

## **Electronic/digital HRM: A primer**

### **Author**

Thite, Mohan

### **Published**

2019

### **Book Title**

e-HRM: Digital Approaches, Directions & Applications

### **Version**

Submitted Manuscript (SM)

### **DOI**

[10.4324/9781315172729-1](https://doi.org/10.4324/9781315172729-1)

### **Rights statement**

© 2018 Taylor & Francis. This is an Accepted Manuscript of a book chapter published by Routledge in e-HRM: Digital Approaches, Directions & Applications on 6 August 2018, available online: <https://doi.org/10.4324/9781315172729>

### **Downloaded from**

<http://hdl.handle.net/10072/382462>

### **Griffith Research Online**

<https://research-repository.griffith.edu.au>

# Chapter 1: Electronic/Digital HRM – A Primer

---

**Mohan Thite**

## **Abstract**

There is an explosion of digital technologies in recent times that have fundamentally altered business models, corporate strategies and the way we live, work, conduct business, and communicate. The human resources (HR) function today has similarly evolved to incorporate digital world in its design thinking, strategising and execution. However, the contribution of technology to HR is so far mainly limited to operational and relational activities with minimal impact on value-adding transformational activities. Further, technology proliferation has also led to unintended negative consequences. This chapter outlines the evolution of the digital world, digital work, and its impact on the workforce. It offers an inclusive definition of the digital HRM and analyses its impact on various HR functions. It concludes with a preview of the other chapters in the book.

## **Learning Objectives**

- Highlight how the digital world today dominates the technology landscape and its impact on the workforce
- Provide an inclusive definition of digital HRM and resultant devolution of HR activities
- Describe the changing roles of HR in the digital world
- Explain the impact of technology on various HR functions, including unintended consequences
- Understand the structure of the book and the key themes espoused in various chapters

## **Introduction**

“Digital is business and business is digital” (Andersson et al., 2016, p.56).

Gollub (2016) posted this blog in social media on ‘how the future will look like’:

“I just went to the Singularity University summit and here are the key learnings:

In 1998, Kodak had 170,000 employees and sold 85% of all photo paper worldwide. Within just a few years, their business model disappeared and they (became) bankrupt. What happened to Kodak will happen in a lot of industries in the next 10 year(s) and most people don't see it coming ... It will now happen with Artificial Intelligence, health, autonomous and electric cars, education, 3D printing, agriculture and jobs. Welcome to the 4th Industrial Revolution. Welcome to the Exponential Age.

Software will disrupt most traditional industries in the next 5-10 years. Uber is just a software tool, they don't own any cars, and (yet, they) are now the biggest taxi company in the world. Airbnb is now the biggest hotel company in the world, although they don't own any properties.

- Artificial Intelligence: Computers become exponentially better in understanding the world. This year, a computer beat the best Go player in the world, 10 years earlier than expected ... Because of IBM Watson, you can get legal advice (so far for more or less basic stuff) within seconds, with 90% accuracy compared with 70% accuracy when done by humans ... Watson already helps nurses diagnosing cancer, 4 time more accurate than human nurses. Facebook now has pattern recognition software that can recognize faces better than humans. (By) 2030, computers will become more intelligent than humans.

- Autonomous cars: In 2018, the first self driving cars will appear for the public. Around 2020, the complete industry will start to be disrupted. You don't want to own a car anymore ... Traditional car companies try the evolutionary approach and just build a better car, while tech companies (Tesla, Apple, Google) will (take) the revolutionary approach and build a computer on wheels ...

- Health: ... There will be companies who will build a medical device (called the "Tricorder" from Star Trek) that works with your phone, which takes your retina scan, your blood sample and you breath into it. It then analyses 54 biomarkers that will identify nearly any disease.

- 3D printing: The price of the cheapest 3D printer (has come) down from \$18,000 to \$400 within 10 years. In the same time, it became 100 times faster ... In China they (have) already 3D printed a complete 6-storey office building. By 2027, 10% of everything that's being produced will be 3D printed.

- Business opportunities: If you think of a niche you want to go in, ask yourself: "in the future, do you think we will have that?" and if the answer is yes, how can you make that happen sooner? If it doesn't work with your phone, forget the idea. And any idea designed for success in the 20th century is doomed to failure in the 21st century".

As you can see from the above (some of which are facts while some are just predictions), technology is all around us. It always has been. During the industrial revolutions of the last two centuries, the industrial economy ushered in transformational change. Mechanised mass production, the steam engine, electricity, the railway network, etc. had the same dramatic and disruptive effect that we see in newer technologies that have emerged since the start of the twenty-first century knowledge economy. One might argue that digital highways have simply replaced the railway networks. But the speed, intensity, and uncertainty of disruptive change brought about by technology today has been unprecedented and is accelerating rapidly. It has been described as 'the fourth industrial revolution' (Industry 4.0), the 'new paradigm' and the 'big shift'.

Coupled with globalization and demographic changes, digital technologies have radically altered the way we live, work, conduct business, and communicate. In the process, they are dissolving the boundaries between personal and work life. The business management discipline has seen structural changes in terms of business strategies, research and development, product/service design, marketing, manufacturing, supply chain management, customer relationship management, human resource management (HRM) and other support services. It is now well established that traditional competitive advantages, such as market leadership, natural resources, financial resources, and technology cannot by themselves lead to ‘sustainable competitive advantage’ to any country or economy or business in the knowledge economy. It is the ‘optimum leveraging of people, process and technology’ (Thite, 2004) wherein technology acts as a catalyst with a multiplier effect provided the organisation has competent leadership along with a workforce and well defined work processes that are optimally aligned to business objectives.

From master craftsmen to standardised processes driven by mechanisation, to adaptable and then intelligent processes, the world of work has come a long way. Today we live in the digital world. While digital technologies are generally used as an umbrella term for computer-based products and solutions, in the business context, they essentially refer to intelligent processes that use continuous real time feedback in order to make constant improvement in the efficiency and effectiveness of work design, processes and outcome (Thomas, Kass and Davarzani, 2013, p.2). In the process, they directly influence and enhance customer value and organisational revenue.

What does the all-encompassing digital world mean for the HRM function? According to Stephen (2016, p.97)

“For HR and business leaders, this digital transformation poses two fundamental challenges. First, HR can help business leaders and employees shift to a digital mind-set, a digital way of managing, organizing, and leading change. Second, HR has the opportunity to revolutionize the entire employee experience by transforming HR processes, systems, and the HR organization via new digital platforms, apps, and ways of delivering HR services”.

Despite the enormous potential of digital technologies in transforming HRM and 72 percent of companies believing digital HR is an important priority, ‘only 38 percent of companies are even thinking about it and only 9 percent are fully ready’ (Stephen, 2016, p.99). This shows that globally, the HR function is far from realizing the potential of digital technologies.

This chapter is a primer on electronic/digital HRM. In that sense, this chapter is a kind of ‘curtain-raiser’ to the rest of the book. We will first look at the impact of the digital world on digital work and workforce. We will then critically examine what we mean by digital HRM and how it has influenced key HR functions and their outcomes. We will conclude with a preview of the key digital HR approaches, directions, applications, and the related problems and prospects, as covered in the rest of the book.

## Welcome to the Digital World

There is no clear definition yet of what is 'digital'. As stated by Andersson, Lanvin and Van der Heyden (2016, p. 52),

“It is clear that the term *digital* currently defies definition. Each organisation's digital journey is individual, with no clear destination in sight. There is no one-size-fits-all way to 'do' digital, nor indeed any 'right way' to do digital ... The lack of a clear definition of the meaning of the term suggests that issues concerning the required competences, capabilities, talent, and resources (including human resources) are surrounded by a similar veil of ambiguity”.

