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Human Resource Management in Complex Environments: A Viable Model Based on Systems Thinking

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Abstract: Developing the company's capacity to deal with changing environments means ceasing to see processes as a traditional and linear model. Therefore, the objective of this research is to apply VSM to HRM to show its complexity. It is qualitative research, which is carried out in two moments. The first consists of a literature review in the WoS, and the second, is the design of the model "MV-HRM", based on the approach of complex adaptive systems, viable system model, soft system methodology, and holistic theory. The MV-HRM consists of five systems: (S1) HRM processes, (S2) information system (S4) operational control, (S4) strategic planning and (S5) governance. The model emphasizes the relationships and interactions it has with its immediate and future environment. Finally, the contribution of the research is to show another look and understanding of the functioning of HRM, in addition to awakening the interest of strategists to develop best practices that allow them to respond in an agile way to the dynamic and complex environment.

Keywords: viable model; HRM; systems thinking; complex systems; adaptability



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1. Introduction

This section presents the context of companies facing changing and complex environments, as well as the conceptual framework, applicable approaches and methodologies, and previous research.

1.1. Context

Undoubtedly, the complexity of today's phenomena and the dynamic nature of the market are pushing companies to (re)consider or transform themselves. Consequently, dynamic capabilities [1] have become a strategic imperative for organizations. Promoting learning and enhancing effectiveness—both in processes and in resource allocation—are, therefore, essential [2,3]. However, developing a company's capacity to address changing environments requires moving away from seeing processes as a "waterfall" model based on linear planning, which lacks flexibility and adaptability [1]. The roots of the traditional model's failure are often attributed to its linearity, determinism, and hierarchical nature. This deterministic approach assumes a degree of environmental stability that is rarely observed today, meaning that a strategy formulated years ago will only remain relevant if the world remains unchanged since the strategy's conception, otherwise it becomes obsolete [4].

Companies are now situated in constantly shifting (economic, political, social, technological, environmental, and other) environments, which are increasingly complex and uncertain. As a result, they face the challenge of adapting and evolving [5].

This shift drives companies to become agile to add value [6], thereby involving all areas and processes within the organization, such as human resource management (HRM) [1]. In recent years, HRM has been recognized as playing a crucial role [7] in enabling companies

to achieve competitive advantage [8] and in promoting employee well-being [9]. HRM, in an integrated manner, equips, motivates, and leverages human resources' capacities to create value for the company [8], hence the growing global interest in agile human resources [6].

Adopting agile HRM requires going beyond mere process redesign and tool utilization (such as Kanban boards, scrums, sprints, and process maps), which, though helpful, are often used in isolation [6]. True agility involves fostering a new culture, mindset, structures, and information flows. Thus, systems thinking becomes pertinent and imperative in companies' agile adoption. Moreover, it is essential to view the organization as a complex adaptive system (CAS), characterized by self-organization, emergence, and evolution—qualities that stand in stark contrast to traditional organizational models [10]. This shift undoubtedly calls for an organizational (re)configuration based on models that enable operations without central oversight (manager, supervisor, leader, coordinator), bounded instability, and parameters that limit individual actions (such as standards, procedures, and protocols) [11].

From this perspective, the organization functions as a complex system that is responsive to its business environment, where behavioral patterns emerge without intentionality [10]. Therefore, developing new ways to understand the organization and its components, particularly HRM, becomes essential.

1.2. Conceptual Framework

This section presents the conceptualization of systems thinking, companies as complex systems, and human resource management (HRM).

1.2.1. Systems Thinking

An alternative approach to understanding the organization is systems thinking, a method that is increasingly applied as simple solutions tend to fail when confronted with the complex problems of today. Systems thinking involves a non-reductionist and holistic view [12]. That is, it prioritizes studying the organization rather than examining its parts in isolation; the focus is not on dividing and addressing individual segments but rather on understanding the function of each part and the relationships among them [13].

In systems thinking, the organization, its components, and its environment are conceived as a system, subsystem, and supra-system, respectively [12]. However, it is insufficient to simply be interested in systems thinking, to merely acknowledge its potential benefits, or to assume its application without thorough engagement. True application requires developing it by analyzing complex situations and addressing them—creatively—from multiple perspectives and approaches [12].

1.2.2. Characterization of the Organization as a Complex Adaptive System

Organizations are viewed as complex adaptive systems (CAS) due to their nonlinear feedback cycles, shaped by the interactions among individuals within them [14]. The interrelationships between employees and the effects on their actions depend on each individual's perception. In this sense, organizations exhibit emergent behavioral patterns that arise without intentionality. Moreover, these organizational behaviors do not necessarily align with the aims of those who initiate them, leading to outcomes that are often unplanned and somewhat intuitive. Undoubtedly, organizations are sensitive to external events and innovations within the business environment, which, as nonlinear systems, keeps them far from equilibrium [10].

As CAS, organizations are characterized by self-organization, new order, and continuous information exchange with their environment. This situates them as dissipative structures [15], which must continuously explore and exploit their environment to (re)configure themselves [16]. Thus, organizations engage in processes of evolution and co-evolution [17], enabling them to transform themselves, impact their environment, and

adapt to its changes [18]. Consequently, it is challenging to anticipate and control the future of organizations through linear approaches [11].

1.2.3. Human Resource Management (HRM)

Human resource management (HRM) is conceptualized as a strategic approach to managing individuals—often referred to as human resources (HR)—who work within an organization. HR represents one of the company's most valuable assets, as individuals and teams contribute to the achievement of organizational goals [19]. Consequently, HRM is understood as a dynamic set of human resource policies and processes aimed at supporting the company's objectives [8]. According to the resource-based view, HRM enables the organization to select and develop its human capital base [20], which can serve as a competitive advantage if it is distinctive, valuable, inimitable, and irreplaceable [21].

Thus, the primary purpose of HRM is to endow the organization with capabilities that ensure its performance [8,22–25]. To this end, HRM must address three key dimensions [8]: First, equipping HR with the necessary knowledge, skills, attitudes, and values, making recruitment, selection, and training and development processes essential. Second, motivating HR, both intrinsically and extrinsically, to fulfill their roles effectively through compensation management, performance management, and labor relations processes. Third, ensuring the opportunity for HR to have both an organizational and personal impact in their career trajectory, where job design processes play a crucial role.

