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INNOVATIVE HRM DESIGNERS: THE DESIGN REGIMES OF HUMAN RESOURCE MANAGEMENT IN FRENCH INDUSTRIAL HISTORY

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INTRODUCTION

The topic of Strategic Human Resource Management (SHRM)'s impact on a firm's innovativeness (or its contribution to innovation, as it is often phrased) has been an ongoing subject of academic debate for the past 2 decades, for both the HRM and the innovation management communities. Indeed, if the purpose of SHRM is to allow "*the choice, alignment, and integration of an organization's HRM system so that its human capital resources most effectively contribute to strategic business objectives.*" (Kaufman, 2015, p.404), then it becomes quickly relevant to understand in what ways the HRM systems contribute to a firm's innovative activities. This type of questioning has produced several works on topics such as 1) how specific HRM strategies, practices or tools directly or indirectly affect a firm's capability to innovate, through its workforce, whether it be employees, managers, or professionals from other support functions; 2) whether the HRM function, characterized by its actors, themselves innovate, to provide the firm with new strategies, practices or tools; 3) how HRM professionals help the firm to respond to external innovations that disrupt its organization and threaten its core activity.

It is not coincidental that the same period has been characterized by a profound shift in the context in which firms, particularly large industrial ones, have been operating. Today, the disruptive effects of exogenous breakthrough innovations are no longer an isolated or ephemeral phenomenon: digital transformation, for instance, has become a reality for most industries, creating observable impacts across all sectors of activity, as well as the functions that drive them. This context of intensive innovation, which imposes an acceleration of the pace and intensity of innovation (Christensen, Raynor & Anthony, 2003; Hatchuel et al., 2010; Midler, 2002; Phelps, 2013), implies being able to establish an ambidextrous approach to the firm's activities and steer continuous exploration activities (March, 1991) to renew "dynamic capabilities" simultaneously (Teece, 2007).

This current context impacts the entire organization of firms, thereby generating important repercussions on their employees. As a result, Human Resources Departments today are faced with problems that call into question the sustainability of their operations and, by extension, of the firms they support: the actors of HRM find themselves having to deal with new challenges, such as accompanying and/or preventing the accelerated mutation of strategic skills, managing the loss or appearance of knowledge and expertise, as well as recruiting or implementing training programs in the face of unknown futures, or assessing the value of the work of exploring innovative project teams (Wright, Nyberg & Ployhart, 2018). At the SHRM level, this brings both practitioners and researchers to wonder how to ensure an alignment between the firm's goals and its available human resources if its strategies keep changing in real time and their employees' competences (sometimes even highly specialized ones) are being made less relevant by exogenous innovations. Yet, this new context is far from being the first transformative episode to challenge HRM systems and practices: on the contrary, the HR function has a rich history of evolution and diversification when it comes to its mechanisms.

The present paper is built on the theory that HRM actors have long been unrecognized designer collectives, who have regularly mobilized their resources and organized creative processes to introduce new managerial solutions, in the form of innovative processes, structures and tools. To test this theory, a longitudinal qualitative study was performed, using the conceptual framework on design regimes to identify collective design phenomena within the evolution of the HRM function throughout industrial French history. The main source of historical data was obtained from Jean Fombonne's seminal work "*Personnel & HRM: the affirmation of the Personnel function in [industrial] firms (France, 1830-1990)*"¹. The article starts by presenting a review of the literature on HRM contributions to a firm's innovative activities and highlights the enduring absence of a framework to describe the "design activity" expected from SHRM actors. Subsequently, the research question will be presented, and the following longitudinal study will rely on the conceptual framework of design regimes to analyze the historical evolution of the HRM function in French industrial firms. This approach will aim to confirm the hypothesis that HRM actors have historically demonstrated collective design activities that mirror those of industrial engineers, albeit in a less formal way. The core managerial implication of this work is that HRM actors can build on this history of informal design activity to institutionalize HRM design practices and empower SHRM actors to create better dynamic alignments in intensely innovative situations.