However, the business rationale for digitalisation, types of digital technologies, and the impact of those technologies on the world of work provide important clues on what we generally mean by digital. The primary drivers for the digital initiatives undertaken by today's organisations are (Andersson et al., 2016, p. 53):

- Improve engagement with customers
- Increase efficiency
- Deliver on customer expectations
- Improve product and service offer
- Grow demand, and
- Customer acquisition

Digitalisation of the global economy is mainly powered by social, mobile, analytics, and cloud (SMAC) technologies. To understand the impact of digital technologies on the business world in general and the world of work in particular, consider these developments:

- Illustrating the power of disruption brought in by new technologies, 'only 12 percent of the *Fortune* 500 companies from 1955 are still in business, and last year alone, 26 percent fell off the list' (Deloitte, 2017a, p.3)
- We spend one third of the time we are awake browsing the web and apps, surfing one billion websites online, playing with four million mobile apps, and checking our smart devices 85 times a day (Now Comms Group, 2017)
- There are more than a billion people on Facebook, over 100 million on Google+, over 450 million on LinkedIn, and over 250 million on Twitter
- 42 percent of Americans play games online for at least three hours per week
- “The Big Six social networks (Facebook, Twitter, LinkedIn, Instagram, Google+, and Pinterest) exceed 2.4 billion people” (Ulrich, 2017, p.1)
- People in the USA look at their mobile phones 8 billion times a day (Deloitte, 2017, p.4)
- Thanks to automation and robotics, one in two jobs are at risk; however, due to new technologies powered by the internet of things (IoT), cloud computing and big data nearly half a million new technology jobs will be created by 2024 many of which don't even exist today (Dehaze, 2016, p.36-37).

## Digital Work & the Digital Workforce

Traditionally, people expected to do the same work for the same employer as a full time employee for most of their career. Loyalty and tenure were key determinants of career progression. Managers dictated what work was done, where, when, and how. Career management, and training and development were directed by the employer and employees were passive participants. Today in the gig economy that is characterised by a labour market consisting of freelance workers, more than a quarter of workers in Western countries are free agents without the constraints of where, when, and how to work (Lanvin, Evans, Rodriguez-Montemayor, 2016, p. 11). Organisations are increasingly relying on the ‘contingent workforce’ of knowledge workers to be innovative, agile, and flexible in order to address business uncertainty and unpredictability. In this section, we will explore how digital technologies have turned the world of work upside down.

As we get thrown into the whirlpool of the digital world, today’s knowledge workers, whether employees or gig economy contractors, need to possess and continually fine-tune a new set of skills and competencies. With an ageing population that is living longer, people are expected to work well beyond 60 years. Rapid technological obsolescence means people need to continually upgrade their skills. As the global economy becomes more technology-intensive with innovation and creativity being key sources of competitive advantage, the demand for skilled talent, especially in Science, Technology, Engineering and Mathematics (STEM) has increased tremendously but the supply is yet to catch up.

Research shows that while 75% of the fastest growing occupations now require STEM skills (PWC, 2015: 12-14), there is an increasing shortage of numeracy and literacy skills across almost all Western countries (OECD, 2015). This has resulted in the shortage of technology professionals, so vital in an innovation-driven and technology-intensive global economy (WITSA, 2016) leading to an increasing global sourcing and ‘global war for talent’, with jobs going where talent is (via services offshoring) and talent going where jobs are (via skilled migration, both temporary and permanent). In the process, countries such as India and China have become key source countries for STEM talent (Craig, Thomas, Hou, & Mathur, 2012: 2-7). At the same time, the global search for and sourcing of talent has become a hot political issue with some commentators declaring that an increasing reliance on foreign talent may lead to a “vicious cycle of off-shoring jobs, losing skills and competencies from the domestic economy and as a result moving more jobs off-shore could become institutionalized” (NIEIR, 2012: 1).

Further, developments in robotics and artificial intelligence (AI) are expected to result in ‘technology-driven unemployment’, with 40% of today’s low- and medium-skilled jobs likely to disappear in the next 15 years. Today’s millennials will be doing jobs that don’t even exist today (PWC, 2015). However, it is not all doom and gloom. As a result of the combined effects of globalisation, automation and digitalisation, new business models are emerging creating new types of jobs, such as Uber drivers, just as it happened during the previous industrial revolutions (Lanvin et al., 2016, p. 4).

**Digital Skills:** In the age of dualities, there is a ‘talent paradox’ (Evans and Rodriguez-Montemayor, 2016, p. 70) in that employers today demand specific technical skills as well as generic soft skills because an innovation economy demands collaboration and co-creation of knowledge (Lanvin et al., 2016, p. 12). Andersson et al. (2016, p. 52) call them ‘e-skills’, a combination of advanced technical skills and high-level softer skills. Colbert, Yee and George (2016, p. 732) also highlight the importance of ‘digital fluency’ in the digital workforce which refers to a level of proficiency that allows employees to ‘manipulate information, construct ideas, and use technology to achieve strategic goals’. Table 1.1 lists some of the key skills and competencies that the digital workforce is expected to have.

Insert Table 1.1 about here

**Career Management in the Digital World:** The career management process is caught in the whirlpool of environmental, organisational, and HRM changes with far-reaching consequences for both organisations and individuals in managing careers. One of the major ironies of contemporary career management lies in the fact that the career-conscious employee is being asked to offer more and more, while the employer is in no position to offer the scale or the kinds of rewards that were available in the past. It is as if employers have adapted a “help us but help yourself” attitude (Thite, 2001).

Whymark and Ellis (1999) argue that “traditionally, (the) employment relationship was characterised by a clear psychological contract. Employers expected loyalty, respect for rules, and commitment in return for job security, steady career progression, and training and development. But today the relationship between the parties is viewed more as a short-term economic exchange arrangement instead of a long-term, mutually beneficial commitment”. Employers seem to be adopting a “here-and-now” transactional attitude to career management rather than a long-term commitment.

Bereft of the life-support from employers, many individuals are clueless on how to manage their careers. Their predicament is aptly described by Gunz et al. (1998): “it is hard for someone being swept downstream in a fast-moving river to make sense of where they are, let alone where they are going”.

As highlighted by Thite (2001), some of the fundamental changes that have influenced career management since the start of the twenty-first century are

- ‘*Networked*’ and ‘*Cellular*’ organisational structures wherein strategic business units (SBUs) function “independently but by networking with others to share common knowledge and information, akin to human DNA, they learn, grow, and adapt to an uncertain environment. Within such cellular organisations, members take full charge of their careers and develop their careers around an agreed set of norms for self-governance and professional allegiance” (Brent et al, 1996).
- Staffing in organisations has moved from position-centred to *portfolio-centred*. Under portfolio-centred staffing, the contract output is identified, the matching portfolio of skills needed to complete the contract are specified, individuals with those skills are located in the HR Information System, the contract is offered and then managed (Templer and Cawsey, 1999).

- Handy (1996) suggests that organisations are taking on a “*shamrock*” configuration whose three levels comprise core, contract and temporary employees. Core employees are those central to the core competencies of the organisation. Contract employees are the new “*portfolio careerists*” – qualified, skills-oriented individuals with a portfolio of skills and clients. Temporary employees are those individuals needed for specific, lower skilled tasks and are employed on a need basis.