1.3. Approaches and Applicable Methodologies

This section presents the complex adaptive systems (CAS) approach and the viable system model (VSM).

1.3.1. Complex Adaptive Systems

Based on Holland's (1995) framework, CAS are systems whose behavior is determined more by the interactions among their components than by isolated actions. These systems consist of agents that interact and adapt as they gain experience, however, no individual agent alone dictates the collective behavior of the system. Feedback processes are therefore fundamental to maintaining diversity within the system, making self-organization, emergence, and evolution key characteristics of CAS [10].

It is important to note that self-organization occurs in open systems that incorporate information [26] and energy [15] from the environment, maintaining states of limited instability [16]. These systems feature stable and unstable, as well as predictable and unpredictable, coexisting states [10,16]. Emergence, as a process of existence and consequence [27], arises from interactions among agents, making future projections difficult [10]. In creating dissipative structures, CAS transform existing patterns, allowing new models to emerge that foster system self-organization [28]. Thus, evolution—defined as the process of transformation—arises from adaptive flexibility to the environment and depends on the adaptive efforts of each agent seeking to improve their capabilities [10].

1.3.2. Viable System Model (VSM)

To understand how HRM addresses the complexity of its tasks, the viable system model (VSM) offers a pertinent approach for analyzing the organization and its sub-systems [4]. A VSM is seen as capable of adapting to its environment, self-organizing, self-regulating, and maintaining a degree of autonomy [29]. VSM envisions organizations as organisms with a "brain". Through VSM, the essential "organization" of systems is captured and described, as this structure defines a system and enables its identity and autonomy [12,30].

The VSM is designed based on three levels of recursion: Level One, or the "system in focus", is the system being addressed; Level Zero is the broader system encompassing System One; and Level Two comprises the primary activities identified within the focus system. System goals are based on environmental complexity, requiring the identification

of operational units that enable goal achievement. The VSM consists of the environment and five systems: System One for implementation, System Two for coordination, System Three for operational control, System Four for development, and System Five for policy. According to cybernetic principles, each element must function across all systems that aim to remain viable [30].

1.3.3. Previous Research

Since the 1990s, there has been a significant, though limited, increase in studies viewing organizations as nonlinear systems from a complexity perspective [9]. Over the last decade, few studies published in the Web of Science (WoS) and Scopus databases have analyzed HRM from a CAS or VSM perspective. A literature review in WoS found no documents with both “HRM” and “CAS” in the title, however, using the descriptors “human resource management” and “complexity”, four publications were identified. Of these, only one focused on sustainable HRM from a CAS perspective [31], while the others addressed: (i) controversies and complexities in linking HRM with organizational outcomes [32], (ii) complexity and dialogue of neo-pluralism in labor relations and the HRM system [33], and (iii) tensions between HRM and IT departments [34].

Regarding publications with “human resource management” and “complex” in the title, four were identified; only one theorized HRM’s contemporary ecosystem as complex and adaptive within a multilevel framework [35]. The others aimed to: (i) structure complex issues to address root cause relationships in HR [36,37], (ii) design a complex systems-based HRM model [38], and (iii) present an integrated HRM framework applying complexity principles at the appropriate abstraction level [39]. Publications containing “human resource management” and “viable” in the title identified two works: one proposing a project-oriented HRM based on VSM [40], and another examining how the VSM approach supports governance in service systems (government entities) [41].

Similarly, a Scopus review identified limited publications on HRM from the CAS or VSM perspectives. For “human resource” and “complex”, four publications were found, two of which were also in WoS [35,36]. The other two aimed to: (i) construct a sustainable HRM hierarchical model under complex interrelations using the fuzzy Delphi method [42], and (ii) propose an agent-based complex system modeling methodology for HRM [43]. Publications with “human resource” and “viable” also identified two studies, previously listed in WoS [40,44]. For “HRM” and “viable”, only one publication was found, exploring HRM in international joint ventures, particularly concerning knowledge transfer and learning using VSM theory [45].

Despite publications linking or analyzing HRM from CAS and VSM perspectives, there is limited evidence on the topic. Applying the CAS approach to organizations remains underexplored [11,46], as do proposals using VSM. The general findings suggest that both the external and internal environments of an organization determine the functioning of the HR system, highlighting the importance of understanding the interactions between these environments due to HRM’s influence on organizational performance [31,35,36,38–40,43–45].

Notably, most HRM literature centers on studying the relationship between HRM practices and organizational performance, often overlooking a deeper understanding of process functioning [7,8]. Several reviewed authors identify knowledge gaps around complex problem management and resource optimization within organizations, and concur on the need for models that identify key problem causes [36] and to improve understanding of HRM dialogue as an emergent, self-organizing process within complex systems [31], where boundaries become increasingly flexible and amorphous. Therefore, there is consensus on further exploring the topic to advance systems thinking and foster collaboration and co-creation across the ecosystem and HRM [35].

To contribute to the literature and promote the CAS and VSM perspectives, this research aims to apply VSM to HRM to illustrate its complexity. The study is organized into five sections: introduction, method, results, and, finally, discussion and conclusions.

2. Materials and Methods

This research is a qualitative, documentary-based study [47] conducted in two phases: the first involves a frontier-of-knowledge review, and the second applies the Viable System Model (VSM) to Human Resource Management (HRM). The first phase focuses on a review in Web of Science (WoS) and Scopus. Two inclusion criteria were applied: (i) publications written in English, and (ii) documents with titles containing any of the following descriptor combinations: (a) “HRM” and “complexity”, or “complex” or “viable”, or “CAS” or “VSM”; (b) “human resource management” and “complexity” or “complex” or “viable” or “CAS” or “VSM”. The literature review consisted of three steps [48,49]: (i) collecting and downloading relevant publications, (ii) analyzing the content to identify research objectives and methodologies, and (iii) presenting the findings, highlighting both concordances and gaps in research on HRM from the VSM and CAS perspectives.

