986). Examples of organizational integration include digital innovations led by existing business units, IT units (Ingmar et al., 2017), and traditional innovation units which can coordinate efforts across the entire organization (Svahn et al., 2017).

Integrating innovation within existing organizational structures may be appropriate with regard to digital innovation, but it requires organizations to adapt their structures, roles, and processes, which is challenging and characterized by a high probability of failure (Kane et al., 2017; Sebastian et al., 2017; Wade et al., 2019).

Research suggests that organizational separation is well-suited for radical innovation, but it does not provide guidance in terms of integration with the existing business at a later stage. Organizational integration, however, supports the reuse of existing capabilities, but it may stifle creativity and novelty, and bring the innovation closer to existing value propositions (Markides & Charitou, 2004; Westerman et al., 2006). The continuum spanning separation and integration does not preclude the coexistence of both approaches to organizing for innovation within the same organization (Birkinshaw et al., 2016). Organizational structures may also change over time as the innovation efforts unfold (Johansson et al., 2007; Obwegeser et al., 2020). What begins as an organizationally integrated innovation approach may be decoupled from the rest of the organization at a later stage, but re-integrated at the end.

Reuse versus new development

Besides separation versus integration, digital innovation is also characterized by a second area for critical decision making with regard to the architecture of the digital artefact. Architectural innovations, defined by Henderson & Clark (1990), ‘change the architecture of a product without
changing its components.’ They can either be radical or incremental. The point is that even an incremental change in the market offering can represent a daunting challenge when, to deliver it, the internal product architecture needs to be overhauled. In the context of digital innovation, this reflects a key decision between reuse and extension of existing resources versus the development of new digital artefacts. Extant literature shows that the reuse of existing resources, like knowledge, can lead to reduced learning (Liao et al., 2008) and innovation performance (Katila & Ahuja, 2020). Similarly, reusing existing technological capabilities can constrain the search for innovative product concepts (Leonard-Barton, 1992). Yet, building hybrid products combining elements of old and new technologies is reported as a strategy that can lead to successful innovation outcomes (Cohen & Tripsas, 2018).

The question of reusing existing resources is particularly relevant when it comes to digital artefacts, which are easily transferred and modified in contrast to non-digital artefacts (Nambissan et al., 2017). Because of their generative potential (Zittrain, 2008), existing digital artefacts can be used as platforms for developing new innovations. Editability allows digital artefacts to be brought into new contexts and their properties support distributability (Kallinikos et al., 2010) and low transfer costs (Yoo et al., 2012).

Digital artefacts are valuable resources that can facilitate innovation through recombination (Henfridsson et al., 2018), extension (Garud et al., 2008), and reinterpretation (Nevo et al., 2016). At the same time, research has shown that digital artefacts may also constrain individual practices (Orlikowski & Robey, 1991) and limit the strategic options of organizations (Woodard et al., 2013) due to technical debt inherent in the stock of artefacts. That is why companies occasionally undergo the painful process of abandoning existing artefacts and starting anew (Mehrizi et al., 2019; Wimelius et al., 2020).

**Intertwining of the two tensions**

While analytically separable, organizational choices tend to be reflected in the architecture of the product under development (Baldwin & Clark, 2000; Conway, 1968). This has come to be referred to as the mirroring hypothesis (Baldwin, 2015; Sorkun & Furlan, 2017). Eisenhardt (2001), for example, leverages the notion of architectural innovation to explicitly discuss changes in organizational arrangements, namely the creation of new charters in a multi-divisional corporation. This demonstrates that the notion of architectural innovation can be used for both products and organizations.

The mirroring hypothesis is easier to apply when products and the organizations they mirror are neatly hierarchically decomposable. However, this is not always the case in the digital context. Thinking in terms of reusable patterns may be more suitable for the digital context (Henfridsson et al., 2014). The challenge of the mirroring hypothesis further comes from the constitution of digital artefacts, which are composed in a layered, modular fashion (Yoo et al., 2010). This presents an alternative logic which is not easy to reconcile with the traditional hierarchical decomposition of products and the organizations they mirror (Hylving & Schultz, 2020). Flowing from this are challenges for organizational arrangements, when companies struggle to place the responsibility for digital innovation in a single department (Svahn et al., 2017).

**Analytical framework**
Building on prior literature, we consolidate the aforementioned tensions between integration and separation as well as between extension and new development in an analytical framework that supports our empirical analysis (Table 2). The framework distinguishes between four approaches to digital innovation, along the two dimensions of organizational and architectural tensions, which are described in the following.

**Table 2: Digital innovation tensions**

<table>
<thead>
<tr>
<th>Architectural tension</th>
<th>Organizational tension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Integration</td>
</tr>
<tr>
<td>Reuse and Extension</td>
<td><strong>Integrated Extension</strong></td>
</tr>
<tr>
<td>New - development</td>
<td><strong>Integrated Development</strong></td>
</tr>
</tbody>
</table>

- **Integrated extension:** An organization uses existing organizational structures and resources to develop digital innovations. The ‘malleability and ubiquity of information technologies (IT) makes them prone to being reinvented, i.e., users changing an IT to pursue new goals’ (Nevo et al., 2016). This pertains mostly to incremental innovation and improvements to an existing product or service rather than introducing something radically new. Because the choice in product architecture mirrors the choice in organizational arrangements, this arrangement should be stable following the mirroring hypothesis. Organizations may still benefit from adopting this digital innovation approach by, for example, exploring some options afforded by the existing stock of digital artifacts. An independent team that seeks and trials new ways of deploying existing resources may prove effective.

- **Separated extension:** An organization relies on a separate unit to develop novel features, but it reuses existing resources. Organizationally, the parent organization may serve as a boundary object facilitating interactions between different social groups (Star & Griesemer, 1989) or even as a technological platform (Tiwana et al., 2010; Woodard et al., 2013). In this case, the mirroring hypothesis is violated, as the innovation is developed by a separate team but also reuses and extends existing resources. The mirroring hypothesis would predict that within one organization this is an unstable setup and one of the two tensions needs to be changed for mirror-like symmetry to be achieved. Organizations may still benefit from adopting this digital innovation approach by, for example, exploring some options afforded by the existing stock of digital artifacts. An independent team that seeks and trials new ways of deploying existing resources may prove effective.

