

Les Cahiers du Digital

#3

The Human beyond Digitalization

Rethinking workspaces,
skills, and HR practices

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The aim of the *Les Cahiers du Digital* collection is to enrich the teaching provided at HEC Liège thanks to the contribution of experts who possess proven field knowledge on key topics related to digital transformation.

The handbooks are written in a clear and accessible style, in order to allow our students to correctly grasp the major challenges of digital transformation and to arouse their curiosity, so that they wish to explore the topic further, including through their theses.

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Numérique et capital humain

La vague digitale déferle et transforme tout au sein de nos entreprises : nos façons de collaborer, d'apprendre, de produire, de manager, etc. mais aussi nos manières de penser et de ressentir.

En effet, si l'intégration d'un nouvel outil provoque un changement, ce sont bien les hommes et les femmes qui se transforment dans ce qu'ils font et ce qu'ils sont.

Pour réussir sa transformation numérique et en saisir toutes les opportunités, il ne suffit donc pas d'investir dans un nouvel outil ou service digital. Il convient également d'investir dans celles et ceux qui en conditionnent la réussite et à les accompagner dans cette transformation.

Un pôle d'expertise RH

Pour aider les organisations à investir adéquatement dans leur capital humain, l'Agence a créé un pôle d'expertise spécialement dédié à cette thématique : le pôle « Développement humain et transformation des organisations ».

À travers 4 programmes pilotes, les experts de ce pôle invitent les chefs d'entreprise et les responsables des ressources humaines à se questionner et à développer une stratégie agile et responsable pour relever les principaux défis humains et organisationnels qui sous-tendent la transformation numérique.

L'humain au cœur de la transformation numérique

4 PROGRAMMES PILOTES

Leadership numérique

Objectif ? Mettre à disposition les outils et méthodes pour impulser et conduire la transformation numérique au sein de son entreprise. Plus de 200 entreprises ont déjà été sensibilisées au change management via des Workshops.

Découvrez »



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Objectif ? Travailler à l'appropriation des valeurs, des modes de travail et de l'outillage digital Workplace nécessaires au développement d'une culture numérique. Face à ces enjeux, une première cartographie a été créée pour aider les entreprises à sélectionner les outils adaptés à leurs besoins.

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Objectif ? Élaborer un processus de développement des compétences numériques et transversales qui répondent aux besoins des entreprises et à la pénurie de main d'œuvre. Quinze entreprises wallonnes de tailles et secteurs variés sont en cours d'accompagnement.

Découvrez »



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DigitalEES

Objectif ? Coconstruire une méthodologie d'accompagnement qui allie défis humains et technologiques. Une fois finalisée, cette méthodologie sera mise à disposition de l'ensemble des entreprises Wallonnes tous secteurs confondus.

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Introduction

Increasingly, companies from all kinds of sectors deploy digital technologies to organize their work processes and to support their work practices. The reliance of firms on digital technologies has notoriously been increasing due to the COVID-19 crisis, which has accelerated the extent to which individuals use new technologies in their daily (working) life, notably through the generalization of remote working practices in many contexts. Organizational transformations that embed new technologies is commonly referred to as “digitalization”. The issue with digitalization, however, is that it is often summoned as a generic and ambiguous term to designate a wide range of different realities. This is why, in this paper, we suggest exploring three aspects of digitalization within organizations (workspaces, skills, and HR practices).

The first chapter investigates “*New Ways of Working*” (NWoW), a label which is commonly used to designate projects through which organizations redesign their workspaces, while deploying new ICT tools and changing the managerial culture. Following the generalization of remote working, NWoW projects are expected to become increasingly commonplace¹. The section focusses on the change process that leads NWoW projects to be implemented in organizations. It also briefly explores some of the impacts of such projects, emphasizing the main issues that managers and employees face in these new forms of organization.

The second chapter focuses on the role of artificial intelligence (AI) in contemporary organizations, and notably addresses the impacts of AI on skills. Rather than considering the impacts of AI in terms of job creation or destruction, we chose to focus on tasks and the evolution of skills supposed by human-machine collaboration. We propose contrasted inputs from the literature and the results of an action-research project we conducted in a telco company.

The last chapter offers a perspective on the digitalization of the human resources management (HRM) function within organizations. It first gives a brief overview of its historical evolution. Then, trends regarding the use of the digital applications in two dimensions of human resources management are exposed. We then move to examining the main claims made by vendors and confronted them with empirical effects observed within enterprises by academics. In the last part of this chapter, we highlight key points for the operational implementation of e-HRM or HR analytics projects.

¹ Jemine, G., & Franssen, M. (2021). Anticiper l'après-crise du Covid-19. Rapport intermédiaire: Politiques et perceptions managériales du travail à distance contraint.

Designing and Implementing NWoW Projects

CHAPTER 1

Chapter 1 - Designing and Implementing NWoW Projects

We live in a world where projects of “*New Ways of Working*” have become increasingly commonplace. Building on the assumption that traditional bureaucracies have reached their limits, and that service businesses ought to rethink their workspaces, work processes, and management practices, proponents of the “*New Ways of Working*” argue that organizations have to undertake large-scale projects of modernization if they want to survive in an ever-competitive environment. These changes are commonly summarized under the popular triptych “*Bricks, Bytes, Behaviours*”, which indicates a joint preoccupation for workspace changes (*Bricks*) – including open spaces, flexible spaces, and activity-based working environments –, for new technologies (*Bytes*) – such as ICT tools to support remote working, paperless projects, and digitalization endeavours – and cultural and managerial changes (*Behaviours*) – which can cover a wide range of desired changes (e.g. workers’ empowerment, increased participation, autonomy, responsibility, or even democracy at work)².

Multiple public institutions and private organizations from various kinds of sectors (insurance, banking, media, federal services, transportation, etc.) have committed to such projects of “*New Ways of Working*” (commonly abbreviated “NWoW” or “NWW”). Due to their ambitious program and scope, and as they cover complex transformations (e.g. relocations or construction of new buildings, adoption of new technologies), NWoW projects often unfold over a period of several years. Moreover, a distinctive feature of NWoW projects is that they bring together many types of experts who have to work together, including project managers, architects, space designers, IT specialists and developers, consultants, HR professionals, ergonomists, coaches, and business representatives. A major challenge of any NWoW project thus resides in securing the collaboration between these groups of actors, in order to ensure that the project has a chance to succeed. Indeed, NWoW projects are far from being self-evident; they require purposeful action to be seamlessly integrated into the life of organizations.

While workspace reorganizations and managerial changes are often presented as being at the centre of *New Ways of Working*, it should never be forgotten that NWoW projects entail a digital transformation of the organization. Indeed, for a firm to properly operate according to the standards of NWoW – with limited working space, non-attributed offices, a high degree of mobility, and remote working practices – technological equipment has to be made available to managers and employees. This includes, *a minima*, laptops for all workers (without laptops, remote working and hot-desking is made incredibly difficult), but also smartphones, electronic document management, collaborative platforms, internal social networks, videoconferencing software, industry software suited to these new ways of organizing work, and HRIS/e-HRM solutions. The particularity of NWoW projects is that their underlying technological ambitions may be highly variable, ranging anywhere between providing the minimal requirements for the employees to be able to work remotely, to putting the digital transformation of the organization at the forefront.

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While workspace reorganizations and managerial changes are often presented as being at the centre of *New Ways of Working*, it should never be forgotten that NWoW projects entail a digital transformation of the organization.

