

# **Electronic HRM in the Smart Era**

# **THE CHANGING CONTEXT OF MANAGING PEOPLE**

Series Editor: Emma Parry

# Electronic HRM in the Smart Era

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INVESTOR IN PEOPLE

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# About the Editors

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# Foreword

It is with great pleasure that I introduce this book *Electronic HRM in the Smart Era* as the next instalment in the series *The Changing Context of Managing People*.

I have long held an interest in the area of HR technology and e-HRM. I attended the first international workshop on e-HRM as a junior researcher and have attended most of these events since – in 2016 I was honoured to give the keynote speech and to celebrate the tenth anniversary of the conference's founding. I am therefore delighted to act as co-editor for a book that contains a selection of the best papers from this anniversary event – and to include the text in my book series.

The area of e-HRM has changed dramatically over the last 10 years and progressed from a nascent, poorly defined and largely a-theoretical field to one that is recognised as a body of literature in its own right. The literature has developed as the technology used in HRM has evolved from HR information systems to e-HRM, Web 2.0, and social media. If predictions are to be believed, over the next few years, the use of technology in practice will evolve further, with the introduction of wearable technology, virtual and augmented reality and robots becoming commonplace as means of managing and supporting employees. This presents exciting opportunities for research as technological advancement continues alongside the theoretical and empirical development of the academic field.

This book provides a useful representation of a point in time in the development of both this research area and the technologies it discusses, via the inclusion of a variety of chapters demonstrating the range of technologies, methodologies, and theoretical perspectives currently in use. I hope that you enjoy these contributions as much as I have.

Emma Parry  
*Series Editor*

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# Introduction, or a Long Way Towards this Volume

Since the end of the 1990s, research into the use of e-HRM in implementing human resource management (HRM) strategies, policies and practices has taken off worldwide. With some certainty we argue that this scholarly field has been championing the effort of self-reflection: during previous nine years since 2007, nine e-HRM literature reviews have been published with discussions about disciplinary, terminological, theoretical, and methodological backgrounds of the field (Bondarouk & Furtmueller, 2012; Bondarouk & Ruël, 2009; Bondarouk, Parry, & Furtmueller, 2017; Johnson, Lukaszewski, & Stone, 2016; Marler & Fisher, 2013; Ruël & Bondarouk, 2014; Ruël, Magalhães, & Chiemeké, 2011; Strohmeier, 2007; Van Geffen, Ruël, & Bondarouk, 2013).

Strohmeier (2007) reviewed the empirical work on e-HRM and brought forward his ideas for further research. In his review, the author described that the ongoing implementation and application of e-HRM in organisations have awakened the interest of academics in the concept of e-HRM. As a result of this interest, research on e-HRM appeared to have reached an ‘initial body of empirical research’ (Strohmeier, 2007, p. 19). On the downside, however, the author noted that most of the research about e-HRM stemmed from various scientific disciplines and was scattered throughout a number of different journals. Thus, e-HRM research appeared to lack the focus to assert itself as its own field quite yet. This was also reflected in the fact that Strohmeier (2007) criticised the lack of a proper definition of the concept of e-HRM itself. Despite that some authors (e.g. Ruël, Bondarouk, & Looise, 2004) already proposed definitions of e-HRM, Strohmeier (2007) disposed these definitions as being too general and not being able to underline that e-HRM was a

multi-level phenomenon. [Strohmeier \(2007\)](#) called for pluralism with regards to theoretical grounding and empirical methods employed. To structure the relevant topics of e-HRM, [Strohmeier \(2007\)](#) suggested a framework that divided e-HRM research into e-HRM context, configuration and consequences on a macro and micro level. The e-HRM configuration was suggested to integrate different actors that perform e-HRM, the e-HRM strategy, and e-HRM activities such as recruiting, training, compensation and the technology. The e-HRM configuration, in turn, determined the e-HRM consequences, whereas the e-HRM context played a moderating effect. [Strohmeier \(2007\)](#) criticised that the contextual factors of e-HRM remained mostly unclear. Also the research on e-HRM configuration was considered very patchy. The e-HRM consequences were, to a great extent, unexamined, [Strohmeier \(2007\)](#) concluded.

In 2009, [Bondarouk and Ruël \(2009\)](#) wrote an introduction for the *International Journal of Human Resource Management*, which can best be described as an e-HRM review of the years between the first and second *International e-HRM Conferences*. The authors described the continuous integration of e-HRM applications within organisations through complicated ERP systems that integrated e-HRM modules with, e.g., financial modules. However, despite all the positive developments regarding the acceptance of e-HRM within organisations, the authors also underlined the fact that there was still no clear definition of e-HRM that researchers had agreed upon. A clear definition of e-HRM was, in the view of the authors, necessary to point e-HRM research into the right direction. The authors redefined e-HRM as ‘an umbrella term covering all possible integration mechanisms and contents between HRM and Information Technologies aiming at creating value within and across organizations for targeted employees and management’ ([Bondarouk & Ruël, 2009](#), p. 507). This definition was aiming to push e-HRM research into a focus on four aspects – the content of e-HRM, the implementation of e-HRM, the targeted employees and managers and the e-HRM consequences. The authors encouraged scholars to reduce studies about cost effectiveness and to focus on reducing the ambiguity of e-HRM content instead. According to them, e-HRM supported not only administrative HR practices but also transformational practices. Moreover, their definition was aiming at a greater focus on the implementation and consequences of e-HRM. Another reason for a refined e-HRM definition was to establish awareness that e-HRM focused on both

managers and employees in comparison to the older HRIS concept, which had its main focus on the managing actors.

Bondarouk and Furtmueller (2012) did a major e-HRM research review into empirical studies over four decades of e-HRM. The authors focused predominantly on e-HRM effectiveness: implementation factors of e-HRM and the consequences of e-HRM implementations. Regarding the implementation factors, they observed that the literature primarily focused on the human aspects of e-HRM implementation. Despite the fact that technology has continued to be difficult and expensive (Bondarouk & Furtmueller, 2012, p. 14) it was not considered to be the most difficult factor at the time. Instead the people factors were considered the most important for the success of an e-HRM implementation. The sudden shift in focus away from the technological factors towards people factors was explained by the lack of factors found for the effectiveness of e-HRM (e.g. Strohmeier, 2007). Also, researchers such as Bondarouk and Ruël (2009) already identified the challenge of different perceptions of various stakeholders on the e-HRM implementations, affecting e-HRM usage and effectiveness.

Regarding the consequences of e-HRM implementations, the literature focused on the transformational consequences, thus emphasising the potential of e-HRM to support the HR's role in becoming a valued business partner. Interestingly, the authors criticised the lack of empirical studies for e-HRM to become a 'mature research tradition' (Bondarouk & Furtmueller, 2012, p. 17). According to the authors, the amount of conflicting findings in the e-HRM literature concerning the goals of e-HRM implementation was high, which could only be antagonised by more theory-driven and evidence-based e-HRM studies.

Marler and Fisher (2013) conducted a review of e-HRM with a special focus on the relationship between e-HRM and strategic HRM. Other than the sources mentioned earlier, this review did not take into account e-HRM research in its broader sense, rather it identified unresolved questions regarding the strategic use of e-HRM specifically. When Marler and Fisher (2013) decided to review the e-HRM literature with the focus on the strategic part of e-HRM, maybe this was the direction in which they thought e-HRM research should be heading. In their review, the authors criticised e-HRM research as being too deterministic. Although other fields such as information technology research evolved over time and treated technology 'as a more nuanced concept that evolves over time and is context dependent'

(Marler & Fisher, 2013, p. 33), e-HRM research appeared to be stuck in its deterministic state. Moreover, the authors recognised a lack of strong theoretical foundation that could ‘guide the research’ (Marler & Fisher, 2013, p. 34). Also there were gaps in the literature regarding the strategic outcomes of e-HRM implementation. The authors criticised the lack of empirical studies that examined e-HRM from a resource-based view.

In the same year, Van Geffen, Ruël and Bondarouk (2013) reviewed the e-HRM literature, but instead of focusing on the strategic part of e-HRM, the authors reviewed e-HRM research with a special focus on the information systems (IS) academic studies and MNCs. The authors found that most e-HRM research was rooted in the HR instead of IS literature. However, the IS literature offered great possibilities for e-HRM research. First of all, it appeared to be a more mature field of research and offered a number of valuable theories that could easily be translated to e-HRM research. The authors found that e-HRM research focused predominantly on post-implementation issues, whereas the IS literature offered a number of topics regarding pre-implementation and implementation issues as well. Thus, there was a scarcity of e-HRM research in those categories. The need for a strong basis of e-HRM research became apparent, when the authors shed light on the e-HRM research done with respect to MNCs. In direct comparison to the IS literature, the e-HRM research undertaken in this area has been considered rather poor. No studies investigated the pre-implementation of e-HRM in an international context, and only a few investigated the implementation phase of e-HRM in an international context (Broderick & Boudreau, 1992; Hannon, Jelf & Brandes, 1996). The international e-HRM literature focused mostly on the post-implementation phase of e-HRM. According to the authors, the e-HRM research could benefit greatly from taking a glance at already existing IS literature and use it to their advantage to fill existing research gaps, especially in the international context.