The most important implication of the forms and features of the new economy on the career management process is that the individual is in full charge of his/her own career. Hall (1996) describes the career of the 21<sup>st</sup> century as “*protean*”, a career that is driven by the person, not the organisation, and that will be reinvented by the person from time to time, as the person and the environment change. The second major implication is that an individual’s career will be in *constant state of flux* and will change directions many times during the career span. Change in career directions also means change in skill components, skill levels, authority and responsibility levels, income levels and so on. Cianni and Wnuck (1997) predict that employees in the 21<sup>st</sup> century will periodically backtrack in their careers, moving from expert back to novice as they are required to have new competencies that may very well be in areas unconnected to their personal preferences. Similarly, noting that contemporary careers are more like ‘*spirals*’, Gratton (2011) believes that individuals need to develop ‘serial mastery’ in being able to make lateral transitions from one career to another.

Studies also show that knowledge workers tend to have certain unique personality and occupational characteristics, such as craving for autonomy, challenging tasks, immediate and frequent feedback and rewards, ownership of ideas and enterprise, commitment to a profession more than an organisation, team work/community of practices and liberal lifestyle (Thite, 2004, p.38-42). However, HRM in many organisations still tends to be practiced in the command and control management style and as such is out of sync with contemporary realities of the knowledge economy.

## Unpacking Digital HRM

Ever since computerisation was introduced in the HR function, many terms have been used to describe the ‘nature, role and contribution of technology’ in managing people. These terms include Web-based HR, e-HRM, Virtual HR, Human Resource Information Systems (HRIS), and recently, Digital HRM and Smart HRM.

E-HRM is the most commonly used and understood term in the HR discipline to denote the use of mainly web-based applications. According to Marler and Parry (2015, p. 2), e-HRM is a set of “configurations of computer hardware, software and electronic networking resources that enable intended or actual HRM activities (e.g. policies, practices and services) through coordinating and controlling individual and group-level data capture and information creation and communication within and across organizational boundaries.”

HRIS became prominent and popular with the increasing emphasis on information systems and enterprise resource planning (ERP) (Thite, Kavanagh and Johnson, 2012). Hedrickson, (2003, p.381) defines HRIS as “integrated systems used to gather, store and analyze



information regarding an organization's human resources". It highlights the critical importance of the systems development life cycle (SDLC) approach and pays attention to planning, analysis, design, implementation and maintenance aspects of technical project management (which is discussed at length in Chapter 3). Some of the important topics considered by HRIS are

- Developing a business case for an HRIS
- Transformation of HR service delivery
- Determining the organization's HRIS needs
- Planning process
- Design considerations
- Vendor selection
- Implementation of an HRIS
- Evaluation of the new system (SHRM, 2015).

Discussions of HRIS have mostly revolved around large, monolithic, inflexible ERP products. However, in recent times, with the rise of cloud computing, both large and small to medium enterprises (SMEs) need not make heavy upfront investment in ERP products and then struggle to implement and maintain them. Rather, they can rent HR and other enterprise applications from third-party service providers which are scalable, flexible, and affordable. On the other hand, Digital HRM includes the latest social, mobile, analytics, and cloud (SMAC) technologies. It aligns with the changing dynamics in the field which is rapidly moving away from traditional ERP to cloud-based software as a service (SAAS). Products and applications are evolving to a point in which the service provider takes care of the technology and the HR user is mostly concerned with the strategic use of the product as a whole rather than the processes in particular (see Chapter 7).

Considering the overall conceptual framework adopted in this book and the definitional expectations set by Bondarouk, Parry and Furtmueller (2017, p. 99) that "it is important to acknowledge the significance of multiple elements that when integrated provide a direction for future e-HRM research, and help to understand the factors that influence its adoption and consequences", Digital HRM can be defined as follows:

*"Digital HRM deals with the nature, role and contribution of technology in strategically managing talent in a digital world. It incorporates social, mobile, analytics, cloud (SMAC) and other emerging technologies for efficient and effective delivery of HR services. It covers related management trends in performing the operational, relational and transformational aspects of HR, such as the devolution of HR administration via self-service applications, shared services, and outsourcing as well as strategic aspects involving evidence based on big data, predictive analytics, artificial intelligence, and managerial insights. It is also conscious of and addresses unintended consequences of technology, including implications for information security and privacy".*

In this book, we use the terms e-HRM and Digital HRM *interchangeably*. Some of the key aspects covered in the above definition are explained below.

### **HR Activities covered by Technology**

*Operational/Transactional HR:* All HR functions involve numerous and time-consuming ‘administrative processes’ that are routine and conducted on a day-to-day basis. Examples of operational HR activities include payroll, recordkeeping, updating policy and informational materials, generating and disseminating internal reports, complying with legislative reporting, benefits administration and administering labour contracts. In fact, 65 to 75% of HR activities can be classified as transactional (Wright, McMahan, Snell and Gerhart, 1998). Because of their routine nature, they can be standardised and automated via electronic data processing (EDP) and in the process, save precious time of HR professionals. These activities can also be performed using self-service applications, shared services and outsourcing.

*Relational HR:* These activities include ‘business processes’ relating to HR functions, including HR planning, recruitment and selection, performance management, learning and development, and remuneration and reward management. These functions add value to an organisation only when they are strategically aligned to and fulfil business objectives. Through business process re-engineering (BPR) and management information systems (MIS), HR and IT can forge a strategic partnership to improve and enhance the efficiency and effectiveness of these functions.

*Transformational HR:* Being situated at the top end of strategic HRM (SHRM), these HR activities include strategic redirection and renewal, cultural change, learning organisation-driven knowledge management, and leadership development. Through decision support systems (DSS) and Executive Information Systems (EIS), HR can provide strategic support to top management to address what-if scenarios, using advanced big data mining, analytics and artificial intelligence.

### **Devolution of HR activities**

*Self-service Applications:* One of the implications of the computerisation of HR is the devolution or delegation of HR activities and processes to

- employees via self-services, such as accessing payslips, HR policies, leave balance and application, benefits administration, self performance appraisal and self-nomination for training programs), and
- managers via management information Systems (MIS), such as performing recruitment and selection activities through the applicant tracking system (ATS), learning and development activities through the learning management system (LMS) performance management activities via an integrated talent management suite, compensation and benefits administration and other HR administration activities, including leave approval and accessing and submitting management reports.

*Shared Services Centres (SSCs):* The concept of shared services has been in practice since the mid-1980s with an aim to reduce costs, improve controls and enhancing customer service. According to Deloitte (2011, p.4), “... an SSC operates as an internal customer service business. It typically charges the business units for services provided, and uses service level agreements as a contractual arrangement which specifies cost, time, and quality performance measures”. Transactional processes are the most predominant work performed by the SSCs, with finance, HR, and IT being the most prolific users (Deloitte, 2017b, p.8). While SSCs are a well-accepted model across the developed world, its implementation has been quite

problematic and challenging as the optimistic proponents of the concept typically underestimate the costs and risks of customisation and implementation caused by behavioural factors whereas the users fear loss of control (AIM, 2011, p.2). Accordingly, experts recommend an “integrated operating model which combines the benefits of central control, scale, and standardization with a flexible, service-centric approach” (PWC, 2010, p. viii).

