IT Consumerization’s Impact on Enterprise IT

Research-in-Progress

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Abstract

More and more organizations are allowing employees to use their consumer devices (e.g., smartphones and tablets) and applications (e.g., Dropbox, Skype, GoogleDocs) at work. This trend is called IT consumerization (Harris et al. 2012). While IT consumerization promises numerous positive benefits including innovation, productivity and employee satisfaction (Harris et al. 2012), IT consumerization is a paradigm shift for enterprise IT. Historically, IT departments have procured, developed, tested and supported the organization’s technology. This research investigates how IT consumerization is impacting IT department practices by reporting on a research project involving three case studies of organizations that have embraced IT consumerization. Using punctuated equilibrium as our theoretical framework, this research shows that IT consumerization has impacted enterprise IT’s strategies, values, structures, and control systems.

Keywords

IT consumerization, IT practices, mobile devices, and punctuated equilibrium

Introduction

The purpose of this paper is to understand how IT consumerization is impacting IT department practices. IT consumerization deals with employees using their consumer devices (e.g., iPhone, iPad and Netbooks) and applications (e.g., Dropbox, Evernote and Skype) in the workplace (Harris et al. 2012)—a growing phenomenon. Given the innovation, productivity and employee satisfaction benefits associated with employees using their consumer devices and applications (hereinafter apps) at work (Harris et al. 2012), organization are lifting bans on these consumer tools in the workplace (Cesare 2011). A 2011 report indicates that 59% of IT departments provide full or limited bring your own device (hereinafter BYOD) support (Cesare 2011) and 64% of European and North American organizations have prioritized supporting employee mobile device use (Forrester 2012).

Empowering employees to use their consumer tools in the workplace will likely impact enterprise IT’s daily practices. Gartner states that IT consumerization, specifically BYOD “represents the most radical change to the economics and culture of client computing in business in decades” (Willis 2013, p. 1). The plethora of devices (e.g., Apple iPhone, Samsung Galaxy and Android), operating systems (e.g., Apple iOS and Android) and apps (e.g., Yammer, Evernote) that an open IT consumerization policy allows, represents sweeping change for IT departments. For decades, IT department have developed, procured, controlled and supported standardized technology that employees use (Chen and Nath 2011; Deng et al. 2010; Harris et al. 2012)

Despite the growing IT consumerization trend, we know little about how IT consumerization may impact an organization’s IT department (Garcia and Silva 2013; Harris et al. 2012; Niehaves et al. 2013). To date, the IT consumerization research has investigated consumerization’s impact on employees and the organization. Research has investigated employees intention to use consumer devices at work (Ortbach et al. 2013b) and the impacts this use has on work-life balance (Sarker et al. 2012), consumer behavior (Ortbach et al. 2013a), stress (Ortbach et al. 2013c) and performance effectiveness (Niehaves et al. 2013).
Enterprise IT consumerization research focuses on the security risk (Anderson and Agarwal 2010; Liang and Xue 2010) and resource drain employees cause when they want to use their consumer devices at work. Consumerization increases enterprise IT’s workload by requiring additional IT investment to update IT infrastructure (Harris et al. 2012), IT architecture and policies (Ortbach et al. 2013a). IT has to rethink its policies, procedures and support practices (D’Arcy 2011; Ortbach et al. 2013a). Questions linger regarding help desk consumer device support and legal implications such as (1) corporate control of personal devices and information and (2) employees using mobile devices after hours.

To explore the radical change that embracing IT consumerization poses for enterprise IT, we are using punctuated equilibrium theory as a theoretical lens to analyze data from three IT departments, situated in Fortune 100 companies that have embraced IT consumerization. The following sections will explain the theory, method, preliminary findings and anticipated contributions.

**Punctuated Equilibrium Theory**

Within the organizational theory context, punctuated equilibrium offers a lens to interpret how work groups (i.e., enterprise IT) react to environmental changes (Gersick 1991; Gruden 2012). The punctuated equilibrium model explains patterns of fundamental organizational transformation, where change occurs as “an alternation between long periods when stable infrastructures permit only incremental adaptations and brief periods of revolutionary upheaval” (Gersick 1991, p. 10). IS researchers have used punctuated equilibrium to explain technology’s impact on organizations (Loch and Huberman 1999; Sabherwal et al. 2001; Street and Meister 2004), work group practices (Jarvenpaa et al. 2004) and communication patterns (Chidambaram 1996).