- **Integrated development:** An organization aims to develop novel digital artefacts within existing structures and without reusing existing resources. The development team needs to be able to escape organizational routines and explore new concepts. Developers are asked
to balance contradictory demands of exploitation and exploration (Wang & Rafiq, 2014) within the same business unit (Gibson & Birkinshaw, 2004). This is one of the quadrants that defies the mirroring hypothesis. Organizationally, the development is integrated but architecturally it is not. Therefore, this should not be a stable organizational setup. Organizations may elect to adopt this digital innovation approach, for example, when migrating from one technology to a closely related one. Another use for such an approach is the case of developing incremental changes to an existing, mature product. In both cases, existing knowledge and practices of the parent organization may help facilitate the development of a digital innovation.

- *Separated development:* An organization establishes a separate unit to develop a digital innovation from the ground up, without reusing existing resources. Such an organizational structure can be suitable for housing radical innovative efforts that explore, e.g., a new technological core (Utterback, 1994). Both architecture and organization are separated. This should be a stable arrangement according to the mirroring hypothesis.

Within this analytical framework, four possible digital innovation approaches are outlined, though two of them are unstable in light of the mirroring hypothesis (Separated extension and Integrated development). In this paper, we focus specifically on organizations that aim to pursue radical innovations and do so by adopting organizational separation as a vehicle for their development. We do so to align with the literature on digital innovation, which has an unmistakable bias toward radical innovations and structural separation has been advocated by many as a way to shield the innovation from organizational inertia (Tripsas, 2009) and thus allow for indisturbed development of novel perspectives (Baiyere & Hukal, 2020; Gong & Ribiere, 2021; Riemer & Johnston, 2019).

**Research design and analysis**

We conducted an in-depth, longitudinal case study (Langley, 1999) of an industry-leading online real-estate platform company to understand how the unique properties of digital artefacts influence the practice of organizing for innovation. We aimed to study the micro-level processes of organizing in order to gain deep insights into the effects of macro-level organizing decisions on daily practices (Whittington, 2006). We wanted to capture the evolution of the firm’s innovation journey; therefore, we decided to follow it over a period of two years.

**Case company**

The case company is a European online real-estate firm—RentCorp—that connects owners of real estate (landlords) with those in need of rental housing. RentCorp has been operating exclusively through digital channels since it was established in 1999; it has become a household name on the national market, effectively replacing physical newspaper classifieds. The company has a single source of revenue: subscription fees from home seekers (landlords use the marketplace for free). This dependence on a single revenue source was the catalyst for the company’s innovation efforts.

At the time of writing, the company employed about 50 people with annual revenues of about $30 million. Developers and customer service staff are the two main employee groups. A small part of the development tasks is outsourced to Eastern Europe. Among the developers, we found front- and back-end developers, designers, and other specialized roles. Many of the key employees have spent substantial parts of their careers at the company. Overall, our informants characterize
the company’s culture as informal with a high-degree of openness and information sharing. For instance, early on, Slack was adopted as the company-wide chat application, including a popular ‘business inspiration’ channel where all employees can share links and ideas that may be helpful for the development of the company.

**Data collection**
We gathered multiple sources of evidence over time: direct interviews, observation of key meetings, archival data (e.g., internal documents and e-mails), and externally available data. The data collection was initiated with a broad interest in how digital innovation unfolds in practice.

Observations enabled us to follow the decision-making process in relation to innovation. This included the kick-off meeting for the initiative where the innovation vision was spelled out. Publicly available information as well as internal data provided additional detail on these meetings. Interview data was collected over time as the innovation process unfolded. Initial interviews were exploratory and helped us understand the challenges of the company. Later, semi-structured interviews were conducted with a focus on the evolution of the vision and plans behind the innovation. Each interview lasted approximately an hour. Table 3 provides a detailed overview.

**Table 3: Overview of interviews**

<table>
<thead>
<tr>
<th>Informant</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Controller</td>
<td>33m</td>
</tr>
<tr>
<td>2 CEO</td>
<td>56m</td>
</tr>
<tr>
<td>3 Head of IT</td>
<td>57m</td>
</tr>
<tr>
<td>4 Scrum Master</td>
<td>59m</td>
</tr>
<tr>
<td>5 Head of IT</td>
<td>1h 25m</td>
</tr>
<tr>
<td>6 Head of New Ventures</td>
<td>1h 4m</td>
</tr>
<tr>
<td>7 Head of IT</td>
<td>1h 5m</td>
</tr>
<tr>
<td>8 Head of Support</td>
<td>1h 22m</td>
</tr>
<tr>
<td>9 Head of IT</td>
<td>30m</td>
</tr>
<tr>
<td>10 Head of Support</td>
<td>48m</td>
</tr>
<tr>
<td>11 CEO</td>
<td>1h 4m</td>
</tr>
<tr>
<td>12 CPO, CFO</td>
<td>46m</td>
</tr>
<tr>
<td>13 Head of Sales</td>
<td>56m</td>
</tr>
<tr>
<td>14 Head of New Ventures</td>
<td>56m</td>
</tr>
</tbody>
</table>

We followed a purposive sampling approach, including interviewees across all vertical and functional divides within the company (from the CEO to software developers). The head of RentCorp IT and the manager of the InnoCircle project (later ‘head of new ventures’) were
interviewed repeatedly. Leaders of various business functions, such as sales and customer support, provided additional insights. Altogether, 14 interviews were conducted over a 20-month period, which allowed us to observe the trajectory of the innovation journey from conception through several trials to launch.

**Data analysis**

We used an abductive approach to qualitative content analysis (Alvesson & Kärreman, 2007), which involves moving back and forth between theory and empirical data in an iterative manner (Mingers, 2004; Wynn & Williams, 2012). The following stages, as proposed in Grodal, Antebay, & Holm (2020), formed the basis for our coding and analysis processes.

First, we started the data analysis with exploratory coding, identifying a variety of ‘first-order codes’ (Knudsen, 1975) that appeared naturally in the data. These codes concerned, e.g., product development, organizational practices, collaborations with external partners, and the growing challenge of integration versus separation. In total, 117 first-order codes were generated. Table 4 provides an overview of some of the frequently used first-order codes grouped into second-order constructs and categories.