*HR Outsourcing:* Business process outsourcing has been one of the fastest growing trends in management, including in HR. Specialised third-party service providers are contracted to provide outsourcing services that are typically non-core to the organisation. The key drivers for outsourcing are access to greater expertise and process efficiencies, improvement in service quality, and potential cost savings. The most outsourced HR activities are payroll, benefits administration, HR information technologies (HR-IT), expatriate relocation, staffing and training. The advantages and disadvantages of outsourcing and the best way to manage it are outlined in the debate section at the end of this chapter, in the context of digital talent outsourcing. According to Reichel and Lazarova (2013), outsourcing non-core HR activities has a positive impact on HR’s strategic position but outsourcing core HR has no impact. Similarly, a study by Glaister (2014) concluded that HR outsourcing stymies HR role transformation and that HR outsourcers experienced limited skill development and an increased focus on cost reduction at the expense of their strategic position.

Subsequent chapters in this book provide a detailed analysis of big data, analytics, cloud computing, social media, and gamification in HR. You will also find a comprehensive account of the application of technology in different HR functions, followed by its strategic evaluation and implications for information security, privacy, and future directions. Thus, the book incorporates, integrates, and critically evaluates the key components of Digital HRM as defined above. We now turn our attention to further understanding the present digital avatar of the HRM function.

### **Emergence of Digital HRM**

With the ever increasing innovation in and adoption of digital technologies and tools, digital HR is waking up to the possibility of creative design thinking in HR services. Table 1.2 lists some of the latest digital tools being adopted by leading companies in the HR space.

Insert Table 1.2 about here

However, HR needs to go “beyond digitizing HR platforms to developing digital workplaces and digital workforces, and to deploying technology that changes how people work and the way they relate to each other at work” (Deloitte, 2017a, p. 7). Thus, the focus of digital HR should be on

- a digital workforce (that is agile and innovation-minded),
- a digital workplace (an environment characterised by learning organisation mindset), and
- an inclusive culture (that is future-focused, global, culturally sensitive, ethical and sustainable).

HR is responding to these changing environmental demands. According to a 2017 Deloitte Global Human Capital Trends survey (Deloitte, 2017a, p.87):

- Fifty-six percent of companies are redesigning their HR programs to leverage digital and mobile tools.
- Fifty-one percent of companies are currently in the process of redesigning their organizations for digital business models.
- Thirty-three percent of surveyed HR teams are using some form of artificial intelligence (AI) technology to deliver HR solutions, and 41 percent are actively building mobile apps to deliver HR services.

### Technology-enabled HR Roles

As explained before, for too long HR has been stuck in the industrial economy mentality and is yet to strategically align its role in the knowledge economy in a way that addresses the changing world of work and the needs and expectations of knowledge workers, both inside and outside organisational boundaries. Dave Ulrich's research on changing HR roles is highly regarded by HR scholars and practitioners for its breadth and depth. Let us briefly look at how he sees technology impacting the role of HRM.

Keeping in mind the strategic nature of HR in the new economy, Ulrich (1998) proposed four key roles of HR: Strategic business partner, administrative expert, employee champion and change agent. Explaining the role of 'administrative expert', Ulrich (1998) emphasised that "Within the HR function are dozens of processes that can be done better, faster, and cheaper. ... Improving efficiency will build HR's credibility, which, in turn, will open the door for it to become a partner in executing strategy". He gave the examples of shared services and centres of expertise to leverage technology. More recently, Ulrich et al. (2013) added the HR roles of 'Innovator & Integrator' (who builds integrated solutions with HR latest insights & practices that last in the long-run) and 'Technology proponent' (who differentiates between administrative & strategic work to improve efficiency & effectiveness).

In his latest work, Ulrich (2017, p.1-2) argues that "digitisation is shaping HR through four *phases*: Phase 1 is performing HR practices more efficiently (e.g., insourcing HR service centers through automation); Phase 2 is the onslaught of HR innovations in all HR practice areas (people, performance, communication, work); Phase 3 is accessing and using information to deliver business results; and Phase 4 is forging connections among people ... But the immediate challenge of managing the tsunami of HR digitalization is to sort out which of these many new ideas HR should invest in". He suggests five *criteria* for knowing which of these technology innovations deserve more attention (Ulrich, 2018):

- Focus outside-in (by connecting with external customers and investors)
- Build on previous practice and research (by relying on sound, time-tested principles and practices)
- Offer an integrated solution (that impacts and integrates many HR practice areas)
- Deliver on strategy and goals (by focusing on existing strategic agendas)

- Fit with values and culture (by not just buying a new app but forming a relationship with the creator of the app who will be a thought partner for future success).

See the Foreword by Dave Ulrich where he explains further on his latest work on digital HR.

### Technology-enabled HR Functions

In line with digital trends, organisations need to overhaul the key HR functions, including recruitment and selection, performance and reward management, career management and learning and development. It's not just about re-skilling but creating a genuine transformational change to people management architecture and eco-system, resulting in what Dehaze (2016, p. 39) calls '*Human Resources 4.0*'. In this new avatar, "burdensome top-down HR processes are giving way to bottom-up digitally assisted systems to help people help themselves, shifting the onus for managing development from the company to the individual" (Evans and Rodriguez-Montemayor, 2016, p. 70).

Below is an illustrative, but not exhaustive account, of some of the radical changes that are needed in the HR function to succeed in the digital world.

**Recruitment & Selection:** The fundamental role of HR is to find the right person for the right job at the right time. In the war for talent, every organisation aims for the best talent but what is best talent for one organisation need not be for another and as such, achieving the right *fit* between person, task, team and organisational culture is essential. This is where market intelligence, job analysis, competency mapping, cognitive tools, and digital technologies, such as social media and analytics play a crucial role in talent acquisition. To attract the best talent, the first step is to create a highly visible, compelling and enduring 'employer brand' using multi-media technologies across the intranet and internet. Third-party service providers, such as LinkedIn and job portals have become indispensable partners in spreading the recruitment net wide and far.

Gamification of recruitment tools is another innovation that is likely to appeal to millennials, the so-called digital natives. The next step is to design and develop a robust applicant tracking system (ATS) that creates well-defined and high quality business processes across the talent attraction spectrum. Leading high-technology firms, such as Google, have successfully harnessed the potential of analytics to design an optimum mix of talent acquisition and selection strategies. For example, Google did a 'study to find the optimal number of times a candidate should be interviewed' and after crunching the data settled on four rounds of interviews (Manjoo, 2013). Digital tools can dramatically reduce time and cost associated with talent acquisition and when strategically deployed, they can also improve the quality of hiring.

**Performance & Reward Management:** In recent times, companies are focusing more and more on providing continuous feedback rather than the traditional annual performance appraisal cycle, future-focused performance development over past-focused performance appraisal, improving if not abandoning the use of the forced distribution bell-curve, and bottom-up feedback process (Deloitte, 2017a, p. 7, 67-68). Balanced score card and multi-source (360-degree) performance assessment tools are being used more often. Thus, new

performance management methods are employee-centric and employee-driven. Some of the digital tools include mobile applications for teams to collaborate, set goals, update goals and track progress, productivity tools for continuous feedback and improvement, and big data tools for analytics. Analytics also help companies mine data to identify best suited performance metrics and measurement, especially for teams. However, digital technologies are yet to catch up with the renewed focus and change in direction of new performance management systems. It is still a work in progress. In this regard an 'agile management approach' is being increasingly followed by leading organisations (see Chapter 4).