LITERATURE REVIEW

The complexities of defining HRM

From an academic point of view, the concept of HRM is polysemous (Haslinda, 2009), which may be seen as desirable by those who would like to avoid compartmentalizing the discipline (Wang & McLean, 2007), but which also leads to numerous debates on what constitutes this concept and how to appropriately name it. We also note the growing emergence of new terminology, such as People Management, which seems to indicate the need for a new definition, one which offers "a wider, more contextual, more multi-layered approach founded on the long-term needs of all relevant stakeholders" (Beer, Boselie & Brewster, 2015). Given the multiplicity of definitions and forms that the HRM function can take, it is not surprising to observe, depending on the case, varying levels of visibility or the scope of activities in different Human Resources Departments. The difficulty in defining the concept of HRM is potentially not recent and could even be a characteristic of this activity. However, in today's context of intensive innovation, this lack of consensus can complicate any exercise that seeks to rethink HRM mechanisms to develop the right management tools and processes, for the purpose of supporting a collective group's innovation capabilities (O'Connor, 2008; Hooge, Dalmaso & Garcias, 2018; Hooge, 2020).

The fragmentation along research communities

While the implications of intensive innovation for HRM, as a corporate function, are regularly addressed in the field of innovation management sciences, the existing literature generally focuses more on broader issues: one part of the academic work aims to define the dynamics of professions (expertise, work or collective dynamics) (Garcias, Dalmaso & Sardas, 2015; Dalmaso & Sardas, 2018), while the other focuses on identifying skills perceived as innovative (creativity, feedback, agile method, etc.), that need to be acquired by employees and fall under the HRM subfield of Human Resources Development (HRD) (Arouna-Hardouin, 2017).

¹ « Personnel et DRH : l'affirmation de la fonction Personnel dans les entreprises (France, 1830-1990) – Translation from the authors.

For the more limited works that focus specifically on HRM contribution to innovation, they usually fall under either traditional HRM research or Innovation Management and, unsurprisingly, they tend to exhibit different understandings of the situations observed. There seems to be a tendency, on the side of innovation research to view HRM issues as “*fragmented and instrumental approach*” where HRM practices are presented as a toolkit that supports innovation at two levels: at the organizational level and at the level of specific innovation stages. On the other side, there seems to be a tendency for HRM research to consider innovation as a rather static phenomenon, thereby not taking into consideration the dynamic and changing processes inherent to innovative activities (de Leede & Looise, 2005). This is made evident in certain cases of collaboration between HRM practitioners and Innovation actors (such as IT implementation teams) seem to speak two different languages and fail to create an efficient collaboration to bring a project to fruition (Bondarouk & Looise, 2005). If there have already been several attempts to bridge the gap between these two traditions and offer an integrated model of innovation & HRM (de Leede & Looise, 2005; Looise, Huijgen & Fisscher, 2005), they have mostly confirmed the notion that HRM strategies and practices are intrinsically linked when it comes to contributing to innovative activities.

The multiplicity of expectations handed down to HRM

In many articles, there is often the idea, mainly in the results and conclusions, that HRM actors are expected to change or come up with solutions to be more relevant to innovation actors. This can take many forms such as 1) building the firm’s identity to ensure employee membership (Schoemaker, 2003), 2) creating new common languages with technical fields like IT, and support them in the implementation of innovative tools by creating user centered approaches to learning and skill development (Bondarouk & Looise, 2005), 3) ensuring the firm’s functional flexibility through HRM job design practices, while also controlling the employee perception of High Commitment HRM, as it will positively impact Innovative Work Behavior. (Dorenbosch, Engen & Verhagen, 2005), or 4) creating frameworks to manage the creation, flow and implementation of new knowledge at an organizational level (Shipton et al., 2005).

The diversity of expectations and how HRM can act upon them is summarized in a recent systematic literature review on the intersection of HRM and innovation, (Koster, 2019) which highlights three main lines of research on this issue: innovative HRM (instances the function which is able to innovate in its own mechanisms), the impact of innovation on HRM systems (more specifically the impact of technology on HR processes), and an innovation HRM (instances in which the HR contributes to the innovation of the firm). However, Koster also points out that these axes seem to have developed relatively separately, leaving room for work that would combine “*several subthemes identified here to conceptualize organizations that are radical innovators in the field of HRM. Such a conceptualization would, for example, consist of organizations developing innovative HR policies and practices as a response to innovations in their external environment to reach high levels of organizational innovativeness. Such a full integration of the three research approaches reviewed in this article is not available in the literature yet.*” (ibid, p101).

