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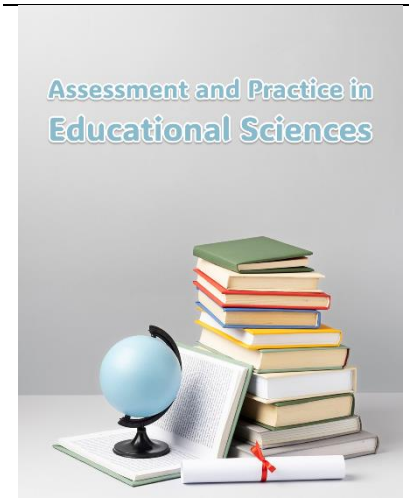


# Identification and Prioritization of Lean Human Resource Management Components: A Study in the Oil Industry of Iraq and Iran



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## ABSTRACT

The purpose of this study is to identify the components of lean human resources in the Ministry of Oil of Iraq and to provide a detailed review of the various dimensions and components of lean human resources that influence the improvement of human resource efficiency and effectiveness. This research is based on an interpretive philosophy, follows an inductive approach, and utilizes a qualitative methodology. In the qualitative phase, a systematic review approach and qualitative content analysis method were employed. The population under study for identifying lean human resource components is the Iraqi oil industry. The keywords used for the search included “lean personnel,” “lean employees,” “lean leadership,” “lean human resource principles,” “lean methods or techniques or tools,” as well as combined searches such as “human resources” and “lean” or “human resource management methods” and “manufacturing companies.” The strategy recommended by Tranfield et al. (2003) was adopted, which generally includes three major stages: planning the review, conducting the review, and reporting the review. The time frame for the reviewed studies spans from 1980 to 2024. Moreover, to conduct the systematic review, this study followed the three-stage review framework of Tranfield et al. (2003). The results indicate that emphasis on training and development, teamwork, competence and expertise, creative innovation, job concepts, cultural values, influential roles, structures and methods, communication and interactions, positive behavior and attitudes, human resources and empowerment, integrated management systems, monitoring and evaluation, and support and backing contribute to the improvement of organizational performance.

**Keywords:** Lean, Human Resources, Lean Human Resources, Systematic Review

## Introduction

Lean human resources management is not merely the transplantation of lean tools into personnel processes but rather an ideological shift in how organizations perceive and utilize their workforce. This approach emphasizes continuous improvement, waste elimination, employee empowerment, value creation, and seamless communication across organizational hierarchies (1, 2). The lean philosophy, originally rooted in manufacturing, has evolved to address broader organizational challenges by embedding strategic, cultural, and operational reforms that involve the workforce as active contributors to innovation and efficiency (3, 4). Scholars emphasize that lean HRM is a key enabler of lean transformation, as it fosters behaviors and attitudes aligned with the principles of kaizen (continuous improvement), teamwork, responsibility, and customer-centricity (5, 6).

Within the specific context of the Iraqi Ministry of Oil, where complex bureaucratic structures and evolving governance norms intersect with national economic imperatives, deploying lean HRM could play a critical role in overcoming operational bottlenecks, skills mismatches, and inefficient administrative systems. Oil ministries, being labor-intensive and often entangled in legacy systems, require agile human resource models that can deliver productivity without compromising workforce engagement or long-term capability development (7, 8). Prior studies in similar public sector contexts have revealed that a lack of lean thinking in HR functions leads to resistance in change management, process rigidity, and underutilization of talent (9, 10).

A foundational dimension of LHRM lies in the recruitment and selection process. Unlike traditional models that focus primarily on academic qualifications and generic experience, lean HR prioritizes recruiting individuals with strong problem-solving skills, cross-functional flexibility, and a predisposition to continuous learning (2, 11). Such individuals are perceived as "lean fit" because they require minimal onboarding and adapt quickly to dynamic process environments (12). Furthermore, lean leadership has been found to correlate positively with the professionalization of human resources in public institutions, underlining the role of leadership behavior in shaping lean culture (12).

Another vital pillar of lean human resource design is communication and feedback systems. Organizations striving for lean transformation must develop transparent, fast, and bi-directional communication channels, enabling knowledge sharing and timely decision-making (13, 14). This aligns with the value-stream orientation of lean philosophy where information flow is as crucial as material flow. Lean HRM leverages performance appraisal systems not only to evaluate but also to coach and realign employees toward strategic objectives (7, 15). In high-stakes environments such as the oil industry, feedback loops must be designed to be responsive and data-driven, thus minimizing inefficiencies and delays in human capital deployment.