**Learning & Development:** As outlined in the section on career management, today individuals are the chief executive officer (CEO) of their own career. They need to adopt a *self-leadership* approach and be pro-active in managing their own careers. Many leading companies, such as GE, have created learning platforms where employees themselves create and share content. However, it is the primary responsibility of organisations to show direction to their employees in terms of what skills and competencies are needed, valued and rewarded. Their role also includes role modelling, mentoring, coaching, providing on-the-job learning opportunities, and facilitating workforce socialisation. New digital tools provide opportunities to companies to offer "curated content, video and mobile learning solutions, micro-learning, and new ways to integrate and harness the exploding library of external MOOCs and video learning available on the Internet (Deloitte, 2017a, p. 31) to create a state of the art learning management system (LMS). While digital technologies can be effective tools in this regard, they cannot substitute for the human touch essential in shaping employee careers.

**Employee Engagement:** The motto of HCL Technologies, a premier information technology (IT) service provider from India is 'employee first, customer second'. While most organisations believe in customer-centric and shareholder-centric management, common sense and research evidence (e.g. Wright, Cropanzano, and Bonett, 2007) dictate that happy employees make happy customers who in turn make happy investors. Therefore, there is a compelling logic to the argument that employees should be the primary focus of the organisation. Firms like HCL aim for total employee engagement in order to harness employee potential and productivity. This can happen when there is optimal alignment between employee goals and organisational goals. Organisational culture plays a vital role in retaining talent. Trust, transparency, employee involvement, and empowerment are some of the vital prerequisites for a happy, motivated, engaged and productive workforce.

Today digital technologies, such as 'productivity and collaboration apps, engagement and feedback apps, performance management apps, well-being apps and employee service platforms', provide immense opportunities to engage employees and enhance the employee experience (Deloitte, 2017a, p. 56). HR can 'feel the pulse' of the workforce through digitised feedback tools, such as employee satisfaction and engagement surveys. Today people can work anywhere, anytime and make use of flexi-work options. Collaboration tools help better connect people across functional and geographic boundaries and thus, enhance workplace socialisation. Integrated employee self-service tools, such as performing administrative tasks, self-enrolment in training programs and cafeteria employee benefits

menu selection can streamline transactional tasks, provide more flexibility through self-selection, and offer routine HR services faster, cheaper, and better. Employee wellness and fitness apps can promote healthy living. Automated social recognition programs (such as employee of the month programs) promote non-financial rewards. Realising the importance of user involvement in HR design thinking, leading companies regularly conduct ‘hackathons’ inviting employee suggestions to offer programs that best meet their needs and expectations.

### Unintended Consequences of Technology

As can be seen below, the impact of technology has not been all positive.

- The digital world is dominated by two regions in the world, namely, the US West Coast and the East Coast of China, leading to digital divide and ‘tremendous spillover effects on wealth, value and power’ (Candelon, Reeves and Wu, 2017, p.2).
- The introduction of new technology has not really resulted in a noticeable increase in business productivity (Deloitte, 2017a, p.3).
- “Information overload and the always-connected 24/7 work environment are overwhelming workers, undermining productivity, and contributing to low employee engagement” (Schwartz et al., 2014, p. 1).
- “Ever-increasing gap between technological sophistication and the amount of work actually performed (is resulting in) income inequality, wage stagnation, and social and political unrest around the world” (Deloitte, 2017a, p.3).
- While technology is increasing at an exponential rate, human adaptability rises only at a slower, linear rate (Friedman, 2016) and this discrepancy is going to overpower people and fundamentally disrupt the world as we know it.
- According to Colbert, Yee and George (2016, p. 733), in a 24/7 digital world, we may not ‘find the opportunity for reflection that increases our self-awareness’ and in curating our social media profile, we may tend to aim for ‘an aspirational image rather than presenting an authentic self’. They further argue that these developments affect inter-personal relationships leading to ‘declining levels of empathy’ and blur the lines between work and non-work domains (p. 734).
- Employees who spend a lot of time writing and answering emails tend to experience higher levels of work overload (Barley, Meyerson and Grodal, 2011).

HR needs to be conscious of and proactively address these negative consequences. You will find some proposed solutions to address these in the rest of the book.

### Preview of what is Ahead

The book is structured around four parts, namely, e-HRM Approaches, Directions, Applications, and Problems and Prospects.

## **PART 1: KEY APPROACHES TO E-HRM**

- *Chapter 2 (Strategic Management Approach to Technology-enabled HRM)* highlights how an increasing number of organisations are recognising the importance of taking a strategic approach to managing HR. It argues that organizations that manage human resources by smartly leveraging technology can create an advantage that is difficult for competitors to imitate.

- *Chapter 3 (Soft Systems Thinking Approach to e-HRM Project Management)* highlights that majority of IT projects fail to finish on time, within budget and satisfy users, primarily due to lack of systems perspective and soft skills. It underscores the critical importance of systems thinking approach, systems development life cycle and quality management framework underpinned by people capability maturity model.

- *Chapter 4 (Agile Approach to e-HRM Project Management)* argues that in an uncertain business environment, agility is the key. This chapter introduces the philosophy and principles underpinning agile way of working and specifically highlights the critical role played by HR that befits the overarching agile philosophy.

## **Part 2: KEY DIRECTIONS IN E-HRM**

- *Chapter 5 (Big Data & e-HRM)* provides a critical perspective of big data, including the need for big data literacy. It introduces the tools to build knowledge from big data to lay the ground for a sense-making intersubjective communication of big data-based cognition, and to find an ethically sound approach to the use of big data in business.

- *Chapter 6 (HR Analytics)* critically examines HR analytics as a way of helping encourage evidence based decisions. It gives an overview of different analytics tools that can be used and then raises some challenges for the HR function that a focus on HR analytics may bring.

- *Chapter 7 (Cloud Computing & e-HRM)* provides an in-depth understanding of cloud technology in the form of various cloud-features along with different cloud deployment models. It explains how cloud technology can increase the efficiency and effectiveness of various HR functions and provides a critical review of its advantages and limitations.

- *Chapter 8 (Social Media & e-HRM)* outlines differences between personal and professional social media platforms, identifies challenges associated with the rapidly changing nature of social media, and describes social media user patterns. It also identifies legal and ethical considerations of using social media in HR.

- *Chapter 9 (Gamification & e-HRM)* introduces the concept of gamification, explores the operational and strategic perspectives on gamification and highlights the implications of gamification for HRM in general.

## **PART 3: E-HRM APPLICATIONS**

- *Chapter 10 (e-Talent Management)* focuses on specific talent management practices – talent acquisition, talent identification, talent development and talent retention – to highlight the



benefits and limitations associated with appropriating technology in strategic talent management.

- *Chapter 11 (e-Recruitment & Selection)* presents an overview of e-recruitment and selection practices and discuss the use of technology throughout the hiring process.

- *Chapter 12 (e-Performance & Reward Management)* explores the nature and role of technology in automating performance and reward functions. It considers the critical adoption factors, in terms of people, technology and organization and highlights the critical success factors.

- *Chapter 13 (e-Learning & Development)* addresses technology issues relating to and the advantages and disadvantages of important e-learning methods. Factors that impact the successful implementation of e-L&D systems in organisations are also discussed.

#### **PART 4: PROBLEMS & PROSPECTS**

- *Chapter 14 (Strategic Evaluation of e-HRM)* shows that not only do many firms fail in capitalising on the advantages of e-HRM, in some cases, e-HRM may also lead to negative and unintended outcomes. It outlines ways in which the strategic value of e-HRM can be assessed.