The ongoing ambiguity of design activity in HRM

Yet, what is consistently lacking in the literature is a focus on how HRM actors are supposed to create, develop, introduce all these new processes, practices, and tools, as is expected of them. Indeed, while it seems clear that HRM systems must act to support innovative activities, particularly in intensive innovation contexts, existing works on situations of HR innovation, (where HR actors create and implement something new) seems to be mostly focused on the

creativity of the individual actors. And yet, the term “design” is so often used by many if not all of the authors previously cited: whether it be “job design”, “designing frameworks for the flow of knowledge”, the biggest expectation seems to be that HRM actors are expected to resort to a structured process of creative action that can provide tailored solutions to the needs of innovative activities within a firm.

This is where existing design theories, enriched by new analytical approaches to work, seem to offer promising opportunities to bridge existing limits and new paths of exploration. Beyond a few practical cases that have sought to apply innovation methods (such as the Design Thinking method) to design user-centered HR tools, or public-private cocreation experiments around innovative HR procedures (Folcher, Bationo-Tillon & Duvenci-Langa, 2017; Cappelli & Tavis, 2018), it appears that this type of approach, linking Design Theory and work analysis, has not yet been applied to the issue of HRM in the context of intensive innovation.

RESEARCH QUESTIONS

The existing research on HRM an innovation has brought us to wonder exactly how HRM actors design new HR practices and mechanisms, for the purpose of helping the firm maintain or pursue innovative activities that have a strategic value. The main questions we wish to address in this article are: are there historical cases of design by HRM actors? If so, where does individual instances of inventive activity or collective design endeavors? From that point on, it is also relevant to ask what kinds of objects (in HR practices, processes, tools, etc.) were being designed? Finally, were there different approaches to such design activities and can they be categorized?

METHODOLOGY AND MATERIALS

In order to provide answers to our research questions, we sought historical data that would permit a longitudinal yet explorative research to detect and identify key phenomena of change (Pettigrew, 1990). The initial focus was on international HRM cases, but the scope was sharpened to focus on historical data regarding the evolution of French industrial firms that shed a light on the emergence and development of the HRM function (or Personnel function as it was known through most of its history).

There are two sets of historical, secondhand data. The first one centers exclusively on the works of Jean Fombonne, a historian of the Personnel function in France, from 1830 to 1990. His seminal research work from “*Personnel et DRH*” (Personnel & HR Management) (2001), provided dozens of study cases and hundreds of testimonies and artifacts on the evolution of the HRM function within key industrial actors of the French economy. Furthermore, additional data was collected from his article from 1963 “*Où en est la formation dans l’entreprise?*” (Where are we with training within the firm?), published in the French journal of *Sociology du Travail* (Labor sociology). The second set of data is also composed of two research articles, that provide more study cases of innovative HRM practices in two French industrial firms that were extensively studied in Fombonne’s work: the auto maker Renault (Touvard & Lebon, 2017), and the tire manufacturer Michelin (Grab, 2017).

The data was analyzed by using the notions of design regimes developed in Design Theory (Le Masson, Weil & Hatchuel, 2017) and by creating a comparative framework inspired by prior endeavors to analyse the innovation regimes of new management tools in the service industry (Canet, 2013).

PROPOSED MODEL

Changing innovation contexts and design regimes

Having highlighted the recurring importance of a design activity necessary to illustrate the contributions of HRM systems to a firm's innovative activities, it now seems necessary to explore the type of literature that can help investigate the nature and processes of such design activities. This brings us to consider the body of work that has emerged from Design Theory, as it is presented by (Le Masson, Weil & Hatchuel, 2017). Specifically, we focus on their conceptualization of design regimes that distinguish different processes of design through the history of industrial development. It is important to clarify that this type of work has been built by looking specifically at the activities of industrial design actors, that were primarily concerned with technical and/or technological exploration to develop new products, such as automobiles or trains. However, as it is rooted in management sciences, this approach does seem promising to apply to HRM design activities as they provide a framework to identify design actors, as well as the expansive reasoning and the performance criteria that can describe the collective process of a design activity.