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² De Kok, A., Koops, J., & Helms, R. (2014). *The new way of working: Bricks, bytes, and behavior*. Pacific Asia Conference on Information Systems 2014 Proceedings.

Just as any other innovation, NWoW do not suddenly appear in organizations: they require individuals to build a compelling problem for which NWoW is a convenient solution. While the reasons to commit to NWoW projects are very diverse, the rationale often builds around a mix of the following elements: infrastructures (e.g. reducing square meters, saving money on buildings), workforce (e.g. attracting and retaining talents, polishing the firm's image), technology (e.g. adopting new technological solutions, implementing remote working), mobility (e.g. reducing commuting) and management (e.g. rethinking governance, implementing new management practices).

The challenges of fostering NWoW projects

The abovementioned elements are the most frequent justifications that underlie NWoW projects; however, they need to be turned into a convincing story that calls for the organization to change. This, in turn, requires to build a business case to test the financial feasibility of the project, but also to guarantee the support and the alignment of the deciding instances of the organization.

Such a process requires considerable work to be conducted, notably in terms of persuasion – by demonstrating rationally the potential impacts of NWoW on the firm in terms of profitability, for instance – but also in terms of inspiration – by visiting other firms engaged in similar projects, for instance.

Legitimizing the project

A first challenge to initiate NWoW projects, then, is to turn them into *strategic* projects that are supported by the deciding instances of the firm.

Legitimizing NWoW: the case of a large insurance company³

A HR strategic advisor of a large insurance company explains how their working group convinced the executive committee of initiating an NWoW project.

“We had three lines of argument. One, this will be a project in which we save money. That was, in fact, the easiest part to demonstrate. Two, if we do that, the commitment and the motivation of our employees will rise. And three, as a consequence, their productivity will rise too. We had a lot of questions on those last two points, and it was not something that was easy for everyone in the executive committee to understand... Because it was at odds with the company's culture (...) Our CEO was not immediately convinced (...) He had a billion questions, ranging from strategic to pragmatic ones. And after six months, he finally said to the executive committee: now, we will not ask further efforts from the team, we have enough information, the real question is, do we believe in it, or not? He used the words: “this is an act of faith”. Then, the committee collectively took the decision to go on with the project.”

Designing for the future

NWoW are all about planning and designing a sustainable future for the organization by rethinking its physical spaces, technologies, and work processes simultaneously. Needless to say, designing

³ Excerpts from Jemine, G., Dubois, C., & Pichault, F. (2020). From a new workplace to a New Way of Working: legitimizing organizational change. *Qualitative Research in Organizations and Management*, 15(3), 257-278.

an NWoW project is a considerable challenge in terms of project management, at least for three reasons.

First, in the course of the process, the various actors involved will develop different conceptions of the change at hand, hence resulting into various sorts of *tensions*. Architects will prioritize the design of new spaces; HR professionals will emphasize the importance of working on employee's well-being and satisfaction; IT specialists will first and foremost consider the technological implications of the project. What should be prioritized, and how can we articulate all the concerns convincingly? Because NWoW involve large-scale projects that cover many organizational dimensions, ensuring that all the actors involved in the project conceptualize it in the same way is a difficult task.

Second, conducting an NWoW project requires juggling with different *temporalities*. Since NWoW projects unfold over a long period of time, securing decisions relative to the future of the organization may be quite daunting, as illustrated by the excerpt below. Finally, multiple unforeseen *twists* can radically alter the change process, modifying the project's objective or the very definition of NWoW itself.

Designing NWoW: planning for the future⁴

A project team working on an NWoW project in a media company disagrees on how the project should be organized.

Real Estate Manager: *There are still pending questions related to space allocation. Well, one of them is about the space dedicated to technical proximity rooms. The more square meters are dedicated to such rooms, the more expensive the project will be.*

IT Manager: *Listen. Today, no one knows anything about the technology we will use in five years. [...] Should we mutualize these proximity rooms or not, I do not know. [...] What I can tell you is, if we keep today's technologies [...] in the currently planned configuration for the new building, none of the studios you plan to have will operate properly.*

Architect: *When can we expect to solve the question of the proximity rooms, then? In five years? Because in two months, we have to initiate the tendering process, and we cannot postpone this deadline for no reason.*

As illustrated above, designing an NWoW project is no easy task, and requires considerable work of *arbitration* to build compromises between the actors involved. Understanding that such projects usually bring together organizational members with very different rationalities and objectives is crucial to successfully complete an NWoW project.

Playing with participation

NWoW projects often convey a managerial philosophy that emphasizes empowerment, autonomy, trust, responsibility, and democracy at work⁵. Taken seriously, these principles would logically call for participative management techniques to be adopted; and many firms committing to NWoW projects indeed seek to engage employees in the change process itself. In this scenario, several middle managers and employees are invited to join the project teams in the course of the design stage of

⁴ *Ibid.*

⁵ De Leede, J. (2017). *New Ways of Working practices: Antecedents and outcomes*. Emerald Group Publishing Limited.

the NWoW project, to give their opinion, voice their concern, and even have some degree of decisional power on how the project should take place.

Participative methods to change have been often praised in the scientific and managerial literature, and it is commonly believed that they could reduce resistance to change and facilitate the adoption of new spaces, technologies, and management practices. However, empirical cases of NWoW projects have demonstrated that this was not automatically the case. Rather, middle managers and employees make a strategic use of their participation, and try to negotiate outputs for the NWoW projects that support their own objectives. A crucial point in NWoW implementation, then, is to recall that each actor that is involved in the process can potentially twist the project to their advantage. The excerpt below illustrates how middle managers can manoeuvre around NWoW projects.



NWoW projects often convey a managerial philosophy that emphasizes empowerment, autonomy, trust, responsibility, and democracy at work.



Twisting NWoW : deviating from the project⁶

A local site has received funding from their headquarters to carry out an NWoW project, but the managers do not see the point of implementing flexible desking and twist the project to their advantage.

Site Manager: *“I am already receiving questions such as, why should I clean my desk every day when I know I will be there again the next day? To be honest, I find it difficult to find a convincing answer.”*

IT Manager: *“Well, clearly, there are also people who should always stay at the same place, such as the planning and management teams.”*

Site Manager: *“That is not really in line with the leading principles [from the headquarters]. We should be more elusive in the words we use.”*

Real Estate Manager: *“We could maybe speak of workstations of specific nature? I mean, for each person who we think should have a dedicated place...”*

Site Manager: *“I like the idea. Generally speaking, I think we should understand the basic intents of the leading principles, rather than strictly apply them. So, what I suggest to do, is that, between us, without showing it to anyone else, we put names on the plans, and we situate those workstations of [...] specific nature [...] so that we have a clearer view on who is going where?”*

This section has highlighted three crucial mechanisms that support the implementation of NWoW projects: legitimation, design, and participation. It is crucial to remember that NWoW projects take a long time before being implemented, and that the change process leading to NWoW implementation is made of many challenges. NWoW projects are far from being self-evident: they require *legitimizing*

⁶ Excerpts from Jemine, G., Dubois, C., & Pichault, F. (2020b). When the Gallic Village strikes back: the politics behind “New Ways of Working” projects. *Journal of Change Management*, 20(2), 146-170.

efforts aimed at convincing, rallying, and enrolling managers and employees in the change process. *Designing NWoW* means to arbitrate between the tensions, temporalities, and twists that can occur. Finally, participative approaches to change that are commonly associated with NWoW projects offer opportunities to organizational actors to twist the project and impact its outcomes.

