

eHR Cloud Transformation: Implementation Approach and Success Factors

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ABSTRACT

The article covers process models for HR IT projects and in particular for HR transformation projects. Based on the authors' experience, an applied process model for HR transformation projects in a cloud-based environment is derived. The article identifies findings applicable to the fields of organisation, business, and IT as well as decisions and critical success factors in the specific context of cloud-based HR solutions.

KEYWORDS:

Cloud-Based HR Solutions, HR, HR Transformation, IT

1. INTRODUCTION AND OBJECTIVES

The research on electronic human resources management (e-HRM) covers two distinct and widely separated fields of academia and practical management: information technologies (IT) and human resources management (HRM). This article will aim at analysing both of them from a holistic and a practice point of view, contributing to the research gap. Therefore, it will analyse fields such as IT and HRM, and how much more effort is needed to bring and integrate them together. There are three focal fields in HR digitalisation: digital employees, work content and digital employee management (Strohmeier and Parry 2014). "Digital employees" refers to the upcoming generations with a high affinity to IT entering the labour market (Prensky 2001). The "work content" defines how to work in a digital working environment while the "digital employee management" refers to applications that "support and network the HR profession". This article focuses on the latter and especially on how to transform HR processes into the digital world with the help of cloud technology. This article is organised in the following way. The article opens with an overview of the evolution of e-HRM including the varying definitions of the terms itself. Subsequent, the impact on the academic research is depicted as well as the implications on the industry using e-HRM solutions. Challenges that arise when transforming HR into the digital world are discussed next. Based on this, a brief overview of project management approaches is depicted and a process model that matches the peculiar requirements of HR transformation projects into a cloud environment is derived. Next, a case study based on experiences from several transformation projects follows. The article finishes by discussing the implications of this article for researchers and practitioners.

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2. STATE OF ART

2.1. IT Supporting HR

Following we discuss the steady evolution of IT supporting the HR digitalisation and the definition of the term electronic HRM. This is followed by a brief overview on the research in the academic and the impact of e-HRM on the industry, closing with challenges that are faced by HR transformation projects.

2.1.1. Evolution and Definition of Electronic Human Resources Management

Already in 1940 with the advent of computers, personnel record keeping and payroll are one of the first cases of “mechanical” HR. During the next 20 years, some skill inventory and screen testing applications are developed by the aerospace and defence industry (DeSanctis 1986). In 1960 employee data is automated, followed by payroll and benefit administration (Martinsons 1997). Tetz (1974) claims that by the late 1960s one must base effective HR decision on a wider range of personnel information. This requirement is met in the ‘70s when more than half of the largest US banks and insurance companies already use computer systems for HR and during that decade, companies with a few thousand employees implement new HR systems (DeSanctis 1986). With the acceptance of the competitive advantages of computers in the 1980s (McFarlane 1984), interest for digital HR rises, resulting in about 40% of companies having a system and according management for it in place.

HRIS (Human Resource Information Systems) is the new term arising, which Kavanagh et al. (1990) define as an integrated computer system that enables an organisation to store, edit, analyse and distribute human resources data.

Another synonym for digital HR shows up in the ‘90s. With the advent of the “e-” trend (e.g. e-commerce) in the business world, “e-HR”, electronic HR follows. e-HR develops in three phases, from simple HR information publishing to HR transaction automation and finally the most elaborate stage of HR transformation (Lengnick-Hall and Moritz 2003).

Zafar (2013) postulates that the difference between HRIS and e-HR is the end user. While HRIS focuses on the HR department, e-HR addresses all employees. Broderick and Boudreau (1992) add to that definition, that during the early ‘90s HRIS has “mostly been used to improve HR decisions with better information” enabled by digitalising the employee records, payroll and compensation information.

Lepak and Snell (1998) proposed an alternative definition with the term “virtual HR” as “the network-based structure built on partnerships and typically mediated by information technologies to help the organisation acquire, develop, and deploy intellectual capital”. They differentiated the following subclasses of outcomes of virtual HR: operational (e.g. reduction of costs), relational (e.g. giving access to HR information or enablement to execute HR processes as a self-service) and transformational (e.g. the transformation of HR to become a strategic business partner).

In the early 2000s, with the advent of the Internet, the web-enabled, web-based, intranet-based HRIS (Raiden et al. 2001; Bondarouk and Ruël 2009), which enables the employee to actively participate in the HR processes over the web, show up. This classification indicates that the HR-centred focus is blurred as HRIS addresses all employees instead of the HR department.

A widely accepted definition of electronic human resource management (e-HRM) is elaborated by Strohmeier (2007) as the “application of information technology for both networking and supporting at least two individual or collective actors in their shared performing of HR activities”.

With the ongoing development of (Internet) technology in the last decade, the implementation and application of e-HRM increases (Strohmeier 2007). Thus, the advent of new cloud technologies (Lin and Chen 2012) and the offer of e-HRM cloud solutions (Jafari Navimipour et al. 2015; Zapotocny 2015) will increase the amount of implementation projects (Harris and Spencer 2016). IT based HRM have been classified as well as innovation management tools (Hidalgo and Albors 2008; Albors-Garrigos et al. 2018).

To summarise, digital HR has evolved over a long-time span, still, the definition is vague. Bondarouk and Ruël (2009) note that e-HRM is “an umbrella term covering all possible integration mechanisms and contents between HRM and Information Technologies aiming at creating value within and across organisations for targeted employees and management”. Subsequent they solicit to redefine e-HRM as a standardized definition is still missing.

2.1.2. Academic Research in e-HRM

Strohmeier (2007) states that academic interest in the field of e-HR evolved during the mid-‘90s. He points out that only 20% of the investigations base on theoretical frameworks and that the research is quite diverse, owed to the wide-ranging topic. He further notes that research rather focuses on the HR department than on all employees. Additionally, he criticises the limited research on how technology can support HR to answer strategic questions. Consequently, several fields of research to sharpen the e-HRM picture are proposed.

Still in 2004 Stanton and Coovert urge to “identify key research questions at the intersection of HR and IT, produce viable theoretical perspectives to frame those research questions, collect meaningful data across multiple organisational settings, and translate their findings into useful advice for practitioners”.

