

Navigating Challenges: A New Conceptual Model for Human Capital Management in Healthcare

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Abstract: In the 21st century, the healthcare sector faces formidable challenges, including the rapid proliferation of medical technology innovations, the extension of life expectancy, and the concurrent trend of ageing within society. Moreover, healthcare grapples with an acute shortage of workforce, accompanied by significant skills gaps and mismatches. The consequences of skills shortages, gaps, and mismatches are profound, potentially impeding the treatment process and compromising healthcare outcomes, thereby jeopardizing both the quality of healthcare and the safety of patients and healthcare professionals alike. These signals underscore the imperative for transformative adjustments within the healthcare sector. Amidst this dynamic landscape, healthcare institutions must cultivate systems and approaches capable of rapid adaptation to evolving circumstances while facilitating future planning and data-driven decision-making. Of paramount importance is the establishment of systems that ensure effective knowledge management for healthcare professionals, identify knowledge and skills gaps, and highlight improvement opportunities. In light of these exigencies, the authors have crafted a conceptual model of human capital management based on skills monitoring and tailored to the healthcare sector. This model encapsulates a human-centric management ethos, seamlessly integrated with a data-driven business strategy within a patient-centric healthcare paradigm. The practical implementation of the Human Capital Management Model would empower healthcare institutions to make informed, data-driven decisions to reach the strategic goals of the institution: ensuring efficient human resource provision with appropriate skill-mix, improving health quality, increasing patient and healthcare professional safety, and the sustainable use of financial resources.

Keywords: Human Capital, Skills Monitoring, Knowledge Management, Healthcare Institution, Healthcare Workforce

1. Introduction

Healthcare service coverage, workforce provisions, healthcare quality, and patient and healthcare professional safety are key criteria for the quality of healthcare systems. With rapid advancements in medical technology, increased life expectancy, and simultaneous trends in population ageing, the necessary changes in the healthcare sector are becoming increasingly evident. Anticipating future challenges, as early as 2007, the European Commission (EC) developed the European Union (EU) health strategy White Paper Together for Health: A Strategic Approach for the EU 2008-2013, where one of the objectives was outlined as the development of dynamic healthcare systems and new technologies (European Commission, 2007). Subsequently, in the European Commission's 2008 Green Paper (COM(2008) 725 final) on the EU workforce for health, it was indicated that continuous professional development, relevance of professional skills, enhancement of the safety of both patients and healthcare professionals, and also mechanisms to implement healthcare workforce monitoring are very crucial to support workforce capacity, education, and needs planning (EC, 2008). In 2016, the World Health Organization (WHO) identified as priority tasks until 2030 - ensuring data availability on human resources in healthcare to monitor and ensure accountability for the implementation of national, regional, and global strategies, as well as investments in healthcare workforce education, skills provision, and alignment with labour market and societal health needs (World Health Organization 2016). To promote investments in the education, skills and employment of the healthcare workforce, a multisectoral partnership, coordination, and funding are necessary; therefore, the WHO has established the "Working for Health platform" and implementation mechanisms to support countries in investment strategy development, monitoring, and management for the planning and financing of healthcare workers, education and employment, as well as protection and performance (World Health Organization, 2022).

The initiatives mentioned above serve to move toward a future perspective – 1) United Nations (UN) Sustainable Development Goals by 2030, to ensure a healthy life and promote well-being for all at all ages (Goal No.3), where among the tasks outlined is the provision of universal health coverage, protection against financial risks, and increasing healthcare financing and workforce (United Nations, 2015), and 2) also to reach the goal set by WHO - to create at least 40 million new jobs by 2030 and to address the projected shortage of healthcare workers,

ensuring that "right number of jobs for health workers with the right skills and in the right places to deliver universal health coverage" (World Health Organization, 2016).