Dealing with the impacts

Space uses and misuses



NWoW projects first and foremost imply brand new working environments that rely on open spaces, non-attributed workstations, new technologies, and a high degree of diversity in space planning.

As it has been said before, NWoW projects first and foremost imply brand new working environments that rely on open spaces, non-attributed workstations, new technologies, and a high degree of diversity in space planning. NWoW workspaces typically entail various types of work zones – areas of concentration, areas for collaboration, creative spaces, small “bubbles”, various kinds of meeting rooms, or “touchdown offices”. Research has shown that, despite the change process that leads to the implementation of NWoW workspaces, several types of deviant behaviours are commonly observed. HR practitioners and proximity managers should pay particular attention to how these behaviours impact the morale of their teams.

A first, well-documented misuse of NWoW workspaces might be labelled *colonization*. As the workspace is not simply a functional space, but also a symbolic space, workers have a spontaneous tendency to seek to appropriate specific workstations, even if the formal rules of the new workspaces usually stipulate that all workstations belong to everyone. While NWoW workspaces are supposedly devoid of any territorial markings, many managers and employees try to recreate boundaries over time.

A second misuse of NWoW workspaces lies in its *stratification*. While NWoW offices are supposedly devoid of any hierarchical signification – all members of the organization, regardless of their position, collectively share the same workstations – empirical observation reveals that many managers

recreate visible symbols of status, notably by systematically occupy a given desk, until this desk is largely and tacitly recognized as being “their” desk.

Finally, NWoW workspaces are also characterized by a certain degree of *inertia*. While the promoters of NWoW vividly emphasize a high degree of mobility in the workspace, notably by entertaining the idea of the employee working “anywhere”, practice shows that most workers prefer to stick to one or two workstations at most. These actual uses and/or misuses of space contrast with the optimistic discourses of NWoW promoters, and show that the new workspaces will inevitably become a source of contestation, tensions, and negotiations, in which HRs and line managers have a crucial role to play.

Managerial control

Managing a team of employees in an NWoW environment raises various challenges. Indeed, teams can be dispersed all over the workspace and some employees may work remotely at all times, making traditional management control methods (e.g. visual monitoring) inefficient. Moreover, NWoW projects may entail a fair share of symbolic violence towards line managers, who are deprived of their own office (and, hence, of their visible symbols of prestige and status), who have no say on the new work environment (they cannot, for instance, decide to allocate a specific desk to a worker in particular, nor to prevent their employees from working remotely). In the meantime, and somewhat paradoxically, line managers are often depicted as the organizational actors to play a crucial role in the success of NWoW projects.

Exerting control over a team in an NWoW environment is no easy task. Studies have shown that the traditional way of controlling employees, visual monitoring, has been replaced by a combination of three nascent control methods. The first is *objective-based* control: by setting realistic objectives for each employee and/or for the whole team, a manager can periodically ascertain whether the results have been attained or not (most often weekly). In this perspective, how employees work on a daily basis has few importance, as long as they manage to reach the assigned objective

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NWoW workspaces rely on a panel of control mechanisms including objective-based control by the manager, self-control by the employee, and peer-control by direct colleagues.



While NWoW offices are supposedly devoid of any hierarchical signification, empirical observation reveals that many managers recreate visible symbols of status.

in the end. Second, NWoW workspaces go hand in hand with the surge of *self-control* practices. Studies report that employees feel more pressured and more responsible in the management of their own workload in these environments; as direct and visual control disappears, they compensate by taking it upon themselves. This phenomenon can lead to harmful consequences, including overwork, lower levels of satisfaction at work, and working compulsively (“workaholism”). Finally, NWoW workspaces also rely on *peer-control* to function properly. If an employee is not performing as (s)he should, for

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instance by not picking up the phone or not working at home, their colleagues will soon understand the situation and will take action to correct the situation. At the end of the day, NWoW workspaces rely on a panel of control mechanisms including objective-based control by the manager, self-control by the employee, and peer-control by direct colleagues.

Conclusion

New Ways of Working are popular modernization projects in contemporary firms that are enabled by digital evolutions of the workspace. However, the implications of NWoW-like projects usually outreach purely technical matters, as these projects raise several change management and managerial challenges. NWoW projects are never self-evident in organizations; instead, they require purposeful attempts of legitimization to become accepted by all members of a firm. Ensuring that all people concur on the objectives to reach is a difficult task. Moreover, it should be expected that organizational actors will not conform to the prescribed uses of the space that have been formulated through rules and regulations: rather, they will deviate from it, seek to re-colonize territories, to recreate symbols of power, and to downplay mobility. Finally, NWoW projects also involve new control methods in the workplace, including objective-based control, self-control, and peer-control, which generates new forms of pressure on employees.

The Impact of Digitalization on Tasks and Skills: A Focus on AI

CHAPTER 2

Chapter 2 - The Impact of Digitalization on Tasks and Skills: A Focus on AI

The impacts of AI on employment

Many scientists address the issue of the impacts of artificial intelligence on employment. Considering the latter in a global way (the job as a whole), they present various deterministic hypotheses, sometimes alarmist, on the number of jobs that AI will lead to disappear or, on the contrary, to appear. The percentages exposed are broken down according to the sectors of activity and their representation in various regions of the world, leading to socio-economic projections for the coming decades and highlighting the risks for certain categories of workers who are more vulnerable (less trained, working in sectors likely to be highly automated or partially or totally taken over by artificial intelligence).

Based on data collected by the OECD, PricewaterhouseCoopers considers the potential impacts of AI and RPA (Robotic Process Automation) in 29 countries⁷. They identify variations according to 12 sectors of activity, from the most threatened in terms of job losses (for example, transport and logistics, manufacturing industry, which would lose nearly 50% to 60% of jobs) to the most spared (such as the human health and social work sector or the education sector, which would lose between 10 and 20% respectively). Frey and Osborne's famous study⁸ takes a similar approach to the U.S. labour market, looking at more than 700 types of jobs. According to their estimates, 47% of jobs in the US are at risk. In addition to most transport and logistics workers, most administrative and clerical support functions and the workforce in production activities would be most at risk from automation or from being taken over (partially or totally) by AI.

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Most administrative and clerical support functions and the workforce in production activities would be most at risk from automation or from being taken over (partially or totally) by AI.

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In addition, a substantial share of employment in service occupations, which have grown strongly in recent decades, is also likely to be subject to automation, as indicated by the recent growth of the market for service robots and the declining comparative advantage of human labor in tasks involving mobility and dexterity. Thus, the more the jobs under consideration involve the performance of tasks with a high degree of routine or simple handling (i.e. repetitive manual tasks), the more likely they are to be automated (machine operators, assemblers, administrative jobs). On the other hand, the sectors less likely to be subject to automation imply spending a higher proportion of working time on social and educational tasks, as well as a higher level of education.

In a longitudinal and macro-economic perspective, Autor comes to the same conclusion of a polarization of the labor market under the effect of automation, artificial intelligence and RPA⁹. Its results

⁷ PricewaterhouseCoopers (2018). Will robots really steal our jobs? An international analysis of the potential long term impact of automation.