Current research focuses on several aspects of e-HRM. Hereafter, exemplary topics and articles in the field of e-HRM research are discussed following:

- **HR Processes:** Several articles examine single HR processes like the performance review (Florkowski and Olivás-Luján 2006; Nura and Osman 2013), e-Learning (Colchester et al. 2017), talent management (Nura and Osman 2013; Martin 2015) or e-Recruiting (Lee 2007; Furtmueller et al. 2011; B. Holm 2014; Kumar and Lalitha 2016). Interfaces to other management systems like knowledge-based systems are also discussed (Martinsons 1997);
- **Technology and Integration:** Furthermore, research on new (mobile) access channels for e-HRM (Mülder 2016), on how e-HRM integrates with existing social networks (Pilarski et al. 2016) and on how new cloud technologies can support process digitalisation (Jafari Navimipour et al. 2015; Zapotocny 2015; Hahn 2016) is conducted;
- **Legal aspects and security:** Legal and security aspects for e-HRM, especially in the cloud context are examined (Zafar 2013; Lehnert and Dopfer-Hirth 2016);
- **Impact, outcomes and value of e-HRM:** The impact of e-HRM is one of the prominent topics for researchers (Ensher et al. 2002; Lengnick-Hall and Moritz 2003; Hussain et al. 2007; Ruël et al. 2007; Parry and Tyson 2011; Maier et al. 2013; Strohmeier and Parry 2014; Stone et al. 2015; Bellou 2016) as well as the perception and the acceptance in the organisation (Fisher and Howell 2004; Voermans and Veldhoven 2007). Other studies focus on the relationship between e-HRM and its contribution to strategy (Marler and Fisher 2013), again others on e-HRM adoption (Strohmeier and Kabst 2009) or on the practical and theoretical implementation of e-HRM (Florkowski and Olivás-Luján 2006; Ngai and Wat 2006; Hooi 2006; Olivás-Lujan et al. 2007; Bondarouk 2011; Varma and Gopal 2011). Furthermore, the value of e-HRM is one of the research fields (Wirtky et al. 2016) and the question which strategic decisions lead to the implementation of e-HRM (Schalk et al. 2013). Finally, HRM has been related with innovation performance (Laursen 2003; Albors-Garrigos et al. 2018).

To summarise, the interest in research on digital HR has started late in comparison to the application of e-HRM solutions in the industry. The impact of e-HRM is a focal topic while there is a widespread range of research opportunities.

2.1.3. e-HRM Applied in the Industry

The digitalization of HR processes has been of secondary significance in comparison to other primary processes for most companies. On the one hand, there are business-related reasons like the subordinated role of HR within the organisation (Brockbank 1997) and the challenge to verify the direct contribution of HR processes to the company's success (Klein 2012). On the other hand, there were HR process design boundaries due to the limited computing performance and the availability of adequate technological e-HRM solutions (Olivas-Lujan et al. 2007; Zapotocny 2015). These limitations are essentially resulting from the on-premise e-HRM solutions available on the market, which digitalise HR subprocesses (e.g. recruiting or learning) inside of process silos, but do not yet offer a holistic and above all, interrelated HR process world. Figure 1 gives an overview of the HR process world, which consists of the talent management, the workforce planning and the operative HR process clusters. The dashed lines indicate potential process interfaces (e.g. one can set the goal to attend a certain learning session or the performance review has an impact on the succession planning).

The technological change from an on-premise world to a cloud-based Software as a Service (SaaS) environment offers the possibility to tackle the challenges of a holistic digitalisation of HR processes (Jafari Navimipour et al. 2015). For example, workforce planners have a business need to offer career paths to establish succession planning. Thus, the necessary roles (containing a description, skills and competencies) for a vacant position are matched with the individual characteristics of an employee in each offered career path. The drivers of complexity are the manifold combinations of roles as well as the number of positions and employees. Only now is the necessary computing performance within cloud-based HR SaaS Solutions (from now on referred to as HR Cloud) available (Zapotocny 2015).

Cloud-based technologies allows organisation to “develop more valuable relationships with their workforces, clearly defining their expectations and the employee value proposition in a tailored employee experience” (Harris and Spencer 2016) contributing to the possibility for HR to position itself as a strategic business partner (Lepak and Snell 1998; Bell et al. 2006) in the long run.

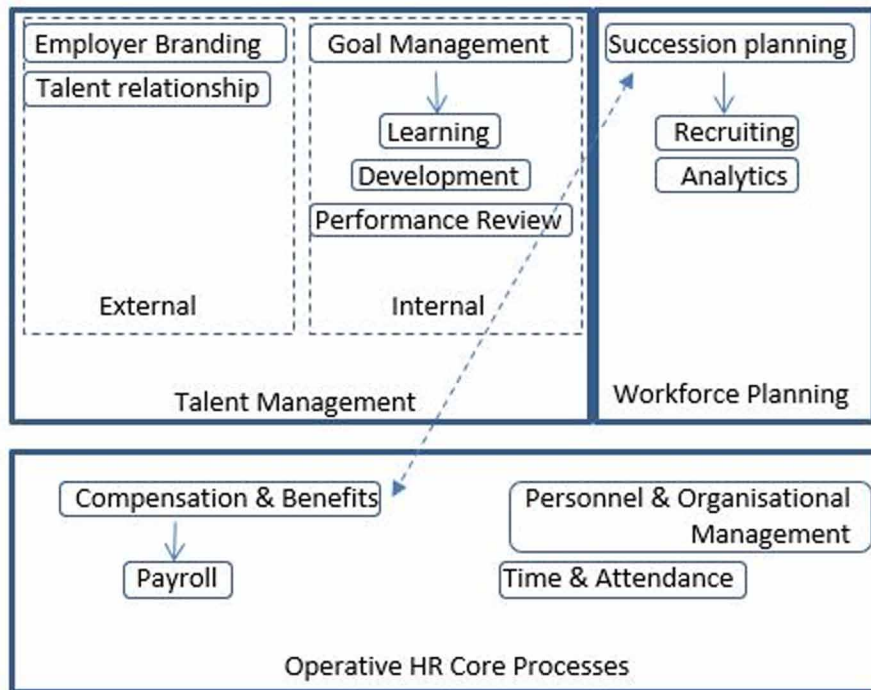
In addition to the general SaaS benefits such as performance improvements (Lin and Chen 2012), the HR Cloud offers further advantages over existing on-premise solutions by offering a holistic process digitalisation approach. For example, the integrated and interrelated modules, as well as the underlying common database, offer a new form of process synergies. From a technological point of view, one must also consider the advanced lifecycle of on-premise HR solutions. Having a look at the plans of software vendors, there is a clear trend, that HR Cloud solutions are in focus for functional improvements, even though maintenance for on-premise solutions is offered, at some point support for them will become obsolete (Harris and Spencer 2016).