Primary components of punctuated equilibrium theory include deep structure, equilibrium periods and revolutionary periods (Gersick 1991). **Deep structure** is “the set of fundamental ‘choices’ a system has made of (1) the basic parts into which its units will be organized and (2) the basic activity patterns that will maintain its existence” (Gersick 1991, p. 14). Relatively long stability periods (equilibrium) are punctuated by compact periods of metamorphic change (revolution). Deep structure explains the interrelationship between these two concepts. Deep structure is a highly resilient underlying order. Deep structure persists and limits change during equilibrium periods. It is what disassembles, reconfigures, and enforces wholesale deep structure transformation during revolutionary punctuations (Gersick 1991, p. 12).

Examples of deep structure in organization’s include: (1) core beliefs and values, regarding the organization, its employees and its environment, (2) business unit strategy, (3) power distribution, (4) organizational structure and (5) control systems (Tushman and Romanelli 1985, p. 176). See Table 1 for definitions and examples.
<table>
<thead>
<tr>
<th>Deep Structure</th>
<th>Definition</th>
<th>Example</th>
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<tr>
<td>Core beliefs and values</td>
<td>Represent the most ubiquitous aspects of organizations where they set basic constraints as to where, how and why an organization competes (Tushman and Romanelli 1985). Beliefs: an acceptance that a statement is true; trust, faith, or confidence in someone or something (Cannon and Edmondson 2001). Values: general criteria, standards or guiding principles that people use to determine desirable behaviors, events, situations and outcomes (Rokeach 1973).</td>
<td>Many IT employees believe that malicious people are trying to access their organization’s IT network. IT employees implement security initiatives like requiring that all devices accessing the organization’s network have a password. Security is a core value for enterprise IT.</td>
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<tr>
<td>Business unit strategy</td>
<td>The pattern of decisions and actions that managers take to use core competencies to achieve a competitive advantage. Includes products produced, markets served and operating environment. Establishes general time and technological constraints (Chandler 1962; Tushman and Romanelli 1985, p. 176)</td>
<td>To allocate limited development resources, enterprise IT may develop prioritization strategies that prioritize application development for the core business (e.g., finding oil) over administrative functions (e.g., finding a conference room).</td>
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<td>Distribution of power</td>
<td>The organizational structure’s ability to utilize resources (e.g., manpower, technology and capital) in ways that accomplish tasks the way management wants (Salancik and Pfeffer 1977). Managers can distribute power across organizational levels, bestowing certain departments and workgroups with power contingent upon the organization’s priorities, the people’s responsibility level and seniority (Wang and Heller 1993). Power can manifest in: personnel arrangements, budgets, policies, and information technology.</td>
<td>An organization’s IT department may lose power when other departments begin purchasing and maintaining their own technology.</td>
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<td>Organizational Structure</td>
<td>The formal system of task and authority relationships that an organization establishes to control its activities. Examples include mechanistic and organic (Barnard 1948).</td>
<td>Some IT departments have moved from centralized structures where IT professionals work in an IT department to distributed structures where IT professionals are dispersed throughout other departments like accounting and sales.</td>
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<tr>
<td>Control systems</td>
<td>Influence people’s behavior over the course of events or activities (Tushman et al. 1986). Organizations control members and their activities through: personal control by managers in the hierarchy, informal control through norms and values, formalization, and standardization (Weber 1949).</td>
<td>IT departments requiring employees to password protect their mobile devices and change the password every 30 days.</td>
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Table 1. Deep Structure in Organizations (Tushman and Romanelli 1985)
Organizations maintain the deep structure defined above during *equilibrium periods*. During equilibrium periods organizations respond to environmental changes with small incremental adjustments thus maintaining their organizational structures and activity patterns. This period of inertia is characterized by very little change within the organization (e.g. structure, strategy, policies and procedures) (Romanelli and Tushman 1994a).