Another defining aspect of lean HRM is its emphasis on job enrichment and decentralization. By empowering employees through participatory decision-making and well-structured delegation, lean HRM fosters intrinsic motivation, autonomy, and accountability (16, 17). Studies have also revealed that such practices contribute to greater psychological safety in the workplace—an essential precursor to innovation and sustained performance (8, 11). The role of coaching and ongoing learning in this regard cannot be overstated. Lean HRM systems emphasize mentorship, knowledge transfer, and self-managed learning trajectories to build a resilient and adaptive workforce (4, 5).

Furthermore, lean HRM insists on integrating performance management with customer value creation. In contrast to bureaucratic performance metrics, lean-oriented evaluation systems align individual performance indicators with end-user satisfaction and process outcomes (1, 3). This reorientation ensures that HR practices are not siloed but are instead embedded into the organization’s value stream. For the Ministry of Oil, where operational excellence directly impacts national revenues and geopolitical stability, this alignment is particularly strategic (18).

One of the more recent developments in lean HR is the integration of digital technologies to support real-time HR analytics, workforce monitoring, and automation of low-value activities. Scholars have introduced the concept of "Lean HR 4.0," which fuses lean principles with Industry 4.0 tools such as AI-based recruitment, predictive analytics for attrition, and digital collaboration platforms (5, 19). These advancements help preemptively identify skill gaps, streamline administrative workflows, and reduce digital waste—a growing concern in organizations undergoing digital transformation (10). Especially in complex bureaucratic settings like oil ministries, leveraging such technologies can simplify regulatory compliance and enhance strategic workforce planning (9, 15).

Nevertheless, successful implementation of LHRM requires attention to cultural, institutional, and contextual contingencies. Lean practices cannot be imposed as mere tools; they must be contextualized within existing administrative cultures and human capital realities. Research by Muñoz-Villamizar et al. (2019) in the agri-food sector found that integration of lean principles is most successful when aligned with local values and operational rhythms (20). Similarly, Rasheed (2023) emphasized the importance of integrating sustainability management with lean practices to ensure long-term value generation and supply chain resilience, a lesson particularly relevant for resource-dependent economies (21).

To guide practical implementation, critical success factors have been identified, including top management commitment, training, employee involvement, and structured change management strategies (8, 22). These are especially crucial in public sector organizations that often grapple with bureaucratic inertia and fragmented authority structures. In the case of the Iraqi Ministry of Oil, cultivating lean leadership at all levels—backed by appropriate policies and performance incentives—will be essential for embedding lean thinking within HR functions (12, 23).

In summary, Lean Human Resource Management represents an integrated framework that enhances organizational competitiveness, responsiveness, and sustainability.

## Methods and Materials

This study was conducted using an interpretive philosophy, an inductive approach, and a qualitative method. A systematic review approach and qualitative content analysis method were employed. The study population for identifying lean human resource components consisted of relevant literature available in reputable domestic and international scientific databases. These databases include, among others, the National Library of Iran, IranDoc, the Scientific Information Database of the Academic Jihad (Research Project Database), University Electronic Journals System, Magiran, and NoorMag, as well as international scientific databases such as Springer, Scopus, Elsevier, Emerald, ProQuest, ScienceDirect, and Google Scholar.

To select relevant studies, the following criteria were considered. The time span of the studies ranged from 1980 to 2024, as the concept of "lean" was first introduced in scholarly articles published in 1980. The languages of the publications were limited to Persian and English. The selected studies included journal articles and doctoral dissertations indexed in credible scientific databases.

In the sampling method of the systematic review phase, relevant sources such as journal articles, dissertations, and books in both domestic and international publications were screened. Sources that addressed key dimensions of the literature on lean human resources—such as the evolution of the concept and its relationship with other constructs—were selected. The researcher limited the search to English and Persian journals between 1980 and 2024. The year 1980 was chosen because it marked the publication of the first scientific article addressing the concept of lean human resources. In the preliminary stage, prior to the operational search for articles, several exploratory searches were conducted in databases such as ScienceDirect and Google Scholar to determine appropriate keywords. These initial searches helped identify relevant terms frequently used in articles, which were then selected as the study's keywords. These included: "lean human resources," "lean work environment," "lean

HR practices," "thinking," "Toyota employees," "Toyota HR," "lean employees," "lean thinking," "lean leadership," "lean managerial behavior," "strategic lean HRM," and "HR productivity."