New internal forums (e.g. SAP SuccessFactors customer community) that offer customers the opportunity to propose and prioritize enhancements for their HR Cloud solution are examples for that trend. In the middle of the 2000s, Gueutal and Stone (2005) state “Today technology has finally begun to deliver on the promises of the 1990s”.

Based on these new technologies, various companies (e.g. SAP, ADP, Kronos, Oracle, or Workday) offer HR Cloud solutions, which aim at increasing the HR business value. Contributions to this objective are the improvement of HR efficiency, the standardization of processes, the upgrading of services, the increase of strategic orientation (Ruël et al. 2004; Strohmeier 2009) and finally the cost reduction (Marler 2009; Schalk et al. 2013). In addition, the new way of HR Cloud licensing delivers an improved cost transparency by offering billing models (e.g. based on user count, used modules, transactions) which enable subsequent cost allocation to the business units.

HR transformation projects become more and more attractive for companies to leverage all those potentials described above. Major exogenous factors that are currently contributing to the number of HR Cloud transformation projects, are the demographic development and the transformation to a knowledge-based economy (Eisner 2005; Roehling et al. 2005) as well as the consequent fight for talent. Thus, e-HRM projects must be both, effective, by adequately filling vacancies, and efficient, by making optimal use of the scarce internal and external resources (Laumer et al. 2010) as recruiting,

Figure 1. HR process world adapted and translated by permission from Springer Vieweg, *Cloud Computing - Die Infrastruktur der Digitalisierung*, (Vom traditionellen Personalmanagement hin zu e-HRM in der Cloud Implementierungsansätze einer digitalen HR-Transformation, (Ziebell et al. 2018) © 2018)



retaining and developing those talents inside the organisation is the biggest challenge ahead for the HR departments (Stone and Deadrick 2015). The human factor is always critical (Martinsons and Chong 1999).

Sierra-Cedar 2016-2017 HR Systems Survey White Paper (Harris and Spencer 2016), based on interviews with 1,528 organisations, states the following evidence, which confirms the tendencies of companies to digitalise HR processes and move to HR Cloud solutions. Since 2014 most large and medium companies assume, that expenditures on HR technology will increase, with budgets for large companies to level in 2017. Moreover, looking at the purchased on-premise versus HR Cloud solutions, one can spot a clear tendency in favour of the latter with 72% of organisations that purchased a talent management suite in a cloud environment. Also, users prefer HR Cloud solutions, which is confirmed by an improved user-experience-score from 2.49/5 (on-premise) to 3.46/5. Additionally, small and medium size companies that adopted HR technology, see an increased revenue in combination with a higher business outcome resulting in a 75% likelihood of HR being accepted as a strategic partner. Last, 24% of the companies plan to transform their current core HRM into a cloud-based solution. Other recent surveys (KPMG and Bitkom 2017) confirm that 65% of German companies already use cloud services and the majority of the people interviewed feel, that their data is safe in the cloud.

2.1.4. Challenges for HR Transformation Projects

Projects that transform and digitalise HR processes into a HR Cloud environment face new challenges. Besides the effort of documenting the current and defining the target processes, technical boundaries within the HR Cloud, limit the free process configuration. Due to that, one can only migrate customer specific customisations within certain boundaries and the limited configurable process variants force companies to adjust and standardise the target processes. The latter has been discussed for

some time within the ERP environment (Luo and Strong 2004) and led to a paradigm shift, since the process workflows need to adapt to the software solution and not vice versa. This also results in a technologically enforced process compliance because of former workarounds (e.g. shadow systems) which, for example, allowed a direct release of a vacant position, will no longer be available.

Another complicating factor is, that the processes within the HR Cloud, along with the processed personal data, are subject to due diligence by public authorities (e.g. German Federal Data Protection Act-BDSG §28 or the German Works Constitutions Act-BetrVG §80) as well as the worker participation based thereon, restricting the HR process' design and the way personal data is handled. Lehnert and Dopfer-Hirth (2016) give a brief overview over the actions needed to comply with those laws in the on-premise HRM world, which can be applied to the HR Cloud as well. Kovach et al. (2002) also emphasize the importance of securing and limiting the access to personal data within the IT system. Those legal challenges are addressed by Strohmeier and Kabst (2009) who argue that a national data protection is a hurdle for personnel data transmission over the internet. However, the European Data Protection Directive "harmonises data protection principles and to a certain extent enables an internal market for personal data" (Robinson et al. 2009). In the United States, data protection is less restrictive than in the EU, although several laws are in place (e.g. Federal Information Security Management Act of 2002 (Public Law 107-347 2007) or the USA Patriotic Act (One Hundred Seventh Congress of the United States of America 2001)). Due to the different legislations, when choosing a HR Cloud solution, one must be aware of the implications on the stored personnel data. It is getting even more complicated when a company has subsidiaries which fall under different legislation but choose to use one HR Cloud solution (Zafar 2013). Consequently, one must consider legal constraints of each country as the HR Cloud services are not necessarily offered within the company's legal domain. In spite of these challenges, Townsend and Bennett (2003) conclude that companies with developed and implemented privacy policies will be able to attract and retain workforce. Furthermore, Harris and Spencer (2016) find, that companies with a HR Cloud are 21% more likely to be confident in their data privacy processes than non-cloud companies.