⁸ Frey, C. B., & Osborne, M. A. (2013). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change*, 114, 254–280. <https://doi.org/10.1016/j.techfore.2016.08.019>

⁹ Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives*, 29(3), 3–30. <https://doi.org/10.1257/jep.29.3.3>



The sectors less likely to be subject to automation imply spending a higher proportion of working time on social and educational tasks.

lead to a plea for the mobilization of machines to replace human beings for repetitive and non-value-added tasks, enriching the tasks of the human person in what is unique and irreplaceable in terms of qualities and skills: flexibility, judgment, common sense, problem solving and creativity. Whether pessimistic or optimistic, predicting massive job destructions or creation of jobs; or concerned with the distributional aspect within the jobs affected, the fear of the replacement of the worker by the machine is brought back to the forefront with AI¹⁰.

AI's impacts on tasks

Some authors¹¹ argue, however, that the impacts of AI and RPA should not only be considered in terms of job creation or destruction, but also in terms of the different tasks that make up jobs. In this way, the hypotheses of global job evolution, stated in the form of positive (creation) or negative (destruction) percentages depending on the sector or country, is replaced by an analysis of the transformation of jobs.

This transformation can be more or less profound depending on the number of tasks that would be handled by AI and RPA, either autonomously or in collaboration with the human being. While routine tasks, whether manual (e.g. simple, repetitive, easily automatable manipulations) or cognitive (requiring basic digital literacy, such as encoding, sorting, filtering data) are “naturally” the first tasks that come to mind when we think of a substitution of man by machine, they are no longer the only ones in this respect. The automation of non-routine tasks can also be considered for manual tasks such as machine troubleshooting, maintenance, and robotic tasks in semiconductor environments. The same applies to non-routine cognitive tasks¹². The table below summarizes the impacts of AI on tasks.

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While routine tasks, whether manual or cognitive are “naturally” the first tasks that come to mind when we think of a substitution of man by machine, they are no longer the only ones in this respect.

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10 See Boyd, R., & Holton, R. J. (2018). Technology, innovation, employment and power: Does robotics and artificial intelligence really mean social transformation? *Journal of Sociology*, 54(3), 331–345.

11 For instance Autor, D. H., Levy, F., & Murnane, R. J. (2003). The Skill Content of Recent Technological Change: An Empirical Exploration. *Quarterly Journal of Economics*, 118(4), 1279–1333.

12 *Op cit.*

	Routine tasks	Non-routine tasks
Manual tasks	Simple, repetitive, easily automated operations	Machine troubleshooting, maintenance, robotic tasks in semi-controlled environments
Cognitive tasks	Encoding, sorting processing, data filtration. Tasks requiring basic literacy	Monitoring/detection of anomalies (definition of “standard” parameters and detection of deviation from them) User interfaces (“question/answer” model according to recurring and evolving scripts) Decision making (advice, optimization of choices, debugging)

Summary of Impact of AI on Tasks (from Frey & Osborne, 2013)

AI's impacts on skills

An approach to the impacts of AI through a task analysis thus leads to focus on the skills needed to carry them out, and on the more or less easily replaceable nature of some of them. We propose to consider three different kinds of skills: soft skills, digital skills and professional skills.

What we call soft skills can be described as intangible skills which are hard to measure and are closely connected with attitudes. Let us cite some of those various skills which are often mentioned under different labels in the literature. Social and interpersonal skills such as communication, negotiation, social and emotional intelligence, assertiveness, moral qualities such as integrity, empathy, fairness or skills such as creativity and innovation, critical thinking, human experience or common sense.

Regarding digital skills, a reference framework (the European framework for the Digital Competence) proposed by the European Commission structures digital knowledge into five main areas: information and data literacy, communication and collaboration through the machine, digital content creation, safety and problem solving. However, some authors classify some of these skills as soft skills or professional skills, depending on the level at which they are understood¹³. In order to avoid an overlap between categories of skills, we opt for a strict acceptance of the concept of digital skills. We limit it to the set of technological skills directly linked to AI (such as robotic process automation [RPA], big data or Python), to data science (such as the use of databases or data analysis) and to the mastering of digital technologies or environments (such as WordPress, Java, COBOL, or Android, IOS, etc.).

We call professional skills all the expertise, know-how and specific knowledge related to a particular field required to exercise one occupation. The concept of professional skills is related to the notion of domain knowledge, that is, the realm of knowledge that individuals have about a particular field

13 Payne, J. (2000). The unbearable lightness of skill: The changing meaning of skill in UK policy discourses and some implications for education and training. *Journal of Education Policy*, 15(3), 353–369. <https://doi.org/10.1080/02680930050030473>

of study. Professional skills can be transversal and embodied by mastering job specificities (such as the “problem solving” or “project management” skills) or else fall within the very field of the jobs (such as “training needs analysis” for HR jobs for example). They refer to the effective implementation of relevant actions by an individual located in a given context (sector, occupation).

Considering the evolution of skills in human-machine collaboration, some authors¹⁴ emphasize the rise of soft skills, in particular creativity, collaboration, empathy, and judgment skills, especially in management. Similarly, Ojanperä *et al.* also note from the literature the importance of developing skills such as problem-solving, critical thinking, adaptability or even socio-emotional abilities¹⁵.

In 2016, the World Economic Forum published a study¹⁶ on the skills that will be required in the digital age, which include critical thinking, creativity and innovation, as well as communication and collaboration. In addition, the authors stress the crucial nature of certain personality traits which one could qualify as “typically human” such as curiosity, empathy, adaptability, persistence, social and cultural awareness and emotional agility.

The assumption is, therefore, that soft skills are not only irreplaceable, but *a fortiori* the most crucial skills to maintain.



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In the literature, Autor’s study¹⁷ led to a plea for the replacement of human beings by machines for repetitive tasks without added value, making it possible to enrich their tasks by mean of what is unique and irreplaceable in terms of qualities and skills, such as soft skills. Shestakofsky also states that “*many tasks requiring flexibility, situational adaptability, creativity, judgement, intuition, spoken language, interpersonal interaction and persuasion are unlikely to be fully automated anytime soon*”¹⁸.

Other authors¹⁹ insist on the necessary development of digital skills, in order to adapt the workforce to the challenges raised by the rise of the AI in a number of sectors and jobs. Digital skills such as data analysis, data selection or data security appear as more and more relevant for all employees of an organization. Berger and Frey (2016) also show at the OECD level that the emergence of new jobs related to digital technologies drive skills demand and a more rapid skill-upgrading in the computer-

14 Kolbjørnsrud, V., Amico, R., & J. Thomas, R. (2016). How artificial intelligence will redefine management. *Harvard Business Review*. <https://hbr.org/2016/11/how-artificial-intelligence-will-redefine-management>

15 Ojanperä, S., O’Clery, N., & Graham, M. (2018). Data science, artificial intelligence and the futures of work. <https://doi.org/10.5281/zenodo.1475162>

16 World Economic Forum. (2016). The Future of jobs: Employment, skills and workforce strategy for the fourth industrial revolution. <https://doi.org/10.1177/1946756712473437>

17 *Op. cit.*

18 Shestakofsky, B. (2017, p. 382). Working algorithms: Software automation and the future of work. *Work and Occupations*, 44(4), 376–423. <https://doi.org/10.1177/0730888417726119>

19 Chen, H., Chiang, R. H. L., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. *MIS Quarterly: Management Information Systems*, 36(4), 1165–1188. <https://doi.org/10.2307/41703503>

intensive industries towards high-level technical skills such as programming, for instance²⁰. Stress is also placed on the development of digital skills within the New Skills Agenda for Europe²¹.