Following the frontier-of-knowledge review, the second phase begins by identifying and selecting the systems tool to be applied [12], namely, the VSM [30]. The configuration of the viable model is then compiled based on Checkland’s soft systems methodology [50]. Data for the model construction are gathered through transdisciplinary collaboration, as integrating different approaches enhances the understanding of complex issues [12,50]. Finally, the viable model [12,30] is applied to HRM, beginning with a system characterization to determine the three levels of recursion. Starting with the identification of the “focal system” (recursion level 1, the company), the broader system it belongs to is specified (recursion level 0, the industrial sector). Next, the viable components of the “focal system” (recursion level 2, HRM) are detailed, and a system diagnosis is conducted, analyzing and describing the environment and the five subsystems.

For System One, each component is examined to establish its environment, operations, and performance metrics. System Two identifies potential sources of disruption or conflict that may either threaten or benefit the organization, ensuring harmonization and coordination. System Three defines the role responsible for auditing System One and securing its functionality, as well as achieving organizational objectives. In System Four, activities are outlined to ensure adaptation to future conditions based on environmental assessments and trend evaluations. For System Five, the role overseeing the system’s policy and identity—representing the essential qualities of the entire system—is identified. Finally, it is confirmed that Systems Two, Three, Four, and Five collectively support the entire system and encourage its practical application.

3. Results

The Viable HRM Model (VHRM) aims to facilitate the understanding of HRM by visualizing its functions through a systems perspective, particularly from a complexity standpoint. It illustrates the interaction, interrelationship, and interconnectivity among its component systems and with the external environment. Emergence and self-organization are viewed as potential inherent properties of the organization, and thus of HRM, due to its structure of five autonomous systems (implementation, coordination, operational control, development, and policy) that continuously interact, thereby altering or transforming overall behavior [10]. Notably, the behavior of these systems is shaped by the configuration of shared meanings generated through the system’s interaction processes [51]. After all, organizations operate within adaptive environments that are in a state of constant change [10].

3.1. Recursivity of the MV-HRM

Given that complex systems exhibit a recursive nature—meaning that systems are structured in hierarchies and that the organizational form of higher-level systems is repeated within their components (in line with cybernetics, all viable systems display the same organizational characteristics) [30]—the recursive nature of the MV-HRM is established (see Figure 1).

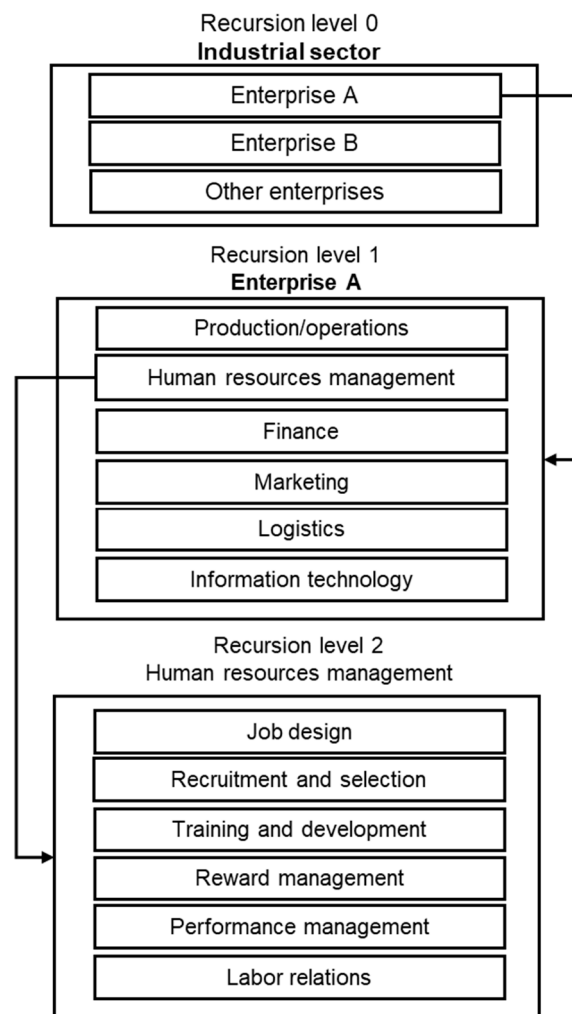


Figure 1. Recursive nature of the MV-HRM. Source: adapted from Beer [30].

Three levels of recursivity are proposed [30]. At Level Zero, the suprasystem is considered, which is the industrial sector to which the company belongs. At Level One, regarded as the “focal system”, is the company itself, along with its most common subsystems (often referred to as areas or departments): HRM, marketing, production, finance, logistics, among others. At Level Two of recursivity, a subsystem of Level One is considered, HRM, encompassing its primary processes or activities [8,52–54]: job design, recruitment and selection, training and development, compensation management, performance management, and labor relations.

3.2. MV-HRM

The MV-HRM, based on the VSM [30], consists of the external environment and five systems: System One (S1) corresponds to HRM processes, System Two (S2) to the HR information system, System Three (S3) to the operational control of HRM, System Four (S4) to strategic HRM planning, and System Five (S5) to HRM governance. See Figure 2.