To summarise, the implementation of a HR Cloud solution offers opportunities and challenges (refer to Figure 2) to break new processual grounds. From an IT point of view, HR Cloud solution vendors already deal with the security (Successfactors 2012; Sepstrup 2015) and legislative issues, resulting in major investments in IT security and region specific data hubs (Successfactors 2016). From a business point of view, the automation of HR processes enable HR professionals to shift the focus to strategic activities (Cabrera and Bonache 1999). Thus, the HR Cloud enables the HR department not only to manage employee data within the lifecycle "from hire to retire" but also to establish a proactive and strategic human capital management (Martinsons and Chong 1999).

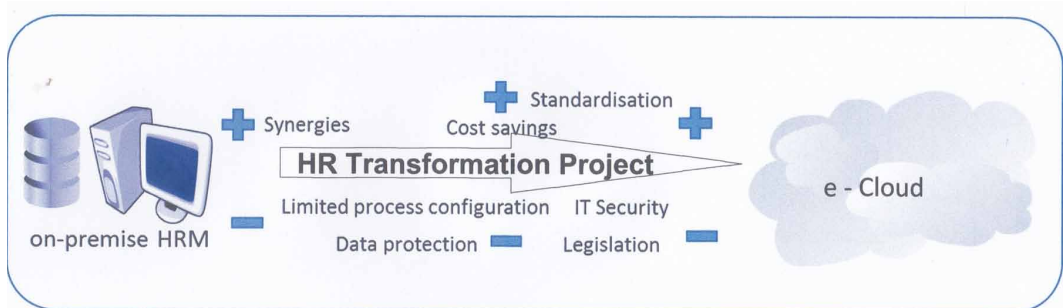
3. PROCESS MODELS FOR IT PROJECTS IN THE HR CONTEXT

Professional IT project management, embedded in the organisation is the prerequisite for positive project outcome. The following project management process models reflect the diversity of IT projects. The selection of the fitting model depends on the project type, where a classical and an agile approach (Wagner 2011) could be applied. Company specific customizations of these models are possible.

3.1. Classical, Agile and Hybrid Models

Examples of classical approaches are the waterfall model and the V-Modell XT. Typical features of these models are clearly defined, linear process phases, from requirement analysis to go-live and the expected results for each phase. The V-Modell XT is the standard process model for IT projects within the German public sector and focuses on the specific activities per project phase and on the project roles. In 2015, approximately 10% of the German gross domestic product was reported as public procurement volume, which explains the high level of utilization of that model (BMWi 2016; Destatis 2016).

Figure 2. Opportunities and challenges of HR transformation projects adapted and translated by permission from Springer Vieweg, Cloud Computing - Die Infrastruktur der Digitalisierung, (Vom traditionellen Personalmanagement hin zu e-HRM in der Cloud Implementierungsansätze einer digitalen HR-Transformation, (Ziebell et al. 2018) © 2018)



Classical models emphasize the formally defined specifications, the detailed documentation and the contractual delivery of services as well as the strict tracking of the project plan. This results in a high administrative effort to meet all formal requirements and a clear preplanning of the expected project outcomes. As this method has, especially regarding small and short-term IT projects, some disadvantages, more and more companies focus on agile project models (Vlietland et al. 2016).

Agile methods aim to generate a visible value and to react quickly to new requirements (Boehm and Turner 2004). Instead of providing all planned project outcomes, prioritisation takes place in a need-oriented manner during the project, allowing to respond to new requirements on short notice. This model not only lets the customer be affected by the project but enables him to actively participate by evaluating the project results, based on prototypes and to decide over the next steps. In contrast to classical models, the documentation of the results is rudimentarily and downstream, since its focus is on quick adaption of new requirements within a defined timeframe.

Hybrid models are a combination of classical and agile methods and leverage, depending on the project type, potentials from both (Habermann 2012).

3.2. Specific Characteristics of HR IT Projects

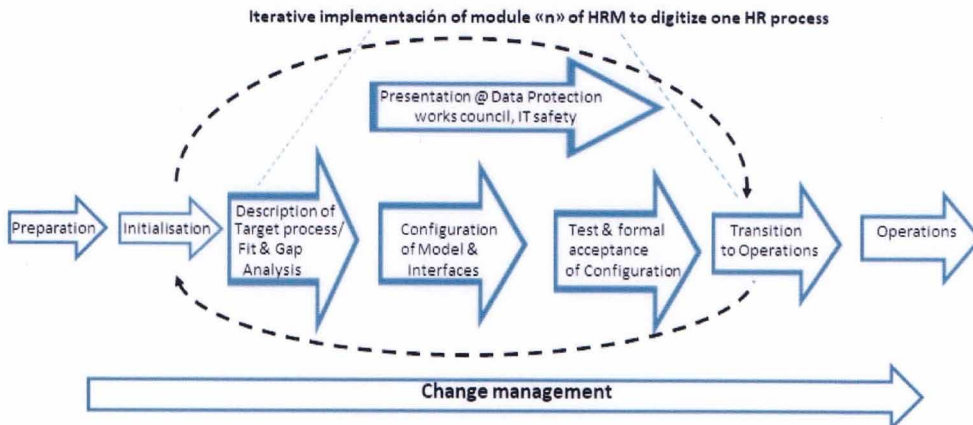
HR IT departments, depending on the type of project, use both, classical and agile project models. A hurdle to take when using an agile approach is the project budgeting that one usually needs to complete before large-scale HR IT projects start. Moreover, as HR is a support process for the value-adding primary activities of a company, usually the project budget is limited. Consequently, mixed projects models are applied, resulting in project phases planned like in classical models and individual phases within, managed agile. The project documentation is also of importance due to the processed HR data, which contradicts agile models.

3.3. Process Model for HR Cloud Transformation Projects

HR Cloud transformation projects are a specific form of HR IT projects and represent a new challenge since the HR Cloud technology limits the degree of freedom of the implementation. One can configure predefined processes, but an entirely free process design is not possible. Full conversion of predefined target processes is not possible, and they rather serve as a template for the customisable processes in the HR Cloud. Figure 3 illustrates a process model for HR Cloud transformation projects, including elements from classical, iterative and agile models.