International level guidelines emphasize the significant role of the healthcare workforce in the overall healthcare system. Furthermore, the effective development of human resource management in healthcare is a critical prerequisite to strengthening the healthcare system. Data-based analysis of healthcare workforce, healthcare economics, and societal health needs promotes evidence-based decision making at the institutional and national levels, as well as policy development in the sector, ensuring the needs-based development of the healthcare sector. However, to implement the EU strategy and achieve the objectives of the UN and WHO, it is essential to develop a systemic approach that involves all stakeholders shaping the healthcare system. Consequently, beyond state policies or national strategies, there is considerable importance in the investments made by healthcare institutions and their strategies at the institutional level. These strategies should promote workforce planning, skills management, and professional development of the workforce. Therefore, to address this issue, the authors have crafted a Conceptual Human Capital Management Model tailored to the healthcare sector.

2. Methodology

The aim of this theoretical paper is to propose a Conceptual Model of Human Capital Management based on skills monitoring and designed for the healthcare sector. Drawing on current trends in the healthcare sector as outlined in guidelines, standards, and regulatory documents, the authors identified the sector's needs to enhance the relevance of the skills of the healthcare workforce. A literature review was conducted to identify aspects of human capital management and intangible asset accounting, revealing a deficiency in qualitative human capital disclosure. Based on these research findings and considering the contextual factors of the healthcare sector, the authors developed a novel Conceptual Model of Human Capital Management to address the gap identified, which has emerged due to the current need for a skills-based approach in healthcare sector. Following the analysis, the authors have also delineated the foundational principles for the conceptual model and impact on strategic goal of healthcare institutions. This model is specifically designed for the healthcare sector to navigate contemporary workforce planning, healthcare quality, patient and healthcare professional safety, as well as financial sustainability challenges.

3. Theoretical Framework

3.1 Human Capital and Its Management

Knowledge management is the management process of creating, sharing, and using organizational information and knowledge (Girard and Girard, 2015). In healthcare knowledge management can encompass various strategies, practices, and technologies aimed to facilitate knowledge creation and dissemination to support evidence-based practice, to improve patient care, and drive organizational effectiveness and innovations in healthcare delivery. Knowledge management can be implemented through various pathways, and one of the approaches involves the learning and training of employees to disseminate knowledge, update clinical skills, and promote continuous professional development among healthcare professionals. According to human capital theory, when employees start their jobs, their knowledge and skills become part of the organization's human capital. Originally seen as just a mix of employees' knowledge and skills, the theory has evolved and now more various factors that characterize human capital are identified. These include intelligence, qualifications (Bontis *et al.*, 1999), competencies (Bontis *et al.*, 1999; Wang, Wang, and Liang, 2014), behaviour and personal energy (Davenport and Prusak, 1998), experience (Abdulaali, 2018; Wang, Wang, and Liang, 2014), mental capacity, thinking style, and ability to act (Lapina, 2010), social competence, professional competence, leadership skills, motivation, and expertise (Abdulaali, 2018), innovations, attitude, commitment, wisdom (Wang, Wang, and Liang, 2014).

The significance of human capital as an intangible asset of the organization has recently become increasingly pronounced. Studies have demonstrated a positive correlation between human capital development within organizations and performance at both the individual and the organizational levels. Moreover, this correlation can be examined from two perspectives: the influence of individual human resource knowledge and skills on organizational performance (Ployhart *et al.*, 2014), and the impact of organizational performance on the individual level (Crocker and Eckardt, 2014). Considering the significant impact of human capital at the organizational level, it is imperative to manage this capital purposefully. Successful implementation of human capital management can attract and retain a high-quality workforce, creating a competitive advantage and

excellent company performance (Delery and Roumpi, 2017). Human capital is a unique internal resource and a key driver of organizational outcomes (Barney, 1991). Human capital has a significant positive impact on innovation (Sima *et al.*, 2020), operational and financial performance, and company growth (Rauch and Rijsdijk, 2013). Researchers also point out that human capital must be integrated through corporate management, as management approach and style influence human capital growth (Khan *et al.*, 2020). Therefore, human capital must be managed purposefully to overcome organizational and contextual challenges.