During *revolutionary periods* a system’s deep structure dismantles and the organization experiences transformative and radical change (Romanelli and Tushman 1994b). During radical change periods, organizational leaders try to create stability by making choices that create new structures (Loch and Huberman 1999). Once these new structures are built, the organization again enters a relatively, long stable equilibrium period (Gersick 1991).

Two sources of disruption can cause deep structures to come apart and launch organizations into revolutionary periods. These are: “(1) internal changes that pull parts and actions out of alignment with each other or the environment and (2) environmental changes that threaten the system’s ability to obtain resources” (Gersick 1991, p. 21). Internal changes like organizational IT implementations and hiring new employees have a long history of breaking apart deep structures (Gruden 2012; Jarvenpaa et al. 2004; Newman and Robey 1992; Porra et al. 2005, among others). IT implementations often lead to changes in values, power and control systems. Environmental changes that can break deep structures may include political, technological, competitive and social factors.

Figure 1 below shows how we are using punctuated equilibrium to frame this IT consumerization study. The model proposes that enterprise IT has been in a state of incremental change with regard to how they manage employee computing since the personal computers and the Internet became common business tools (i.e., the far left-hand side of the diagram). During this non-revolutionary time, IT departments were responsible for learning about, developing, implementing and supporting technology to support employee computing (Harris et al. 2012). The figure proposes that embracing IT consumerization can be a revolutionary change for IT departments when combined with other environmental factors and internal disturbances. Using punctuated equilibrium, this study is investigating how this revolutionary change is impacting the IT department’s deep structures.

![Figure 1. Research Model](image-url)
Method

Recognizing that our research is investigating a how question and that IT departments are in the early stages of embracing IT consumerization, we rely on an interpretive case study approach (Klein and Myers 1999) grounded in the accounts of each corporation’s IT professionals (Madill et al. 2000). This allows us to study IT consumerization in its context (Walsham 1995a; Walsham 1995b). To investigate how IT consumerization impacts IT department practices, we are interviewing IT professionals at three organizations that have embraced IT consumerization in recent years. We will refer to these corporations by descriptive pseudonyms: ConsultingCo, OilCo and DistributionCo. All the corporations had large internal IT departments responsible for supporting each corporation’s operations including IT infrastructure, application development and end-user support. ConsultingCo is one of the largest professional services corporations in the world, its primary services include assurance, tax advisory and financial advisory. OilCo ranks in the Fortune 100’s top tier, its business in finding and producing oil and natural gas. DistributionCo is a supply chain corporation with more than $40 billion dollars in annual sales. It delivers groceries, fast food and liquor to convenience stores, drug stores, mass merchants, and restaurants. Table 2 provides interviewee details.

<table>
<thead>
<tr>
<th>Corporation</th>
<th>Interviewee Job Title</th>
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<tbody>
<tr>
<td>ConsultingCo</td>
<td>- National Technology Director&lt;br&gt;- ITS Application Development&lt;br&gt;- Information Technology Services</td>
</tr>
<tr>
<td>OilCo</td>
<td>- Director, Client Computing&lt;br&gt;- Director, Application Development Services COE&lt;br&gt;- Supervisor, ADS Architecture COE&lt;br&gt;- IT Knowledge Management Analyst&lt;br&gt;- Associate Business Analyst&lt;br&gt;- IT Security Intern&lt;br&gt;- IT Security Analyst</td>
</tr>
<tr>
<td>DistributionCo</td>
<td>- Chief Financial Officer (3 interviews)&lt;br&gt;- Vice President of information Systems (2 interviews)&lt;br&gt;- Information Security Manager&lt;br&gt;- Help Desk Associate</td>
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Table 2. Interviewee Details

Data collection began in February 2013 and we have conducted 30 interviews. We conducted our most recent interviews in September 2013 and we expect to conduct follow-up interviews after further data analysis. We gained access to these corporations through relationships the first author cultivated in her university role placing students in internships and full-time IT positions. Once the initial contact at each corporation approved the study, the contact then arranged interviews with IT professionals that were engaged with each corporation’s IT consumerization strategy.