The five project phases (preparation, initialisation, implementation, transition to operation, operations) are characteristics of a classical approach. A project-accompanying change management supports during each step.

Figure 3. Process model for HR Cloud transformation projects adapted and translated by permission from Springer Vieweg, Cloud Computing - Die Infrastruktur der Digitalisierung, (Vom traditionellen Personalmanagement hin zu e-HRM in der Cloud Implementierungsansätze einer digitalen HR-Transformation, (Ziebell et al. 2018) © 2018)



A particularity shows up during the implementation phase, which includes a control circuit during which, prototypes, that represent partial results of the process configuration are presented. This prototyping makes evaluation and adjustment possible on short notice. Agile elements are also included by limiting the number and periods of iterations based on experience from other projects.

This approach is applied during all phases of the implementation for each HR target process (refer to Figure 1) while the outcome of the processes, the user groups, and the potential interfaces differ.

3.4. The Application of E-HRM in Small and Medium Enterprises (SMEs)

Does the size of the enterprise influence the use of eHRM? Very few academic studies have analysed the subject in developed countries. While, Bondarouk et al. (2009), posed that the use of e-tools in medium sized organisations was perceived as useful, but difficult to implement and small organisations perceived that utilising HRIS facilitated their HRM, Carvalho and Machado (2016) found in an exploratory study in Portugal, that e-HRM was more commonly used among administrative communication and recruitment processes. Industry sources (Harris and Spencer 2016) claim that 24% of SMEs have operative HR systems while 23% had some under development. We can conclude that there is certain research gap from the academy point of view on a holistic view of the e HRM problem and, especially, in the substructure and cloud networking of the HRM. Thus, we should focus on the digital transformation of HR processes with the support of cloud technology.

4. RESEARCH METHODOLOGY

There are three different methodologies for empirical research: qualitative, quantitative and mixed-method approach, whereby the latter is a combination of the first two methods. All of them are applied to reconstruct social situations or processes (Creswell 2013; Neuman 2014).

In contrast to a quantitative approach which tests existing theories or hypothesis, this study is conducted using a qualitative approach. We have based our methodology on the review of seven case studies. This research method is recommended when “analysing a contemporary phenomenon within a real-life context” (Yin 2008). Moreover, the variety of the firms and the singularity of the research justify the method (Creswell 2013). This field study was carried out from 2012 to 2018. The reason for the choice of this qualitative approach lies in the relatively new topic and the resulting limited access to a large group of firms. Additionally, quantitative methods are not suitable for collecting

Table 1. Summary of case studies revised

Project ID	Industry	# Employees	HR Cloud Solution	Implementation Period	% of suite functionality used
[PID 1]	IT-Services	75,000 - 149,999	SAP SuccessFactors	2012 - ongoing	100%
[PID 2]	Retail	8,000 - 14,999	SAP SuccessFactors	2015 - 2016	85%
[PID 3]	Transportation	75,000 - 149,999	SAP SuccessFactors	2014 - 2015	20%
[PID 4]	Banking	15,000 - 74,999	SAP SuccessFactors	2018 - 2019 (planned)	100 % (planned)
[PID 5]	Energy Supply	8,000 - 14,999	Workday, Umantis	2018 - 2019 (planned)	20 % (planned)
[PID 6]	Retail	> 150,000	SAP SuccessFactors	2016 - 2017	85%
[PID 7]	Consumer Goods	15,000 - 74,999	SAP SuccessFactors	2017 - 2020 (planned)	40% (planned)

specific expert knowledge. Both Gummesson (2006) as well as Gläser and Laudel (2010) point out that the new global digital environment favours the use of qualitative research methods. The case studies selected justify the followed method since they have been implemented in large companies with experience in IT projects and working in a variety of sectors, industry, and services. The authors interviewed twenty managers of these companies in various stages of their project development to analyse the project developments and their outcome.

4.1. Case Study for an Exemplary HR Cloud Transformation Project

The experiences described below results from several HR Cloud implementation projects in Germany during 2012-17. Table 1 resumes their main characteristics.

4.1.1. Project Scope

The project scope contains the digitalisation of all processes including talent management, workforce planning, and HR core processes. The individual HR processes will migrate within modules (e.g. module “recruiting”) inside the HR Cloud, which can be configured separately and offer optional interfaces in between them. For example, the module “goal management” can link to the module “e-Learning” if an employee has the goal to participate in a learning activity. The project strives for these kinds of synergies. The chosen cloud solution is based within the EU legislative space, resulting in all personnel data to be stored on servers within the EU. As one participant stated “*the selection of the project scope was a crucial step in developing the project*”.

4.1.2. Project Phase: Preparation

Even during the preparatory work, the general commitment of the senior management for the HR Cloud needs to be clearly stated. One must understand, support and communicate the HR Cloud paradigm, which does not allow a completely free design of processes, as well as the external storage of personal data. Various managers stated that “*the preparation and communication phase of the project was important for the final success*”.

Fisher and Howell (2004) emphasize to clearly define the values and mission that the project wants to support as otherwise, one risks unintended consequences. Thus, one must define the HR Cloud transformation objectives clearly. In addition to the anticipated process optimization by digitalisation and cross-module synergies, one often anticipates cost savings. The calculation of these potential savings as well as the other benefits, both of which are presented in a business case, depend on various factors. Lengnick-Hall and Moritz (2003) emphasize the importance of a convincing case based on “available, accessible and tangible measures”, as the investments in e-HRM can be an expensive venture. In contrast to that, Harris and Spencer (2016) urge companies, implementing HR Cloud solutions to rethink these projects and convert them to constant change management processes without a fixed timeline. As a participant argued “*operating a HR Cloud solution is constant change management, though the implementation costs and timeframe can be evaluated upfront*”.