- *Chapter 15 (Information Security & Privacy)* provides an overview of the basics of information security and privacy concepts and frameworks. It highlights the major roles HR can play in designing, applying and monitoring appropriate controls throughout the employment cycle.

- *Chapter 16 (Future Directions of Electronic/Digital HRM)* draws the book to a logical conclusion by looking back and looking forward in terms of the evolution of HR function. It examines the latest empirical trends in HR technology and presents a strategic framework of Digital HR Strategy.

#### **Summary**

Despite the claims made by HR technology vendors, the evidence so far suggests that the adoption of technology in HRM has not really led to strategic outcomes (Marler and Fisher, 2013). While technology has certainly been able to increase the efficiencies of most transactional and some relational HR activities in terms of cost reduction and speed, organisations today are more concerned about effectiveness of these activities in terms of strategic outcomes. Further, as further explained in the next chapter, strategic HRM is primarily most focused on transformational HR activities, such as culture change and leadership development and here, technology has somewhat fallen short of expectations (Thite, 2013; Bondarouk, Parry and Furtmueller, 2017).

But as we will see in Chapter 3, technology is not the primary determinant of technical project management success. Instead, success is dependent upon organisational and social

factors and actors, such as systems thinking, agility, user involvement and acceptance, managerial competency, communication, governance, and stakeholder collaboration. Technology is only a tool and cannot fix broken processes and substitute managerial competence.

Today, disruptive digital technologies dominate the landscape and have already radically altered the way we work. It is too early to evaluate their effectiveness. The shape of the twenty-first century technology-intensive knowledge economy is still unclear. With lack of clarity on what is digital, what to do and how to do digital, “most companies are still in a ‘digital fog’ (and) most approaches are still in an exploratory phase” (Andersson et al., 2016, p.56). With the digital world taking over the business and millennials who are born digital natives set to take over the workplace, time will tell whether going digital is a boon or a bane.

## **Case Study: The Workforce of the Future - Employers' Evolving Relationship with Workers**

A Chief Human Resources Officer (CHRO) arrives at the office in a shiny town car, dropped off by a very polite Uber driver. The CHRO has returned from visiting corporate offices in three other countries where some work had been sent and where new business was developing. During the drive from the airport the driver shared with the CHRO that he's an Uber driver when he's not working as an independent contractor in technology for multiple companies.

The driver explained that he'd learned that there was a lot of project work available - he just uses his phone to log into the available virtual talent marketplaces to bid on jobs that interest him and that meet his pay, location, and schedule needs. He'd even done some work for the CHRO's company, and recently won a competition created by a software company to get the public to help it solve a tricky coding problem. While he didn't have health or other benefits, he proudly told the CHRO that he was making more money now than he had before being laid off in 2008 during the recession.

As the CHRO passes through the office lobby she notes that the security officer is not actually an employee of the company, although he's wearing the company logo, and that the custodian going by with a cleaning cart has another company logo on her shirt. The CHRO is met upstairs by one of two administrative assistants; her assistants job share, with each working part time, with a few hours of overlap for coordination of tasks. She sees that the hoteling office space is full; it's a seasonal business, and this is the season where extra employees are brought on board to help manage the workload. Now that many people are working from home there is space available in the building.

As she sits in her office, the CHRO reflected on what she had just seen over the past 30 minutes. Traditional long-term, full-time, paid employment is being supplanted by other, newer, more flexible options. Everyone was now talking about the "gig" economy. Companies didn't just have employees - they had people performing work in a variety of arrangements. These include part-time employment, temporary employment, independent contracting, franchisor-franchisee co-employment, and customers performing work that was formerly performed by employees.

The CHRO knows some of the factors that are driving this development: global economic competition, de-regulation, rapid technological change, entrepreneurship and demographic changes. But she realized that she wanted to know more.

She has come to you, her newest addition to the HR team, and asked you to prepare a white paper answering one of the following questions.

### **Case Study Questions**

- What are the implications of this "gig" economy for current and future regulation of the "employment" relationships, including such aspects as what constitutes an "employee", discrimination, wages and hours, labor relations, and health/safety?
- Considering all of the changes to the traditional long-term, full-time, paid employment relationship, what should be the role of the CHRO in leading and

advising other senior executives and the Board of Directors? What should she be doing?

Source: National Academy of Human Resources. Ram Charan HR Essay Contest, 2016.  
Reproduced with permission.

Note: The winning essays of this competition can be accessed at  
<http://www.nationalacademyhr.org/node/57>

## Debate: Should We Outsource Digital Talent?

### Introduction

With increasing globalisation and global competitiveness, organisations around the world are under constant pressure to produce “more with less”. They need to offer products and services that are faster, cheaper and better than competitors. With disruptive technologies almost destroying old industries and skills and in the process creating new industries, the human resource management practitioners are similarly under pressure to constantly upgrade the skill profile of their workforce to make it most up-to-date, competent, and cost-effective.

### Arguments in Favour

- Outsourcing is a management trend that became main stream in the 1980s as a result of competitive and cost pressures in a globalised business environment. The key rationale behind outsourcing is that one should stick to the knitting, meaning, one should focus on core competencies and outsource the rest to specialist providers who focus on offering various products and services.
- The main drivers for outsourcing are access to specialist expertise, greater process control, operating efficiencies or cost reduction, and risk reduction. Most importantly, for workforce management, it can be a key competitive enabler if planned and implemented strategically.
- Today, talent sourcing has become global with organisations scouting around the world for the best talent and at the most competitive price. One can see doctors, nurses, IT managers, software developers, engineers etc. being recruited from a global pool of talent. In fact, most of the Western hospitals, especially in rural and regional areas simply cannot function without the help of overseas professionals.
- An innovative economy demands state of the art skills that are rapidly changing. This is true particularly in STEM areas. With booming demand for but declining supply of STEM talent due to ageing population etc., emerging economies, such as India and China have emerged as key source countries for STEM talent.
- If done strategically and smartly, talent outsourcing can be a sustainable competitive advantage.

### Arguments Against

- There can be serious negative repercussions of outsourcing talent, such as long-term negative effects on costs, employee morale, and loss of organisational knowledge. If not managed strategically, costs can spiral out of control, employee morale can sink and precious organisational knowledge lost.
- Talent management is indeed a core competency for most high-technology organisations and therefore, they need to adopt a long term perspective on talent sourcing and make all out efforts, in collaboration with government and industry bodies, to develop local talent without unduly relying on outside talent. Otherwise, it may lead to a ‘contracting-out culture’.

- Outsourcing may not be an ideal solution for every industry, company and occupation and every time. For effective management of outsourcing one has to take small steps, learn from mistakes, ensure that outsourcing agreements are well thought out and not merely focus on short term cost reductions. Strategic partnering with key and reliable outsourcing partners is another important prerequisite which is easier said than done.

### Video Learning Resources

- What is 'Digital'? <https://www.youtube.com/watch?v=xsWbEckVqgI>
- 2017 Global Human Capital Trends: Rewriting the rules | Deloitte Insights: <https://www.youtube.com/watch?v=dvTGfw4wWoE>
- Digital HR: Using Digital Tools to Unlock HR's True Potential: <https://www.youtube.com/watch?v=RyZRtolpmmw>
- Digital Transformation Of HR: <https://www.youtube.com/watch?v=2qkTjWJ2C-Y>
- Burning questions – Should we outsource our workforce? <https://www.youtube.com/watch?v=Q3o4vp2OMKU&t=5s>

**Acknowledgements:** The author gratefully acknowledges Profs. Mark Lengnick-Hall and Cynthia Lengnick-Hall for their feedback on and suggestions for improvement of this chapter.