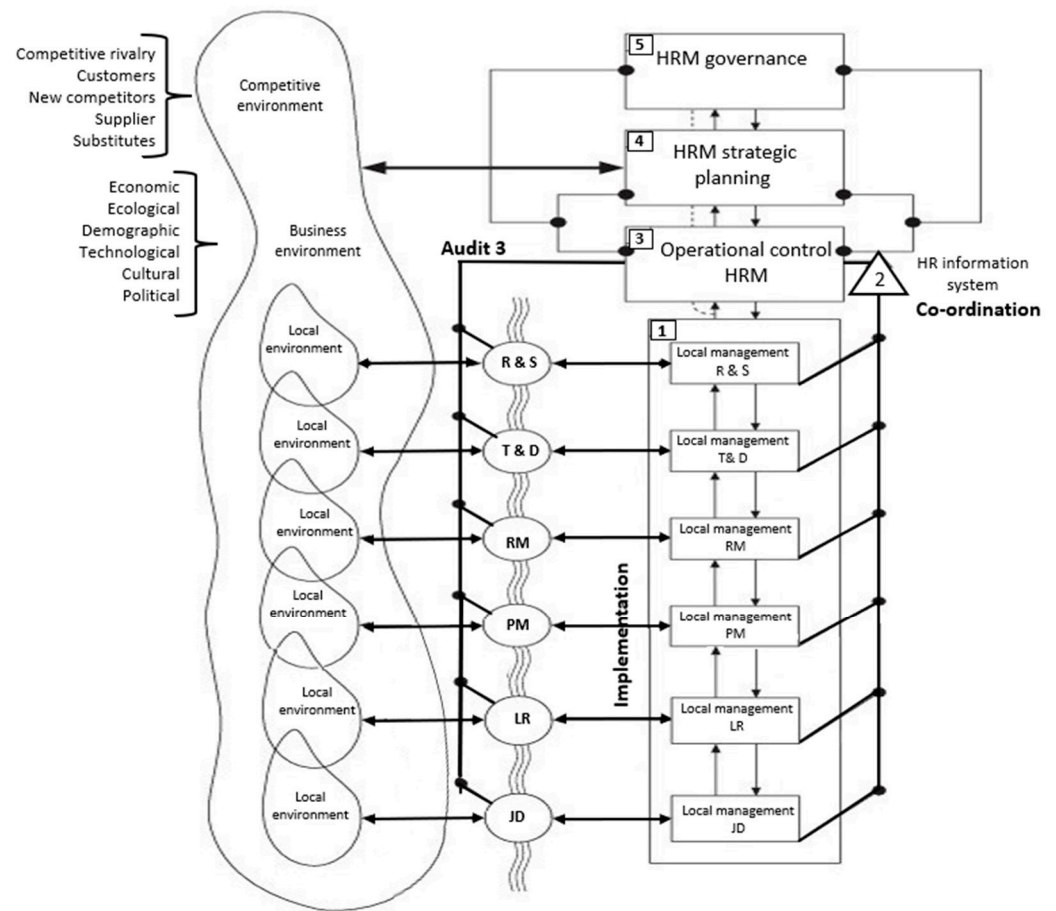


Figure 2. Viable HRM model. Source: adapted from Beer [30].

S1 expresses and represents the purposes of HRM, with each of its processes—recruitment and selection (R and S), training and development (T and D), remuneration management (RM), performance management (PM), labor relations (LR), and job design (JD)—linked to significant aspects of the environment. Each process has its own relationships with other processes, which may involve shared resources, transmitting subsets, or using shared facilities. Each process operates with its own management, allowing greater autonomy to respond to environmental changes according to specific priorities. This autonomy supports the system’s control and leadership across the organization, enabling each process to have its own policies, functions, planning, implementation, and operational control to ensure viability [30]. For example, the recruitment process aligns its objectives with senior management while those responsible interpret these objectives for their operations, receive performance feedback, and apply corrective measures as needed. In line with the VSM, component autonomy is sustained if each part functions within the larger organization. The governance system validates objectives, while the operational control system of HRM converts them into actionable goals, audits them, and monitors performance through a vertical command channel. Meanwhile, the HR information system is responsible for coordination.

The MV-HRM highlights the importance of HRM processes and the supportive functions of the other systems (S2 to S5) to ensure and facilitate the overall system’s functioning. It emphasizes the interrelationship between processes and the environment. For instance, the recruitment and selection process depend on inputs from T and D, RM, PM, LR, and JD to achieve its goals, underscoring the critical role of the HR information system, which handles coordination. It must also adapt to environmental changes, as shifts can destabilize or render objectives irrelevant, highlighting the strategic importance of HRM planning (S4). To maintain system stability, it is crucial that none of the support systems (S2 to S5) obstruct

HRM processes, which are fundamental to embodying the organization's identity. Thus, coordination (S2) and auditing (S3) are essential.

In the MV-HRM, S2 is the HR information system (HRIS), which ensures that HRM processes (S1) do not interfere with each other and operate cohesively. Regulations and rules are essential, prescribing actions for S1's elements, while information and communication are also key. S2 relies on HR analytics, which uses data-driven HRM strategies [55] for collecting, analyzing, and communicating HR data to support evidence-based strategic decision-making [56]. This system may use internal and external data that aid HRM [55,56]. Internal data include HR metrics and data from other organizational systems (such as finance, production, and marketing) [57]. The HRIS requires appropriate measures, as well as data availability and quality [58]. Content validity is crucial for decision-making [59]. Thus, HRIS collects data to support system auditing, communicate HR effectiveness and efficiency, and facilitate government reporting [60]. It consolidates all valuable data for HRM and the organization [54,57], enabling the integration of HRM data with broader organizational data, facilitating intelligent human and organizational resource management [61].

S3's importance lies in ensuring the objectives set by HRM strategic planning and HRIS guidelines are met, as it monitors and verifies the performance of HRM processes. S3 audits all activities in S1, relying on metrics for process performance, individual contributions, and organizational outcomes. If issues arise, S3 makes immediate adjustments, self-regulating as needed. Improvement suggestions are sent to S4. S3 ensures the HRM system functions effectively, upholding policy standards. Positioned in the vertical command channel, S3 must develop a coordinated plan, communicate it to HRM processes, and report necessary information to HRM strategic planning for governance, where policies are set.

Although the HRM process, information, and operational control systems have some autonomy, they lack a comprehensive view of the organization's environment, underscoring the importance of S4 (HRM strategic planning) and S5 (HRM governance). With a global view, these systems can respond to external opportunities and threats (the future). S4's role is to harness HR capabilities to meet organizational goals, addressing HR needs both quantitatively and qualitatively [19]. S4 integrates information from operational control with company-wide data for decision-making, capturing critical data about the entire organizational environment. This capability is vital not only for responding to dynamic, complex environments but also for positioning the organization and projecting its future state. In cases requiring quick action, S4 communicates directly with operational control; for long-term implications, it engages HRM governance (S5).