Influencing factors for the cost calculation can be the current degree of digitalisation and the number of HR solutions as well as their position in the application lifecycle. Another relevant factor for the cost calculation is the flexibility of the licensing model because when using a HR Cloud solution, one usually does not buy licenses but procures them over a limited period and needs to renegotiate after the expiration of the contract. The reduction of IT operating cost is one of the underlying assumptions when using SaaS. In contrast to that, the decrease of HR headcount is a delicate topic as the new HR Cloud affects the HR staff that must contribute during the project with their HR process knowledge. Academic literature has already pointed out these factors. The concept of “moderate voluntarism” defined by Strohmeier (2009) describes that dilemma. Furthermore, Roberts (1999) postulates that “we do need to be creative in looking at other benefits, especially with new technologies” when calculating an return on investment for HR systems. Therefore, involving the HR department to deliver intangible indicators (e.g. “better workforce”) can help to justify investments - even if the new strategic alignment of HR with the help of IT is the lonely reason.

To select the right HR Cloud solution, one should carry out a fit & gap analysis to match the current HR processes or the target processes with the offered configuration possibilities of each product during vendor presentations. As various managers stated “*fitting the project and HR processes*” was a determinant factor in the project development.

Since a direct migration of the processes is not possible, the following list serves as a base for decision-making:

- Quantity and quality of the processes included;
- Maturity of the HR Cloud product in general;
- Integration into the existing IT infrastructure;
- Total cost of ownership of the solution.

The HR department needs to participate actively during the tender to not perceive the HR Cloud solution as a lonely decision by the IT department. The future project team therefore consists of people from both worlds: IT and HR. IT culture plays then a key role as it was also outlined by most participants.

In addition to the software solution, one must find an implementation partner who configures the processes within the HR Cloud. In addition to the costs, the project experience plays an important role. The internal IT often cannot provide the initial configuration as the expert knowledge for each HR Cloud solution is very complex and short-lived. One should contractually agree on a knowledge transfer (e.g. through joint teams or training) with the implementation partner to enable operations to tackle upcoming configuration adjustments after the project finished. Surveys confirm that 78% of the supporting implementation partners help with the configuration (Harris and Spencer 2016) and accentuate that the internal capacity needed is higher when transforming HR into a cloud compared to on-premise environments. One could argue, that this is also necessary to enable the customer to become independent from external providers. The mix team assembly proved to be a necessary task.

Even before the start of the implementation, one must inform and involve the works council, data protection, IT architecture and IT security and to follow up on them during the subsequent phases of the project. Due to the personnel data processed, regular appointments with the works council are recommended during the entire duration of the project; meetings with the other units will be scheduled when needed (e.g. when a new interface is introduced and has an implication on the IT architecture).

4.1.3. Project Phase: Initialisation

The initialization phase includes the definition of the formal project as well as the initial technical setup of the HR Cloud environment. During this definitions of the formal project, there is a focus on two topics: the stakeholders and the project charter.

During the previous preparation, as an IT project manifested “*the first business units were already involved in the communication*”. Then it was time to identify more stakeholders and multipliers, which are not actively participating in the project but will be affected by it. It then is recommended to name key users from non-HR departments that will be updated and participate in the progressing project (e.g. during the user acceptance tests). The project-accompanying change management, which supports the systematic and organisational change is another success-critical action to improve the collaboration and communication with the stakeholders. In this direction, as Harris and Spencer (2016) found out that only 43% of large and 46% of medium size companies support vital projects with change management initiatives although the successful introduction of the HR Cloud is less dependent on the technological implementation than it is on professional change management. The initial technical setup and the operations of the HR Cloud is less complex compared to on-premise projects because the degree of freedom when designing processes tempts to implement complex on-premise systems. In contrast, the configuration limitation of the HR Cloud implicitly leads to a reduction of the complexity.

To work efficiently during the workshops in the following implementation phase, it is necessary that the relevant, informed decision makers participate. Experience shows, that when faced with IT projects, business units tend to act more in the role of affected rather than of proactive and contributing participants. Increasing the involvement of the business unit can be achieved not only by the demanded commitment of the higher management during the preparation phase but also by the participation of the HR managers during the implementation workshops. The early naming of responsible module managers has proven its worth. Those module managers are responsible for one or multiple modules and will be in charge of adjustments during operations. A high affinity to HR and IT is the prerequisite for that position. Already in 1986 DeSanctis defines the ideal HR IT manager as the person, who has competencies in both, data processing and HR application and concludes along with Hall and Torrington (1986) that it will be challenging to find this person in the HR business unit due to the lack of affinity to IT. This challenge is still ongoing, although 30 years have passed.

The project charter is essential as it contains the scoping of the project. Two fundamental decisions need to be made when defining the scope: how to integrate the HR Cloud in the existing IT infrastructure and in which order to implement the modules.

The selection of an appropriate integration scenario depends on whether and which HR processes are already digitalised and which of them are to be consolidated within the HR Cloud. There are three possible scenarios (Harris and Spencer 2016). A “side-by-side” or “hybrid” scenario implies, that a leading on-premise HRM is still on site while a reduced HR master data set is synchronized inside the HR Cloud. If a company is not using an on-premise HRM or decides to migrate all HR processes in the HR Cloud a “green field” or “rip & replace” approach can be applied. Especially German companies prefer the side-by-side scenario due to complex German payroll processes which are currently not available at the same quality that is offered by on-premise solutions. Furthermore, HR departments demand the highly customized on-premise HRM for their daily work (e.g. reporting or bonus scenarios). A “parallel” or “patchwork” scenario is defined by having HR processes that run parallel on multiple HR Cloud and on-premise system (e.g. subsidiaries have another cloud-based solution for the performance appraisal while mother company uses an on-premise system). Referring to the above mentioned Sierra-Chedar study, companies transforming their HR technology, used a rip&replace approach (28%), followed by the patchwork scenario (21%). Of those companies that still plan to change their HR technology, 35% favour the hybrid approach. Additionally, almost half of the large companies prefer the hybrid approach, moving only the talent management or workforce management processes to the cloud while keeping the operative HRM processes on-premise.