The next e-HRM review was written by Ruël and Bondarouk (2014). The authors described e-HRM research as having a rich foundation, but also still a lot of potential to grow even further. The field still had not overcome its rigor versus relevance problems and its knowledge base was still limited and skewed. Interestingly, the authors proposed an addition to the e-HRM definition in order for it to be able to hold in light of emerging HRM and IT issues and developments. The review captured what had been mentioned by other reviewers before; e-HRM

research needs more structure, a basis of empirical evidence (e.g. Strohmeier, 2007). The authors identified two streams of e-HRM research, the implementation of e-HRM (IT focus) and the consequences of e-HRM (HR focus). However, as of today, there was not a single factor found that explained a successful e-HRM implementation. A lot of research focused on an ‘all-inclusive’ perspective, whereas research on particular e-HRM applications was highly needed. Research on e-HRM was seen as not precise enough and thus not accountable for much in practice. The authors, again, referred to the underrepresentation of the IS literature and MNCs in the e-HRM research.

In the most recent literature review, conducted by Bondarouk et al. (2017), the authors built a TOP model to classify factors affecting e-HRM adoption in three areas: technology, organisation, people. The authors also conclude that over four decades of e-HRM research, there has been a switch in the goals of e-HRM (from efficiency to the strategic reorientation of HR departments), and realised outcomes of e-HRM (from poor administrative to transformational).

Such a productivity in e-HRM literature reviews echoes the great enthusiasm of the e-HRM scholars in their attempt to introduce the field to well-established HRM, MIS, or general management research traditions. However, it also raises questions like, *Why do we need such an intensive reflection? What do we miss without the literature overviews?*

Our answer is simple. We still miss a strong theoretical foundation that would guide our empirical enquiries. To illustrate this statement, we turn to a brief overview of Calls for Papers in e-HRM conferences since 2006. All of them required a strong theoretical framing of the field (Figure 1).

In 2006, the *First European Academic Workshop of e-HRM* was hosted at the University of Twente (the Netherlands) under the topic of ‘The Future of e-HRM Research’. Despite the optimistic theme of the conference, e-HRM research during this time was still considered to be in its infancy. Researchers were unclear about what e-HRM actually was and tried hard to distance the field from the two well-established academic fields of HRM and IT. Consequently, the leading scholars of e-HRM research were calling for theoretical work that could clarify the relationship between e-HRM and various actors and entities that are related to the traditional role of HRM. From the Editorials and Call for Papers of the conference, no particular direction of research could be recognised. The 2006 conference aimed at gathering

Time	2006	2008	2010	2012	2014
Source	1st e-HRM conference	2nd e-HRM conference	3rd e-HRM conference	4th e-HRM conference	5 e-HRM conference
Leading Topics	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">The definition of e-HRM</div> <div style="border: 1px solid black; padding: 5px;">The relationship between HRM and e-HRM</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">The impact of e-HRM on the traditional HRM function</div> <div style="border: 1px solid black; padding: 5px;">The HR function as a multilevel phenomenon</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Rigor vs. relevance debate on e-HRM</div> <div style="border: 1px solid black; padding: 5px;">Evidence-based e-HRM</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">The potential of e-HRM to assist organisations to meet strategic objectives</div> <div style="border: 1px solid black; padding: 5px;">e-HRM as a tool for innovation, change and creativity at work</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">The value proposition of e-HRM: strategically, operationally, academically</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Unintended consequences of e-HRM implementation</div> <div style="border: 1px solid black; padding: 5px;">Models for e-HRM strategic outcomes and e-HRM goals</div>
	Desired research direction	Strengthening the theoretical backbone of e-HRM	Exploring a new topic of interest: HRM transformation	Strengthening the theoretical backbone of e-HRM	Exploring a new topic of interest: e-HRM, Innovation and Creativity

**Figure 1.** Overview of Five e-HRM Conference (2006–2014).

empirical evidence on e-HRM in numerous directions with the intention to strengthen the theoretical backbone of e-HRM.

In 2008, as technology continued to penetrate deep into the structure of the HR function, the *Second European Academic Workshop on e-HRM* was hosted by L'université de la Méditerranée Aix-Marseille II (Aix-de-Provence, France). During that time, e-HRM researchers were no longer questioning whether there was a relationship between e-HRM and HRM. Rather, they were calling for empirical evidence on impacts of the integration of e-HRM on the conventional HRM function. Thus, the research focus firmly shifted away from the initial question of whether e-HRM had sufficient scientific depth to exist as an independent academic field to the question of how e-HRM contributed to the transformation of the traditional HRM function. e-HRM was recognised to play a role in the change of HRM from a two-level (HR departments—line managers) structure into a multi-level phenomenon dependent on various conditions and contingencies. With the 2008 conference having the clearly defined topic 'e-HRM: Barrier or Trigger for an HRM Transformation', it became apparent that academics in e-HRM research wanted to explore the HRM transformation as a particular topic of interest and clarify whether e-HRM acts as a barrier or trigger to HRM transformation instead of deepening the existing knowledge.

In 2010, the *Third European Academic Workshop on e-HRM* triggered a debate about the rigor and relevance of e-HRM research (University of Saarland, Germany). The idea was to create knowledge relevant for academics and practitioners. It was acknowledged that to achieve that goal, the research focus had to shift away from the exploration of particular topics of interest to the agglomeration of already existing knowledge. Specifically, researchers emphasised that e-HRM studies had accumulated a lot of knowledge; however, the knowledge density was not seen as high enough to be put into practice. As a result, practitioners were viewed as facing non-theoretical research consisting of mixed and unreliable results. At this point in time, e-HRM seemed to be broadly understood, just not in a scientific and reproducible way. Once again, academics called for strengthening of the theoretical backbone of e-HRM research with the theme of the conference being 'Evidence-Based e-HRM? Towards Rigorous and Relevant e-HRM Research'.

In 2012, for the *Fourth International e-HRM Conference* (Nottingham Trent University, UK), the e-HRM research seemed

to have accumulated sufficient knowledge about the operational influences of e-HRM on the traditional HRM function. e-HRM was being presented as an accepted tool to automate existing HR processes. However, scholars and practitioners criticised that the true potential of e-HRM, providing the possibility for the HR function to play a more strategic role within an organisation, was mostly neglected in the literature. In particular, the ability of e-HRM to promote innovativeness and creativity with regards to work practices within an organisation ought to get an increased amount of attention. Thus, the fourth conference on e-HRM had its very specific theme ‘Innovation, Creativity and e-HRM’ in order to lead the researchers into this particular research direction.

In 2014, the *Fifth International e-HRM Conference* was held by the University at Albany-SUNY (NYC, USA) without a particular theme. The conference’s focus appeared to be the value proposition of e-HRM from a strategic, operational and academic point of view. Despite there being a clear new topic of interest for the researchers to discover and focus on, the conference also called for models that provide a theoretical foundation for the connection of e-HRM and positive strategic outcomes, as well as models that are able to help examine what the goal of e-HRM is. Moreover, researchers are calling for evidence on unintended consequences like ‘deskilling, outsourcing, downsizing, work reduction and marginalisation of the HR function’ (5th e-HRM Conference, 2014, Editorial). Hence, the direction in which e-HRM research was going in 2014 can be interpreted twofold. The focus is two fold: strengthening the theoretical core of e-HRM research and the exploring of new topics of interests.

Another observation cannot be left unnoticed. Since 2004, more than 10 special issues in different international peer-reviewed journals have been published. ‘New technologies are all around us. ... This is just as true in the field of human resource management ...’, did Mark Huselid sincerely notice in 2004 in his Editor’s Note to the Special Issue on e-HR in the *Human Resource Management* when he also called for a deeper understanding of the consequences of e-HRM for the HR organisation (Huselid, 2004). Four years later, in yet another Editor-in-Chief’s Note to one of the issues of the same journal, Theresa Welbourne advanced this topic by stressing the role of IT in social networks of HR academics and practitioners (Welbourne, 2008).