<table>
<thead>
<tr>
<th>First order codes</th>
<th>Second-order constructs</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product, branding/presentation, organizational arrangements, work practices, staff/resources</td>
<td>Areas of separation/integration</td>
<td>Separation and integration</td>
</tr>
<tr>
<td>Synergy, leveraging, common infrastructures, cannibalization, technical debt, modularity</td>
<td>Effects of digital artefacts</td>
<td></td>
</tr>
<tr>
<td>Move-in report, digital contract, advertising, data services, move-in report, payment collection</td>
<td>Solutions for landlords</td>
<td>Product extensions</td>
</tr>
<tr>
<td>Payment, digital signatures</td>
<td>Solutions for tenants</td>
<td></td>
</tr>
<tr>
<td>Agile development, prototypes, self-organizing teams, continuous deployment, common prioritization, KPIs</td>
<td>Management models</td>
<td>Organizational practices</td>
</tr>
<tr>
<td>Informal decision making, inter-departmental collaboration, communication, power struggles</td>
<td>Culture</td>
<td></td>
</tr>
<tr>
<td>Outsourcing, suppliers, digital components</td>
<td>Existing</td>
<td>Inter-organizational arrangements</td>
</tr>
<tr>
<td>possible external partners, platform ambitions</td>
<td>Envisioned</td>
<td></td>
</tr>
</tbody>
</table>
Grodal et al. (2020) suggest that the basis for formulating initial codes is a puzzle, i.e. ‘observations at odds with our existing knowledge about a category.’ For us, such an ‘unusual incident’ (Katz, 2001) occurred when the organizational separation did not produce the expected results. Also, the company did not seem to be able to keep the innovation unit and parent organization fully separated. The topic of organizational separation versus integration was then explored in subsequent interviews as we decided to focus on investigating the specific dynamics of organizing for digital innovation.

Second, we focused on integration versus separation and dropped or merged other codes. For instance, the matter of external collaboration became less relevant to the emergent objective of investigating internal organizational dynamics influenced by digital artefacts. ‘Partitioning’ and ‘unbundling’ (Miles et al., 2014, p. 285) of the data was a way to obtain more clarity in response to the identified puzzle: Which aspects of digital innovation efforts should be integrated versus separated? What organizational structures are most supportive of innovation efforts? And how do digital artefacts influence the dynamics of innovation? To explain these puzzles, we started working with the literature on digital materiality (Kallinikos et al., 2013).

Third, we worked with coded transcripts and interpreted them based on the analytical framework (Table 2). We followed three main areas derived from coding in stages one and two (organizational matters, product, and branding/presentation) and analysed their evolution against the configurations of the analytical framework (Table 1). With the case data, we were able to analyse each of the three areas (product, organization, presentation/branding) in three out of the four configurations of the analytical framework (Table 2). As such, the analytical framework provided a sensemaking device and a tool to structure the chronology of the case.

Lastly, we intended to ‘to create a theoretical scaffold to explain the studied phenomena’ (Grodal et al., 2020). The properties of digital artefacts as described in extant literature provided the concepts necessary to analyse the empirical data and make sense of the case. Table 5 presents an overview of the data across all interviews with emphasis on categories of theoretical interest. Three main areas are displayed horizontally: (1) Whether the innovation unit should be separated or integrated (organization), (2) what new product features should be developed, and (3) how the results of the innovation efforts should be presented. Specifically, should they be framed as a new product or branded as part of the existing product?

**Results**

Below, we present the results of our case analysis by following the original timeline of events, starting with an outline of RentCorp’s initial motivation to engage in a radical digital innovation project (InnoCircle) and the steps and decisions that followed thereafter.

**Introduction: Going beyond classifieds**

Since its establishment in 1999, RentCorp had experienced rapid growth of its national online marketplace for rental housing. The growth was reported by the business press, which recognized the company with five awards, between 2007 and 2015, for being the fastest growing company in
the country. RentCorp is a monolithic company with one product that generates a single revenue stream. Despite a track record of adopting innovations like social media advertising, the company never successfully executed a larger-scale innovation that would allow it to diversify its revenue stream.

As a firm with a single business unit, the IT architecture is rather centralized and unified; however, it is plagued by a high degree of technical debt in some areas. This debt can be traced back to the earliest days of the company where development was outsourced. The central digital artefact of the company is a voluminous database storing transactions accumulated over the entire 16-year history of the company. Besides technical debt, additional challenges are imposed on development efforts as a result of some design choices made in relation to existing digital artefacts (e.g., database, interfaces, and applications). For instance, the original structure of the database behind the RentCorp product was tailored to facilitate a classifieds business and was not suitable for newly envisioned extensions. Some of the technologies on which the old infrastructure was based were also seen as outdated by today’s standards.

RentCorp enjoyed market dominance for a long time. However, between 2016–2017, the company experienced a period of reduced growth and even a slight decline in revenue. Top management was concerned with the developments, especially since they received an industry award recognizing RentCorp’s impressive growth just the year before. Management interpreted these negative financial results as a sign that the market was getting saturated. Saturated or not, the worrying decline in revenue questioned the longevity of the business model. The board and CEO were aware that the company was at risk and susceptible to market fluctuations. In light of the 2016 results, the CEO and board considered different sources of growth and how RentCorp might pursue them.
## Table 5: Preview of the data

<table>
<thead>
<tr>
<th>Category</th>
<th>Views on separation (Illustrative quotes)</th>
<th>Views on integration (Illustrative quotes)</th>
<th>Views on digital artefacts (Illustrative quotes)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organization</strong></td>
<td>We had the problem of not being able to do this project within the organization that we currently have. So, now we are doing it in this way, pursuing this idea in an Innovation Lab sort of manner. (06)</td>
<td>It’s important that we don’t get too far apart. If InnoCircle becomes a separate company and they’re successful, then all of a sudden, RentCorp can be in trouble. I think there’s too much value in us working together for that to be very long term. (13)</td>
<td>In InnoCircle, we are building our own database and our own from end data, yeah, workflows and all that, but we still have a lot of links to the old, we are building it as micro-services. (04)</td>
</tr>
<tr>
<td></td>
<td>We wanted to hire a new front-end developer but if we were to do that in InnoCircle, then we had a front-end developer in RentCorp who said, ‘I would love to do that.’ And, we told him, ‘you, you are not going to do that, we are going to hire a new one to do that.’ (03)</td>
<td>I always wonder what can we learn from each other across RentCorp and InnoCircle, I go around in the organization talking about new ideas about InnoCircle and RentCorp, how we can cooperate better and so on. (15)</td>
<td>That’s one of the benefits of what we are doing right now. We are using RentCorp, some of their services that the back-end team supplies. (08)</td>
</tr>
<tr>
<td><strong>Product</strong></td>
<td>We do not want to be developing the product and then putting it back into RentCorp. (04)</td>
<td>Right now, it makes more sense for this service that we have made to launch it with RentCorp, so that’s what we did. So, instead of saying, alright it needs to split into whatever scheme we have for this, then this actually makes sense right now. (06)</td>
<td>You should use all the data and then make your listings even better. We have all the data now. We have the old classifieds business. We have been here for almost 20 years, so if someone should do this, we should do it. (15)</td>
</tr>
<tr>
<td></td>
<td>We need to be sure that we can go to the market with two different products that take the benefit from both landlords and housing seekers, but we need two different products. (08)</td>
<td>We will have some links, like advertise your property here or a call to import your match, if you advertise something and then you have a match. (14)</td>
<td></td>
</tr>
<tr>
<td><strong>Presentation/ Branding</strong></td>
<td>If there is a loose connection to RentCorp, then we are more free to make the choices we want [in InnoCircle]. And of course, it has something to do with that we want to expand out to other markets as well. (07)</td>
<td>I’m a little sceptical whether it’s the right solution because if a user is used to the RentCorp interface, then you move to InnoCircle, everything looks completely different. (11)</td>
<td>But if you are a RentCorp user, then you have this feature built into the interface you are used to, and then you, then you can port your data to the new InnoCircle interface (07)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>We don’t want to charge customers twice for the same thing. If you are buying the contract module in RentCorp, and then you are also getting that in InnoCircle, then you would essentially pay for the same thing twice. (11)</td>
<td>Digital contracts will be the central module of InnoCircle, once that’s released. For now, we are spending the time until the full release to learn about how the contracts work by having them inside RentCorp. (06)</td>
</tr>
</tbody>
</table>