Another decision, directly resulting from the chosen integration scenario is the number and type of new interfaces. If one selects a side-by-side scenario, a secure interface between on-premise HRM and the HR Cloud needs to be set up. If all processes will be migrated into the HR Cloud, this interface is obsolete, and only the one-time migration of data is necessary. The module interfaces (e.g.

to transfer degree of goal achievement to the compensation and benefits module) multiply with the number of implemented modules and the process synergies in between them. Interfaces to other HR applications outside the cloud (e.g. using an external payroll) need to be taken into consideration as well. When doing a cost-benefit analysis, if in the future all HR processes will be digitalised inside the HR Cloud, it is recommended to reduce interface implementation effort.

Likewise, the type and number of interfaces have an influence on the order of the module implementation. The majority of informants confirmed that there are several more influencing factors. It might be necessary to replace a HR legacy system due to its advanced position in the application lifecycle. Also, when leveraging process synergies, module dependencies need to be considered. For example, succession planning depends on identified talents within the organisation and both processes are digitalised in separate modules. Talent management works independently but executing succession planning without an existing talent pool is questionable. One more influencing factor is the timeline when a certain HR process is executed. Typically the bonus payment is done once in the year and the amount is a direct result of the performance appraisal. Having these dates, one can recalculate the latest implementation start for these modules. The experience from projects showed that a successive order of implementation is preferable to a parallel approach, even if synergies between modules exist. Concluding, the decision to implement a certain module depends on a technical and process complexity. Already at an early stage of the project, the implementation of a less complex module is advised to gain experience with the new project model.

Considering all these factors is important as all of them have an impact on the final project timeline. In this sense, Harris and Spencer (2016) see a connection between the size of a company and the amount of time needed for HR Cloud transformation projects. While small companies require about 7 months to implement the operative personnel administration and two modules, large companies already need up to 13 months for the same scope and that has been the results of the examined cases.

4.1.4. Project Phase: Implementation

After the infrastructure and the first interfaces have been setup, the implementation of the modules is executed in the order defined during the previous phase.

The implementation phase consists of a certain number of iterations that vary in regard to the implemented module. Usually, three iterations are required. Each iteration comprises a series of workshops, which vary in length depending on the complexity of the module. The iterative approach has the advantage that one can match the new process requirements with a running standard process (fit & gap analysis). In addition, one can present practical results within a short timeframe. The long idle time until a business unit can see the first results of the implementation, known from classical approaches, reduces. The following iterations base on the previous results and tests, leading to a consistently improved degree of module completion.

Another positive aspect as some project manager confirmed, is the improved estimation of the project duration. Implementation times for each module base on experiences from comparable projects. The limitation to three iterations additionally sets a clear guidance. Theoretically, more repetitions are possible, but the marginal benefit diminishes after three iterations.

From the side of academia, Fisher and Howell (2004) recommend HR and IT professional to work closely during the design and implementation phase to improve user acceptance. This was confirmed by the research. Participants of the workshops are the responsible process owners, the module managers, the implementation partner and at least one employee from the IT department who can derive the technical implications. Concluding, the project team needs to support the structured testing as well as the tracking of change requests.

The first iteration contains the following activities:

- Presentation of the modules and its standard process;
- Matching the defined HR target process with the configuration possibilities of the HR Cloud;

- Identify alternatives to adapt and implement the target process;
- Documentation of the target process inside the HR Cloud and of optional interfaces;
- Presentation of the documentation and obtaining consent from data security, works council, IT security and IT architecture;
- Configuration of the target processes within the HR Cloud test system and optional interfaces;
- Presentation of the configuration by the implementation partner;
- Testing of the configuration by the business unit and collecting change requests.

The second iteration consists of the following activities:

- Documentation of the adjusted HR Cloud process and the optional interface adjustments based on the change requests from iteration 1;
- If the process has fundamentally changed or new interfaces are needed, a new presentation at the data security, works council, IT security and IT architecture will be necessary;
- Configuration of the changes inside the HR Cloud;
- Presentation of the adjusted configuration by the implementation partner;
- Testing of the configuration by the business unit and collecting change requests.

After finalising the second iteration, the module already depicts 80-90% of the target process. In the third and final iteration usually only tiny, often graphical adjustments take place. The activities in the last iteration are identical with the previous ones and complemented by the following actions:

- Final configuration of the target process in joint teams, consisting of implementation partner and module manager;
- Migration of the configuration from the HR Cloud test system to the productive instance;
- If necessary, migration of existing data and shut down of legacy systems;
- Transfer of the documentation to IT operations.

Taking the decision to start with a clean database (e.g. not migrating old target agreements from legacy systems) when introducing the new HR Cloud processes, avoids expensive migration of legacy data.

One can communicate to the business units that they will still be able to address change requests after the final iteration. However, not the implementation partner but the internal module manager handles these new requirements. To enable knowledge transfer from the implementation partner to the module manager, both parties should participate in joint teams during the last iteration as it is contractually agreed on. We found that this was usual practice among the surveyed firms.

4.1.5. Project Phase: Transition to Operations

To enable a smooth transition to an operation, the optimal timing of the module introduction is essential. All modules run independently from another but can unfold their full process synergies only together. A recommendation is, to choose a less complex module and restrict the defined circle of the key user to gain experience with the new technology as well as the new processes.

From now on, the module manager is responsible for the demand management and this enables the business unit to be more autonomous from the IT department. The knowledge transfer to the module manager already began with the last iteration in the previous phase and the knowledge can now be widened by attending separate module trainings. No later than now, one must finalise the operations manual containing all necessary activities for HR Cloud operations. One is advised to also name one person inside of the HR department who takes the responsibility for the process. This person is the one interface to the module manager to reduce complexity.

The training of the employees is also a success-critical factor as they can participate proactively in more digitalised HR processes which in return results in a reduction of administrative HR tasks. Since the support contract of the cloud vendors typically includes maintenance tasks (e.g. updates & upgrades), and only the interfaces continue to be the responsibility of the local IT operations, IT administration tasks will reduce as well. Additionally, resources are set free due to a shutdown of legacy systems.

Our findings show that, usually, it takes about 20-30% of the overall project time to finish the transition. During that time the implementation partner can be contacted for questions that are related to the configuration of the system but those inquiries should decrease and be addressed to the software vendor.