The debate on the evolution of skills within human-machine collaboration seems to focus mainly on soft skills, presented as irreplaceable and crucial, and on the necessary development of digital skills in order to meet the challenge of automation.

Contrasting results from the field

The results of our action-research project commissioned by a telco company show contrasting trends that deviate from this literature.

First of all, starting from the hypothesis of a close interweaving of the technology and the social context in which it evolves, we were led to pay attention to the contextual factors that can influence the adoption of AI and the strategic choices that will result from it. For the company we analysed, it appears that these influences are materialised in the following choices: firstly, as things stand, the projects developed seem to be mainly concerned with process automation, with AI applications being for the most part at the stage of studying use cases. Secondly, AI applications are primarily envisaged for process optimisation, rather than disruption. Thirdly, AI and RPA applications are envisaged to handle repetitive and low value-added tasks, as a decision support tool and as a support tool for complex tasks. Lastly, this technology is presented as “suffered” rather than being appropriated by employees for certain jobs (customer relations in particular).

According to the actors interviewed, the increasing implementation of AI in the company would not lead to the massive appearance of new jobs or the massive destruction of existing jobs, but would be more noticeable in the development of new skills and the transformation of existing jobs. The debate on the evolution of jobs linked to AI is therefore essentially about their transformation. These changes are more or less profound depending on the number of tasks that would be taken over by AI and RPA, either autonomously or in collaboration with human beings. These results then lead us to consider the skills needed to successfully carry out the evolution of these tasks.

Overall, the integrated analysis of the different approaches carried out in this research leads to three major lessons regarding the evolution of skills:

- the questioning of the primacy of ‘soft’ skills
- the need to strengthen business skills in the interaction with machines
- the essential acquisition of a basic digital culture.

The analysis of the empirical data highlights above all the preponderant character of professional skills: they underline their necessary evolution in the perspective of an increased collaboration of humans with AI, as well as to deal with complex situations. Field expertise is also pointed out as essential to support the design of processes and provide business feedback on technical aspects. A fortiori, professional expertise is central to the AI training (or education) process, but must be accompanied by new skills for interacting with the machine and identifying biases and errors.

20 Berger, T., & Frey, C. B. (2016). Structural transformation in the OECD: Digitalisation, deindustrialisation and the future of work. In *OECD Social, Employment and Migration Working Papers* (Issue 193). <https://doi.org/10.1787/5jlr068802f7-en> OECD

21 Carretero, S., Vuorikari, R., & Punie, Y. (2017). DigComp 2.1: The digital competence framework for citizens with eight proficiency levels and examples of use. In *Publications Office of the European Union*. <https://doi.org/10.2760/38842>.

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Digital skills are bound to become widespread in all or almost all professions, with a view to achieving a basic digital culture, covering the understanding of how tools work, their developments and their limits, or even the minimum knowledge of a technological language.

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The importance of soft skills is certainly recognised, insofar as these skills are considered irreplaceable. However, several actors we met denounced a certain overstatement of their importance, both in the literature and in the perception of concrete developments in the workplace. The attention given to skills such as creativity or innovation tends to conceal the increasing formalisation of processes and the strengthening of procedures and standardisation. This allows us to put forward the hypothesis of a differentiated evolution of competences in the AI era.

Conclusion

The aim of this chapter was to present the state of the art and the results of empirical data collection and analysis aimed at documenting and anticipating skills evolutions with artificial intelligence. These results were elaborated in the context of an action-research project commissioned by a telco company. They carry, in our opinion, valuable lessons on various aspects. First, our results bring back to the centre of the debate the relevance of professional skills, a topic that had been pushed over the last years into the background in favour of the importance of digital skills and the irreplaceability of soft skills. These results show that the respective weight of the three types of skills in human/machine interactions does not always appear in the same order depending on the job category considered. The organizational strategic choices and the types of human/machine interactions that are therefore favoured influence the relevance of the different types of skills. Therefore, as a manager, it is important to keep these elements in mind in order to anticipate the evolution of the jobs and skills required within your company.

Finally, this chapter allows to discuss the topic of skills development with the implementation of new technologies, according to the strategic choices made by each company which favour certain types of human/machine interactions. This approach highlights the interest of considering the context of technology integration and of considering the strategic choices made by each organization. This focus on organizational choices thus provides a complementary view to macro approaches supported by major quantitative surveys, by highlighting intra-organizational differences. The related findings can serve as a basis for drawing up a company's HR strategy in terms of reskilling, upskilling and anticipating the skills profiles sought. From there on, various actions can be carried out such as the targeted recruitment of specific profiles, the development of staff skills through training and/or retraining actions, the development of diversified career paths, etc.

Digitalization of the HR Function

CHAPTER 3

Chapter 3 - Digitalization of the HR Function

Digitalization has been taking over the business world and the human resources management is no exception to this trend. The amount of digital solutions available to HR managers has been growing exponentially over the last decades; a tendency further boosted by the COVID-19 pandemic, which particularly disrupted internal communication, training and onboarding practices²². When did it start? What are the digital solutions being currently developed? What are the main claims made by vendors and what actual effects can be observed in companies? What is at stake when digitalising HR practices? We will take a look at these questions throughout this chapter.

A historical perspective

The first step towards the digitalization of the HR function originates in the 80s in what is called the Human Resources Information System (HRIS). HRIS are used for automating HR data processing thus saving HR professionals from managing data manually or by juggling between spreadsheets.

In the 90s, HRIS capacity and scope extended beyond simple automation of HR data to reach automation of services for employees and managers, which can in turn use this system for HR-related questions such as updating their information or participating in personnel assessment procedures. The term e-HRM became increasingly used to characterize HR practices supported by digital technologies, which target both HR staff as well as employees and managers.

As e-HRM systems can be distilled in any HR practices the organization wishes to automate, it therefore has the ability to produce enormous, if not endless amount of HR data that can be gathered, analysed and measured. Consequently, over the past few years, HR analytics and artificial intelligence have been emerging as 'must have capabilities' for the HR profession as a way of dealing with these stocks of data. The goals are to provide added value for the organization by establishing business impact and enabling data-driven decision-making.

Which data can be used for HR analytics and AI?

Common data sources in HR includes, for example, internal data like demographic employee information, skills and competencies, formal education qualifications, payroll data, hours worked, performance measured through sales made, hours billed to clients or appraisal, training followed, staff attitude surveys, etc. It also includes external data such as labour market data, demographic data population, social network communications, etc. It is worth noting that not only HR data can be used for HR analytics. Any type of data that might be relevant for the specific project aimed can be used.

²² Gemine, J., & Franssen, M. (2021). *Anticiper l'après-crise du Covid-19. Rapport intermédiaire : politiques et perceptions managériales du travail à distance contraint*. <http://hdl.handle.net/2268/262459>

Digital trends in HRM

Numerous HR practices have been digitalised through different digital technologies. Let us have a look at trends regarding the use of the digital applications in two key dimensions of human resources management policies: recruitment and selection, for which most of the digital solutions have been developed; and training.

Recruitment / selection



Robotic process automation (RPA), which is the automation of a business process via software is used to automate the recruitment process.