Before we describe the different design regimes proposed, it is important to understand the use of the expression “design regimes” and its intrinsic link to innovative activities. The term “design” first comes to offer a more precise definition of “innovation”, as the latter term encompasses a great variety of meaning and is used to describe many different objects, whether products or services, processes, etc. By using “design” the authors wished to focus on the activity at the heart of innovation, one that precisely implies the process of combining existing needs and available knowledge to achieve “*the creation of knowledge, [and] the generation of alternatives and new worlds.*” (Le Masson, Weil & Hatchuel, 2017, p.10). As for the term “regime”, its addition serves to add the idea of several varied, long-lasting, and stable phenomena of collective action, thereby creating a concept that can “*describe the logic of collective action in design leading to innovation.*” (ibid, p.10).

Analytical framework

The notion of design regimes offered by Le Masson, Weil and Hatchuel is characterized by three core dimensions : 1) a particular design reasoning, which will describe how knowledge is mobilized and expanded during the design process; 2) a form of collective organization, which will describe how actors and resources participate in the design process; and 3) a performance logic (specific to a firm or ecosystem), which will define the expected value criteria of the object that should result from the design process (Le Masson & Weil, 2014).

It is by observing the diversity or change within these dimensions that the authors can identify four distinct types of regimes: 1) Wild Design; 2) Parametric rule-based design; 3) systematic rule-based design; and 4) Innovative design. As we will detail the characteristics of each regime, according to the three dimensions previously presented, in a historical manner, it is paramount to keep in mind that the chronical order of each regime is an indicator of when they emerged as new and distinct approaches of collective design (in the sense that they can be broadly observed through historical testimonies and artifact of industrial activities at a given time). Therefore, one should not assume that an earlier regime disappears at the following emerges: on the contrary, further research has shown that designer collectives regularly alternate between different regimes depending on their resources as a collective and the stability of an object's identity (here the term “object” refers to what is being designed, whether it is a product, a service, a tool, a process, etc.).

Table 1: Comparison of design regimes²

	Wild design	Rule-based design	Systematic design	Innovative design
Actors, resources and organization	A few engineers or design actors Poor initial knowledge Learning by trial and error	Recipe (Generator model based on a conceptual model) Distinction of actors designing the recipe and those designing the product	Design department 4 languages Division of labor and specialized skills	Managing the learning process Extending the ecosystem of design actors and knowledge providers beyond the firm
Expansive Reasoning	Gradually work out the dimensions and stabilize the identity of the objects	Product family but the product is determined by the generator model	Product families (dominant design) Limit innovation to known performance Set out in ranges and families	Expand on existing knowledge and create new definitions of objects
Performance criteria	Construct a potential skill/ singular value	Catch-up Maximize connectivity without producing additional knowledge	Expansion extended by controlling learning processes Still connective (Robustness: minimize risk) Industrial system	Measuring expansions according to variety, originality, value, and robustness

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² Adapted from an earlier (partial) model from Le Masson, Weil & Hatchuel (2017, p.51)

Wild” or Entrepreneurial Design

The first design regime can be observed since the earlier days of the Industrial Revolution in England: it was the collective design process of inventor-entrepreneurs, usually engineers with a strong business acumen who were the first industrialists to create fundamentally new objects, such as mechanical spinning machines, steam engines, machine tools, railways, steamships, etc. They fostered close communities of exchange, through learned societies such as the Lunar Society of Birmingham or the Smeatonian Society of Civil Engineers. As described by the authors, *“the resources were limited to a few engineers, their initial knowledge was poor, and the learning process, primarily through the trial and error of successive generations, served as a design space and hence learning for those that followed. In terms of expansion, there was still only a poor organisation for repeating or reproducing a particular design, and it was always just one product (and its associated process) that was designed: the designers attempted to discover the extent of its performance and gradually stabilize the object’s identity.”* (Le Masson, Weil & Hatchuel, 2017, p.50). This type of design activity can easily be observed today, particularly in entrepreneurial startups, where founders and early team members must design everything from scratch, depend heavily on trial-and-error approaches, and often form communities of likeminded individuals for support.