Note: This table shows illustrative quotes under the three most common categories of codes. Dichotomy between integration and separation is blurred due to properties of digital artefacts (shown in the last column). The numbers in parentheses refer to interview numbers as given in Table 3.
InnoCircle as a separated development
The development of a radical innovation, with the aim of establishing a new and self-sustaining business unit, was initiated within a separate organizational structure (‘separated development’). The aim was to develop a separate product that could be marketed under a new brand identity. The entrance to the office building was adorned with a new logo, highlighting the separate visual identity of InnoCircle, as it was placed right next to the logo of RentCorp. To employees and visitors, this was intended to signal commitment to becoming a multi-division business. Clear separation would enable the company to dedicate resources to the innovation and develop a product that would be a radical departure from the product that has propelled the company to its present market-dominant position.

Organization
When the alarming financial results were released in 2016, the company consisted of around sixty employees, half of which were developers organized in one department. Other departments included customer support and traditional support functions like finance. Management understood that the company’s fortunes could turn on a dime, even before the financial results came. However, it was difficult to cope with the uncertain future. In the words of the CEO:

We have the experience that if we innovate at the same time that we are doing the development on the main platform, it tends to be a second priority or third priority. So, no real work gets started and as soon as we can, we take the resources away from that new project and then we lose the interaction and then it’s stopped (CEO).

This was echoed by the head of IT, who at that point, lamented about the amount of development time that is taken up by the development of technologies for internal use:

At one point, we listed, I think, ten areas that the development department was handling—everything from operation to monitoring internal tools and so on. And only one of those ten items were actually creating new features for the product (Head of IT).

In light of the difficulty to carve out time and resources for innovation, it was decided to pursue innovation within a separate organizational unit. A dedicated manager was appointed, and the unit was staffed with new hires in an office space that was physically separated from the rest of RentCorp. The new unit was named InnoCircle in reference to the product concept that they were tasked with developing. The goal of InnoCircle was to achieve financial and organizational independence in a short to medium timespan. However, in the very early days, the InnoCircle team relied on support from the parent organization, but the new unit was eventually fully staffed and was, on the face of it, succeeding in its separation efforts. In fact, our interviewees enthusiastically discussed how InnoCircle would become its own legal entity with a product that had the potential for expansion into foreign markets.

Actually, the worst thing that can happen is that we get a few important customers for InnoCircle, but not traction—not really growing that much. So, we would have a small
team that needs to maintain a group of very important new customers but not that many. That’s going to be very costly to do that. Then we would need to put that back into operation mode along with RentCorp. That’s actually a worst-case scenario (Head of IT).

Product
RentCorp’s old business was a classifieds service that matched landlords with potential tenants. Tenants paid for a subscription to the service to contact landlords. While remarkably successful, it required a lot of resources to maintain operations.

RentCorp, the old company, consumes all of the resources. All these small tasks swallow all the time. So, the old RentCorp, which is very successful, is our biggest problem at the moment because it’s a success. So, we need to do something totally different (CEO).

Management knew that something ‘totally different’ was needed, but it also sought ways to leverage existing capabilities and assets in developing the concept. Two insights were key as the CEO and the newly appointed manager of InnoCircle considered the path forward: First, while RentCorp was generating revenue through paid services to tenants, the large population of landlords were essentially given access to the marketplace for free. Second, while the rental relationship encompassed a large number of interactions between tenants and landlords (e.g., finding a place, signing a contract, and paying rent), RentCorp was only facilitating the initial matchmaking.

The idea was to deepen the range of services provided, especially to landlords, to cater to the various events and interactions that occurred over the rental lifecycle (hence the name InnoCircle). InnoCircle was intended to become a suite of services supporting all these interactions and, at the same time, open up a new revenue stream from the landlords who were using InnoCircle as their main ‘operating system.’ Management envisioned a future in which landlords would see RentCorp as a provider of an essential suite of services rather than just a digital version of the classifieds page in a newspaper. In the words of the CEO:

We want to give customers a platform where they can have this ongoing dialogue with tenants around a property. So, we hold the property and then we have a lot of dialogue going on.

Pursuing this vision would accomplish two things: First, the company could obtain a new revenue stream from the landlords. Second, the company would provide customer value and engagement for a much longer time period than just during the time when tenants were searching for housing. If the new services supported the signing of rental agreements, collection of rent, and ongoing communication, there would be the potential for establishing a recurring source of revenue through a subscription model, a very attractive proposition for RentCorp.
Technologically, InnoCircle started out with the ambition of building a ‘greenfield product.’ Besides avoiding the technical debt amassed on the legacy platform, InnoCircle would be better positioned to develop the envisioned features. Therefore, InnoCircle started the feature development with the purposeful intention of not reusing existing digital artefacts.

A new database was formed, which was a radical decision as it presented a break with the core digital artefact around which RentCorp was built. InnoCircle further distinguished itself from the legacy organization by choosing modern programming languages and frameworks as opposed to the outdated technological stack that was used in the legacy organization:

> We have some new, younger people sitting here. Some work on top of some old legacy PHP code, which people just hate. In InnoCircle we are trying to evolve, we are trying to make use of microservices, a docker, and all the new stuff that’s coming up, trying to be innovative on that (Head of InnoCircle).