S5 is responsible for directing the HRM system as a whole, setting policies based on data from HRM strategic planning, which are then communicated to operational control for implementation in HRM processes. Balancing external and internal demands is crucial, with external demands driven by HRM strategic planning's interaction with the environment and internal demands from operational control's commitment to autonomous HRM operations. S5 must enable adaptation to external conditions without destabilizing the organization. The HRM governance system is composed of team members involved in HRM operations—including both employees and external consultants or agents—requiring strong integration, organization, and communication skills, as well as formalized oversight of decision outcomes without compromising flexibility and freedom of interactions. Finally, S5 articulates the identity and objectives of the HRM system with the overarching system to which it belongs: the organization (Level One of recursivity).

3.3. System Feedback Mechanisms

As illustrated in Figure 2, feedback within the HRM system flows both top-down and bottom-up. System complexity arises from interactions with operational units in both the internal and external environments, enabling the system to achieve its objectives more effectively and increase the organization's adaptability to its surroundings [30]. Notably, Systems S1 through S4 have decision-making capabilities, which facilitates the strategic direction of the HRM system. The MV-HRM thus encompasses structure, activities, interre-

relationships, and information flows that collectively demonstrate the system’s capacity to develop, learn, and adapt to a dynamic, complex environment. In essence, it reflects the characteristics of a viable system: capable of achieving autonomy, self-organization, and self-control to respond to external conditions [30].

The following section provides a more detailed description of the system’s three feedback cycles, based on the VSM [30] (see Figure 3). Cycle 1 flows bottom-up, originating in HRM processes (S1), which in turn receive immediate feedback from the external environment (the “here” and “now”). This information ascends to operational control (S3) via the HR information system (S2). S3 then decides whether to escalate the information to strategic planning (S4) and governance (S5). Notably, S4 also receives direct feedback from the anticipated future environment (the “there” and “then”).

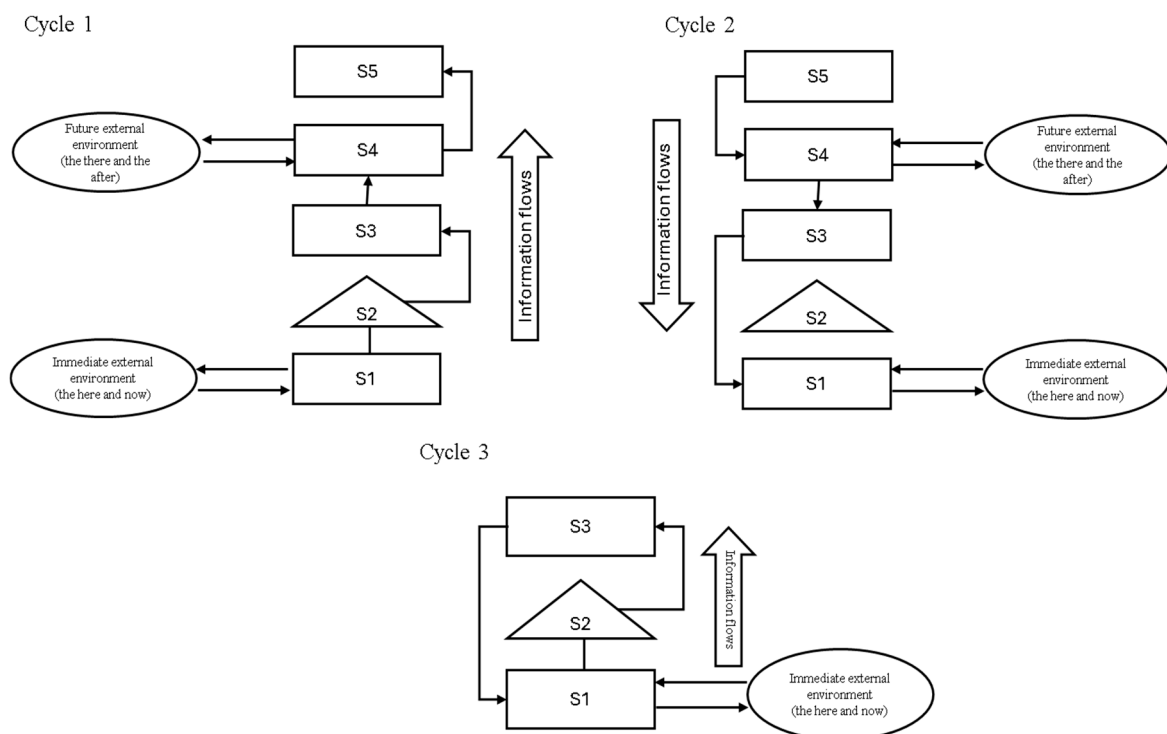


Figure 3. MV-HRM feedback mechanisms. Source: own elaboration.

Cycle 2 is a top-down process, in which the governance system (S5) determines the course of action. This information is passed to strategic planning (S4), which receives feedback from the anticipated future environment (as mentioned earlier), before descending to operational control (S3). S3 then provides instructions to the HRM process system (S1), which also receives feedback from the external environment, as previously noted.

Cycle 3 is considered the shortest and most immediate feedback loop, moving bottom-up. It originates in the HRM process system (S1), flows through the HR information system (S2), and reaches operational control (S3). Here, it is determined that the information does not need to escalate to strategic planning, so it is sent back down to the HRM process system (S1) for immediate action. This cycle underscores the importance of understanding the inputs and outputs of these processes.

3.4. HRM Processes (S1)

In alignment with the VSM, HRM processes are interconnected with one another and with the external environment. To clarify these information-based interrelationships, an outline is provided below detailing the inputs each HRM process receives or requires—both from external and internal sources—as well as the outputs each process generates.

3.4.1. Job Design (JD) Process

The JD process, which determines workflow, job types, and combinations to achieve organizational objectives [19,53], requires various external inputs to address immediate needs. These external inputs may include information from the Sustainable Development Goals (SDGs), particularly those related to gender equality, decent work, industry innovation and infrastructure, and the reduction of inequalities. Additionally, JD relies on information regarding global market trends, labor mobility, downsizing (planned elimination of positions), outsourcing (contracting other companies to carry out business processes), and offshoring or global sourcing (moving work to overseas locations). JD also requires insights into labor regulations, labor market conditions (understood as the space in which employers find specific types of workers) [53], as well as job supply and demand, wages, job descriptions, and HR market demographics such as age, education level, enrollment rates, gender, health status, and nationality.