So that the interviewees could prepare for the interview, we provided an executive summary and interview questions prior to the interview. See Table 3. Most interviews lasted about 1 hour and were semi-structured, tape-recorded and transcribed. We tailored the interview questions, which were open-ended.
and exploratory, to each IT professional’s role. We wrote extensive field notes describing our other unstructured interviews and interactions with the interviewees.

**Your Role**

1. Please describe your job title and responsibilities.

2. What is your role in your organization’s IT consumerization strategy?

3. How has your role supporting employees who use mobile devices like tablets and mobile phones changed in the past five years? For example has IT consumerization (i.e., employees adopting mobile phone apps on their own) affected what you do? Has the organization adopted a mobile strategy or changed its support policies for BYOD in ways that have expanded or changed what you do?

**The IT Department**

4. Describe the IT department’s current stance/strategy with regard to supporting employees who use mobile phones and tablets for work?

   a. To what extent does the IT department support personally-owned mobile devices connecting to the corporate network? What are the main support challenges associated with your current stance on personally-owned mobile devices?

   b. Has IT’s stance/strategy with regard to supporting employee use of mobile devices changed in recent years? If so, what lead to this change?

   c. How has the IT department’s current stance on mobile devices impacted the IT department’s support practices for employees who use mobile devices? Can you share a specific example of a support practice that has changed?

5. Now that more employees are using smart hand-held devices, has this changed how the IT department develops/deploys workforce support applications? If so, how?

6. Can you share an example of an initiative the IT department is working on/developing to help employees use smart hand-held devices to do their jobs better. For example, maybe an application that makes employees more productive or saves them time.

**The Organization**

7. How has your organization’s approach to employees using mobile devices like iPads and tablets, evolved over the past five years. Describe the current approach.

8. Can you describe any organizational factors or organizational changes (e.g., culture, budgets, 5-year plan) that impact the internal IT departments’ ability to support employees who use smart hand-held devices like smart phones and tablets?

9. From an organizational perspective, explain your organization’s success and/or challenges with supporting employees who use mobile phones and tablets for work.

**Table 3. Interview Protocol**
To date we have analyzed interviews conducted at OilCo, a pseudonym. Our data analysis is following an exploratory approach (Strauss and Corbin 1998). First, we read through each transcript to understand how each corporation’s consumerization strategy and how IT consumerization is impacting IT department practices. After reviewing the organizational theory literature, we decided that punctuated equilibrium (Gersick 1991; Tushman and Romanelli 1985) offers the best lens to analyze the data. Upon choosing this theory, we read through the data again to better understand the IT practices that IT consumerization is changing. We are using QSR NVivo 10 to organize our data analysis. To assess our research approach, we are relying on Klein and Myers’ (1999) principles of interpretive research, which have become the standard for evaluating interpretive case studies in IS.

Findings: How IT Consumerization Impacts IT Practices at OilCo

Our preliminary analysis shows that OilCo’s journey into IT consumerization is impacting its IT department in many ways. The paragraphs that follow discuss how OilCo’s journey into IT consumerization has lead enterprise IT to shift from a low-provider to a value-added business partner and promote innovation. Table 4 below explains the processes associated with these changes and links these changes to punctuated equilibrium’s deep structure.

<table>
<thead>
<tr>
<th>Impacts of IT Consumerization on OilCo’s IT Practices</th>
<th>Deep Structure Attribute</th>
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<tbody>
<tr>
<td>Shift from low-cost provider to value-added business partner. Implemented by changing:</td>
<td>Business unit strategy</td>
</tr>
<tr>
<td>• Performance metrics</td>
<td>Control system</td>
</tr>
<tr>
<td>• Project approval processes</td>
<td></td>
</tr>
<tr>
<td>• Service mechanisms for staffing and provisioning</td>
<td></td>
</tr>
<tr>
<td>Promoting innovation. Implemented by:</td>
<td>Core beliefs and values</td>
</tr>
<tr>
<td>• Encouraging employee ideation</td>
<td>Organizational structure</td>
</tr>
<tr>
<td>• Launching an emerging technology group</td>
<td></td>
</tr>
<tr>
<td>• Budgeting innovation dollars</td>
<td>Control system</td>
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</tbody>
</table>