4.1.6. Project Phase: Operations

After having finished the transition to operations, operating the HR Cloud is typically handled onsite. In the previous article, operations were out of scope, but due to experience gained after several transitions, one could argue that accompanying the operation phase should be a part of the project. Successful IT experiences such as DevOps stress this approach. This DevOps (Debois 2011) strategy enables the operations to learn from the experiences made by the project team and to ensure a smooth transition. ITIL (APM Group Ltd 2012) proposes templates for a standardised service management which can also be applied to a HR Cloud solution and should be the base for the whole operations in which the following fields of action can emerge:

- **Change Requests:** Usually there is a backlog of change requests that were collected during the previous project phases that could not be implemented and furthermore some modules (e.g. performance) need regular adjustments due to new business policies. One should evaluate the effort to implement those changes and put them on a timeframe. Each of these changes can have side effects due to the interfaces between the modules, especially if those changes are made directly on the core platform (e.g. changing the way a certain personnel data is displayed). According to a majority of respondents “*change procedures were a major source of problems*”;
- **Upgrade / Updates:** The vendors usually provide 2-3 major updates, correcting errors, and upgrades, containing new features for the HR Cloud environment each year (Harris and Spencer 2016). The impact of these updates/upgrades are described and published by the vendor. Module managers have to verify each of them and analyse if and how the implemented modules are affected. As some of the upgrades are optional, operations need to present them to the responsible HR process managers to decide whether to implement them or not. It is advised, that one tests all affected processes before applying them to the productive system.

All three, change requests, upgrades and updates requires less configuration effort than the initial module setup but can be considered as smaller HR transformation projects:

- **Support:** Enabling a helpdesk to support the end user at first level helps to improve the acceptance of the system and to minimise the questions ending up with the module managers or the project team. One is recommended to hand over a list of common questions and answers for each module which have been collected during the project phase. Again, support tools and systems were a strong facilitator for the whole implementation and operational success.

5. DISCUSSION AND CONCLUSION

This article shows, that a professionally executed HR Cloud transformation project lays the foundation for the acceptance of a HR Cloud solution. Applying the derived process model of this article as well

as avoiding the described pitfalls, helps to reach that goal and ultimately supports the overall project success. The contributing aspects of this research result from its strong operational experience with mature IT culture firms.

The evolution of e HR spans from the 1960s and with the advent of internet impacted on e-HR in the early 2000s as well as the growth towards cloud was initiated in 2012 and academically registered in 2015. But, still, there is a lack of academic research in the field of HR Cloud approach. However, industry associations have an ample scope of studies covering e-HR evolution.

State of the art shows preoccupation from the academic world in the fields of processes, technology and integration, legal aspects and the impact value of e HR although the question of KPIs has not yet been discussed. However, measuring the project success after implementation objectively is one of the challenges arising, especially in regard to the impact on efficiencies, as well as how the effectiveness that is presumably improved by the HR Cloud. This aspect is typical of all innovative management practices. HR Cloud solutions, bearing cross-domain processes, not only offer new processual ways to work but simultaneously to collect data for each process.

About the e HRM project planning our research has confirmed the academic recommendations of Fisher and Howell (2004), Lengnick-Hall and Moritz (2003) as well as the industry guides (Harris and Spencer 2016) regarding mission communication, risk analysis, etc.

Regarding project development, our research confirms as well the industry recommendation (Harris and Spencer 2016) about mixed teamwork and the application of proved philosophy such as DevOps (Debois 2011) that facilitate migration between development and operations based in intra team collaboration.

We have confirmed some of the published research recommendations. As Stone et al. (2015) state, the maturity of solutions for e-HRM varies and few publications examine whether the aim of e-HRM is either increase efficiency or effectiveness. Furthermore, and sustaining the research gap, Marler and Fisher (2013) indicate, that few studies are examining the impact of e-HRM on HR. A possible solution lies in the framework, elaborated and applied by Maatman (2006), as a base for further research to measure the effectiveness of e-HRM in the cloud.

Concluding, we can summarize the main contributions of this study as follows:

1. **Proposal of a project procedure model:** The literature review shows a significant focus on the effects of digital HR transformation. However, the concrete implementation is often ignored, and only the results are assessed retrospectively. This article bridges between analogue and digital HR worlds and paves the way for a successful transformation through the derived project procedure model;
2. **It shows experience from real projects as well as stakeholder notions:** From experience gained in numerous transformation projects, we can conclude what could be an optimal project organisation. The stakeholders and their respective influence are analysed and offer an improved possibility of project management. The role of stakeholders contributes in particular, as various articles have suggested (Achterkamp and Vos 2008); and
3. **Cloud Architecture:** The article contributes to the IT view of cloud architectures, because this depends on various (functional) parameters and the final stage of expansion must optimally reflect the organisational HR requirements.

5.1. Limitations and Future Research

Being a new area of research there are a number of fields that merit our future interest. Identifying and applying new Key Performance Indicators (KPIs) within a continual improvement process (ISO 2015) to incrementally improve the HR processes within the HR Cloud can be another field of research. (e.g. “what are the recruiting channels where our top performers are sourced?”). This is the goal of our next research phase. Concluding, improved processes relates to the efficiency and

effectiveness of the e-HRM solution itself. Another contribution of our research is the confirmation of the goodness of the technology acceptance mode developed and applied by Davis (Davis 1986, 1989) as a framework to measure acceptance of technology by evaluating the perceived usefulness as well as the perceived ease of use. Other researchers such as Voermans and Veldhoven (2007) applied this framework to the e-HRM usage within a corporate context. Applying this acceptance model to HR Cloud based solutions to verify the acceptance and usefulness, is an additional future field of research.

Schalk et al. (2013) study the influencing factors for decisions to implement e-HRM and conclude that decreasing cost is the dominant driver. With the changed market environment and the new technology, it can be worthwhile to verify if new drivers appeared or if the order of the drivers has changed.

Finally, our study has concentrated in large firms. Therefore, still the question related to eHRM and firm size still seems to be unresolved as academic literature claims (Carvalho and Machado 2016).

To summarise, further research based on cloud-based e-HRM solutions includes the impact, the acceptance and usefulness, as well as the initial reasons for implementation.

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