Parametric Rule-Based Design: “Recipe-based” Design or Pathways for Industrial Catch-Up

During the mid-19th century, continental European countries, such as France and Germany, have taken notice of England’s expanding industrial development and seek out ways to “catch up” as *“one thing was certain: the process of building up a population of technical specialists and inventor-entrepreneur engineers similar to that which existed in England would take too long and seemed difficult to push forward.”* (ibid, p.50). The Swiss scientist and mechanical engineer Ferdinand Redtenbacher would develop an original approach known as parametric design. This approach is distinguished by 2 key steps that separate design actors into 2 distinct roles: the first actors would initially create “recipes for design” by determining all key design parameters of an object and scenarios that may require variety or adjustment of said object. The second group of actors would use these recipes to design many kinds of machines by following the instructions and testing out methodically different variations in parameters. Through this approach, the design effort was displaced and more controlled: engineers could rapidly design many variations from one initial product, creating families of products. This made industrial firms start organizing teams of specialized designer engineers whose performance was measured by the rapid design of controlled variations on machines that could be quickly tested, and this limited the production of new knowledge and costly exploratory work to the select few who were part of the first group (those who design the recipes). Once again, such design regime is can still be observed today, in firms that come to standardize their product or service and will focus on providing variations of the same to increase market shares.

Systematic Rule-Based Design: The Invention of the Engineering Department

By the beginning of the 20th century and with the impulse of the 2nd industrial revolution, the ruled-based design regime we previously exposed would come to evolve, to meet more demanding challenges. Indeed, *“with the increase in production volumes, preoccupation with industrial efficiency became a priority. Customers (often in a B2B situation) became more competent and more demanding. Finally, the product dynamic made it essential to reconcile the new knowledge spaces: heat or electricity might be added to mechanics, for example.”* (ibid, p.56). It is in the United States and Germany that this new design regime took form and expanded outwards. In terms of organization, the previous logic of recipe designers and recipe users persisted but evolved as there was a major change in scale and intensity. Design actors

increased in numbers and were structured into Engineering Departments and Design Bureaus (*bureau d'études*) and regrouped according to increasingly advanced specialties. As a result, they needed to develop several compatible design languages, that make it possible to discuss the same object at hand with different specialists and professionals within the firm. It is in Germany that a more universal 4-language model was developed, which relied on 4 dimensions to describe a design object: 1) the functional language, to express the customer's needs; 2) the conceptual language, which corresponded to engineering sciences, such as mechanics, thermodynamics, etc.; 3) the morphological language, to describe the assembly of the product, and 4) the language of detailed design, which sought to define even the most precise components of the product and their location in the manufacturing process. The expansive reasoning aimed high level improvements (optimization) and pursuing continuous incremental innovations on the product families. This led to performance criteria focused on optimizing the costs and resources of design activities and developing forecasting models or provisional tools. This design regime, defined by the advanced rationalization of product development is best embodied by the large R&D departments still present today and came to mark a new era: "*the modern large enterprise was born*" (Segrestin & Hatchuel, 2012, as cited in Le Masson, Weil & Hatchuel, 2017, p.58)

Innovative Design

As systematic rule-based design became the new industrial norm, "*innovation in the 20th century was not just a singular event, but was continuous, incremental, robust—powerful. It was intentional, organized, manageable and controllable.*" (ibid., p.125). However, as we have discussed at the beginning of this paper, the 21st century saw the appearance of new technological computer and digital industries, and other crisis events that had the effect of destabilizing well implanted traditional industries. This has changed the strategic focus of industrial actors, as they strive to achieve an ambidextrous approach (March, 1991) that will simultaneously help them maintain their market position and generate radical and disruptive ideas that can put them ahead of their competitors. In other words, "*all modes of value formation are nowadays concerned by a logic of innovation and technology is only one of those modes. One of the major evolutions today is the transition from a problem of optimizing enterprise capacity (involving decision theory) to a problem of expanding enterprise capacity (involving design theory)*" (Galarreta, 2018, p.63). Born from the theoretical work of C-K Theory (Hatchuel & Weil, 2009, 2003), the innovative design regime seeks to offer a new design approach that is compatible with organizations structured around institutionalized systematic rule-based design activities. Indeed, a capital distinction with the previous regime is found in its novel approach to expansive reasoning: the priority of innovative design is to provide an alternative to the restrictive controlled imposed on knowledge creation and instead encourage the inclusion of new sources of knowledge, usually foreign or "exotic" to a particular community of designers. This approach aims to overcome cognitive "fixations" around a particular object, so that designers can "break" the limits of their integrated way of defining a product or service. An example of this could be to introduce automobile engineers to other forms of mobility that can help them expand the definition of what a car is and what it could be. In terms of performance criteria, there again, there is a fundamental switch to operate: "*while systematic design gives value to minimizing expansions in order to attain a known objective, innovative design provides value to expansions*" (Le Masson, Weil & Hatchuel, 2017, p.150). That is to say that the design process must mobilize knowledge (K) that will bring designers to propose new concepts (C) that open new avenues of exploration, avenues which would have remained closed or unknown without the injection of new knowledge. As an alternative to the CQT criteria (Cost-Quality-Time), the exploration through C-K Theory is determined with the V2OR model: Variety (of concepts discovered),