### References

- Australian Institute of Management (AIM) (2011). *Shared services in the public sector: A triumph of hope over experience?* Green Paper, September 2011, Australian Institute of Management, North Sydney.
- Andersson, L., Lanvin, B. and Van der Heyden, L. (2016). Digitalisation initiatives and corporate strategies: A few implications for talent. In B. Lanvin & P. Evans (Eds.) *The global competitiveness index 2017: Talent and technology*. INSEAD. PP. 51-57.
- Barley, S. R., Meyerson, D. E., and Grodal, S. (2011). Email as a source and symbol of stress. *Organisation Science*, 22: 887-906.
- Bondarouk, T., Parry, E. and Furtmueller, E. (2017). Electronic HRM: four decades of research on adoption and consequences. *International Journal of Human Resource Management*, 28(1): 98-131.
- Brent, A., Snow, C., Miles, R. (1996) Characteristics of managerial careers of the 21<sup>st</sup> century, *The Academy of Management Executive*, 10(4):17-27
- Candelon, F., Reeves, M. and Wu, D. (2017). The new digital world: Hegemony or harmony? Boston Consulting Group. 14 November 2017. [Online] <https://www.bcg.com/en-au/publications/2017/strategy-globalization-new-digital-world-hegemony-harmony.aspx> Accessed 24 January 2018.

- Cianni, M. and Wnuck, D. (1997) Individual growth and team enhancement: Moving toward a new model of career development, *The Academy of Management Executive*, 11(1):105-115
- Colbert, A., Yee, N. and George, G. (2016). The digital workforce and the workplace of the future. *Academy of Management Journal*, 59(3): 731-739.
- Craig, E., Thomas, R. J., Hou, C. & Mathur, S. (2012). Where will all the STEM talent come from? Research Report. Accenture Institute for High Performance. May, 2012
- Dehaze, A. (2016). The skills imperative: Shaping the future of work through talent and technology. In B. Lanvin & P. Evans (Eds.) *The global competitiveness index 2017: Talent and technology*. INSEAD. PP. 35-41.
- Deloitte (2017a). *Rewriting the rules for the digital age: 2017 Deloitte Global Human Capital Trends*. [Online]  
<https://www2.deloitte.com/content/dam/Deloitte/us/Documents/human-capital/hc-2017-global-human-capital-trends-us.pdf>
- Deloitte (2017b). *Global shared services. 2017 survey report*. [Online]  
<file:///C:/Users/s254357/Downloads/us-global-shared-services-report.pdf> Accessed 25 January 2018.
- Deloitte (2011). *Shared services handbook: Hit the road*. [Online]  
<https://www2.deloitte.com/content/dam/Deloitte/dk/Documents/finance/SSC-Handbook-%20Hit-the-Road.pdf> Accessed 25 January 2018.
- Evans, P. and Rodriguez-Montemayor, E. (2016). Are we prepared for the talent overhaul induced by technology? A GTCI research commentary. In B. Lanvin & P. Evans (Eds.) *The global competitiveness index 2017: Talent and technology*. INSEAD. PP. 67-83.
- Friedman, T. (2016). *Thank you for being late: An Optimist's Guide to Thriving in the Age of Accelerations*. Farrar, Straus & Gioux.
- Glaister, A. J. (2014). HR outsourcing: the impact on HR role, competency development and relationships, *Human Resource Management Journal*, 24(2), 211-226
- Gollub, U. (2016). How the future will look like. [Online]  
<https://www.linkedin.com/pulse/how-future-look-like-udo-gollub/> Accessed 28 January 2018.
- Gratton, L. (2011). Workplace 2025 – What will it look like? *Organizational Dynamics*, 40:246-254.
- Gunz, H. P., Jalland, R. M. & Evans, M. G. 1998. New strategy, wrong managers? What you need to know about career streams. *The Academy of Management Executive*, 12(2):21-37.
- Hall, D.T. (1996) Protean careers of the 21<sup>st</sup> century. *The Academy of Management Executive*, 10(4):8-16
- Handy, C. 1996. *Beyond Certainty*. Boston: Harvard Business School Press.
- Hendrickson, A. R. (2003). Human Resource Information Systems: Backbone Technology of Contemporary Human Resources; *Journal of Labor Research*, 24(3): 381-394.
- Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D. and Buckley, N. (2017). *Achieving digital maturity*. MIT Sloan Management Review and Deloitte University Press, July 2017. [Online] <http://www.technologypeople.com.au/wp-content/uploads/2017/09/Achieving-Digital-Maturity.pdf> Accessed 23 January, 2018.
- Lanvin, B. & Evans, P (Eds.) (2016). *The global competitiveness index 2017: Talent and technology*. INSEAD.
- Lanvin, B., Evans, P. & Rodriguez-Montemayor, E. (2016). Shifting gears: How to combine technology and talent to shape the future of work. In B. Lanvin & P. Evans (Eds.) *The global competitiveness index 2017: Talent and technology*. INSEAD. PP. 3-41.

- Manjoo, F. (2013). The happiness machine: How Google became such a great place to work. [Online] [http://www.slate.com/articles/technology/technology/2013/01/google\\_people\\_operations\\_the\\_secrets\\_of\\_the\\_world\\_s\\_most\\_scientific\\_human.html#!](http://www.slate.com/articles/technology/technology/2013/01/google_people_operations_the_secrets_of_the_world_s_most_scientific_human.html#!) Accessed 24 January 2018.
- Marler, J. H., & E. Parry. (2015). Human resource management, strategic involvement and e-HRM technology. *The International Journal of Human Resource Management*, 1–21.
- Marler, J., & Fisher, S. (2013). An evidence-based review of e-HRM and strategic human resource management. *Human Resource Management Review*, 23, 18–36.
- National Institute of Economic and Industry Research (Australia) & Australian Services Union & Finance Sector Union of Australia. (NIEIR) (2012). Off-shore and off work the future of Australia's service industries in a global economy: an update. Clifton Hill, Victoria: National Institute of Economic and Industry Research.
- Nieto-Rodriguez, A. (2014). Organisational ambidexterity. [Online]. <https://www.london.edu/faculty-and-research/lbsr/organisational-ambidexterity#.WmPaKK6WaHs> Accessed 21 January, 2018
- OECD (2015). OECD Skills Outlook 2015: Youth, Skills & Employability. Paris: OECD Publishing. [Online] <http://www.mecd.gob.es/dctm/inee/internacional/1-skillsoutlook2015.pdf?documentId=0901e72b81d77c93> Accessed 24 January 2018
- PriceWaterhouseCoopers (PWC). (2015). A smart move: Future-proofing Australia's workforce. [Online] <https://www.pwc.com.au/pdf/a-smart-move-pwc-stem-report-april-2015.pdf> Accessed 24 January 2018.
- PriceWaterhouseCoopers (PWC) (2010), 'Review of the Shared Services Model for Queensland Government'. PricewaterhouseCoopers, Brisbane, Australia. September, 2010. [Online] <http://www.hpw.qld.gov.au/SiteCollectionDocuments/SharedServicesReviewSep2010.pdf> Accessed 25 June 2018.
- Reichel, A. & Lazarova, M. (2013). The effects of outsourcing and devolvement on the strategic position of HR departments, *Human Resource Management*, 52(6), 923-946.
- Schwartz, J., Berkel, A., Hodson, T. & Otten, I. W. (2014). *The overwhelmed employee: Simplify the work environment*, Deloitte University Press, March 7, 2014, [Online] <https://dupress.deloitte.com/dup-us-en/focus/human-capital-trends/2014/hc-trends-2014-overwhelmed-employee.html?id=gx:el:dc:dup682:cons:awa:hct14> Accessed 19 January, 2018.
- Senge, P. M. (1990). *The Fifth Discipline*. London, UK: Random House.
- SHRM (2015). *Designing and managing a human resource information system*. [Online] <https://www.shrm.org/resourcesandtools/tools-and-samples/toolkits/pages/managingahumanresourceinformationsystem.aspx> Accessed 24 January, 2018.
- Stephen, M. (2016). Digital HR: Revolution, not evolution. In *Global Human Capital Trends 2016. The new organization: Different by design*. Deloitte University Press. [online] <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/HumanCapital/gx-dup-global-human-capital-trends-2016.pdf> Accessed 19 January, 2018.
- Templer, A. J. & Cawsey, T. F. 1999. Rethinking career development in an era of portfolio careers. *Career Development International*, 4(2)
- Thite, M. (2013). Problems and prospects of technology as an enabler of strategic HRM. *Journal of Human Resources Education*, 7(3/4): 22-30.
- Thite, M., Kavanagh, M. and Johnson, R. D. (2012). Evolution of human resource management and human resource information systems. In M.J. Kavanagh, M. Thite &