Similarly to other professions, the healthcare sector often faces a mismatch between the existing skills of employees and the skills required for their roles. This disparity highlights concerns about the potential underutilisation of human capital, where employees may have skills that exceed the requirements of their roles, or about the quality and safety of healthcare services, where employees may lack essential skills (Organisation for Economic Co-operation and Development, 2016). Hence, the authors have taken the initial step of developing a Conceptual Model for Human Capital Management in healthcare institutions. This model is predicated on the notion that an institution's human capital is constituted by the knowledge and skills of its workforce, and that effective human capital management is context-specific, considering the unique dynamics of the healthcare sector.

3.2 Human Capital Data Metrics and Disclosure

As the concept of human capital continues to evolve and the paradigm shifts, the issue of human capital disclosure grows in significance. With a company's intangible assets now estimated to represent an average of 52% of its market value (Klemash, Neill, and Smith, 2019), the measurements and the value of human capital become extremely relevant to the company's management, stakeholders, shareholders, and investors. The Standard and Poor's 500 index (S&P 500) summarizes the performance of approximately 500 high-value companies in the United States, reflecting the performance of the US stock market and the entire US economy. And, as the study shows, since 2009, the market value of non-material assets in S&P 500 companies has increased by 255%, while the volume of material assets during the same period has increased by only 97% (PricewaterhouseCoopers, 2021). Despite the increasing importance of non-material assets, the accounting model has remained largely unchanged. Human capital is not treated as an asset that requires accounting and valuation compared to financial or physical assets, and its value is predominantly absent from the organization's balance sheet or other financial statements. Consequently, traditional reports typically provide minimal or no information on human capital value, skills, management effectiveness, and productivity in relation to revenue and profit. However, there is a growing recognition in the literature of the significance of measuring and analysing human capital data to enhance strategic decision-making. To enhance employee performance, metrics are required to gauge the value of human capital (such as accumulated knowledge, skills, experience, etc.), and the garnered knowledge should be leveraged to efficiently administer the organization. Human capital measurement presents challenges, and assessing its value can be subjective. Without a unified understanding and widely accepted methodology or consistent approach, there is no avenue to incorporate the value of human capital into the annual balance sheet. Nevertheless, this does not hinder organizations from addressing this issue in a separate report on organizational human capital or integrating it into annual financial or other types of reports to showcase company value and transparency.

Currently, initial efforts are underway to find ways to reflect the intangible value of the company. For example, in 2018, the international audit and tax consulting firm 'Deloitte' introduced the 'Human Capital Balance Sheet,' a document designed to transparently consolidate human resources from cost, expense, and risk perspectives (Deloitte, 2018). Furthermore, trends that underscore the need for accounting and reporting of human capital are evident in various documents and initiatives at the international level. In 2018, the International Organization for Standardization (ISO) issued a new standard - 'ISO 30414:2018 Human resource management - Guidelines for internal and external human capital reporting' (International Organization for Standardization, 2018). In 2020, the International Financial Reporting Standards (IFRS) Foundation established the International Sustainability Standards Board (ISSB) and the Sustainability Accounting Standards Board (SASB) to address non-financial reporting issues, including human capital reporting (Sustainability Accounting Standards Board, 2021). The World Economic Forum (WEF) in its report "Human Capital as an Asset: An Accounting Framework to Reset the Value of Talent in the New World of Work" indicates that a robust framework for measuring and accounting human capital provides a more precise approach to workforce management and that differentiated accounting practices and isolated metrics need to be replaced with a more integrated, holistic approach (World Economic Forum, 2020). Adopting the principles of a paradigm shift, human capital accounting can help organizations to focus on long-term strategies, invest in human resources, and to create value by embracing the thinking of

people, work, and skills. Organizations should identify themselves as socially responsible participants in the broader ecosystem and thus create a three-way win-win-win situation, where beneficiaries are the organization, employees, and the wider society (WEF, 2020). In the report developed in collaboration with Deloitte, Ernst & Young, KPMG, and PricewaterhouseCoopers - "Toward Common Metrics and Consistent Reporting of Sustainable Value Creation" (2020), WEF proposes human capital accounting metrics: "1) Average hours of training per person that the organization's employees have undertaken during the reporting period, by gender and employee category (total number of trainings provided to employees divided by the number of employees); 2) The average training and development expenditure per full time employee (total cost of training provided to employees divided by the number of employees)" (World Economic Forum, 2020). At the same time, WEF points out that these indicators may not reflect the overall impact of learning on measurable performance improvements.