Value (of knowledge to break fixation effects), Originality (of concepts proposed) and Robustness (of knowledge mobilized). Finally, the organization of actors also takes a new form in this regime: there is 1) an incentive for design actors to engage in continuous learning processes and manage the dissemination of new knowledge, and 2) the community of design actors grows at an ecosystem level, to include new and original design partners and structure them into innovation communities. Such a design regime is best exemplified by the many cases of Open Innovation programs initiated by large firms, and their collaborations with startup incubators.

MATERIAL ANALYSIS

We used the framework of comparative design regimes, summarized in Table 1 as an analytical lens to read the changes and evolutions of HRM systems in the industrial history of France. Our aim is to seek instances of HRM design activity and see if they can be characterized according to the design regimes presented hereabove.

Starting with Fombonne's work, we intuitively chose to follow his own chronological segmentation of HRM history and identified multiple instances of design activity, embodied by collectives of HRM actors. When analyzed through the criteria of the different design regimes, we categorized them according to the 3 first ones (Wild, Recipe ruled-based and Systematic rule-based design). As mentioned, the author highlights a historical progression of the HRM function that first emerged out of necessity around the 1830s, but one which wasn't embodied by a dedicated department or profession before 1917. The second phase proposed by the author, that of a "personnel function with personnel departments", saw the appearance of multiple designations from 1950 onwards: personnel department, industrial relations office, social and human relations department, social affairs department. Then, in the 1980s, the term human resources management, which came from the United States, was translated, and widely adopted. However, this homogenization of the nomenclature did not prevent the appearance of many distinct HRM models.

Wild Design for a “Headless” HRM function: 1850s-1950s

According to Fombonne's historical accounts, for early French industrial firms in the latter part of the 19th century and the beginning of the 20th century, forms of organized management of employment relations were mostly burgeoning. These industrialists understood they needed to stabilize the availability of the workforce and sought to ensure the continued quality and rhythm of production. Initially, the core actors are members of the Board of Directors, who are going to directly oversee matters related to employment and payment. These entrepreneurs will gradually start to exchange managerial ideas and test out innovative tools, such as the *livret ouvrier* (Employment record books, p.55), the *période d'essai* (employment trial period, p.64), the *restauration en entreprise* (foodservices, p.82) or the *règlements intérieurs* (employee by-laws, p.95). During that period, these mechanisms are quite new, and practices differ wildly. Later, some of these, like the *Livret de travail* will be made illegal, while others, such as the *période d'essai* will be codified into law. One of the first records of a Chef du Personnel (Head of Personnel, p.286) appears in 1906 at Schneider.

	Wild design	The HRM function without a profession
Actors, resources, and organization	<p>A few engineers or design actors</p> <p>Poor initial knowledge</p> <p>Learning by trial and error</p>	<p>Limited to the members of Board of Directors (<i>Conseil d'Administration</i>) who wish to retain control on all aspects of employment and relationship with the workforce.</p> <p>Small communities of shared practices emerge, trying to align on certain recruitment processes</p>
Expansive Reasoning	<p>Gradually work out the dimensions and stabilize the identity of the objects</p>	<p>Stabilize recruitment processes (integrating structured processes for entering a firm's workforce)</p> <p>Increase security on the job (reducing the high number of work-related accidents)</p>
Performance criteria	<p>Construct a potential skill/singular value</p>	<p>Make the workforce more available (less likely to leave) and more dependable (ensuring they can fill a role)</p>
HRM objects of design	<ul style="list-style-type: none"> - Introduction of employment record books to establish employment history - Employment trial periods to assess new employees - Introduction of by-laws within factories to regulate workplace conduct - First cases of subsidized foodservices 	