**Branding/presentation**

InnoCircle’s goal to become independent was ambitious. Many employees, including InnoCircle’s head, believed that InnoCircle would eventually outgrow the old business. The new services for landlords were not dependent on the domestic monopoly, although access to the domestic market helped; therefore, those new products could help with entering markets in new countries. It was only natural that InnoCircle had its own brand and identity. It was decided to develop a new front-end system in support of InnoCircle’s online presence. A completely new user interface was designed with a visual style reflecting the new InnoCircle brand, complete with a new colour scheme and modern layout that didn’t resemble the old classifieds service at all. A high-fidelity mock-up of the new interface was presented at the kick-off meeting of the InnoCircle project. The company purchased a new .com domain name in anticipation of the internationally minded product. The legacy product had been hosted on a national domain name.

**InnoCircle as a separated extension**

As the development of the ‘greenfield product’ was underway, a series of seemingly sensible decisions to leverage existing digital artefacts were made. While the InnoCircle unit remained organizationally separated, development efforts began to draw increasingly on existing digital resources, and as a result (moving from ‘separated development’ to ‘separated extension’), the radical innovation ambition started to dissipate.

**Organization**

Following the establishment of InnoCircle, the new unit became increasingly organizationally independent. The InnoCircle team formed routines, and a new organizational culture was beginning to take shape. In fact, some attempts at sharing developers’ time between the old and new units resulted in minor clashes, which only fuelled this process and helped foster distinct identities. The vision of InnoCircle was appealing to many, and it was easier to recruit new developers rather than convince job candidates to work on maintaining the aging online service of RentCorp.
Management understood the need to set up a new team that would be less burdened by the legacy platform. There was, therefore, a strong preference for establishing an independent team under separate management. Over time, as InnoCircle was staffed with its own people, its reliance on the parent company’s resources declined.

The organization was indirectly impacted by choices with regard to how digital artefacts were set up. InnoCircle continued to develop its own database but found ways to synchronize the new database with the old one. That way, InnoCircle was able to define the data structure that was needed to develop the envisioned services while drawing on the parts of the RentCorp database that were useful. Consequently, the use of the legacy platform would result in knowledge transfer from RentCorp to InnoCircle.

So, the decision right now is that we are going to collaborate on that concept level, so we get the same instances and the same understanding of how to structure data and then make interfaces that communicate with each other (Head of InnoCircle).

InnoCircle also relied on a set of critical back-end services developed by RentCorp:

So, wherever it makes sense, we use something that’s already been built. Could be a service that looks up businesses or the official registers. If there is already something we built there, we will just use that (Head of InnoCircle).

The linkages between the two databases and the reuse of digital artefacts led to more frequent collaboration, which undermined the previously erected boundaries between InnoCircle and RentCorp.

**Product**

The InnoCircle team worked on making the vision a reality module by module. The first module was a feature that supported the crafting and signing of digital contracts. This module was seen as vital to the whole InnoCircle vision. If InnoCircle was to aid landlords in managing more parts of the rental relationship, they would first need to collect additional data. Collecting data for a formal rental agreement (i.e., a contract) was a natural first step. The digital contracts feature was intended as an isolated development task that would allow the new team to prove itself and act as a steppingstone toward realizing the vision.

Already at this stage, the divisions between the old business and InnoCircle had started to blur—not because the organization grew more independent, but because of reusing the digital artefacts. The intertwining of RentCorp and InnoCircle was paradoxically enabled by the choice to use different technology. InnoCircle chose to rely on microservices, partly as an attempt to pre-empt the cumbersomeness of the technological debt-ridden legacy product. However, microservices are easy to deploy across different products, which contributed to blurring the boundaries:
One of the services we are offering has been made by one of the developers now on the InnoCircle project. It’s now being used, for the next six months or so by RentCorp, and it’s been fully developed by the guys in InnoCircle. So, it’s already a mix of resources and usage. These things need to be very clear before the project starts and that’s a perfect example of how blurry it can get (Head of IT).

Besides the digital contract module, the subsequent features of the roadmap that the InnoCircle manager had defined included most notably rent collection and monitoring, electronic move-in and move-out reports, and data services about trends on the rental market. Providing landlords with data services became the next milestone. It represented the means to capitalize on the treasure trove of data accumulated over time by RentCorp. Based on data on past volumes and prices of rentals, InnoCircle would be able to sell information packages about trends in rental prices in particular neighbourhoods or provide similar data-based products. However, the development of the digital contract feature occupied the team longer than expected. When the work on digital contracts neared completion, questions were raised about how to bring it to market.

**Presentation/branding**

During development of digital contracts and other features supporting the InnoCircle vision, questions were occasionally raised about the long-term perspectives. It was beginning to seem conceivable that parts of InnoCircle could be integrated into the RentCorp service. After all, the linkages at the technological back-end resulted in data exchanges that facilitated a form of convergence. As the initial modules from InnoCircle began to be deployed within RentCorp, a careful customer could notice that when interacting with the new features, the browser quickly redirected them through an InnoCircle domain name. Also, the InnoCircle logo was still hanging at the entrance of the RentCorp office building.

However, reusing the RentCorp name and interface began to appear sensible for the new product. Even the InnoCircle team started to see the opportunities of integrating with the legacy platform as a way to rapidly reach a critical mass of customers.

All in all, as the development of InnoCircle was underway, organizational separation only strengthened, but the distinctiveness of the unit was eroding as it increasingly reused digital artefacts from RentCorp. The decision to, for instance, harmonize the old and new databases and rely on RentCorp’s back-end services chipped away at the initial product vision. But the transactions went both ways. RentCorp could also deploy some of the digital artefacts developed by the InnoCircle team. The microservice architecture followed by InnoCircle made the redeployment easier. All these changes together paved the way for the eventual merging of the two organizational units.

**InnoCircle as an integrated extension**

In the final stage of the case study period, the vision of InnoCircle being a separate business unit was largely abandoned. The InnoCircle unit was set on a trajectory from independence to semi-independence until it was fully re-integrated into RentCorp. The features that were the bread and butter of the InnoCircle vision were released and assimilated by RentCorp, and the InnoCircle
brand was only used internally to refer to the team that incubated and developed new RentCorp features.

**Organization**

With the growing reuse of existing digital artefacts, InnoCircle was no longer seen as a separate business unit in the making. Rather, the developed features were seen as something to be mounted on top of the legacy platform, and the InnoCircle team was perceived less as developers of a ‘greenfield product’ and more as a team responsible for incubating and developing RentCorp. A new name was also used, which indicated the shift in role. It was no longer InnoCircle, but ‘the innovation lab.’ Our main informant changed his job title from head of InnoCircle to the much broader head of new ventures.