Five years later, in 2009, two special issues on e-HRM were published in the *Journal of Managerial Psychology* and the *International Journal of Human Resource Management (IJHRM)*

respectively. The first focused on the ‘paradigm shift in HRM practices’ related to ‘the amount, quality, and utilization of technology in HRM service delivery’ (Gueutal, 2009). The central theme of the articles in the *IJHRM* was value creation through e-HRM (Bondarouk & Ruël, 2009). Contributors to this special issue searched for an answer as to whether e-HRM is paid to be innovative and whether it builds competitive advantage or mirrors competitive necessity. In 2010 the *International Journal of Training and Development* published a special issue on e-learning in a business context aiming to understand the directions and focal points for e-learning and blended learning within different organisations in a global context, especially within emerging economies (Bondarouk & Ruël, 2010a). In the same year, the *International Journal of Technology and Human Interaction* published two special issues: one on the IT and workforce management and another on e-HRM in a cross-national context (Bondarouk & Ruël, 2010b, 2010c). After a 2-year break, several special issues on e-HRM, one after another, appeared in international journals. The *German Journal of Research in Human Resource Management* dedicated its pages to the evidence-based transformation of HRM enabled by information technologies (Strohmeier, Bondarouk & Konradt, 2012). Emerging topics in theory and research on electronic HRM formed a special issue in *Human Resource Management Review* (Stone & Dulebohn, 2013) that aimed to advance theory and offer new directions for research and practice and enhancing (understanding of) effectiveness of e-HRM in organisations. The *European Journal of International Management* inspired the set of articles on e-HRM in multinational corporations (Ruël & Bondarouk, 2013); and the special issue in the *Journal of Strategic Information Systems* explored reasons of limited exploitation of HR information systems (Grant & Newell, 2013). The special issue in *Employee Relations* about HRM in the digital era was published in 2014. Strohmeier (2014) collected a set of wonderful articles covering three focal areas: ‘digital employees’, ‘digital work’, and ‘digital employee management’.

Evidently, e-HRM research has been blossoming over the past decade: topic-wise the field developed from working on its disciplinary boundaries, definitions and challenges to acknowledging the importance of its context, the multinational firm, cross-cultural issues, its strategic potential and its impact on the HR profession (Parry, 2011). However, special issues also leave us with unanswered questions, like *What is exactly the context of*

*e-HRM and its role in e-HRM success? To what extent does technology shape the e-HRM context?*

## HOW SMART IS HRM?

We observe that technologies penetrate HR practices with an unanticipated speed and intensity that suggests to consider the dual role of e-HRM technology: as the context that settles boundaries for HRM operations, but also as the tool. The convergence of the digital and the physical in the HRM world, however, is far from fully appreciated in research. It is surprising as we see new breed of companies as the fastest-growing in history: Uber, Instacart, Alibaba, Airbnb, Seamless, Twitter, WhatsApp, LinkedIn, Xing, Facebook, and Google. These companies are indescribably thin layers that sit on top of vast supply systems (where the costs are) and interface with a huge number of people (where the money is), that requests ‘smart’ HR professionals.

Speaking of new digital technologies in HRM, it is not astonishing to see that latest developments are undergoing the new phase, and business, HRM and people are confronted with new technological possibilities like artificial intelligence and robots, self-driving cars, 3D-printers, censored networks, digital cameras, lab-on-a-chip, or commercial drones. However, various (HRM) publications sense a fear of new technologies, and especially new robots that are reasonable. While popular publications put remarkable images of brutal and/or snobbish creatures, and raise the issues of robots’ taxation; scholars in the field of technologies and work are more optimistic. Thus, [Davenport and Kirby \(2015\)](#) suggest to reframe the threat of automation with an opportunity for augmentation. Instead of asking a traditional question, What and how much of tasks will be taken over by new technologies?, they suggest to ask, ‘What new feats might people achieve if they had better thinking machines to assist them?’ ([Davenport & Kirby, 2015](#), p. 60). While automation with its efficiency-minded HRM systems deploys computers to chip away HR routine tasks that can be codified, augmentation starts with understanding what HR professionals actually need to do to support ‘smart’ business, how they perform their tasks, and how these tasks and achievements can be deepened with the help of computers. With this new mind-set, HR professionals will be able to see technologies as partners to collaborate in creative problem solving, and truly integrate big data into HR analytics. Some new insights should land at the employers’ side: it is time to acknowledge that the combination

and integration of humans and computers are better than either working alone (Davenport & Kirby, 2015).

We understand that the HRM scholarly community is not united yet in its vision whether robots will (partially) replace HR professionals, which consequences will smart industries have on HRM, and what smart HRM will constitute in the future. We do not expect the e-HRM scholars to reach consensus on these issues soon. But we want to open the debate, to move the field further and to follow simultaneously with technological developments.

## GOALS AND APPROACH IN THIS VOLUME

To hallmark the achievements on the academic field of e-HRM, this volume will focus on the progression from e-HRM to digital (*d*-HRM) – towards smart HRM. Since Tapscott coined the term ‘digital economy’ in 1995, it has been extending its scope of impact from automating work processes to monitoring and influencing consumer behaviours, from value creation in the production chain within a company to the whole value chain within and across businesses. The HRM field is entering smart businesses where the human, digital and high-tech dimensions seem to increasingly converge, and HRM needs to anticipate its own *smart* future. Technological developments and interconnectedness with and through the Internet (often called ‘Internet of Things’) set new challenges for the HRM function. Smartness enacted by HRM professionals, notions of ‘smart industries’, ‘smart things’ and ‘smart services’ all put new pressures on strategic HRM.

The volume revisits the concept of e-HRM, critically assesses academic and business achievements in this field, and highlights the latest developments. What kind of electronic, digital and strategic HRM will the new breed of companies need? What kind of smart solution can and will HRM offer to meet the expectations of the latest business developments? Can HRM become *smart* and combine digitisation, automation and a network approach? What will be an impact of new technologies on employment management? How do businesses futureproof their HRM in the smart era? What competences do employees need to ensure businesses flourish in smart industries? Moreover, how should research into HRM respond to these changes?

With rapid business and technological developments, and ever-greater automation and information available, the HRM function needs to focus on non-routine and complex,

evidence-based and science-inspired, creative and value-added professionally demanding tasks.

A set of chapters in this volume builds on the achievements of international conferences on electronic HRM. First of all, we see our research and publication mission as exploring further a new sub-topic of e-HRM, i.e. HRM for smart industries. Second, we suggest a need to continue building our theoretical contributions – the call that has lasted since the very first meeting of e-HRM researchers. At the same time, we suggest we do not need more proof that e-HRM does create value for organisations. Over the years, we have seen that great CEOs, CFOs and CDOs already believe in it. Instead, this volume moves towards fluent translation of academic findings into the practices of e-HRM, that – in their turn – will inform our theory.

We believe that the chapters reveal some of the major conceptual and methodological tensions, paradoxes, and doubts that currently shake and shape the e-HRM research field. We also see good reasons for strong optimism as they show the way towards *smart HRM*. We invite you to enjoy the volume and to judge whether HRM has become smarter in the digital era.

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CHAPTER

# 1

## An Investigation of the Factors Driving the Adoption of Cloud-Based Human Resource Information Systems by Small- and Medium-Sized Businesses

Richard D. Johnson and Kristina Diman

### ABSTRACT

**Purpose** – The purpose of this study was to develop and empirically examine a model of cloud-based human resource information systems (HRIS) adoption by small businesses based on the technology–organization–environment model (Tornatzky & Fleischer, 1990).

**Methodology/approach** – This study utilized a survey of 41 small- to medium-sized enterprises in the northeastern United States to examine what HR functions were being supported by cloud-based HRIS and the relationship between three technology factors, three organizational factors, and

three environmental factors, and their relationship with the adoption of cloud-based HRIS.

**Findings** – Findings indicated that small businesses are most likely to implement cloud-based HRIS to support day-to-day HR operations. In addition, the findings indicated that top management support (positive), vendor support (positive), and anticipated growth (negative) were each related to organizational adoption of cloud-based HRIS.

**Implications** – The study illustrates how the adoption of a cloud-based HRIS is motivated by different factors than those underlying the adoption of other types of information systems. Executives and small business owners will need to adapt their strategy when considering cloud-based HRIS compared to other types of systems.

**Social implications** – Given that small- to medium-sized organizations are the backbone of most global economies, findings from this study can help support society by helping these businesses better understand how to best consider the factors that will support the implementation of cloud-based HRIS.

**Originality/value of the chapter** – This chapter represents one of the first to empirically validate a model of the factors affecting adoption of cloud-based HRIS by small businesses.

**Keywords:** Technology adoption; HRIS adoption; small- to medium-sized enterprise; electronic human resource management

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## 1.1. Introduction

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Despite the fact that small businesses account for the vast majority of all organizations (Hayes, Chawla, & Kathawala, 2015), only limited research has focused on how they can more effectively manage their human resources (HRs) (Heneman, Tansky, & Camp, 2000). One way that most, if not all, of the larger organizations have utilized to streamline HR operations and improve efficiency is the implementation of human resource information systems (HRIS) (Johnson, Stone, & Lukaszewski, 2016; Ruël, Bondarouk, & Van der Velde, 2007; Stone, Deadrick, Lukaszewski, & Johnson, 2015;

Strohmeier, 2007). A HRIS is an information system “used to acquire, store, manipulate, analyze, retrieve, and distribute information regarding an organization’s human resources to support HRM and managerial decisions” (Kavanagh, Thite, & Johnson, 2015, p. 17). For these larger organizations, HRIS are at the core of how they motivate employees, how applicants and employees develop relationships with the them, and how they receive HR services (Johnson, Stone, et al., 2016; Stone & Dulebohn, 2013; Wirtky, Laumer, Eckhardt, & Weitzel, 2016).