Rule-based Design for an institutionalized HRM function: 1950s-1990s

As Fombonne explains “*it was in the 1960-1970 decade that the number of central personnel departments was multiplied, i.e. a personnel function attached to the general management, exercising a political role over the whole of the company and taking into in charge of new responsibilities: management of executives, training, human resources planning, part of collective relations with staff representation.*”³ (p.309). The second part of the 20th century sees the proliferation and institutionalization of Personal Management departments, in large part because French industrial firms wish to rebuild their competitive advantages after WWII and embrace a logic of catch up, by looking first towards the United States and later towards Japan. One example of this is the TWI method (Training Within Industry) which originated in the US army and provided a rigid but highly structured framework for training managers in what was seen as universal management attributes that all higher-level employees should possess. If its popularity is nearly immediate, the TWI gradually appears both rigid in form and limited in scope, its “one size only” does not fit all management situations. This will lead Personnel Departments to develop new HRM roles such as Training Managers, who are in charge of creating variations to the TWI method, focusing mostly on keeping the structure of these trainings and introducing a wide variety of new topics that could be better suited to different type of management professionals.

³ « C'est dans la décennie 1960-1970 ont été multipliées les directions centrales de personnel, c'est à dire une fonction Personnel rattachée à la direction générale, exerçant un rôle politique sur l'ensemble de l'entreprise et prenant en charge des responsabilités nouvelles : gestion des cadres, formation, planification des ressources humaines, une partie des relations collectives avec la représentation du personnel. » (p.309)

	Rule-based design	The HRM function with a Head of Personnel
Actors, resources, and organization	<p>Recipe (Generator model based on a conceptual model)</p> <p>Distinction of actors designing the recipe and those designing the product</p>	<p>Gradually, most industrial firms create a role of Head of Personnel (<i>Chef du Personnel</i>), charged with overseeing matters of employee management and labor relations, and creating necessary mechanisms</p> <p>Secondary actors, such as training managers and facilitators create and deliver training programs and workshop sessions</p>
Expansive Reasoning	Product family but the product is determined by the generator model	Apply TWI training “recipes” to various topics of professional training
Performance criteria	<p>Catch-up</p> <p>Maximize connectivity without producing additional knowledge</p>	<p>Quickly adopt managerial innovations originating from the US and ensuring mass implementation throughout the firm or targeted populations of employees (such as managers)</p> <p>Maintain technological advances by disseminating regularly key technical knowledge within the firm.</p> <p>Identify opportunities for improved efficiency / lower cost</p>
HRM objects of design	<ul style="list-style-type: none"> - The TWI model and its many variations - Institutionalization of continuing education processes in firms - T-group workshops and their many variations - Suggestion offices and internal competitions 	

Systematic design for a strategic HRM function: 1960s-1990s

With the increased internationalization of industrial activities and greater worldwide competition, French industrial firms seek future-oriented models to management human resources, on a global scale. During this phase, Fombonne details the emergence of HRM mechanisms that offer a more generic approach to organizing the workforce and provisional insights as to the possible evolutions of their talent pool.

	Systematic design	The HRM function with HR Departments and CHROs
Actors, resources, and organization	<p>Design department</p> <p>4 languages</p> <p>Division of labor and specialized skills</p>	<p>Structured HR departments with increasing levels of decentralized representation</p> <p>Increasing multiplicity of technical and legal languages</p> <p>Division of HRM work in 5 core specialties (recruitment, training, careers, sanctions,</p>

		assessment)
Expansive Reasoning	Product families (dominant design) Limit innovation to known performance Set out in ranges and families	Organizational matrix structures, combining hierarchical and functional forms of authority Forecasted career paths and provisional workforce plannings Standardized assessment systems for employees and work performances
Performance criteria	Expansion extended by controlling learning processes Still connective (Robustness: minimize risk) Industrial system	Transition to more generic workforce “components” by switching from traditional professions to an organization of the workforce by skills possessed. Incorporate uncertainties into HRM models and decisions (such as provisional workforce planning) Capacity to intervene at both the macro (strategic) and micro (individual and operational) levels, on large scales, and often in international contexts
HRM objects of design	<ul style="list-style-type: none"> - Strategic workforce planning tools and processes (provisional models, economic forecast reports) - Assessment tools and processes (assessment centers, performance evaluation charts) 	