Table 4: IT Consumerization’s Impact on OilCo’s IT Practices

Shift from Low-Cost Provider to Value-Added Business Partner

For OilCo's Chief Information Officer (CIO) embracing IT consumerization by allowing employees to use their iPads and iPhones at work was a visible way to show an IT strategy shift from: low-cost provider to value-added business partner. To support IT consumerization, enterprise IT changed three control mechanisms from controlling cost to providing value. These were performance metrics, project approval processes and service mechanisms.

OilCo's CIO replaced IT employees’ cost management performance metrics with metrics encouraging IT to help the business. For decades, enterprise IT (hereinafter IT) was a low-cost provider. OilCo's management prided itself on spending considerably less on IT than its industry peers. Annually, management cut IT's budget and expected IT to find efficiencies and better ways of conducting business. IT's performance metrics emphasized cost management and ensuring system availability (e.g., keeping the servers running). An IT director explains: “IT was able to squeeze every ounce out of every dollar we spent. We didn't want to hear ideas from end-users, they weren’t in the budget and we couldn’t do them.”

Upon embracing IT consumerization, the CIO instituted performance metrics that encouraged IT to provide new services to the business. IT's revised performance metrics incented IT to encourage the business to bring needs to IT and ensuring that IT meets these needs. The CIO launched the metrics by requiring that the IT group identify and develop 20 iPhone and iPad apps. Since the business had to generate the app ideas, this encouraged IT to work with the business to see what they needed. Enterprise
IT's performance metrics then built upon this renewed IT-business relationships and began incorporating the business value of tools IT delivers. An IT manager comments, "We get some feedback from the business--did we reduce the time it took them to do something? Were they able to get a sale or sell oil at a higher price because of it? What was the actual financial impact to the company for some of those services that we provide?"

Supporting IT consumerization required that OilCo upgrade its IT infrastructure on a "leap of faith,"¹—a contrast from OilCo's stringent project approval process. Prior to embracing consumerization, OilCo's governed IT by controlling and requiring expenditure approvals so that IT could "serve the most for the least." An IT manager comments, "There was an extensive process, six or seven gate checks around requesting IT resources. We'd vet projects to make sure they met muster. If someone ended up coming through the process then we might do their project."

IT's reengineered project approval process shifted from this cost model to a value model. In the value model, IT looked at opportunities and chose ones with the most value-delivery potential. As a result, enterprise IT made three changes encouraging saying "yes" to users more often. First, IT evaluated multi-million dollar projects using return on investment (hereinafter, ROI), choosing projects that would return the greatest value. Before consumerization, IT primarily approved cost-savings projects and would often reject projects with business funding.

Second, because IT consumerization has the potential to generate more projects, many of which are small such as building iPad apps, IT waived project approvals for projects less than $250,000. Newly created client engagement sheets directed business units to IT professionals who could complete their project. If there was a business justification, IT would work on the project. Third, IT gave its developers discretion, allowing developers to work on projects for the business without approval as long as the projects were under 40 hours. Combined, these three changes reduced IT development time, primarily by reducing bureaucracy and streamlining project approval time.

To support the growing business demands IT consumerization created, IT instituted service mechanisms affecting staffing and device provisioning. IT was no longer locked into a headcount as it had been in the past, now IT could expand its staff as needed. An IT Director explains how flexible staffing allowed IT to move from responding to end-users' requests with "no" because of staffing constraints to adopting the motto: "If you've got the money honey we've got the time." With regard to device provisioning, IT changed its device provisioning decision criteria. Historically, IT chose the lowest cost device for end-users, because the organization judged IT on cost not on end-user productivity. With consumerization, IT allowed users to choose devices that afforded them intangible benefits (e.g., comfort and convenience) and productivity despite the potential for this to increase enterprise IT's device maintenance and development costs.