Research suggests that small- to medium-sized enterprises (SMEs) have been unable to take advantage of the cost and efficiency savings these systems make possible, and have lagged larger organizations in the extent to which they have adopted these systems (Ball, 2001; CedarCrestone, 2014). According to the US Small Business Administration, an SME is a business that has fewer than 500 employees (although in some industries, it can be as large as 1500 employees) (U.S. Small Business Administration, 2016). There are several reasons that SMEs lag behind their larger counterparts in the adoption of HRIS. These include a lack of financial resources to support its implementation and a lack of organizational readiness for the complexity needed to adopt large-scale, integrated HRIS (Iacovou, Benbasat, & Dexter, 1995; Johnson, Stone, et al., 2016). For this reason, SMEs often use some combination of paper-based forms, Excel spreadsheets, and simple Access databases to manage their HR data. But, as SMEs data needs expand, these approaches can become burdensome and unable to handle the complex reporting needs required for a growing SME.

Recent technological advances in cloud computing are changing the situation for small businesses. With cloud computing, the large capital investments, complex implementations, and expensive hardware and software requirements are reduced relative to traditional on-premise solutions require. (Kavanagh et al., 2015). Rather than designing and customizing software for each organization, cloud vendors offer standardized, non-customizable software that all organizations can configure to their specific needs (Johnson, Stone, et al., 2016). The software is then accessed and delivered over the Internet.

It is appropriate to study the adoption of cloud-based software for several reasons. First, the vast majority of all businesses are small businesses. Recent statistics suggest that SMEs make up over 99% of all businesses in the United States and Europe (Airaksinen, Luomaranta, Alajääskö, & Roodhuijzen, 2016; U.S. Small Business Administration, 2012). Second, the growth of cloud-based

HRIS provides small businesses with an alternative to either outsourcing HR or utilizing less efficient methods. Third, HRIS vendors are continuing to look for new markets to sell their products, and ways to better meet the needs of all organizations. This study can help by identifying the important factors SMEs consider when adopting HRIS. Fourth, the factors that drive adoption of information systems by SMEs, may differ between smaller and larger organizations (Chong, Ooi, Lin, & Tang, 2009; Lee, Lin, & Pai, 2005). Finally, unlike other information systems, HR data collection and reporting is more constrained by legal and government regulations (DeSanctis, 1986; Johnson & Gueutal, 2012; Johnson, Stone, et al., 2016). For these reasons we believe that additional research is needed that focuses on the factors that drive decisions by SMEs to adopt cloud-based HRIS. Specifically, this chapter focuses on three key research questions:

1. What are the theories that can be used to address the adoption of cloud-based HRIS by SMEs?
2. What functions are being adopted by SMEs (e.g., recruitment, selection, benefits, etc.)?
3. What are the specific factors that drive adoption decisions?

The remainder of this chapter is organized as follows. First, we discuss the key terms in this chapter. Next, we present a series of theories that have been used to investigate the adoption of information systems, by individuals, SMEs, and large organizations. After this, we outline our theoretical model of choice, the Technology–Organization–Environment model (L. Tornatzky & Fleischer, 1990). We then present the results of an introductory study of SMEs in the United States and the factors that drive their adoption decision. Finally, we discuss the results of our study, and its theoretical and practical implications.

## 1.2. Background

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Although HR was one of the first areas of business to be automated (e.g., payroll), it has often lagged behind other areas of business in its use of technology. Today, though, most large organizations have implemented large-scale, integrated HRIS to support HR operations and the use of employee data (CedarCrestone, 2014). An HRIS is an information system “used to acquire, store, manipulate, analyze, retrieve, and distribute information regarding an organization’s

human resources to support HRM and managerial decisions” (Kavanagh et al., 2015, p. 17). HRIS are used to support core HR functions such as recruitment, selection, and benefits, as well as areas such as succession planning, employee scheduling, and engagement. The major organizational goals of implementing an HRIS are to streamline HR operations, make better people decisions, and ultimately to make HR more strategic (Bondarouk, Ruël, & van der Heijden, 2009; Johnson, Thatcher, & Burleson, 2016; Parry & Tyson, 2011; Schalk, Timmerman, & Van den Heuvel, 2013).

There have been a number of terms used to describe the use of technology to support the HR function. These include electronic human resource management (e-HRM) (Gueutal & Falbe, 2005; Strohmeier, 2007), web-based human resources (Ruël, Bondarouk, & Loosie, 2004), and virtual HRM (Lepak & Snell, 1998). In addition, the sixth international e-HRM conference has encouraged researchers to begin studying the impact of digital and smart HRM on the practice of HR (e.g., Van den Heuvel et al., 2016).

Of these terms, the two most commonly utilized are e-HRM and HRIS. In this chapter, we take the perspective of Johnson and colleagues (Johnson, Stone, et al., 2016; Johnson, Thatcher, et al., 2016) that the term HRIS focuses on the technology itself and focuses on the various information systems that organizations have implemented to support the HR function and people-related decisions within the organizations. Conversely, e-HRM reflects technology-enabled HR practices. As Ruël et al. (2004) note, it is “a way of doing HRM” (p. 366). This study focuses on HRIS, specifically the factors driving the adoption of a HRIS by small businesses, rather than how technology can enable different types of HR practices.

### **1.3. Previous HRIS Adoption Research**

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It is important for researchers to study not only technology-enabled HR practices (e.g., e-HRM), but also issues surrounding the implementation and use of that technology (e.g., the HRIS). Johnson, Stone et al. (2016) identified a number of studies that have focused on the adoption and use of HRIS by larger organizations. The majority of these studies have been theoretical or case study focused. For example, researchers have reported on the types of technology being utilized by private and public sector

organizations to support HR (Ball, 2001; Elliott & Tevavichulada, 1999). Others have focused on the factors that affect the diffusion and use of HRIS (Florkowski & Olivas-Luján, 2006; Marler, Liang, & Dulebohn, 2006). Finally, others have presented case studies on the implementation of a specific HRIS in a specific organization (Olivas-Luján, 2007; Ruël et al., 2007; Tansley, Newell, & Williams, 2001). Despite a growing interest in how and why organizations adopt HRIS, more research is needed that focuses more theoretically and empirically on the specific factors driving organizational-level adoption decisions by SMEs.

## 1.4. Theories of Information Systems Adoption

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Researchers have long been interested in how organizational information systems are adopted, and many different theories have been proposed to explain how and why individuals and organizations adopt information systems. At an individual level, the adoption of an information system is defined as an individual's "decision to make use of an innovation" (Van Slyke, Belanger, Johnson, & Hightower, 2010, p. 18). In other words, adoption occurs when an individual uses the information system. There are a few theories which have dominated research on individual's decision to adopt and use new technology. These include the technology acceptance model (Davis, Bagozzi, & Warshaw, 1989), the theory of planned behavior (Ajzen, 1991), innovation diffusion theory (Rogers, 1995), and the unified theory of acceptance and use of technology (Venkatesh, Morris, Davis, & Davis, 2003). We briefly discuss each in turn.

### 1.4.1. TECHNOLOGY ACCEPTANCE MODEL

Derived from the theory of reasoned action (Ajzen & Fishbein, 1980), the most widely utilized theory of individual adoption and use of information systems is the technology acceptance model (TAM) (Davis et al., 1989). This model posits that it is not simply objective usability characteristics of the system which drive an individual to use an information system. Instead, user believes about the perceived usefulness of the system and its ease of use that will drive adoption and use of an information system. Meta-analytic research has found that TAM is robust across a number

of different technologies, user experience, and samples (King & He, 2006).

#### 1.4.2. THEORY OF PLANNED BEHAVIOR

A shortcoming of TAM is that it does not consider normative beliefs or the control that individual may or may not have over using a new system. Therefore, researchers have adapted the theory of planned behavior (TPB) (Azjen, 1991) to more fully articulate factors affecting adoption decisions. For example, research has found that beliefs of coworkers and managers about the value of a system can affect the extent to which employees will adopt an information system (Taylor & Todd, 1995). In addition, research has found that control factors are also related to adoption decisions (Mathieson, 1991). Within the HRIS domain, Marler, Fisher, and Ke (2009) utilized TPB finding that attitudes, normative beliefs, and perceived control factors all were significantly related to employee self-service adoption intentions.