Innovative Design for an innovative HRM function: 2000s-Present

Fombonne’s historical analysis stopped at the end of the 1990s, but we propose to pursue his approach a little further, by including more recent historical events that shed a light of the latest evolutions in HRM practices and how its actors have adopted new design logics. We will therefore look at 2 major French industrial players that are featured prominently in Fombonne’s work: Renault and Michelin. Both companies were case studies in a recent academic publication on the development of industrial ecosystems of innovation. In the case of Renault, the article details the CEO’s desire to boost the firm’s innovation and create a community of innovators to imagine the future of the auto-industry. To give an impulse to this strategy, the CHRO of Renault at the time, designs and organizes a Learning Expedition in North America, along with other CEOs of French firms. That expedition will mark the start of the first Renault innovation community, called the *Cercle de Montréal* (Circle of Montreal). As for Michelin, the case details the creation and institutionalization of Open Innovation Challenges, by higher management and the HR departments, to regularly invite external innovators to come and enrich the Michelin products and processes.

	Innovative design	The HRM function with HR Departments and CHROs
Actors, resources, and	Managing the learning process Extending the ecosystem of	Innovation collectives managed by HR Departments that create ecosystems of design partners beyond the firm or its traditional industry limits.

organization	design actors and knowledge providers beyond the firm	Diversification and individualization of the learning / development / training processes
Expansive Reasoning	Expand on existing knowledge and create new definitions of objects	<p>Seek out new/ unfamiliar knowledge in other countries, industries, professional activities.</p> <p>Attract new design actors to enrich the definition of object identities</p> <p>Encourage the individualization of learning experiences to increase the variety of skillsets</p>
Performance criteria	Measuring expansions according to variety, originality, value, and robustness	<p>Reward innovative project proposals</p> <p>Create incentives to travel and take part in international learning expeditions</p>
HRM objects of design	<ul style="list-style-type: none"> - Intrapreneurship - Learning expeditions - Open innovation challenges, supported by an ecosystem of innovators 	

RESULTS & CONCLUSION

We aim to obtain four new conceptual results: 1) a 4-part genealogy of the HRM function has been identified, confirming previous historical works while also offering a design-based language, better adapted to innovation management. 2) The evolution of HRM closely mirrors that of industrial innovation management over the last two centuries, which suggests that these two functions have, so far, shared a similar sensitivity to the environmental contingencies of different eras. 3) A new identification of historical stakeholders' roles in HRM innovation, one based on the nature of their involvement in the design process. 4) Certain HRM tools (such as assessment forms) and processes (such as recruitment and training) have gone through several cycles of flow and stasis in the evolution of their identities, highlighting periods of varying experimentations and converging stabilization that coincide with major changes in the innovative context.

While our work will reinforce the well-established view that HRM is closely linked to innovation and transformative periods, we hope that it will provide a new framework to analyze and expand on the interactions between HRM and innovation, and therefore to better align Strategic Human Resource Management with the strategic nature of innovative activities. By looking at the design regime(s) of the firm's innovative activities, and comparing it to those of its HRM system, SHRM actors can determine whether there is a compatibility in innovative reasoning, expansion and performance. Compatibility shouldn't necessarily require an exact alignment in design regimes between the firm's core innovative activities and the way the HRM system supports it. Indeed, it is completely possible that some innovative processes that follow an innovative design pattern, such as automobile makers defining what the future of mobility can be, can be supported by updated HRM practices that are the result of a systematic rule-based design approach. On the other hand, this also opens up for a scenario where such an innovative ambition may require that SHRM actors simultaneously develop explorative HRM practices, so as to enable core design actors to, in turn, successfully explore the full diversity of conceptual proposals. This could take the form

of new forms of financial incentives for employees, unprecedented career paths, original topics, and forms of training, etc.

In terms of scientific research, we believe that this approach could provide the basis for a multi-level approach to innovation SHRM (Shipton et al., 2017). Furthermore, we see the possibility to move a step further in the ongoing debate between “Best fit” and “Best practices” (Koster & Benda, 2020) by incorporating them in a design driven approach, as sources of functional parameters and extended knowledge, respectively. Finally, this opens the possibility for further experimental work to test out the properties of other design theories in innovative HRM design activities, such as C-K Theory (Hatchuel, Masson & Weil, 2017), or Axiomatic Design (Suh, 1998).

Finally, we are certain that this will provide SHRM practitioners with the means to face increasingly unknowable situations (climate change and resource sustainability, blurring of personal and professional spaces through technological innovations and global crises, emergence of new and diverse expectations from employees and staff, etc.) and propose novel and tailored management answers.

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