In recruitment, digital trends include digital professional and social network platforms (such as LinkedIn and Facebook) which started in the mid-to-late 2000s and are now mature. They provide additional and consolidated digital channels where firms can post their job opportunities and collect information on job candidates. Robotic process automation (RPA), which is the automation of a business process via software is used to automate the recruitment process. For example, RPA tools can allow an automated sorting of CVs. These tools are generally englobed in larger software applications called Applicant Tracking Systems (ATS), which organize and make searchable information about job seekers, job postings and job applications. Others aspects of the recruitment process can be mentioned such as the digital check of administrative documents (diplomas, training certifications, work certificate) with blockchain in order to counter forged documents.

Electronic selection systems are becoming increasingly popular, such as digitized interviews or the use of mobile device for assessments. Asynchronous video interviews analysis via AI is finding its audience amongst the selection techniques of organizations with the use of software such as HireVue or Pymetrics or Affectiva. Based on the characteristics (breathing, eye movements, tone of voice, vocabulary used, ...) found in previous candidates considered to be the best, the system's algorithm propose to the HR professional a pre-selection of candidates likely to perform well, even before they take a look at the videos. Artificial intelligence can also be used in screening software such as automated skills systems. These systems are designed to leverage a skills taxonomy to

accurately detect skills in human capital data such as resume and job ads and are used to better match candidates to jobs. Such applications are often parts of larger automated hiring systems, which combine AI and machine learning to speed up every part of the hiring process, from CV review to onboarding.

Training

With regard to training actions that companies can put in place, e-HRM systems provide flexible platforms for employees to follow training and development needs. In the last decade, digitalization has also encouraged the emergence of new trends in e-learning initiatives. Firstly, the use of virtual reality (100% virtual sessions) or mixed reality (a combination of virtual and physical sessions) for applications related to vocational training and awareness raising. These training sessions can also be embodied in serious gaming²³ principles. Secondly, the development of HR analytics systems based on algorithms. They are used to make personalised recommendations to employees about actions they may take and training they may want to follow.



The use of virtual reality or mixed reality for applications related to vocational training and awareness raising.

Digital tools in training – Illustrative examples

The company Bouygues Construction has created a safety awareness module for worksites. Employees are immersed in a 100% virtual worksite and relive accidents that have already occurred in the past. The aim is to bring about a lasting change in behavior on working sites²⁴.

In an offshore drilling company, HR analytics were used to demonstrate the significant benefits the business derived from the company's graduate training program. As a result, the program doubled in size²⁵.

The company IBM uses algorithms to advise employees on what training make sense for them to take, based on the experiences of similar employees²⁶.

²³ Applications based on gameplay principles, which purposes are not solely to entertain people but to promote learning and behaviour change.

²⁴ Baudoin, E., Diard, C., Benabid, M., & Cherif, K. (2019). *Transformation digitale de la fonction RH* (Dunod (ed.)).

²⁵ Rasmussen, T., & Ulrich, D. (2015). Learning from practice: How HR analytics avoids being a management fad. <https://doi.org/10.1016/j.orgdyn.2015.05.008>

²⁶ Tambe, P., Cappelli, P., & Yakubovich, V. (2019). Artificial intelligence in human resources management: Challenges and A path forward. <https://doi.org/10.1177/0008125619867910>

Claims and evidences

Ever since organizations have started to digitalize their HR practices, various promises about software's results have been made to HR practitioners. We classify these promises in three broad categories: efficiency, effectiveness, and services improvement. The fundamental assumption hidden behind relates to an improvement of the overall performance of the organization. There is, however, a need to distinguish claims made by vendors and empirical effects observed within enterprises, the latter being generally more nuanced than what has been guaranteed.

Efficiency

First, the ideas defended are that part of the HR work could be accomplished by reducing costs engaged or at a faster pace, most often by a combination of these two options. The hidden suggestion behind often relates to the realization of more HR work with fewer personnel. Second, these ideas relate to the automation of time consuming and repetitive administrative tasks, such as the setting up of the onboarding process of a new employee (creation of an email box, security clearance, parking pass, expense account, etc.).

Academics have led two consequent literature reviews²⁷ synthesizing the conclusions of years of empirical research on the matter of cost savings with the digitalization of the HR function. Both reviews conclude that serious disagreements exist among researchers regarding the actual cost-saving effects of the digitalization processes. Tension remains between those who can provide numerical data for cost savings due to e-HRM and others who do not find support for such argument.

Regarding the administrative burden, a couple of studies²⁸ found efficiency gains with e-HRM in the form of a decrease in administrative burden for HR staff. However, this decrease can sometimes be compensated by an increase of the administrative burden of employees and line managers²⁹.

Effectiveness

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Algorithm results bluntly expose the choices of their designers and, along with it, pre-existing biases whether embedded in a flawed code or most frequently in the training data.

Regarding HR effectiveness, vendors claim that AI powered software would eliminate or mitigate biases in skills management or recruitment processes, therefore improving the quality of these processes. It is also argued that the matching that results from those applications will offer greater satisfaction for both parties (employees or candidates, and companies).

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In the last couple of years, the misconception of algorithmic objectivity in recruiting has been debunked, most notably through the example of an Amazon recruitment tool. In 2018, its development had to be scrapped after it showed bias

27 Bondarouk, T., Parry, E., & Furtmueller, E. (2017). Electronic HRM: four decades of research on adoption and consequences. <https://doi.org/10.1080/09585192.2016.1245672>

28 Ruël, H., Bondarouk, T., Looise, J., & Kees, J. (2004). E-HRM: Innovation or irritation. An explorative empirical study in five large companies on Web-based HRM. <http://hdl.handle.net/10419/78883>

Reddick, C. G. (2009). Human resources information systems in Texas city governments: Scope and perception of its effectiveness. <https://doi.org/10.1177/009102600903800402>

29 Martin, G., & Reddington, M. (2010). Theorizing the links between e-HR and strategic HRM: a model, case illustration and reflections. <https://doi.org/10.1080/09585192.2010.500483>

against women. Because the training dataset was mostly composed of men's curriculum vitae, the AI assumed being a man was an asset in being recruited and systematically decreased women's CV value. As it turns out, algorithm results bluntly expose the choices of their designers and, along with it, pre-existing biases whether embedded in a flawed code or most frequently in the training data.

On the matter of adequate matching between an employee and the company, we argue that candidates develop adaptive techniques that seek not to sell their work potential, but to best adapt and correspond to the more or less opaque criteria used by the algorithms to determine future top performers. In other words, applicants are looking to maximize their worthiness in front of the algorithm's eye. For example, an increasing number of universities now offer guides to HireVue interviews. The same adaptive techniques regarding automated screening systems were discussed during a large study we led on the impact of artificial intelligence on a telco company. As one HR professional put it, "*candidates adjust their C.V. to the automated sorting techniques. For example, they will add in white colour high demand skills so that they are read by the machine, but invisible to the naked eye. Or they will write their résumé using the language elements favoured by the company. It is a new form of techniques for being hired*".

Services improvement

Corollary of the time savings sought in terms of efficiency, professional literature often underline that the digitalization of the HR function will help HR professional focus on higher added-value tasks. Freed from routine tasks, HR professional will be able to focus on more complex, more specific cases, or unanticipated exception. Services improvement also refer to the abolishment of physical barriers and space made possible by e-HRM.

Over the years, several studies³⁰ have asserted that HR professionals progressively focus more on strategic and value added activities. However, contradictory statements exist as other practitioners³¹ opine that, rather than freeing up time for HR practitioners, the adoption of e-HRM in practice led to the replacement of administrative duties with technology-related ones.