One of the challenges of the TPB, though, is that each adoption context may differ, and the factors driving adoption may differ depending upon the type of technology utilized and the context in which it is used (Azjen, 1991; Mathieson, 1991). This suggests that although previous research on the adoption of information systems is relevant, the unique nature of a HRIS adoption may cause adoption decisions to be driven by different factors than for a general organizational information system.

#### 1.4.3. INNOVATION DIFFUSION THEORY

Innovation diffusion theory (IDT) (Rogers, 1995) is a broad sociological theory that describes the process through which innovations diffuse throughout society over time. A portion of this theory focuses on the social connections and communication patterns through which these systems are adopted. Unlike TAM and TPB, which take into account a number of different technology and social beliefs, IDT focuses exclusively on the characteristics of the innovation that drive adoption decisions. Rogers identifies five key characteristics: relative advantage, compatibility, complexity, trialability, and visibility. Of these factors, meta-analytic research has found that the characteristics most strongly related to adoption are relative advantage, compatibility, and complexity (Tornatzky & Klein, 1982). These findings are also

consistent with findings from the information systems literature as well (Moore & Benbasat, 1991; Venkatesh & Davis, 2000).

#### 1.4.4. UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY

The final and most recently developed theory is the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003). Through a review of the major adoption theories used in information systems, Venkatesh and colleagues developed a model that integrated the theories and variables from multiple models, including TAM, TPB, and IDT. By investigating the different variables of interest in each theory and comparing the various different theoretical constructs, they hoped to develop a model which accounted for the various different technological factors and beliefs which drive adoption decisions. This model suggests that four core beliefs affect user's intentions to use an information system. These include performance expectancy (extent to which the system will improve a user's job performance), effort expectancy (how hard or easy a system is to use), social influence (extent to which salient others believe that an individual should use the system), and facilitating conditions (extent to which the user believes that technical and organizational resources exist to support system use) (Venkatesh et al., 2003). As with the other theories presented above, UTAUT has been found to effectively predict individual-level adoption decisions (Dwivedi, Rana, Chen, & Williams, 2011).

#### 1.4.5. ORGANIZATIONAL-LEVEL ADOPTION THEORIES

Although it may be tempting to utilize these theories to when investigating the adoption of cloud-based HRIS by small businesses, these individually based adoption theories are not appropriate for organizational adoption decisions for multiple reasons. First, the individuals making an organizational adoption decision are often not the same people who will actually use the system (Marakas, 2006). Decision-makers may think more about organizational outcomes such as costs, improved decision-making, and better data compared to users who may consider individual outcomes such as usability and ease of use. Second, the above theories are heavily focused on the system characteristics and the beliefs about the use of that system. The individual-oriented models do not account for the organizational and environmental factors

that organizational decision-makers should consider when adopting a new information system.

For this reason, two new models have been developed to address the organizational adoption of information systems, especially those by small businesses: the EDI adoption model (Iacovou et al., 1995) and the technology–organization–environment (TOE) framework (Tornatzky & Fleischer, 1990). The EDI adoption model focuses on the factors that affect an organization’s decision to adopt electronic data interchange (e.g., systems which allow multiple organizations to share data together). Three factors were identified as important: perceived benefits, organizational readiness, and external pressure. In other words, the theory suggests that the benefits of the system itself, the organizational context, and external pressures can affect adoption of EDI by small business. Of these, Iacovou et al. (1995) found that the strongest driver of adoption was external pressures. This should not be surprising given that the value of these systems are found only when all organizations within the value chain adopt it. Unfortunately, this model does not focus on the specific characteristics of the technology itself, but instead focuses only on the benefits of using this technology. The final model, and the one chosen for this study, is the TOE framework.

## 1.5. The Technology–Organization – Environment Model

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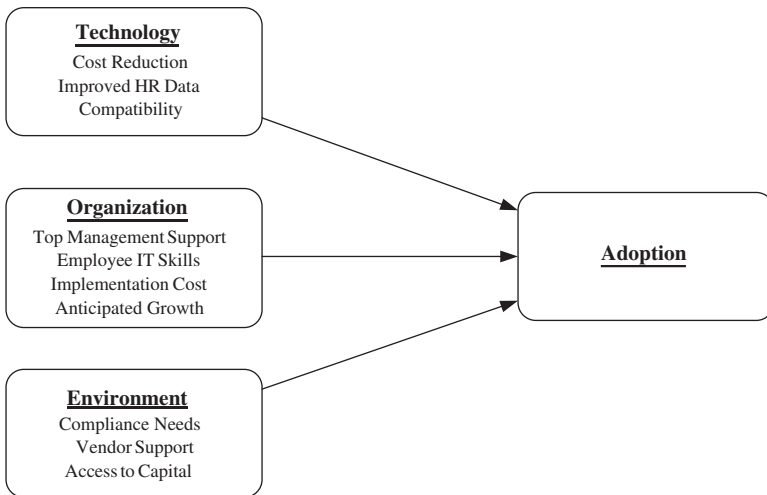
The TOE framework (Tornatzky & Fleischer, 1990) describes the process by which an organization’s adoption and implementation of technological innovations is influenced by the technological, organizational, and environmental contexts. Technological factors include factors such as the cost of the new technology, the complexity of the software, the compatibility of the software with current operations, and the relative value of the software over current operations. Organizational factors include factors such as top management support, the technology expertise of the current employees, and the size of the business. Finally, environmental factors include factors such as the competitive pressure the organization faces, vertical organizational linkages, and external support.

As noted above, the TOE model was selected over other models for several reasons. First, it was specifically created for technology adoption at the organizational level. Second, it

provides the opportunity to examine internal and external as well as tangible (e.g., capital) and intangible (e.g., employee skills) factors. Third, it has been shown to predict the adoption of a variety of different technologies by small businesses (Chau & Hui, 2001; Kuan & Chau, 2001; Premkumar & Roberts, 1999), including HRIS by large organizations in Taiwan (Teo, Lim, & Fedric, 2007). Finally, it is broad enough to be adapted to many different contexts. As noted by Azjen (1991), it is important to consider the specific context to best understand the factors that will drive behavior and decision-making. For example, compared to many other areas of business, HR is heavily regulated and has a large amount of legal and compliance requirements. Thus, governmental reporting requirements may play an important role in the adoption of cloud-based HRIS. The theoretical model is found in Figure 1.1.

1.5.1. TECHNOLOGY CONTEXT

The first context in the TOE model is the technology context. The technology context focuses on the internal and external technologies that are relevant to the organization. The technology context can include both equipment as well as processes. For an organization to invest in a HRIS, it must provide benefits to the organization that exceed those of the current system, or way of doing business. Benefits can include improved HR processes,



**Figure 1.1.** Technology–Organization–Environment Framework.

reduced operating expenses, and making more effective use of HR data.

A HRIS that requires less effort to enter, maintain, and analyze HR data compared to current HR processes should increase the likelihood that an organization will adopt the HRIS. Academic research has found that the implementation of HRIS is associated with reduced staffing and HR costs (Cober, Brown, & Doverspike, 2000). In addition, in a study carried out by PwC, the adoption of cloud-based HRIS was associated with reduced staffing and streamlined HR processes (PwC, 2014). Further, research has consistently found that higher perceived benefits were associated with higher adoption intentions and use for various technologies (Chau & Hui, 2001; Ifinedo, 2011; Lertwongsatien & Wongpinunwatana, 2003; Premkumar, Ramamurthy, & Nilakanta, 1994; Premkumar & Roberts, 1999; Thong, 1999). In other words, just as a system that will help an individual be more effective in their job should lead to greater use and adoption, so also will decision-makers be more likely to adopt a HRIS for their organization if they believe it can make them more effective. Thus, the following hypothesis was investigated:

**H1.** Small businesses that perceive greater benefits from cloud-based HRIS are more likely to adopt cloud-based HRIS than those who perceive fewer benefits.

The second technological factor that should affect the adoption of cloud-based HRIS is the improvement in quality, accuracy, and scope of HR data. HR has always been data intensive, but the volume of internal and external data available to HR, and HR's reliance on these data continues to increase. For example, data are captured and stored from the initial candidate application, through employment tenure, and for some, even into retirement. Thus, it is possible that the organization is capturing data on employees for more than 20 years. These data are used for multiple employee-related decisions (e.g., hiring, performance evaluations, compensation, government reporting, etc.).

Although not directly investigated in the TOE framework previously, the information system literature has long considered information quality to be an important outcome of the implementation of any system (DeLone & McLean, 1992). Information quality is a reflection of characteristics such as completeness of information (e.g., does the system provide all the needed information), the accuracy of the data, the currency of the data (e.g., is it up-to-date), and the format of the data (how usable is the data as

presented) which are each important outcomes, and may affect adoption decisions (Wixom & Todd, 2005). Given the centrality of HR data to organizations, organizations should be more likely to consider adopting a cloud-based HRIS if they believe it will improve their ability to capture, store, and utilize HR data. Thus, the following hypothesis was investigated:

**H2.** Small businesses that perceive cloud-based HRIS will lead to greater improvements in HR data and are more likely to adopt cloud-based HRIS than those who perceive fewer improvements in HR data.