The interactions between the two teams became more frequent until, eventually, the CEO made the decision to merge the two teams under the leadership of the Head of Product. RentCorp continued to maintain two databases, but the linkages at the technological back-end required intensive cooperation between the two groups and resulted in blurring the boundaries between them. The two groups had no problem joining forces under common leadership when the merge decision was made. After the reorganization, the InnoCircle team members focused on the new features that targeted landlords, whereas the original RentCorp members focused on home-seeker features.

**Product**

InnoCircle was developing new features that would have become part of the ‘greenfield product’ originally envisioned. However, the new features were used to extend the existing classifieds business. The original vision of a separate InnoCircle business existed only in fragments. As an example of such a fragment, it was widely agreed that providing services across the entire rental lifecycle was a goal to be maintained, as it supported the subscription model and, therefore, would help increase revenue.

The increasing technological integration between RentCorp and InnoCircle paved the way for closer integration of services. They were not only linked at the back-end via the deployment of microservices developed by InnoCircle; it was also increasingly sensible to link front-ends as well. A new CEO was among those who doubted whether the new InnoCircle user interface was ideal, as the new design, compared to the one used by RentCorp, might potentially confuse and alienate users because it was foreign to them. After all, it would be a waste not to capitalize on the large number of users that could potentially be converted to subscribers of the new services?

Moreover, the merging of the two units impacted the type of features that were considered for future development. As the groups merged, the vision of InnoCircle became irreconcilable with the old business:

InnoCircle may release new features that are difficult for RentCorp to release because politically they may offend some of our existing users in the RentCorp environment. In InnoCircle it isn’t very obvious to release that kind of a service. So, then we are
owning both the InnoCircle and the RentCorp, and we may offend some customers in one setup and please them in another one (Head of IT).

More broadly, the services and vision of InnoCircle were reinterpreted and adapted to fit a wider umbrella of RentCorp services. Even as InnoCircle’s innovations were growing into the legacy product, many in the company still believed in the vision of InnoCircle becoming a separate business unit:

InnoCircle has a huge potential. And hopefully will grow and fulfil that potential. So, in two, three years, customer service will be different than it is today. In a few years, InnoCircle may not be considered a part of RentCorp. It may be a small start-up business in itself (Head of Customer Service).

Figure 1: Trajectory of InnoCircle

Presentation/branding
The arguments for presenting InnoCircle features as a part of the legacy platform revolved around taking advantage of synergies and leveraging existing strengths. Among those strengths were a well-known brand, a user interface familiar to the existing user base, and the unique and voluminous database at the core of RentCorp.
Right now, it makes more sense to launch this service with RentCorp, so that’s what we did. So, instead of saying, alright it needs to split into whatever scheme we have for this, then this actually makes sense right now (Head of IT).

Similar arguments unfolded in relation to the branding of InnoCircle. Much like the user interface, it was concluded that RentCorp’s brand recognition in the market was strong and should be leveraged. Each decision to leverage existing assets reduced the novelty of the original vision. This drift away from an innovation toward incremental improvement of an existing service went mostly unnoticed because it was the result of many small and, what seemed like, sensible decisions.

Consequently, only those features that were aligned with the established platform were eventually released. The original vision of InnoCircle was reduced to a series of incremental improvements to the legacy platform (a rough illustration of the process is provided in Figure 1). Key aspects of the vision, e.g. the goal of InnoCircle to eventually become an independent company, became unattainable as the new features were integrated into the legacy platform. However, the InnoCircle project was not considered a failure, as it resulted in extensions to the traditional classifieds business that users welcomed. However, the radical vision of establishing a new business relying on new sources of revenue was not realized. Several months after we finished data collection, the logo of InnoCircle disappeared from the entrance of the RentCorp office.

Discussion: Drift of digital innovation
The case of InnoCircle can be summarized as a story of an ambitious venture that fell short of expectations. Over time, the goal of developing a self-sustainable, radical innovation was gradually revised as it drifted toward more incremental improvements. The vision was of novel market offerings at the outset, but it ended up being add-ons to the existing business. The team began the journey as an organizationally separate unit, but it drifted toward integration and eventually merged with the parent company. The presentation and branding of the new features started with its own completely new identity, but they were eventually subsumed under the brand and user interface of RentCorp. In summary, it is a case of radical digital innovation drifting toward incremental digital innovation.

We use the term drift as an allusion to the work of C. Ciborra et al. (2000) who contrast drift with control in their studies of corporate IT infrastructures. Innovation drift, as we describe it is a testimony to the challenges of radical innovation and is reminiscent of the previously articulated perspectives on organizational inertia (Cohen & Tripsas, 2018; Leonard-Barton, 1992). In the context of digital innovation, the properties of digital artefacts provide a new source of such challenges. When we link innovation drift to the properties of digital artifacts, we do not draw a picture of deterministic causality. Instead, the path from digital artifacts to drift is contingent on actions governed by economic rationality like strategy making and acting upon economic incentives (Henfridsson & Bygstad, 2013).

The RentCorp case study and the described attempt at radical innovation showcases how the specific properties of digital artefacts influence organizing for innovation. In the remainder of this
section, we will discuss the notion of innovation drift as it relates to organizational arrangements, product architecture, and presentation/branding. An overview is provided in Table 6.

**Drift in digital innovation organizations**

Our analysis shows that, without careful managerial decisions, distributable and editable digital artefacts may contribute to a drift of radical innovations toward more incremental innovations. The reuse of digital artefacts, and parts thereof, have the potential to trigger a gradual departure from intended organizational separation (separated extension and separated development) to organizational integration (integrated extension and integrated development). In the case study presented, the innovating unit (InnoCircle) was established as organizationally separate, which was seen as a prerequisite for getting the project ‘off the ground.’ A stream of academic literature points to the benefits of organizational separation in support of radical innovation (Christensen & Raynor, 2013; Markides, 2013). It provides innovation space to grow ideas independent of legacy structures (Duncan, 1976). During the development journey of InnoCircle, the team decided to increasingly rely on existing technological resources. Links to the old database were established, the old user interface was repurposed, and new features were eventually merged with the traditional classifieds service business. The organizational unit remained separate, but as more and more technological bridges were built, the integration of the two organizational units also grew tighter and tighter. Interactions between members of the two units increased in frequency and knowledge was transferred across organizational boundaries, which reduced the distinctiveness of the InnoCircle group of employees.