The abolishment of physical barrier sought through digitized video interviews is counterbalanced by the audio and video disruptions that influence interview pace and rhythm. Interviewers have to repeat or rephrase the question. The conversational approach normally used in a face-to-face interview leaves place to semi-structured questions. Because of signal distortions created by technology, recruiters



Because of signal distortions created by technology, recruiters are less able to use their expertise to judge whether the candidate is suitable for the position or not.

30 Reddick, C. G. (2009). Human resources information systems in Texas city governments: Scope and perception of its effectiveness. <https://doi.org/10.1177/009102600903800402>

Parry, E. (2011). An examination of e-HRM as a means to increase the value of the HR function. <https://doi.org/10.1080/09585192.2011.556791>

Lievens, F., De Corte, W., & Politieacademie, L. W. (2015). Understanding the building blocks of selection procedures: Effects of response fidelity on performance and validity. <https://doi.org/10.1177/0149206312463941>

31 Gardner, S. D., Lepak, D. P., & Bartol, K. M. (2003). Virtual HR: The impact of information technology on the human resource professional. [https://doi.org/10.1016/S0001-8791\(03\)00039-3](https://doi.org/10.1016/S0001-8791(03)00039-3)

are less able to use their expertise to judge whether the candidate is suitable for the position or not. This situation increases the risk that suitable candidates might be rejected because of a perceived performance diminished by the video-quality, a bias that does not seem to go away even when recruiters are aware of it.

Where to go now? A critical yet practical approach

Now, let us highlight points that we believe are particularly relevant to the implementation of e-HRM or HR analytics projects. These points are not meant to be envisaged separately nor should they be seen as *one best way* practices to be followed blindly. They are connected pieces of change management and project management plans for digitalization of the HR function, which have to be adapted to the context by taking into account the strengths as well as the constraints specific to each company.

Understand the underlying paradigms

It is essential to understand that choices in terms of HR software are not neutral in terms of paradigms and views about what should be valued within an organization. They reflect specific concepts of ideology, politics and power. For example, the very question of what constitutes a “good employee” (and therefore which variables are measured) can be subjected to large debate.

How can modelling and algorithm-based approaches to people management drive down job quality and damage performance? An example from the retail sector

All large retailers use workforce planning software to plan optimum staffing levels in their stores. Such software typically assumes labour is a cost to be minimised (Ton, 2009). Widespread adoption of this software has typically led retailers to reduce staffing levels, as stores with higher labour costs are portrayed by the modelling as damaging profitability. However, the assumption that labour was a cost to be controlled fails to take into account that the quality of labour input has a bearing on performance outcomes. Reducing staffing costs by employing fewer people can also drive down the quality of labour input as workers are spread more thinly, thus do not have the time to ensure that displays are organised attractively, stock is kept moving onto shelves or that customers received help when requested³².

This understanding should primarily be applied to the apprehension of the funding paradigm of the algorithm-based approach mostly used today in A.I., that is problem solving via probabilities. The probabilistic approach to problems give you an estimation of the correspondence between the case you are confronted with and the previous cases the analysis is based on. One aspect of this method is its guarantee of always providing an answer to the question, a critical principle that is often neglected. Consider the following situation: a machine-learning algorithm has to estimate, between five persons it is presented with, which one is the most likely perpetrator of a crime that has been committed. The algorithm will provide an answer to that question. It will designate one of the persons as holding the highest probability of having committed the crime. Nevertheless, should the real offender not be among the five persons, you would still end up with a wrong answer.

³² Angrave, D., Charlwood, A., Kirkpatrick, I., Lawrence, M., & Stuart, M. (2016). HR and analytics: why HR is set to fail the big data challenge. <https://doi.org/10.1111/1748-8583.12090>

Do not neglect legal and ethical issues

Legal and ethics issues concern both the storing and the analyzing of HR data. Applying data science analyses to decisions about people can create serious conflicts with what society typically sees as important for making consequential decisions about individuals. Rich sources of data can easily encode characteristics that are illegal to use in the hiring process. The AI black box problem, i.e. the fact that we cannot analyze and explain how and with which variables most AI-tools reach their conclusions is one of the biggest hurdles users face today. There is currently a lack of regulation regarding those matters. Additional transparency from vendors about their practices are crucial to further the understanding of these systems. Nevertheless, properties that are not yet encompassed under anti-discrimination laws can still pose some serious questions when used by automated systems. Facial analysis techniques and inference of emotions from facial expressions suffer from disparities in error rates across gender, racial and cultural lines³³.

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The AI black box problem, i.e. the fact that we cannot analyze and explain how and with which variables most AI-tools reach their conclusions is one of the biggest hurdles users face today.

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Define project objectives grounded in the field

Projects should have clear objectives, and digital HR projects are no exception to this rule. Specifically regarding HR projects, the definition of objectives can help in different ways. First of all, e-HRM goal clarity has a significant impact on attitudes towards using e-HRM. Second, it often happens that enterprises develop different RH projects simultaneously. The definition of key objectives can sustain the integration of those different projects in a portfolio of digital HR projects that makes sense for the company and for its current strategy. Third, it can temper the phenomenon of mimetic isomorphism.

What is mimetic isomorphism?

Broadly defined, mimetic isomorphism refers to the modelling of a company's practices based on other companies' practices, under the assumption that what works well for another company will work just as well in theirs. Mimetic isomorphism is often encountered when goals are ambiguous, when organizational technologies are poorly understood or in uncertainty contexts³⁴.



33 Buolamwini, J., & Gebru, T. (2018). Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification. <https://doi.org/10.2147/OTT.S126905>
 Feldman Barrett, L., Adolphs, R., Marsella, S., Martinez, A. M., & Pollak, S. D. (2019). Emotional expressions reconsidered: Challenges to inferring emotion from human facial movements. <https://doi.org/10.1177/1529100619832930>

34 DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Isomorphism in organizational fields' article in *advances in strategic management*. <https://doi.org/10.2307/2095101>

In the case of HR projects, mimetic isomorphism is often driven by aggressive sales campaigns from the large IT companies and consultancies. Having built an expensive piece of software as a solution to some companies' HR problems, they re-imagine this problem as a general problem facing all corporations and try to force the widespread adoption of the software onto them. Defining objectives will force heads of companies to specify to what specific needs the solution envisaged does respond. These needs expressed at the field level must be gathered and collected. By analyzing current processes and establishing how the applications might transform them according to the objectives one sets, they will be better equipped to distinguish management fad from well-fitted solutions.

Assess data structure and availability

Several questions regarding data have to be addressed when implementing e-HRM or HR analytics projects. First, one ought to start by analyzing which type of data they already possess and what uses they make of it within their actual HRIS. We strongly advise to start by making better use of this data to create and capture value before moving to more advanced form of big data analysis. This also includes considering the question of data legacy, i.e. when essential enterprise information is stored in an old or obsolete format or computer system that needs to be upgraded before moving on with any type of data analytics.

Second, e-HRM and/or HR analytics projects also pose questions in terms of data integration. Companies have a long tradition of holding HR data in separate pieces of software which each carry out different HR processes. Digital tools are dispersed, unintegrated and unconnected, and internal political battles over control over data are frequent. The management of these databases is a fundamental challenge in analyzing HR practices and outcomes. Information has to be extracted, converted to a common format and joined together before analysis can be performed. Moreover, upgraded HRIS held in cloud-based data warehouses gathering data can be seen as a response to this challenge. Data sharing has to be viewed as a priority in the short run, and data standardization and platform integration as priorities in the long run.