Next, inclusion and exclusion criteria were established for the systematic review based on the research question. The PICOS framework (Population, Interventions, Comparisons, Outcomes, and Study Design) was used to guide the specification of these criteria. Additional criteria, such as credible databases and publication year range, were also incorporated to improve the rigor of the review process.

**Systematic Review Method**

This study adopted the strategy recommended by Tranfield et al. (2003) and followed a protocol that clearly delineates each phase of the review. This approach includes three primary stages: (1) review planning; (2) conducting the review; and (3) reporting and dissemination. Thus, a successful systematic review generally includes three major steps: planning the review, executing the review, and reporting the findings. These steps are detailed below.

The first stage involved defining the review methodology, which was developed by a review panel composed of the article's authors. The protocol included written guidelines on search procedures, screening, data extraction, analysis methods, and specific criteria to reduce potential bias before initiating the review. After development, the protocol was tested during the study and then shared with two to three experts for review and feedback to refine its quality. The inclusion and exclusion criteria, as well as the search terms used to locate articles in the selected databases, were specified in the study's methodology. Entry and exit criteria were used to help gather data from publications and provide relevant insights (Tranfield et al., 2003). The current study's inclusion and exclusion criteria are presented in Table 1. Tóth et al. (2016) recommend using citation-based sources to ensure the diversity of the studies included in the review. Similar to previous systematic reviews, the current review was limited to peer-reviewed academic journal articles and excluded grey literature (e.g., reports, conference papers, theses, etc.). This study reviewed articles from Taylor & Francis, Google Scholar, SpringerLink, Scopus, Elsevier, Emerald Insight, and ScienceDirect. For dissertations, ProQuest and domestic databases such as the Academic Jihad site, NoorMagz, the Comprehensive Humanities Portal, and IranDoc were used. The foreign databases mentioned also comprise most of the records used in systematic literature reviews (SLRs) conducted by Cherrafi et al. (2017) (Reinders et al., 2022). It is important to note that due to the authors' limited access to other academic databases, the scope of the current review was restricted to these selected sources. Following a similar methodology to Promma & Antony (2019) and Antony et al. (2021), only English-language articles were retrieved. According to Shafril et al. (2020), researchers should select the time frame for evaluation based on the level of conceptual maturity. The authors of this study opted for a longer publication window, as the lean HR concept is a mature topic with a substantial body of literature.

**Table 1. Article Inclusion Criteria**

| Inclusion Criteria | Exclusion Criteria |
|---|---|
| Articles published between 1980 and 2024 | Any publication before 1980 or after May 2024 |
| Academic journals | Online sites, grey literature (textbooks, doctoral dissertations, conferences, technical reports, master's theses, working papers, etc.) |
| Full-text access articles | Articles without full-text access |
| Peer-reviewed articles from Taylor & Francis, Google Scholar, SpringerLink, Scopus, Elsevier, Emerald Insight, ScienceDirect, ProQuest, and domestic sites such as Academic Jihad, NoorMagz, Comprehensive Humanities Portal, and IranDoc | Non-academic databases |
| Articles related to lean HRM and lean personnel management | Articles focused solely on hard lean production or unrelated lean-hybrid approaches such as lean-agile, lean-resilient, lean-green, or Six Sigma |
| Articles discussing HR-related components | Other lean production components unrelated to HR practices |
| Articles related to the production sector | Articles related to the construction and service sectors |

In the second stage, or the review execution phase, search strings were constructed using combinations of the keywords identified during the planning stage. The systematic review employed keywords such as “lean,” “lean human resources,” “lean employees,” “lean HR management,” “lean personnel management,” “lean management,” “lean leadership,” “lean recruitment,” “lean retention,” “lean HRM,” “lean work environment,” and “lean methods/techniques/tools.”

An example of a search string is as follows: “lean personnel” OR “lean employees,” “lean leadership” OR “lean HR principles,” “lean methods/techniques/tools,” or combined searches like “human resources” AND “lean” or “HRM methods” AND “manufacturing companies.” A total of 286 academic journal articles were collected during this process. The gathered data were organized into a database using an Excel spreadsheet (Lietz et al., 2020), with columns for article title, author(s), journal name, publisher, publication year, and article type. Duplicate entries were removed, and the remaining articles were reviewed.