For the parties involved, it seemed sensible at the time that InnoCircle wanted to leverage existing digital artefacts. After all, they are editable (Kallinikos & Mariátegui, 2011) and can be adapted to serve different purposes (Nevo et al., 2016). This is especially true for artefacts such as the old user interface, which could be modified to accommodate new features. Moreover, artefacts like the RentCorp database are open and reprogrammable and can serve as a platform (Garud et al., 2008) for new development of some (but not all) features. Using these artefacts was unproblematic, as they could be distributed and copied at no cost (Kallinikos et al., 2010), and multiple users could use the same artefact simultaneously (Faulkner & Runde, 2011).

**Drift in products of digital innovation**

When digital drift occurs, the nature of digital artefacts may influence innovation efforts to shift from the ambition of a ‘greenfield product’ to extensions of existing products and services (Figure 1). The original roadmap for InnoCircle included features such as rent collection and management of move-in reports. Those features, however, were difficult to realize as extensions of existing digital artefacts, and as the InnoCircle team became increasingly reliant on these artefacts, development priorities shifted toward features like selling data services, which could be more easily accommodated based on existing digital artefacts.

The decisions that were made can be rationalized and explained by considering the specific properties of digital artefacts. Extant literature presents digital innovation as a recombination process (Yoo et al., 2010) in which different resources are linked to generate value (Henfridsson et al., 2018). The new linkages allow for existing artefacts to be extended (Eck et al., 2015; Zittrain,
2008) and used as building blocks for new development (Faulkner & Runde, 2009; Garud et al., 2006). In fact, from a strategic point of view, it has been argued that the stock of digital artefacts dictates what strategic moves a company is able to make (Woodard et al., 2013). Digital artefacts also carry symbolic properties that can steer development of innovation. Ekbia (2009) cites Day (2001, p. 73) to drive a similar point about digital artefacts: ‘[digital artefacts] are representations of social desires that utilize objects in order to bring about goals of social organization’. Hui (2016, p. 57) similarly asserts: ‘Digital objects take up the functions of maintaining emotions, atmospheres, collectives, memories….’ Therefore, reuse of digital artefacts can anchor and direct innovation efforts from conceptualization to realization.

As an unintended consequence of the properties of digital artefacts, overreliance on existing digital artefacts in pursuit of digital innovation may challenge the novelty and radicalness of innovation efforts and engender their reduction to incremental improvements. Radical innovations may be envisioned but the development of breakthrough concepts may not be easily attained by leveraging existing artefacts. Furthermore, even though existing artefacts can be reinterpreted (Nevo et al., 2016), such an effort is demanding, and the reuse of a digital artefact can anchor development efforts by making certain (less radical) ‘design moves’ (Woodard et al., 2013) more easily attainable than others.

Table 6: The influence of digital artefacts following Kallinikos et al. (2013) on innovation

<table>
<thead>
<tr>
<th>Organizational arrangements</th>
<th>Editable /interactive</th>
<th>Open and reprogrammable</th>
<th>Distributable</th>
</tr>
</thead>
<tbody>
<tr>
<td>How is the development of new products organized?</td>
<td>The same artefact can be adapted and made sense of by different social groups.</td>
<td>Key digital artefacts can not only help connect organizational units and enable development of new features, but also constrain development of others.</td>
<td>Effects of organizational separation may be dampened as digital products can facilitate convergence.</td>
</tr>
<tr>
<td>Product</td>
<td>Unstable identity of the total product. Product can be different things according to how it is assembled.</td>
<td>Products can be extended in various ways. Different features can be developed by extending the stock of digital artefacts.</td>
<td>Different products can converge into one. New product derivations are possible by combinations.</td>
</tr>
<tr>
<td>What features can be developed?</td>
<td>Features can be integrated into different products and can be hard to brand as distinct.</td>
<td>Digital artefacts can provide a platform not just in the technical sense but also in the sense of providing brand and legitimacy.</td>
<td>Digital components can be locally assembled and can lose distinctiveness as a result.</td>
</tr>
<tr>
<td>Branding / presentation</td>
<td>Enabling contingent actions.</td>
<td>Enabling generativity</td>
<td>Facilitating convergence</td>
</tr>
<tr>
<td>How are product features presented?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Threat of a drift from radical to incremental innovation.
Drift in presentation and branding
The InnoCircle project started with the ambition of becoming a venture in its own right, with new features for a new group of users, under a fresh brand name, and through a separate interface from the parent company. The digital innovations developed by InnoCircle ended up, however, being swallowed by the parent company and its products. The most prominent example is the feature supporting digital contracts. It might have served as the foundation for a separately branded suite of services targeting landlords. It was, however, also possible for this feature to be integrated into the existing classifieds service. As an add-on to the classifieds service, it gained instant exposure to users. By merging the new and existing services, InnoCircle closed the door on breaking away as a separate business with its own brand. The feature instead extended and reinforced the existing RentCorp business.

Properties of digital artefacts can partly explain the drift in presentation of the output of digital innovation from a novel brand to an extension of an existing brand. Editability (Kallinikos et al., 2013) of digital artefacts enables them to be dynamically assembled and re-assembled. New features can, therefore, be a part of old products and services that are already familiar and recognizable. Generative digital artefacts, like platforms (Baldwin & Woodard, 2008), are not only enablers of the development of new solutions but also sources of legitimacy. This desire for legitimacy may motivate a tightening of the reins on innovation efforts so as not to stray too far from the platform that enables development of, e.g., new features to begin with. (Hinings et al., 2018). Newly developed features are embedded in digital artefacts that can be distributed, locally interpreted, and together with the property of editability, can attain such a degree of dynamics that they can lead to a loss of distinctiveness.

As a counter-intuitive implication of such properties of digital artefacts, establishing new product identities can be more difficult in digital innovation. By new identities, we understand both new brands and the introduction of innovations that challenge the identity of organizations as a whole (Tripsas, 2009; Obwegeser & Bauer, 2016).

Alternative mechanisms
In our presentation of the case study, we have emphasized the role of digital artefacts and their specific properties as a potentially contributing factor to innovation drift. By doing so, we aim to address the need for in-depth investigations of digital materiality (Faulkner & Runde, 2011; Leonard & Barley, 2008) and digital artefacts (Grover & Lyytinen, 2015; Orlikowski & Iacono, 2001; Tilson & Lyytinen, 2010) in organizing for digital innovation. It is, however, also necessary to acknowledge alternative mechanisms that likewise explain or provide justification for the reasoning that drives the dynamics between integration and separation. Besides the material account, it is necessary to discuss efficiency considerations and strategic choices.