These initiatives are highly valuable and desirable; however, the authors believe that within this novel framework, deeper transformative adjustments are imperative based on two considerations. Firstly, human capital accounting remains fragmentary and is not widely developed or implemented in practice, unlike financial accounting, which is a common standard in organizations. Secondly, existing solutions focus primarily on the collection of quantitative data, such as the number of training sessions attended or the time spent in training, but do not provide a deeper insight into the qualitative and substantive aspects of human capital. The authors suggest that human capital metrics should be based on qualitative skills management, ensuring human capital disclosure, and transparently reflecting the value of an organization's human capital. All stakeholders should have access to transparent information, specifically regarding the knowledge and skills possessed by the employees who constitute the organization's human capital. This should include detailed insights into the specific knowledge and skills acquired or refreshed by employees, and also the proficiency levels achieved, and recency or regularity of these acquisitions. This transparency not only allows better assessment and utilisation of human resources, but also fosters trust and engagement among stakeholders, including investors, clients, employees, and regulatory bodies. By providing a comprehensive view of the capabilities of the workforce, organizations can more effectively align their human capital with strategic objectives, drive performance improvements, and support informed decision-making processes.

3.3 Context of the Healthcare Sector

For particular organisations, such as healthcare institutions, especially those that are state-funded, the primary objectives are not focused on revenue generation, improving competitiveness, or expanding market share. Therefore, the approach to human capital management should be evaluated within the context of the healthcare sector, including the functions mandated by the state, providing a minimum level of medical assistance and ensuring the quality of healthcare, as well as the safety of patients and healthcare professionals. Over recent years, since the European Commission introduced the "New Skills Agenda for Europe," which promotes balancing skills acquisition, developing skills systems, and enhancing lifelong learning, there is still a notable lack of evidence regarding the practical implementation of a human capital management approach in healthcare sector institutions (Grigorovica *et al.*, 2022). The quality of healthcare and the safety of patients and healthcare professionals are the key factors distinguishing enterprises and institutions in the healthcare sector from other sectors. Therefore, human capital management in this sector is context-dependent, and healthcare aspects are paramount in the development of the Human Capital Management Model.

According to the WHO, patient safety is the reduction of risk of unnecessary harm associated with healthcare to an acceptable minimum. The acceptable minimum refers to the collective judgment of current knowledge, available resources, and context in which care was delivered, and evaluated against the risk of non-treatment or alternative treatment (World Health Organization, 2009). Patient safety is a framework of organized activities that creates cultures, processes, procedures, behaviours, technologies, and environments in healthcare that consistently and sustainably reduce risks, reduce the occurrence of avoidable harm, make error less likely, and reduce its impact when it does occur (World Health Organization, 2021). Consequently, the failure of healthcare institutions to ensure safe care incurs additional expenses, paradoxically reducing funding for healthcare provision. The WHO also notes that investments in promoting patient safety can lead to financial savings, as evidenced by estimates showing that costs associated with medical errors amount to approximately \$42 billion annually, excluding lost wages, productivity, or healthcare expenses, collectively comprising nearly 1% of global health expenditures (World Health Organization, 2019).

As indicated in the report 'Patient Safety 2030', reducing harm requires the development of an integrated, systemic approach that includes fostering a culture of safety, placing patients and healthcare personnel at the

centre of all intervention measures, and implementing evidence-based policy (Yu *et al.*, 2016). Evidence-based policy aligns with human capital management, as the costs that healthcare institutions incur to reduce harm to patients would be more meaningfully invested in improving healthcare quality by primarily investing in institutional human capital, developing healthcare personnel skills, ensuring systematic human capital development and making data-driven decisions, thus also reducing risks to patient safety. Therefore, healthcare institutions must integrate human capital management with systems that signal skills gaps, skills mismatch, existing or protentional skills imbalance in the healthcare process, to reduce and prevent patient harm.