The standardization of data in a multinational company – An illustration

This interview excerpt is extracted from one of our own action research project related to A.I. and jobs, during which we benchmarked the practices of several telecommunications companies regarding A.I. and the use of data. The interviewee, a Data & A.I. ambassador provide a concrete example of how data standardization issues can be framed.

“Across our Group, every country has its own big data platform. But if one platform of one country reaches a conclusion based on its analysis, it is valid across the Group because all platforms comply with certain standards. For example, at what point do you consider that a customer using prepaid card has left you? Is it after one month, three months, or six months? The customers are not required to tell the company that they are not using their services anymore. They just stop topping up their prepaid SIM cards. But the determination of this criteria (when do you consider that the client has left us?) inside the Group can have a huge impact on analytics. And this time frame is harmonized throughout the Group.”

Third lies the issue of the amount of data needed. Small data are a concern for the validity of machine learning's predictive outcomes, especially for HR analytics. Here lies a fundamental tension. With the Software as a Service (SaaS) distribution model, IT vendors have the ability to combine data from many employers to generate their algorithms, as data are imported and treated

onto the vendor's platform. However, as this platform is common and shared across clients, the adaptation to the organizational and social realities of the different users are difficult. This statement is confirmed by the analysis of the pre-assessments tools available. By trying to provide general pre-built assessments, these tools do not adapt well to the organizational, social and applicants' characteristics that can vary across geographical locations, hence biasing the outcomes away from the client's specific needs.

Consider the necessary skills

Skills anticipation with digital transformation is a key question to which we dedicated chapter two of this handbook. This question is just as relevant for HR professionals as it is for any other operational function.

The HR managers who responded to the European Digital Skills Survey declared that basic digital skills were essential in achieving their job tasks, but that advanced and specialist digital skills were not important at all. This statement is questioned by several authors who underline that new cognitive and statistical skills are necessary to understand the results and processes of AI algorithms used in HR. As of today, HR practitioners often lacks the skills, knowledge and insight to ask the right questions of the HR data they have at their disposal.

Regarding professional skills, we highlight two tendencies. First, the increasing connection of HR with marketing. With the development of social media, HR professionals find themselves in the need of possessing more and more communication and online marketing skills, including target oriented marketing strategies. Second, a deformation of long-possessed professional skills with the use of digital applications and more particularly with the use of AI-based applications, because of the new paradigm it involves, as exposed earlier.

Involve users and create multidisciplinary teams

Several studies looked at the potential of users' involvement in designing and training AI to bring their professional expertise through participatory design. Most of the studies dedicated to the implication of users' jobs into the design and training of AI applications is linked to the possession of professional skills. Using human knowledge is extremely helpful to design, train and understand AI. As explained earlier in this chapter, robust training datasets are crucial very early in the process to ensure that the results obtained are not biased, skewed or faulty. These issues have much more to do with selecting the adequate features than with technical solutions or sophistication of the algorithm models. The much-publicized Amazon example illustrates that it was not technical strength that lacked the company, but an expertise in the domain in which the algorithm operated.

Later on, human workers can be asked by the machine whether the results it comes to are right or wrong; or whether the answer a chatbox provides are appropriate or not to the question that was asked. Thus, interacting with users throughout the process can help establishing an AI system

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Interacting with users throughout the process can help establishing an AI system efficiently. Involving users in the development and implementation of the applications gives them voice to raise concerns, offer suggestions and ask questions, which can enhance users' adoption of technological innovations.

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efficiently. Involving users in the development and implementation of the applications gives them voice to raise concerns, offer suggestions and ask questions, which can enhance users' adoption of technological innovations. These recommendations can also apply to socio-technical innovations that would be considered as "more basics", such as tablets. These points of view lead to more porous borders regarding tasks which are therefore not systematically devoted to data processing jobs.

Invest in training

Several concrete points regarding the otherwise already largely debated aspect of training can be highlighted. In particular, we encourage readers to establish a differentiated training policy based on an analysis of expected developments as recommended in the second chapter of this paper.

Scarce training can enhance collaboration between users who have to use the digital devices, but in return affects in a negative way its adoption. Similarly to giving users a certain degree of influence over the development and the implementation of technology, that training can enhance the use of digital devices of e-HRM applications. Keep also in mind that the amount of information to be given should be distributed among enough training sessions.

On the matter of digitized video interviews, specific training in conducting video-interviews can moderate the signal distortion induced by the technological equipment, hence underlying the importance of training for professional skills. However, the common mistake made by organizations is to believe that experience and interviewing skills used in face-to-face interviews can directly be translated into a digital context, without adequate training for digitized interviews.



The common mistake made by organizations is to believe that experience and interviewing skills used in face-to-face interviews can directly be translated into a digital context.

Conclusion

This chapter has intended to give a synthetic overview of the digitalization of the HR function. With a historical start around the 80s, this process has since expanded to reach automation of services not only for HR staff, but also for employees and managers. In the latest years, focus has been put on data analytics and AI.

Digitalization of the HR function is implemented in companies in a wide variety of ways and aspects. After having taken a glance at what is at stake in the recruitment/selection and training dimensions of human resources in terms of applications, we moved on to comparing claims and evidences about empirical effects of such applications. As it turns out, most academic researches are more cautious with what can be expected from such pieces of software. Finally, we proceeded with a critical yet practical approach to implementing e-HRM or HR analytics projects. We highlighted key points we think are particularly relevant to such ambitions.

As it can be deduced from the density of information given, digitalization of the HR function regroups a large array of intertwined subtopics. Readers interested in deepening their understanding of the subject should start by investigating the articles of Angrave *et al.* (2016) and Tambe *et al.* (2019)³⁵

35 Angrave, D., Charlwood, A., Kirkpatrick, I., Lawrence, M., & Stuart, M. (2016). HR and analytics: why HR is set to fail the big data challenge. <https://doi.org/10.1111/1748-8583.12090>

The Human at the Core of Digitalization

This *Cahier du Digital* explores three aspects of digitalization within organizations, namely workspaces, skills and HR practices. Each in their own way, they demonstrate that the implementation of technologies must not be taken for granted but rather designed by taking into account a variety of other dimensions. These dimensions include the underlying paradigms of the technologies, the implications of organizational members with different rationalities, the skills that will be modified and the training it requires, the availability of data as well as the strategic objectives pursued.

Such considerations constitute sharp reminders of the fact that technology cannot and should not be separated from users. It is made by and for individuals whom, at all level of the organizations, possess the abilities to interpret the technologies affordances and constraints. They are at the forefront of seeing and experimenting the evolutions of their jobs related to digitalization.

The nature of technological innovations is both structuring and malleable. Technological potential will continuously resonate with socio-organizational structures. This can be illustrated by the high dependence of technological trajectories with the strategical interpretations of actors. Digitalization is not a self-standing project. To implement it is to consider the dynamic interactions between people and organizations and the technologies they use. As Callon, Lhomme and Fleury³⁶ put it, “*there is no adoption without adaptation*”.

36 Callon, M, Lhomme, R., & Fleury, J. (1999). Pour une sociologie de la traduction en innovation. <https://doi.org/10.3406/refor.1999.1574>

The Human beyond Digitalization

Les Cahiers du Digital - N°3

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