For internal inputs, JD needs data from other organizational processes regarding their objectives and operations, as well as from HRM processes. For example, JD requires information from training and development (regarding competencies fostered within the organization), remuneration management (job evaluations, wage determinations, services, and benefits), labor relations (individual and collective negotiations), and performance management (standards for job competencies and performance). JD outputs include data such as workflow structures, job analysis and descriptions, as well as job design methods and techniques (see Table 1).

Table 1. Job design process.

Inputs	Process	Outputs
<p>External:</p> <ul style="list-style-type: none"> • SDGs: gender equality (SDG 5), decent work (SDG 8), industry, innovation and infrastructure (SDG 9), reducing inequalities (SDG 10). • Global markets: labor mobility, downsizing, outsourcing, offshoring. • Labor regulations. • Labor market: labor supply/demand, salaries, jobs (functions, responsibilities, working conditions, labor competencies), among others. • HR market: age, schooling, enrollment rate, gender, health, nationality, etc. 	<p>Internal:</p> <ul style="list-style-type: none"> • Company processes: purpose and operation of the processes. • Training and development process: labor competencies. • Compensation administration process: evaluation of positions, salaries, services and benefits. • Labor relations process: individual and collective labor negotiations. • Performance management process: labor competency and performance standards. <p>Determine the workflow, type and mix of jobs to achieve business objectives [19,53].</p>	<ul style="list-style-type: none"> • Workflow. • Job analysis and job descriptions: location, duties, responsibility, effort, working conditions and job profile (job competencies). • Job design methods/techniques.

Source: Own elaboration; Note: SDG (Sustainable Development Goals), downsizing (planned elimination of positions), outsourcing (contracting other companies to perform business processes), offshoring or global sourcing (relocating work to overseas locations).

It is important to note that JD, like all HRM processes, connects to other internal and external processes through the outputs it generates. In this case, JD outputs serve as inputs for other processes within the organization, fostering continuous interaction across systems.

3.4.2. Recruitment and Selection (R and S) Process

The goal of the R and S process is to locate, attract, and select suitable candidates for the organization [19,53]. This process connects to external sources, similar to the JD process, as well as to internal organizational processes (e.g., production, marketing) based on their HR needs and objectives. It also links with the finance department regarding the budget allocated to the recruitment process. Within HRM processes, R and S is interconnected with job design, training and development, remuneration management, performance management, and labor relations.

In terms of outputs, the R and S process generates information such as job postings, candidate profiles, reports to government labor agencies, and recruitment and selection methods/techniques. For further details, see Table 2.

Table 2. Recruitment and selection process.

Inputs	Process	Outputs
<p>Internal:</p> <ul style="list-style-type: none"> • Company processes: HR objective and needs. • Finance process: budget. • Job design process: job description. • Training and development process: HR career plan and career path. • Compensation administration process: job evaluation, incentives, services and benefits. • Performance management process: job competencies and performance standards, HR performance evaluation, validation of selection tests, promotions, transfers and dismissals. • Labor relations process: individual and collective labor negotiations. <p>External:</p> <ul style="list-style-type: none"> • SDGs: gender equality (SDG 5). • Global markets: labor mobility, downsizing, outsourcing, offshoring. • Labor regulations. • Labor market: labor supply/demand, salaries, positions (roles, responsibilities, working conditions, job skills), digital platforms, among others. • HR market: age, schooling, enrollment rate, gender, health, nationality, culture, use of digital platforms, etc. 	<p>Locate, attract and select suitable candidates for the company [19,53].</p>	<ul style="list-style-type: none"> • Job offer(s) (vacancies). • Candidate profiles. • Reports to governmental labor agencies. • Recruitment and selection methods/techniques.

Source: own elaboration.

3.4.3. Training and Development (T and D) Process

Given that T and D promotes learning and enhances the workforce’s competencies [19,53], the process is linked externally to educational institutions, the labor market, SDGs, global markets, and labor regulations. Internally, T and D connects with other organizational processes (based on their objectives, functions, and training needs), with the finance process (through the budget allocated to training and development), as well as with other HRM processes such as job design, performance management, and labor relations.

The output generated by T and D includes training programs, career plans, professional trajectories, reports to government labor agencies, and training and development methods/techniques. See Table 3 for further details.

3.4.4. Remuneration Management (RM) Process

The function of RM is to design strategies, policies, and processes that ensure employees’ contributions to the organization are recognized, both financially and non-financially [62]. This requires external information, such as economic conditions, labor and policy regulations, labor market trends, SDGs, and information from unions. RM also relies on internal information from other processes regarding their objectives and functions, and from the finance process, specifically regarding the company’s financial capacity and the budget allocated to remuneration. Additionally, RM is internally connected to other HRM

processes, including job design, performance management, labor relations, and recruitment and selection.

Table 3. Training and development process.

Inputs	Process	Outputs
<p>External:</p> <ul style="list-style-type: none"> • Educational institutions: professional competencies. • Labor market: labor competencies. • SDGs: gender equality (SDG 5), industry, innovation and infrastructure (SDG 9). • Global markets: labor mobility, downsizing, outsourcing, offshoring. • Labor regulations. 	<p>Internal:</p> <ul style="list-style-type: none"> • Company processes: purpose and operation of processes, training needs. • Finance process: budget. • Job design process: job description. • Performance management process: HR performance evaluation and job competencies, promotions, transfers and dismissals. • Labor relations process: individual and collective labor negotiations. <p>Promote HR learning and job competencies for the achievement of company objectives [19,53].</p>	<ul style="list-style-type: none"> • Training programs. • Career plans and professional trajectory. • Reporting to governmental labor agencies. • Training and development methods/techniques.

Source: own elaboration.

As outputs, the RM process generates job evaluations, salary scales, benefits and services, incentives, payroll, reports to government agencies, and remuneration management methods/techniques. For further details, see Table 4.