**Promoting Innovation**

Changing strategy from low-cost provider to value-added partner, required launching innovation-promoting initiatives. OilCo started by encouraging employees to develop and share ideas about using consumer devices in the workplace. These initiatives changed OilCo's organizational structure and control systems. Initiatives included (1) encouraging employee ideation, (2) launching an emerging technology group and (3) budgeting innovation dollars. Combined these initiatives changed enterprise IT's values from IT employees avoiding new things because failure and mistakes were "no no's" to one where IT leadership encouraged IT employees to "roll out new things and fail fast."

IT encouraged employees to brainstorm projects where they could use consumer devices by introducing crowdsourcing to democratize innovation, affording all employees a say in innovation. This involved the "there's an app for that campaign" and innovation forums. The "there's an app for that campaign" allowed employees to submit ideas for consumer device apps that would benefit OilCo. Employee ideas described the app, its intended users, its anticipated benefits and how it would function. Many entries included screen shots explaining the app. Employees subsequently voted on the apps they thought the IT department should implement. The IT department developed and implemented the top 5 ideas and then

¹ Quotes in the text come from the field notes.
reviewed all submitted ideas. IT grouped similar ideas, categorized ideas by business unit and shared ideas with business units to evaluate their merit.

OilCo initially ran its “there’s an app for that” contest for 3 weeks and received 346 ideas. Enterprise IT is incorporating the crowdsourcing software into its practices affording employees a forum to share ideas. An IT Director comments, “Normally if you had an idea, you’d tell your boss and that would go on his list with the other 100 things he had to do. Then you’d fill out paperwork that would go through a committee. This forum gives employees a chance to know where to funnel their ideas.”

In addition to the crowdsourcing software, OilCo launched an innovation forum that allows employees to discuss and demonstrate new ideas that can help the business. The CIO hosts the forum monthly and it is open to anyone. If an employee has an idea and needs help presenting it, they can invite a vendor to the forum. Apple was the first participating vendor.

To bring the generated ideas to fruition, OilCo instituted innovation dollars, money IT can use to develop and implement ideas that are beyond a business unit’s budget. The underlying philosophy is to encourage business units to adopt consumer devices. Even with an open BYOD policy, many business units hesitantly embraced BYOD because of device costs and concerns about whether enterprise IT would develop useful apps. By IT using its own innovation dollars to develop the best apps from the “there’s an app for that campaign,” enterprise IT demonstrated its commitment to providing infrastructure and apps that increase consumer devices’ workplace usefulness.

To manage the ideas that will continually flow from OilCo’s ideation campaign, OilCo launched an emerging technology group. The group studies new technology and determines OilCo’s direction and adoption strategy. When the group recommends a new technology, it develops standards, architecture, processes and guidelines before releasing the emerging technology to the business units. The emerging technology group initially focused on consumer devices (e.g., iPhones, iPads and apps). The group recommended and developed apps for these devices using several different platforms, subsequently writing standards the business units could use after the emerging technology group passed iPhone and iPad development to OilCo’s business units. Combined, the emerging technology group, the innovation dollars and the innovation campaign have helped promote innovation as a core value at OilCo.

Conclusion

This research investigates IT consumerization’s impact on enterprise IT using punctuated equilibrium theory as a theoretical framework. While this research-in-progress paper discusses two impacts based on our preliminary analysis of OilCo’s IT consumerization experience, over the coming months we will analyze our other two cases and share these findings at the AMCIS conference. We expect this research to empirically support (1) claims that consumerization has caused a misalignment between IT and its users (Dernbecher et al. 2012; García and Silva 2013; Harris et al. 2012) and (2) predictions that IT consumerization will impact IT infrastructure (WeiB and Leimeister 2012).

Furthermore, this research will enrich academic and practitioner understanding of IT consumerization and show that IT consumerization may have far reaching consequences on enterprise IT’s strategies, values, power distribution, structures and control systems. Showing these consequences, will add depth and richness to punctuated equilibrium theory’s deep structures. Our study will explicate enterprise IT’s values and show how: employee-introduced technology can change these values and IT consumerization is impacting enterprise IT’s structure.

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