4. Conceptual Human Capital Management Model for Healthcare Institutions

In the dynamic contemporary work environment, the workforce is a dynamic asset that requires intentional human capital management. To improve the effectiveness of forecasting and planning human resources in healthcare and to address increasing workforce shortages and skills mismatches within existing staff, healthcare institutions must adopt a comprehensive human capital management strategy. The Human Capital Management Model proposed by the authors ensures not only the accounting numerical measures, but also incorporates qualitative, in-depth skills monitoring at the individual employee level. Skills monitoring as a central part of human capital management enables the acquisition of current employee skills levels, reflecting the extent and level of individual performance. It should be noted that within this model, the term 'skills' is used according to the European Commission's programme 'A New Skills Agenda for Europe' - skills refer 'broadly to what a person knows, understands, and can do' (European Commission, 2016).

Following the analysis, the authors have delineated the foundational principles for the Conceptual Model of Human Capital within healthcare:

- *Human capital management is grounded in skills monitoring.* A skills digital monitoring system should be established within the Human Capital Management Model, facilitating the accumulation and analysis of skills information. The skills digital monitoring system captures a wide range of skills data that are integrated into individual and institutional skills portfolios, enabling qualitative disclosure of the value of human capital. The authors assert that the improvement of healthcare quality and the safety of patients and healthcare professionals can only be achieved through rigorous validation of knowledge and skill acquisition. Monitoring skills effectively cannot solely rely on the collection of training programmes and course attendance certificates, as these do not guarantee the actual acquisition of knowledge and skills by the employee. Skills monitoring should be based on qualitative skills management, ensuring transparent human capital disclosure and revealing the specific knowledge and skills employees possess (including also the date of skill acquisition and refreshment).
- *Human capital management is based on an ecosystem of healthcare systems.* Human capital management must ensure seamless information integration between the skills digital monitoring system and other healthcare-specific data acquisition systems. These systems can vary between different institutions and can change over time, but systems such as patient satisfaction surveys, patient safety reporting systems, general quality surveys, and performance management systems, among others, can serve to identify existing or potential skills shortages or mismatches.
- *Human capital management is integrated at all levels of the institution.* At the strategic level, the management of a healthcare institution is responsible for defining the human capital management strategy, fostering a culture of learning, and incorporating an analytical approach and data-driven decision making. At the operational level, the human resources management unit performs the functions of collecting human capital data and performing data analytics, coordinates learning activities, and monitors all skills portfolios. Meanwhile, at the tactical level, the healthcare workforce, through active training and skills development, enriches the institution's human capital.