The final factor of interest in the technology context is compatibility. Compatibility is defined as “the degree to which an innovation is perceived to be consistent with the existing values, past experiences, and needs of the potential adopters” (Rogers, 1995, p. 224). More specifically a business must determine if the new system is compatible with the organization’s current IT infrastructure and its current processes. For example, some areas of the business may already have adopted a system for finance or supply chain, and the executives may worry that these systems will not “talk” to each other for important budgeting, salary analysis, and other decisions. In this scenario a new information system would be less compatible technologically if data could not seamlessly transfer between systems. Compatibility of business processes must also be evaluated. If the intended use of a cloud-based HRIS is employee or manager self-service, and employees have historically relied heavily on HR to provide information, a new system that integrates self-service may not be as compatible as one that does not.

Research also supports these arguments, finding that the more compatible a new technology is with existing processes, practices, and systems, the more likely a SME will be to adopt the technology (Lertwongsatien & Wongpinunwatana, 2003; Premkumar & Roberts, 1999; Thong, 1999). Thus, the following hypothesis was investigated:

**H3.** Small businesses that perceive cloud-based HRIS to be more compatible with current organizational processes are more likely to adopt it than those who perceive cloud-based HRIS to be less compatible with current organizational processes.

### 1.5.2. ORGANIZATION CONTEXT

The second context in the TOE framework, the organizational context, refers to the characteristics and resources of the organization

such as its size, degree of centralization, degree of formalization, managerial structure, the employee skills and capabilities, amount of slack resources, and linkages among employees. Of interest in this study are top management support, employee IT skills, and anticipated organizational growth.

It should not be surprising that top management support is crucial when implementing a new technology. Executives have the influence and authority to secure capital, allocate resources, set a climate for change, and influence employees. Without the support of top management, a project can often lose momentum, stall, and fail to succeed. In a small business, this influence can be even stronger because top management is more intimately involved in the day-to-day operations of the organization. Many studies have theorized and found that when there is more top management support, the organization will be more likely to adopt new technology (Ifinedo, 2011; Premkumar & Roberts, 1999; Ramdani, Kawalek, & Lorenzo, 2009; Thong, 1999). Thus, the following hypothesis was investigated:

**H4.** Small businesses that have greater top management support are more likely to adopt cloud-based HRIS than those with lesser top management support.

The second organizational factor is employee IT skills. Small businesses are less likely to have a dedicated IT department, and thus will rely more heavily on other employees to support any technologies utilized. But not all employees have the same set of skills, abilities, and confidence to use technology (Marakas, Yi, & Johnson, 1998). Small businesses in particular can lack the specialized technical skills needed to implement new technology (DeLone, 1988; Thong, 1999). When employees lack the expertise, skills, and confidence with technology, they should be less likely to pursue new technological innovations. Empirical evidence supports these arguments, with research finding that small businesses that have employees with lower IT skills are less likely to implement a new technology than those whose employees have higher IT skills (Premkumar & Roberts, 1999; Thong, 1999). Thus, the following hypothesis was investigated:

**H5.** Small businesses with employees who have greater IT skills are more likely to adopt cloud-based HRIS than those whose employees have lesser IT skills.

Small businesses also face tighter budgets and financial constraints than larger organizations. The implementation of a new

HRIS is an expensive capital investment, and can include upfront costs such as consulting, hardware, software licenses, and other implementation costs, as well as ongoing maintenance costs. Historically, these costs made the purchase of HRIS beyond the scope of many small businesses. Therefore, small businesses have lagged behind larger organizations in the implementation of HRIS. Thus for small businesses, the higher the perceived costs of implementing cloud-based HRIS, the less likely they should be to implement cloud-based HRIS. This argument is consistent with previous research, which found that the higher the perceived implementation costs, the less likely small businesses would be to adopt a new technology (Chau & Hui, 2001; Ifinedo, 2011). Thus, the following hypothesis was investigated:

**H6.** The greater the perceived cost of implementation of a cloud-based HRIS, the less likely a small business will be to adopt cloud-based HRIS.

The last organizational factor of interest in this study is anticipated growth. We are not aware of any previous work that has investigated anticipated organizational growth as a factor in an adoption decision, but it likely plays an important role in adoption decisions by small businesses. Growth can add complexity to any business, and given the heavily regulated nature of HR, increasing data and reporting needs have the potential to overwhelm HR. In addition, anticipated growth can lead key decisions-makers to perceive that there will be increased organizational revenue available to make technology investments. Thus, as an organization anticipates growth, it should be more likely to adopt new technology. Although not directly tested previously, research has found that organizational size was positively related to adoption intentions (Premkumar & Roberts, 1999; Ramdani et al., 2009; Thong, 1999). Thus, the following hypothesis was investigated:

**H7.** Small businesses that perceive greater business growth will be more likely to adopt cloud-based HRIS than those that perceive lesser growth.

### 1.5.3. ENVIRONMENTAL CONTEXT

The final context of interest in this study is the environmental context. This context includes factors such as the size and structure of the industry, the organization's competitors, the macro-economic context, the regulatory environment, and the

availability of external resources (Tornatzky & Fleischer, 1990). Of particular importance to HRIS investments is the increasing regulatory and reporting requirements, the availability of external IT support, and the availability of capital. This specific variable has not previously been studied by researchers interested in SME adoption of information systems, but it should be particularly important in the context of an HRIS due to the increasing data reporting requirements of local, state, and federal laws in the United States. In addition, European Union and country-specific regulations governing employees and the protection and use of employee are growing and adding complexity to organizations conducting business within and across EU borders.

In addition, because many reporting requirements are based on organizational size, as an employer grows, the regulatory requirements clearly increase and a HRIS can help it organize and refine the data for maximum compliance. For example, in the United States many federal labor laws such as the Equal Pay Act, the Age Discrimination Act, and the required filing of an EEO-1 report are determined by number of employees in the organization. In addition, the US government now requires that many reports be submitted electronically. Without a HRIS, the burden of submitting these reports can be overwhelming. For this reason, we believe that the more that an organization believes that it has compliance needs, the more attractive a HRIS will be to it. Thus, the following hypothesis was investigated:

**H8.** Small businesses that perceive greater compliance needs will be more likely to adopt cloud-based HRIS than those that perceive lesser compliance needs.

The second environmental factor is the availability of external software vendor and consulting support. SMEs generally have their expertise focused in their primary area of business and often lack the HR and technology knowledge and skills needed to effectively implement new technology. Therefore, they will need to rely on third-party support when implementing a new HRIS. Research has been mixed, with some finding that external vendor expertise was positively related to the adoption of information decisions by SMEs (Chau & Hui, 2001; Thong, Yap, & Raman, 1996), and other finding that external vendor support was not related to the adoption decision (Ifinedo, 2011; Ramdani et al., 2009). But overall, given the relative lack of IT and HR skills within smaller organizations, we believe that external

support may be an important factor. Therefore, the following hypothesis was investigated:

H9. Small businesses that perceive greater vendor support will be more likely to adopt cloud-based HRIS than those that perceive lesser vendor support.

The final factor in the model is access to capital. Although it is important that the company perceive a cloud-based HRIS to provide benefits, it must also be implemented within the financial constraints of the organization. If an organization lacks access to the capital necessary to afford a new system, the organization still may not implement the system, even if the system could provide tremendous benefits. This argument is similar to that from the theory of planned behavior, which argues that intention may be less important when a person lacks the resources to engage in the chosen behavior (Azjen, 1991). When an organization believes that it can access the needed capital for a cloud-based HRIS implementation, whether internal or external, it should be more likely to implement it. These arguments are also consistent with findings from SME adoption of non-HRIS technology (Alamro & Tarawne, 2011; Ifinedo, 2011). Thus, the following hypothesis was investigated:

H10. Small businesses that perceive greater access to capital will be more likely to adopt cloud-based HRIS than those that perceive lesser access to capital.