Table 4. Compensation administration process.

Inputs	Process	Outputs
<p>External:</p> <ul style="list-style-type: none"> • Economy: GDP performance, inflation, general minimum wage, wage survey, cost of living. • Labor regulations and wage policies. • Labor market: labor supply and demand, wages, services and benefits, incentives, working conditions. • SDGs: gender equality (SDG 5), decent work (SDG 8), reducing inequalities (SDG 10). • Global markets: labor mobility, downsizing, outsourcing, offshoring. • Trade unions: collective bargaining. 	<p>Internal:</p> <ul style="list-style-type: none"> • Company processes: purpose and operation of the processes. • Finance Process: Financial capacity (budget) or payment capacity of the company. • Job design process: job description. • Performance management process: evaluation of performance and job competencies, promotions, transfers and dismissals. • Labor relations process: individual and collective labor negotiations. • Recruitment and selection process: candidate profiling. <p>Design strategies, policies and processes necessary to ensure that people’s contribution to the organization is recognized through both financial and non-financial means [62].</p>	<ul style="list-style-type: none"> • Job evaluation. • Salary scale. • Benefits and services. • Incentives. • Payroll. • Reports to government agencies. • Remuneration administration methods/techniques.

Source: own elaboration.

3.4.5. Performance Management (PM) Process

The purpose of the PM process is to motivate and foster HR development [19,53]. Key external inputs include SDG 5 on gender equality, global and labor market trends, and labor regulations. Internally, PM connects with other organizational processes, particularly finance, and with HRM processes such as job design, training and development, and labor relations.

PM outputs include performance standards and job competencies, HR performance evaluations, the validation of selection tests, as well as HR promotions, transfers, and terminations. Additionally, PM generates methods and techniques for performance management. See Table 5 for further details.

Table 5. Performance management process.

Inputs	Process	Outputs
<p>External:</p> <ul style="list-style-type: none"> • SDGs: gender equality (SDG 5). • Global markets: labor mobility, downsizing, outsourcing, offshoring. • Labor regulations. • Labor market: level of labor skills. 	<p>Motivate and promote HR development in order to enhance company performance [19,53].</p>	<ul style="list-style-type: none"> • Performance standards and job competencies of the positions. • HR performance evaluation. • Validation of selection tests. • Promotions, transfers and dismissals. • Performance management methods/techniques.
<p>Internal:</p> <ul style="list-style-type: none"> • Company processes: purpose and operation of the processes. • Finance process: budget. • Job design process: job description. • Training and development process: career and career path plans. • Labor relations process: individual and collective bargaining. 		

Source: own elaboration.

3.4.6. Labor Relations (LR) Process

The LR process is focused on establishing and/or maintaining the relationship between the organization and its employees [19]. Key external inputs include labor and policy regulations, as well as economic conditions, labor market trends, global market dynamics, and SDGs. Internal input consists of information from other organizational processes regarding their objectives and functions, as well as data from finance regarding the company’s financial capacity. Additionally, LR requires information from other HRM processes, including job design, performance management, training and development, and remuneration management.

The outputs from LR include individual and collective bargaining agreements, workplace injury and disability provisions, internal work regulations, workplace health and safety programs, and collective bargaining methods/techniques. See Table 6 for further details.

The processes within the HRM system are definitively linked to the external environment, underscoring the importance of fostering their autonomy to achieve objectives while responding effectively to the complexity and dynamism of the modern world. However, a balance must be struck between control and autonomy: excessive control restricts operations, potentially limiting the HRM system’s adaptability to environmental changes. Conversely, if autonomy is excessive, it is unlikely that objectives will be met [30].

In this structure, HRM governance sets the overall direction. HRM strategic planning defines the system’s engagement with the external environment; HRM operational control measures system performance; the HRM information system coordinates synchronization; and HRM processes constitute the system’s core functions. Thus, by conceiving HRM as a viable system—capable of self-organization and self-regulation—its internal and external linkages become clearer, facilitating decision-making. This structure ensures that the

organization is equipped with essential HR capabilities to achieve its objectives and fulfill its vision.

Table 6. Labor relations process.

Inputs	Process	Outputs
<p>External:</p> <ul style="list-style-type: none"> • Labor regulations and wage policies. • Economy: GDP performance, inflation, general minimum wage, wage survey, cost of living. • Labor market: labor supply and demand, wages, services and benefits, incentives, working conditions. • SDGs: gender equality (SDG 5), decent work (SDG 8), reducing inequalities (SDG 10). • Global markets: labor mobility, downsizing, outsourcing, offshoring. • Trade unions: collective bargaining. 	<p>Internal:</p> <ul style="list-style-type: none"> • Company processes: purpose and operation of the processes. • Finance Process: Financial capacity (budget) or payment capacity of the company. • Job design process: job description. • Performance management process: evaluation of performance and job competencies, promotions, transfers and dismissals. • Training and development process: training programs and career and career path plans. • Compensation administration process: job evaluation, salary scale, benefits and services, incentives and payroll. <p>Create and/or maintain the interconnections between company and worker in the workplace, from the individual dimension (individual work contracts) and/or collective dimension -union- (collective work contract) [19].</p>	<ul style="list-style-type: none"> • Individual and collective labor negotiations. • Occupational hazards and disability. • Individual and collective labor contracts. • Internal labor regulations (art. 422, LFT). • Occupational health and safety program. • Reports to STPS and SS. • Collective bargaining methods/techniques.

Source: own elaboration.

4. Limitations of the MV-HRM

The formulation and adoption of efficient and effective HRM strategies within the MV-HRM are complex due to the intricate interactions among its processes, systems, and the immediate and future contexts of HRM. However, achieving HRM objectives relies on this mutually reinforcing integration [52]. A key limitation of the system is the lack of understanding regarding the reciprocal influence, communication, and direct participation inherent in each interaction, which involve autonomous decision-making and time-oriented behaviors [43].