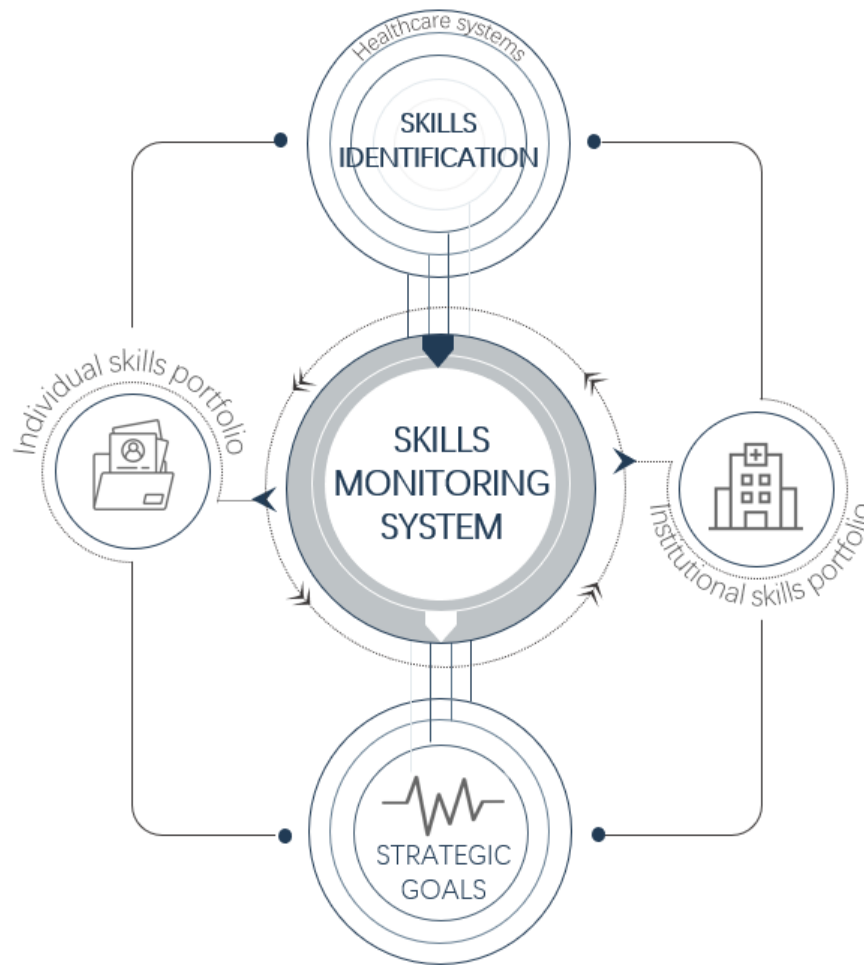


Figure 1: Conceptual Human Capital Management Model for Healthcare Institutions (by authors).

The model provided (Fig.1) is dynamic and flexible and can be customized to suit diverse settings and institutional needs. The implementation of the Human Capital Management Model can yield benefits across various operational levels of the institution, and through effectively executed human capital management, healthcare institutions have the opportunity to enhance the achievement of strategic goals:

- *Provision of Human Resources.* Skills monitoring supports the management of employees' skills, the implementation of professional development plans, the development of career paths, and the management of individual healthcare personnel's recertification plans. Managing these data enables more qualitative and precise forecasting and planning of human resources, performance evaluation, annual goal definition, and the preparation of precise, data-driven human capital reports for board, shareholders, stakeholders, and public administration from various perspectives.
- *Healthcare Quality & Safety.* With a suitable workforce with up-to-date skills, the risks of harm to patients are reduced and the results of healthcare processes are improved. If signals about existing or potential skills shortages or mismatches are linked with skills monitoring at an individual level, it is possible to ensure timely acquisition or refreshment of skills. This approach promotes quality enhancement, reduces the occurrence of avoidable harm, and allows for the prevention of potential future risks to patients or healthcare personnel.
- *Financial Sustainability.* By conducting human capital management equally as managing other types of capital and investing resources in employee knowledge and skills, institutional financial sustainability is promoted, as well as financial planning grounded in data-driven decisions. As incidents causing harm to patients decrease, the expenses of the healthcare institution related to harm reduction and compensation diminish. Concurrently, this demonstrates deliberate long-term action and fosters a positive institutional reputation.

5. Conclusions

Human capital is a crucial intangible asset for healthcare institutions, comprised of the knowledge and skills of their employees. In the healthcare sector, targeted and effective human capital management can improve the achievement of strategic objectives – ensuring efficient human resource provision, improving health quality, increasing the safety of patients and healthcare professionals, and the sustainable use of financial resources. The Human Capital Management Model provided by the authors deepens transformative adjustments in the field and drives to shift the mindset – from numeric measures to qualitative valuation, from systems to integrated ecosystem, and from costs to investments.

By implementing human capital management based on this novel Human Capital Management Model, healthcare institutions have the opportunity to navigate through contemporary challenges and to meet the health sector goals set by the World Health Organization and the United Nations – to ensure healthcare coverage with sufficient human resources and an appropriate skill-mix by 2030.

Future research should aim to (1) develop a detailed concept for a skills digital monitoring system designed to the healthcare institution (establishing skills levelling, categorization, and process integration), (2) develop a human capital management process from the perspective of innovation integration, and (3) expand the analysis of the impact of human capital management on the strategic objectives of healthcare institutions.

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