## 1.6. Method

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### 1.6.1. PARTICIPANTS

As an initial test of this model, a convenience sample of 41 small businesses in the northeastern United States was surveyed. Survey respondents included CEOs, business owners, and vice presidents, or directors of human resources. Of these, the vast majority (71%) were directors or vice presidents of human resources. Organizations came from industries such as banking, insurance, financial, industrial, logistics, manufacturing, not for profit, health care, and human services. The mean age of the firms was 55.7 (SD = 34.1) and the mean number of employees supporting HR was 5.1 (SD = 6.5). The US Small Business Administration defines a small business as typically having fewer than 500 employees, but in some industries, it can be as large as 1500 employees (U.S. Small Business Administration, 2012). In our

**Table 1.1:** Sample Organization Characteristics.

Dem	HR Staff		Annual Revenue (Millions)		
Job Title					
Owner	17.1%	1–2	34.1%	<1	4.9%
CEO	7.3%	3–5	34.1%	1–5	9.8%
Director of HR	53.7%	6–10	12.2%	6–10	9.8%
VP of HR	9.8%	>10	7.3%	11–20	7.3%
HR Manager	7.3%			21–30	9.8%
				31–50	7.3%
				>50	12.2%
Industry	Firm Age (Years)		Total Employees		
Financial services	7.3%	<10	2.4%	<50	24.4%
Food and beverage	2.4%	11–20	7.3%	51–100	4.9%
Health care	26.8%	21–30	9.8%	101–250	14.6%
Manufacturing	4.9%	31–50	22.0%	251–500	24.4%
Professional services	7.1%	51–100	34.1%	<500	24.4%
Construction	2.4%	>100	9.8%		
Public & not for profit	22.0%				
Retail	4.9%				
Technology	2.4%				
Transportation service	4.9%				

case, only one organization exceeded this size, but it was kept in the analysis due to the low sample size of the pilot study. A summary of the organizational characteristics is included in [Table 1.1](#).

### 1.6.2. MEASURES

Scales for each construct were measured with a mixture of existing scales and those developed specifically for this study. All scales utilized a 5-point Likert-type scale anchored by 1 (*strongly disagree*) to 5 (*strongly agree*). *Perceived Benefits* was measured with three items adapted from [Kuan and Chau \(2001\)](#) and [Ifinedo \(2011\)](#). A sample item included: “Cloud-based HR software will allow my staff to make more effective HR decisions.” The coefficient alpha reliability estimate for this scale was .73.

*Improved HR data* was measured with five items developed for this study. A sample item included: “Cloud-based HR

software reduces the number of errors in my employee data.” The coefficient alpha reliability estimate for this scale was .85. *Compatibility* was measured with three items adapted from Premkumar and Roberts (1999) and Van Slyke et al. (2010). A sample item included: “Using cloud-based HR software to manage my human resource function is compatible with how my organization does things.” The coefficient alpha reliability estimate for this scale was .56.

*Top Management Support* was measured with four items adapted from Premkumar and Roberts (1999). A sample item included: “Top management enthusiastically supports the adoption of cloud-based software.” The coefficient alpha reliability estimate for this scale was .88. Employee IT skills were measured with three items adapted from Premkumar and Roberts (1999) and Ifinedo (2011). A sample item included: “Our employees have the technical skills necessary to use cloud-based HR software.” The coefficient alpha reliability estimate for this scale was .87. *Implementation Costs* were measured with two items developed for this study. A sample question included: “Implementing cloud-based HR software is very expensive.” The coefficient alpha reliability estimate for this scale was .72. *Anticipated Organizational Growth* was measured with two questions developed for this study. A sample question included: “Our organization’s growth should exceed that of competitors in our industry.” The coefficient alpha reliability estimate for this scale was .72.

*HR Compliance Support* was measured with four items developed for this study. A sample item included: “Cloud-based HR software helps my company to meet the requirements of growing governmental reporting regulations.” The coefficient alpha reliability estimate for this scale was .78. *Vendor Support* was measured with four questions adapted from Premkumar and Roberts (1999). A sample item included: “Software vendors provide technical and implementation expertise that help me to implement new cloud-based HR software.” The coefficient alpha reliability estimate for this scale was .63. Finally, *Access to Capital* was measured with three questions developed for this study. A sample item included: “My organization has sufficient access to capital to invest in new HR technology.” The coefficient alpha reliability estimate for this scale was .76.

The dependent variable was the *adoption of cloud-based HRIS*. It was measured as the self-report sum of the HR functions where cloud-based HRIS was either the current software used or which would be used in the next 10 months. The

functional areas of HR were Employee Self-Service, Manager Self-Service, HR-Orientated Help Desk, Employee Tracking, Labor Scheduling, Labor Budgeting, Talent Acquisition Services, Performance Management, Compensation Management, Workforce Planning, Benefits, Workers Compensation, and Retirement & Pensions.

### 1.6.3. ANALYSES

The hypotheses were tested using multiple regression/correlation analyses.

## 1.7. Results

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To better understand the current status of HRIS adoption by these small businesses, we first investigated how they were currently utilizing HRIS in support of 13 different HR functions (Table 1.2). Some interesting highlights of the current and planned deployment of software are that small businesses are still lagging in the use of HRIS. For example, over 50% of the firms surveyed had no form of technology to support workforce planning, compensation, performance management, and employee scheduling. In other areas though, small businesses appear to be embracing cloud-based HRIS. Specifically, cloud-based HRIS was the most chosen approach for employee and managerial self-service, employee tracking, employee benefits function. Finally, small businesses are more heavily outsourcing employee benefits, workers' compensation, and retirement processes. Thus, it appears that small businesses are looking at technology, especially cloud-based technology, to support simple transactional processes, whereas they either outsource or manually handle more complex and strategic functions such as workforce planning and HR budgeting.

### 1.7.1. TESTS OF HYPOTHESES

Table 1.3 shows the descriptive statistics for each of the measured variables as well as the correlations. The results of the multiple regression analysis are found in Table 1.4.

The results of each specific hypothesis are presented below. Support was found for H4 and H9. Both top management support ( $\beta = .461$ ,  $t(27) = 2.20$ ,  $p < .05$ ) and the availability of vendor support ( $\beta = .428$ ,  $t(27) = 1.77$ ,  $p < .05$ ) were positively

**Table 1.2: HRIS Deployment.**

Function	HRIS Deployment				
	None	Self-Developed	On-Premise	Cloud SaaS	Outsourced
Employee self-service	20%	10%	20%	45%	5%
Manager self-service	25%	7.5%	25%	40%	2.5%
HR help desk	62.5%	12.5%	7.5%	10%	7.5%
Employee tracking	12.5%	17.5%	27.5%	35%	7.5%
Employee scheduling	52.5%	22.5%	20%	0%	2.5%
HR budgeting	35%	27.5%	22.5%	10%	2.5%
Talent acquisition	50%	10%	10%	20%	7.5%
Performance management	55%	17.5%	7.5%	12.5%	5%
Compensation	50%	15%	12.5%	10%	10%
Workforce planning	72.5%	10%	7.5%	2.5%	5%
Employee benefits	10%	5%	17.5%	30%	35%
Worker compensation	25%	7.5%	15%	12.5%	37.5%
Retirement	22.5%	5%	5%	17.5%	47.5%

**Table 1.3:** Correlations among Variables.

	M	SD	1	2	3	4	5	6	7	8	9	10
1. Adoption	2.43	2.77										
2. Benefits	11.22	2.03	.309*									
3. Improved HR data	18.95	3.97	.309*	.692**								
4. Compatibility	9.39	2.39	.240	.188	.081							
5. Top management support	12.88	4.08	.629**	.472**	.277*	.440**						
6. Employee IT skills	9.57	3.62	.611***	.415**	.332*	.455**	.755***					
7. Implementation costs	6.35	1.52	-.121	-.211	-.136	-.155	-.145	-.241				
8. Anticipated growth	6.37	1.95	.060	.211	.089	.268*	.366*	.273*	.204			
9. Compliance needs	15.23	2.62	.404**	.428**	.437**	.322*	.485**	.417**	-.288*	.133		
10. Vendor support	9.51	2.06	.517**	.103	.119	.502**	.458**	.574***	-.281*	.249	.353*	
11. Access to capital	5.45	1.93	.399**	.164	.166	.402**	.417**	.562***	-.063	.286*	.076	.708**

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

**Table 1.4:** Results of Regression Analysis.

Variable	Adoption of Cloud HRIS <sup>a</sup>	
	Beta	<i>t</i>
<i>Technology</i>		
Benefits	-.031	-0.17
Improved HR data	.131	0.66
Compatibility	-.176	-1.16
<i>Organization</i>		
Top management support	.461	2.20*
Employee IT skills	.162	0.75
Implementation costs	.151	0.95
Perceived growth	-.274	-1.84*
<i>Environment</i>		
Compliance needs	.035	0.20
Vendor support	.428	1.77*
Access to capital	-.054	-0.25

<sup>a</sup> $R = .755$ ;  $F(10, 27) = 3.59$ ;  $p = .004$ .