While the MV-HRM is presented as a means to illustrate system complexity and as a proposal to enhance process effectiveness within organizations, it also aims to empower HR as the owners of these processes. Thus, the model’s effectiveness hinges on the acceptance and application by those within the system, as it remains a challenge for company leaders to move away from a linear and superficial view toward a systemic and holistic perspective that enables them to understand HRM’s functioning in depth [63,64]. HR is considered essential to the system’s effectiveness due to its knowledge, motivation, experience, and commitment to the organization [65]. Therefore, the effectiveness of the MV-HRM depends not solely on the function of each system component but on HR’s engagement and actions [66]. This underscores the importance of the governance system (S2), which is based on democratic participation of all HRM system members. It requires shifting away from seeing the director or manager as solely responsible for decision-making or system direction.

Clearly, open attention and dialogue—a wide-ranging, unfocused awareness of the full landscape—are needed [67], as well as sustained collective inquiry into processes and the assumptions underlying daily experience [68]. This approach facilitates system adaptation to environmental changes without compromising essential organizational characteristics. As HRM is considered a complex adaptive system (CAS), it possesses an unlimited capacity to adjust its behavior based on experience [69], enabling the organization and HRM to evolve by transforming knowledge, mental models, or organizational structures [70]. Ultimately, the MV-HRM fosters organizational learning, allowing modifications to processes, policies, knowledge, or mental models to improve or maintain system performance [71,72].

It is essential to move away from a linear causality perspective on HRM—being inherently static—in order to fully understand the dynamics of the interrelationships proposed in the model [73].

5. Discussion

Companies that survive are those best adapted to their environment, regardless of size [53]. To face the changing conditions of today's environment, one solution is to redesign organizations to be agile [53], and another is to understand them through systems thinking [13,30,50,72]. A simplistic view of HRM rarely succeeds due to the complexity it faces; holistic [13] and creative [12] solutions are needed. Organizations can no longer be viewed in fragmented terms, with attempts to arrange separate components, as this approach loses the intrinsic sense of interconnection with the whole [72].

Given the strategic importance of HR within organizations, as a source of value creation, it is imperative to analyze and understand the HRM system and its potential to provide sustainable competitive advantages. This requires, on the one hand, innovative ways to manage HR and, on the other, a shift away from the classical management view, which merely divides the system into parts without comprehending the whole [7]. It is necessary to manage these parts through the manipulation of inputs and monitoring of outputs [30] to help organizations achieve their objectives and foster interest among those involved in the system. This is not simply a matter of adopting the latest management trend or tool [7], rather, companies require profound change, a shift to systems thinking [30], and must ensure that organizational processes are efficient, that knowledge is generated and shared, and that flexible structures [74] and transformational leadership [75] are promoted. These elements are essential for building “intelligent organizations” capable of fostering continuous and collective learning, commitment, and freedom of action in HR to achieve objectives and, critically, to cultivate new ways of thinking grounded in systems thinking [72].

Change is inevitable: consumer preferences, competitor presence, political and legal policies, and societal structures are in constant flux. The HRM system remains viable only when it has the capacity to respond adeptly to the changing environments in which it operates [12,30]. Organizations operate on the edge between order and chaos, maintaining a state of limited instability. When companies distance themselves from rigid patterns and established rules, they open the door to creativity, new work methods, and organizational forms that support innovation [16]. The MV-HRM challenges the conventional managerial role, introducing a longitudinal dimension. For HRM governance, democratic participation is essential; decision-making requires the involvement of all members of the HRM system, rather than solely the director [30]. In this sense, an HR CEO becomes a pivotal figure in defining and implementing business strategies, with an increasing number of companies—including Intel, Ford, Electronic Arts, and United Technologies—incorporating HR leaders into their core business teams to ensure critical information sharing [53].

For a company to act quickly and gain a competitive edge, it “must be agile” [53]. This agility requires a new perspective, the development of new capabilities within the HRM system, and the systemic implementation of HRM processes. As illustrated by the MV-HRM, HRM practices and initiatives undoubtedly impact the internal environment of the organization,

influencing financial outcomes, organizational resources, and competencies [8,76], as well as the external economic, political, social, and environmental spheres.

6. Conclusions

The agility and performance of the HRM system do not depend on a single component or process but rather on the integration of all its parts, making it essential to analyze and understand the critical interactions among them. Optimizing one part of the HRM system without ensuring effective interactions among components can destabilize the entire system [12,30]. For this reason, the VSM is applied to HRM to illustrate its inherent complexity.

The MV-HRM comprises the environment and five systems: S1 represents HRM processes, S2 is the HRM information system, S3 is operational control of HRM, S4 is HRM strategic planning, and S5 is HRM governance. Notably, the model emphasizes the relationships and interactions with both the immediate and future environments, facilitating the identification of essential feedback structures. Consequently, information flow and communication are fundamental, as is recognizing that objectives are dynamic and constantly evolving due to interdependence with the external and internal environments.

Based on the literature review conducted in WoS and Scopus, there is limited evidence of studies that address the study of companies, specifically HRM, through systems thinking and complexity theory [31–39]. Generally, existing studies focus on the relationship between HRM practices and organizational performance, often overlooking a deeper understanding of process functionality [7]. Unlike previous proposals, the MV-HRM primarily focuses on understanding HRM system functioning through the lens of the VSM. The MV-HRM aims to provide an alternative perspective on HRM functionality through the framework of complex adaptive systems, encouraging strategists, HRM professionals, and organizations to develop more agile practices suited to a dynamic and complex environment.

One limitation of the MV-HRM is that it remains a theoretical proposal requiring more in-depth analysis of both immediate and future environments with which it interacts. The literature review is restricted to publications in English in WoS and Scopus with selected descriptors in the document titles. The input–output flows of HRM processes (S1) were developed internally and serve as illustrative examples based on limited literature. Future research should expand the scope of environmental analysis and precisely define HRM system linkages, as well as conduct a more rigorous review of HRM process inputs and outputs. Further studies should also examine in detail how the MV-HRM adapts to incoming information flows and delve deeper into the functioning of self-regulation mechanisms. Additionally, applying the model to visualize HRM dynamics within organizations and measuring its effectiveness in designing strategies could help verify its practical utility. Another valuable research direction would be to integrate performance perspectives with CAS and VSM approaches for studying the HRM system.

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