- R.D. Johnson (Eds.). *Human resource information Systems: Basics, applications and future directions*. PP. 2-34. Thousand Oaks, CA: Sage.
- Thite, M. (2004). *Managing people in the new economy*. New Delhi: Sage.
- Thite, M. (2001). Help us but help yourself: The paradox of contemporary career management. *Career Development International*, 6 (6): 312-317
- Thite, M. R. (2000) *Career management in the new economy: Surfing the turbulent waves of change*. Proceedings of the 2<sup>nd</sup> Annual Conference of the International Association of Insight and Action. Brisbane: School of Management, Griffith University.
- Thomas, R. J., Kass, A. and Davarzani, L. (2013). *How digital technologies are changing the way we work*. Accenture. Outlook, No. 3. [Online]  
[https://www.accenture.com/t00010101T000000Z\\_w\\_/au-en/acnmedia/Accenture/Conversion-Assets/Outlook/Documents/1/Accenture-Outlook-How-Digital-Technologies-Are-Changing-The-Way-We-Work.ashx#zoom=50](https://www.accenture.com/t00010101T000000Z_w_/au-en/acnmedia/Accenture/Conversion-Assets/Outlook/Documents/1/Accenture-Outlook-How-Digital-Technologies-Are-Changing-The-Way-We-Work.ashx#zoom=50) Accessed 28 January 2018.
- Ulrich, D. (2018). *5 things that will help you sort through endless HR technologies*. Melbourne: Australian HR Institute. [Online]  
<http://www.hrmonline.com.au/section/featured/5-help-sort-endless-hr-technologies/> Accessed 26 January 2018.
- Ulrich, D. (2017). *Do an HR technology audit to get the most out of digital HR*. [Online]  
<https://www.linkedin.com/pulse/do-hr-technology-audit-get-most-digital-dave-ulrich/> Accessed 25 January, 2018.
- Ulrich, D., Younger, J., Brockbank, W. & Ulrich, M.D. (2013). The state of the HR profession. *Human Resource Management*, 52(3), 457-471
- Ulrich, D. (1998). A new mandate for Human Resources. *Harvard Business Review*, 76(1), 124-135
- Whymark, K. & Ellis, S. 1999. Whose career is it anyway? Options for career management in flatter organization structures. *Career Development International*, 4 (2).
- WITSA (2016). The global skills gap and the changing nature of work and their impact on the digital age. World Information Technology and Services Alliance. December, 2016.
- Wright, T. A., Cropanzano, R. & Bonett, D. G. (2007). The moderating role of employee well being on the relationship between job satisfaction and job performance. *Journal of occupational health psychology*. 12(2): 93-104.
- Wright, P., McMahan, G., Snell, S. and Gerhart, B. (1998). *Strategic human resource management: Building human capital & organisational capacity*. Technical report, Ithaca, NY: Cornell University.

**Table 1.1: Competency Portfolio of Digital Workforce**

- Future-focused
- Out of the box critical and innovative thinking
- Digital fluency (Colbert, Yee and George, 2016, p.732)
- Strategic thinkers (see chapter 2)
- Systems-thinkers (see chapter 3)
- Agile (see chapter 4)
- Self-leadership
- Big data literate (see chapter 5)
- Analytical (see chapter 6)
- Social media-savvy (see chapter 8)
- Organizationally Ambidextrous (exploiting existing competencies while simultaneously exploring new opportunities; balance between alignment and adaptability, flexibility and efficiency, radical and incremental) (Nieto-Rodriguez, 2014)
- Inter-personal skills
- Communication skills, both in the virtual and real world
- Cross-cultural competency
- Emotional intelligence
- Multi-tasking
- Ability to work with multi-generational workforce
- Life-long learning
- Personal mastery (Senge, 1990)
- Team learning (Senge, 1990)

Source: Author

**Table 1.2: Examples of Digital Tools in HR Applications**

<b>Wade and Wendy</b>	This chatbot service, brings AI and chatbots to recruitment and career planning and helps candidates better understand career strategies and company culture
<b>Mya</b>	This Firstjob’s chatbot answers candidate questions during recruitment
<b>Switch</b>	This recruitment app gives Tinder-like experience for job search
<b>Know Your Worth</b>	This tool from Glassdoor provides compensation data for similar jobs by city, tenure, industry and company
<b>Checkpoint</b>	IBM’s new performance management tool with new feedback process
<b>CHIP</b>	Powered by IBM Watson, CHIP (Cognitive Human Interface Personality) handles a wide range of HR-related queries
<b>Embark</b>	‘Pre-boarding’ application developed by Royal Bank of Canada
<b>Brilliant U</b>	An online learning platform by GE offering employee-driven learning opportunities where content is created and shared by employees
<b>Recruiter Mobile</b>	Dedicated app by LinkedIn for mobile recruitment
<b>Gamified Recruitment Apps.</b>	- ‘America’s Army’: a recruitment-oriented game developed by US Army (see Chapter 9) - ‘The Candidate’: a recruitment campaign by Heineken (see Chapter 10)
<b>Crowdsourcing</b>	This is a cloud-based process of obtaining online information from a large set of people for completion of a particular project (see Chapter 7)
<b>Virtual HRs</b>	Enabled by ‘Expert Cloud’, V-HRs facilitate HR experts from around the world to collaborate to share knowledge, skills & expertise to quickly solve any business problem (see Chapter 7)
<b>DataRobot</b>	Automated machine-learning software program for HR data analysis (see Chapter 6)
<b>Social Index</b>	The company provides a digital footprint or online profiles for both candidates and recruiters (see Chapter 10)
<b>MOOCs</b>	Web-based Massive Open Online Courses through online learning platforms, such as Coursera and edX (see Chapter 13)
<b>Experience API or Tin Can API</b>	Learning technology that allows the tracking of e-learning activity (see Chapter 13)
<b>SuccessFactors</b>	Developed by SAP, it offers a complete, recruit-to-retire solution across all talent processes ((see Chapter 10)

Source: The top 8 entries are adapted from Deloitte (2017, p. 31, 90-91). Rest are drawn from different chapters in this book