\* $p < .05$ .

related to the adoption of cloud-based HRIS. Contrary to H7, perceived company growth was negatively related to the adoption of cloud-based HRIS ( $\beta = -.274$ ),  $t(27) = -1.84$ ,  $p < .05$ . Thus, small businesses that were anticipating greater business growth were less likely to adopt cloud-based HRIS than those that were anticipating lesser business growth. The remainder of the theorized relationships did not find support. Contrary to H1, H2, and H3, benefits ( $\beta = -.031$ ),  $t(27) = -0.17$ ,  $p = \text{n.s.}$ ), improved HR data ( $\beta = .131$ ),  $t(27) = 0.66$ ,  $p = \text{n.s.}$ ), and compatibility ( $\beta = -.176$ ),  $t(27) = -1.16$ ,  $p = \text{n.s.}$ ) did not exhibit a statistically significant relationship with the decision to adopt cloud-based HRIS. In addition, H5 and H6 were not supported. Employee IT skills ( $\beta = .162$ ),  $t(27) = 0.75$ ,  $p = \text{n.s.}$ ) and implementation costs ( $\beta = .151$ ),  $t(27) = 0.95$ ,  $p = \text{n.s.}$ ) were not statistically significantly related to the adoption decision. Finally, compliance needs ( $\beta = .035$ ),  $t(27) = 0.20$ ,  $p = \text{n.s.}$ ) and access to capital ( $\beta = -.054$ ),  $t(27) = -0.25$ ,  $p = \text{n.s.}$ ) were not statistically significantly related to cloud-based HRIS adoption. Thus, H8 and H10 were not supported.

## 1.8. Discussion

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This study had three goals. The first goal was to briefly overview the key theories that can be used to address the adoption of cloud-based HRIS by SMEs. To do this it first reviewed the findings from four individual-level adoption theories, the technology acceptance model (Davis et al., 1989), the theory of planned behavior (Ajzen, 1991), the innovation diffusion theory (Rogers, 1995), and the unified theory of acceptance and use of technology (Venkatesh et al., 2003). It then reviewed two organizational-level theories, the EDI adoption model (Iacovou et al., 1995) and the TOE model (Tornatzky & Fleischer, 1990). After a brief discussion of the strengths and weaknesses of each, a decision was made to utilize the TOE and to adapt it to the cloud-based HRIS context. The second goal was to investigate what functions were most adopted by SMEs. Using a pilot study of 41 SMEs, we found that firms were most likely to use cloud-based HRIS for day-to-day operations such as employee self-service and employee tracking, and benefits administration. Firms were least likely to use cloud-based HRIS for more strategic tasks such as compensation and workforce planning. This is consistent with the arguments and findings of Johnson, Stone, et al. (2016), who have suggested that much of the research and value found in HRIS implementations to date have come from the automation of HR processes. Associated with this finding, the second most popular implementation option was to have no software supporting HR. For example, over 50% of firms had no software supporting employee tracking, 35% for HR budgeting, and over 20% for employee and managerial self-service. This suggests that the potential market for cloud-based HRIS is still robust.

Finally, the third goal of the study was to determine what specific factors were driving adoption decision by SMEs. Using a survey, we investigated factors associated with the technology, the organization, and the environment. The theorized model did not find full support, but there were several interesting findings. First, in the regression, the technology context did not appear to play a role in adoption decisions. Despite the lack of statistical significance in the regression, as is shown in Table 1.3, both perceived benefits ( $r = .31, p < .05$ ) and improvements in HR data ( $r = .31, p < .05$ ) were statistically significantly correlated with an organization's decision to adopt a cloud-based HRIS. This suggests that the limited sample size may have reduced the power of

our test to fully capture the relation between technology characteristics and the adoption decision.

Two organizational factors were found to play a role in adoption decisions: top management support and organizational growth. The more that top management supports implementing a cloud-based HRIS, the more likely the organization will be to adopt it. This should not be surprising given the importance of top management support for any new business initiative. With small businesses, though, the role of top management support may be even stronger, because the top leaders are in closer contact with employees and may exert an outsized influence on business activities. Surprisingly, anticipated growth was negatively related to adoption decisions. A potential reason for this may be that as a small business anticipates growth it may feel that it needs to invest in pursuing that growth rather than in expanding its technology offerings.

In addition, neither internal IT skills nor the costs of implementing a new system were related the adoption decision. As with the technology environment, IT skills were correlated with adoption decision ( $r = .61, p < .001$ ). It is possible that the high correlation between top management support and the internal IT skills of employees ( $r = .76, p < .001$ ) suppressed the relationship between skills and adoption. Indeed, when top management support was removed from the regression, the IT skills of the employees were an important consideration in the adoption decision ( $\beta = .436, t(28) = 2.29, p = .05$ ).

Finally, of the three environmental factors, only the extent of vendor support was related to the adoption of cloud-based HRIS. Despite the nonsignificance of compliance needs and the availability of capital, both were positively correlated with adoption (compliance:  $r = .40, p < .01$ ; capital:  $r = .39, p < .01$ ). Not surprisingly, vendor support and availability of external capital had a somewhat high correlation ( $r = .71, p < .001$ ). The removal of vendor support though did not change the regression findings with respect to either variable.

### 1.8.1. CONTRIBUTIONS

Overall the findings of this study extend our understanding of both the adoption of HRIS as well as small business adoption of technology. First, this chapter extends findings from the broader information systems literature by investigating a new information system context, cloud-based HRIS. The study reinforces the

importance of top management support as the primary driver of adoption decisions in small businesses (Ifinedo, 2011; Premkumar & Roberts, 1999; Ramdani et al., 2009). In addition, it extends previous research by identifying other factors such as anticipated organizational growth, access to capital, and the regulatory environment, which are of particular importance to the HR context. Although not all hypotheses were supported, we still encourage future researchers to investigate variables such as these to develop a model of cloud-based HRIS adoption which more fully captures the unique nature of the HRIS environment compared to the broader information system environment.

With respect to the HRIS literature, this study represents one of only a few studies to have empirically examine SME adoption of HRIS, specifically cloud-based HRIS. Very few studies have previously investigated the adoption of HRIS and, these have either used individual-level adoption models (Marler et al., 2009), have focused on larger organizations (Teo et al., 2007), or have used case studies (Olivas-Luján, 2007). Thus, this study represents an extension of the adoption models of HRIS by using a model directly tied to both organizational decisions and small businesses. Together this opens up a new area of research for scholars to pursue.

This study also has several implications for SMEs. First, it reinforces the importance of top management to the implementation of any new system. Upper management should ensure that it is in support of the implementation of the new system and that this support is clearly communicated to employees. By doing this, the implementation should go more smoothly and should improve the likelihood that the system is successfully implemented. For those whose top management is less enthusiastic, it is important to convince them of the importance of the adoption of cloud-based HRIS, to help them become more knowledgeable about the HRIS, and to communicate to employees how cloud-based HRIS will help improve both organizational functioning and employee outcomes.

Second, it is important for vendors and SMEs to understand the importance of vendor support during the implementation of a cloud-based HRIS. SMEs often lack the understanding of how to manage the change associated with the adoption of a new technology. The vendor can help by matching a SME to either internal or external consultants who can help them manage the transition. For example, software vendors such as Workday and SuccessFactors have developed relationships with external

consulting firms to help small and large organizations manage the culture and technological shift to a cloud-based HRIS environment.

Contrary to the theorized positive relationship between anticipated growth and adoption, our findings suggested that when organizations were anticipating growth, they would be less likely to invest in cloud-based HRIS. Given that the implementation of a HRIS can streamline operations and reduce costs, it is surprising that firms would be less likely to implement when they are anticipating growth. A HRIS could help provide savings that could be then reinvested in any growth opportunities. The challenge is that it is likely that small businesses with limited capital may not see the value of tying up capital in an HRIS project when it can be invested in growing business opportunities. Therefore, it becomes important for HR directors and vice presidents to clearly communicate the value that an HRIS will provide to the organization, and how it can help a firm meet the challenges of future growth opportunities. Conversely, the research could suggest that these same leaders communicate to the organization how they can help meet growth opportunities and table HRIS conversations during periods of growth.

### 1.8.2. LIMITATIONS

Although the findings of this study are interesting, there are a number of potential limitations which may affect generalizability. First, the data were collected from a single region in the United States. Therefore, our sample may not be representative of all small businesses. Second, the data from this study only come from a small number of firms (e.g., 41). Thus, the power of the tests is somewhat limited. A smaller sample size and power in our analyses may have caused us to miss some relationships with smaller effect sizes. Therefore, we believe that the results should be replicated with larger sample sizes as well as samples from other settings (e.g., other parts of the United States, Europe, Asia, etc.).

## 1.9. Conclusion

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The goal of this study was to better understand the factors that affect decisions by small businesses to adopt cloud-based HRIS. In a pilot study of 41 organizations, we adapted the TOE model

of small business adoption and found that top management support of the project and the availability of external implementation and IT support drive the decisions to adopt cloud-based HRIS. We believe that this study represents a strong first step toward understanding the motivation of small businesses to adopt cloud-based HRI, but that it is only a first step in a program of research which we believe can help small businesses more effectively adopt technology to support their human resources.

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