First, the drift from radical innovation to incremental can be attributed to an economic incentive to reuse resources in the name of efficiency. Those resources include staff, which can be shared between the innovation and legacy teams, knowledge, or digital artefacts, as discussed at length.
Sharing of resources may be economical in development, and presenting the new innovation bundled with existing market offerings may be more effective.

Second, the drift from radical to incremental innovation can be attributed to a strategic choice. Radical innovations are sometimes seen as desirable, as was the case in RentCorp. In other cases, however, incremental innovation is what an organization may prefer. For instance, when dealing with an established digital product, a stream of incremental innovations may be what existing users prefer. Of course, as we know from Henderson & Clark (1990), what may appear as incremental innovation to the user may be enabled by a significant change in technology (Mehrizi et al., 2019; Wimelius et al., 2020).

The economic incentive and the strategic intent are two considerations that managers should be mindful of when deciding on the target of the innovation development effort (radical or incremental) and the way the target innovation is going to be reached (choices along architectural and organizational tensions).

**Revisiting the analytical framework**

At the outset of this paper, we outlined a simple analytical framework (Table 2) to guide us through the case (Figure 1). The framework outlines two essential tensions in organizing for the delivery of digital innovation, i.e., tensions between integration and separation and between reuse and development of new digital artefacts. The case study presented traversed three out of the four quadrants of the framework, but it did not speak to the fourth. The unexplored quadrant (integrated development) presents a scenario of how the case could have evolved under different circumstances. If InnoCircle had not started reusing digital artefacts and instead grown organizationally intertwined with the legacy organization, it might have precipitated a decision to unify the two organizations architecturally. Based on the mirroring hypothesis, this would be followed by a harmonization of frameworks and programming languages in use and eventually by merging the two products together. Such a progression through the events would point less to the influence of digital artefacts and more to the economic incentives of sharing and reusing staff, skills, and knowledge.

**Conclusion**

We presented a longitudinal case study of a born-digital company operating an online marketplace for rental housing that experienced the challenges of digital innovation. What began as a vision of radical innovation drifted toward becoming incremental improvements of existing organizational arrangements, the product, and its branding/presentation. This course of events was surprising because organizational separation has many advocates as an effective strategy for developing radical innovations (Birkinshaw & Gupta, 2013; Christensen & Raynor, 2013; Duncan, 1976; Gilbert, 2004). Our findings suggest that organizational separation may be less effective in the context of digital innovation, as digital artefacts can freely diffuse throughout organizational units (Ekbia, 2009; Kallinikos et al., 2010, 2013). We have captured this phenomenon under the label ‘innovation drift.’
The concept of innovation drift and our case study presents a challenge to the prevailing view of digital innovations as radical, paradigm-shifting discontinuities (Baiyere & Hukal, 2020; Riemer & Johnston, 2019). Our case shows that companies should consider the full spectrum between incremental and radical when developing innovations with digital technologies. To steer the process effectively, companies need to make decisions about how to organize the development and how to treat digital artefacts (reuse or new development).

This paper also contributes a novel perspective to the literature on digital innovation, which describes the recombination potential of digital artefacts as a driver and source of digital innovation due to their generative potential (Henfridsson et al., 2018; Yoo et al., 2010). In the case of RentCorp, a set of seemingly sensible decisions to leverage and recombine available digital artefacts in support of digital innovation challenged the vision of novel market offerings and reduced radical innovation efforts to incremental improvements of an existing classifieds service. Echoing earlier observations that technologies can be both enabling and constraining of action (Orlikowski, 2000), we similarly assert that digital artefacts can be generative and constraining. Innovation drift is one way the constraining effects may manifest.

Managerial implications
This research addresses a topic that concerns many organizations seeking to innovate with digital technologies, particularly born-digital firms. Much like traditional firms, organizations in the digital era have the option of developing radical innovations or more incremental innovations. To enable this development, both integrating innovation efforts within existing structures or separating them in dedicated units are possible options for organizations with digital or traditional products. Separation may seem particularly advantageous as it allows for the development of new concepts and routines away from the pressures of the governing rules and norms of the parent organization. In other words, members of such a separate organization enjoy greater degrees of freedom to explore and create. However, in the context of digital innovation, the role of digital artefacts needs to be considered. How are existing digital artefacts to be treated? Are innovation efforts going to rely on the reuse of existing digital artefacts, or will they be developed as part of those innovation efforts? As the case study demonstrates, answers to these questions influence the process and outcome of digital innovation. The threat of neglecting conscious management of digital artefacts is that they can result in drift of the innovation ambition from radical to incremental.

Our research uncovers three particular areas of which managers should be conscious. First, reuse of digital artefacts can decrease effectiveness of organizational separation. Second, if new products are grafted on top of existing solutions as additional features, any radical innovation attempt may be threatened. Third, the radical vision behind new digital products can be dissolved if they are presented under the established brand identity. All these threats can be attributed to the particular nature of digital artefacts, which can be distributed and extended freely. Mindful management of the choices along those three dimensions can prevent a radical innovation effort from drifting toward incremental innovation.
The digital innovation process can be negatively impacted if digital artefacts are reused by members of the innovation team at the expense of the independence and novelty of the innovation. The decision to reuse such artefacts may seem both rational and innocent, as they provide a powerful means of kickstarting or accelerating innovation efforts, but they come at the cost of dependence on the parent company, making it difficult to develop, e.g., new product concepts and organizational routines.

**Limitations and future research**

As our research presents the results of a single, longitudinal case study, it may be regarded as a first step toward investigating and understanding how the properties of digital artefacts influence how companies organize for innovation. As digital innovation is a broad concept that encompasses different phenomena; therefore, additional qualitative work is needed to corroborate and extend our findings by including other empirical settings and different types of digital innovations. Our research is limited as it presents the results of a single case study of an attempt at radical innovation through an organizationally separated unit. As highlighted in the analytical framework (Table 2), other digital innovation approaches are possible and thus call for further investigation. Quantitative studies may also contribute insights by surveying a large sample of innovation projects to evaluate the effectiveness of different organizational arrangements in support of digital innovations. Future contributions that seek to develop prescriptive knowledge by employing interventionists methodologies (David, 2002) would also be welcome.

**Acknowledgements**

We would like to thank Youngin Yoo for invaluable editorial guidance as well as our two anonymous reviewers for their constructive feedback and input.

**References**


0-08-097086-8.73062-5
Baskerville, R., Meyers, M., & Yoo, Y. (2019). Digital First: The Ontological Reversal and New Challenges for IS. *MIS Quarterly (Forthcoming)*.
http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:the+ambidextrous+organization:+Desining+dual+structures+for+innovation#0


https://doi.org/10.1016/j.infoandorg.2008.03.001