To ensure alignment with the study’s scope and objectives, abstract evaluation was the first step in the analysis process, used to determine whether a publication was relevant to lean HR practices. The authors independently reviewed the selected publications and simultaneously assessed their compliance with the inclusion criteria. The next stage involved retrieving the full texts of the selected publications, which were then read to identify potential areas for future research related to HR topics. A total of 98 articles were found to meet at least one inclusion criterion after screening. Some articles were excluded at the title screening stage, others after abstract review, and the rest after full-text review.

The next step involved analyzing the selected literature for the systematic review. Based on the inclusion criteria (English and Persian language), initially 98 articles were included, which were later narrowed down to 57 studies directly related to lean human resources. Only 4 of these were conducted within Iran and written in Persian. After examining the components, HR-related elements from each study were extracted and entered into an Excel file. The extracted codes, or components, were categorized using selective coding into broader categories labeled as themes, and convergent themes were grouped under specific components.

## Findings and Results

Based on the final model, various stages were undertaken to reach the model, which are detailed below. Relevant codes were refined. As a result, the findings obtained from the qualitative analysis after extracting the components from the sources are outlined in Table 1.

**Table 1. Initial Codes and Their Sources**

| No. | Initial Codes (Identified Primary Components) | Sources |
|---|---|---|
| 1 | Selection of individuals with minimal training needs | (4, 14) |
| 2 | Focus on value-creating and self-directed individuals | (1) |
| 3 | Spirit of humility and learning | (8, 15, 16, 20) |
| 4 | Problem-solving and creativity skills | (2) |
| 5 | Multi-skilling and job enlargement | (15, 20) |
| 6 | Elimination of unnecessary communication | (9) |
| 7 | Creation of rapid feedback loops | (1) |
| 8 | Streamlining workflows and reducing redundancy | (7, 12) |
| 9 | Flexible roles and work structures | (22) |
| 10 | Decentralization and distribution of power | (17, 19, 23) |
| 11 | Knowledge-sharing networks and employee participation | (7, 12) |
| 12 | Managing critical and value-generating positions | (20) |

| | | |
|---|---|---|
| 13 | Development of a problem-focused culture | (4, 13, 14, 24) |
| 14 | Emphasis on creating customer value | (11) |
| 15 | Elimination of non-value-adding activities | (2, 22) |
| 16 | Time management | (7, 12, 17, 23) |
| 17 | Small group problem solving | (4, 24) |
| 18 | 5S system | (5, 7, 12, 23) |
| 19 | Team learning | (2, 22) |
| 20 | Just-in-time training | (1, 21) |
| 21 | Coaching development | (5, 7) |
| 22 | Broad access to data and information | (11) |
| 23 | Defining goals, expected outcomes, and job expectations | (4, 14) |
| 24 | Monitoring and identifying performance gaps | (10) |
| 25 | Follow-up on implemented actions | (2, 5, 7) |
| 26 | Performance-based compensation | (15, 20) |
| 27 | Employee voice system | (3, 6, 11, 18) |
| 28 | Optimization of labor relations | (20) |
| 29 | Monitoring employee expectations | (15) |
| 30 | Accountability, transparency, and persuasion of employees | (4, 6, 18, 25) |
| 31 | Promotion of empathy and mutual trust | (7, 12, 17, 23) |
| 32 | Creation of a safe work environment (psychological, physical, and job safety) | (4, 13, 20, 21, 24) |
| 33 | Self-directed and cross-functional work teams | (5, 7, 12) |
| 34 | Team-based decision making | (11, 15, 20) |
| 35 | Delegation systems and job enrichment | (17, 23) |
| 36 | Human resource branding and credibility | (2) |

The components of each document, identified in Table 1 as codes for the present study, were categorized into higher-level components using qualitative content analysis, taking into account the indicators of convergence and relevance. In the next step, which is presented in Table 2, the concepts and core components were developed.

**Table 2. Development of Lean Human Resource Categories**

| Code No. | Initial Codes (Identified Primary Components) | Category Development (Lean Human Resource Components) | Category ID |
|---|---|---|---|
| 1 | Selection of individuals with minimal training needs | Problem-solving and learning-oriented human resources | 1 |
| | Focus on value-creating and self-directed individuals | | |
| | Spirit of humility and learning | | |
| | Problem-solving and creativity skills | | |
| | Multi-skilling and job enlargement | | |
| 6 | Elimination of unnecessary communication | Agile structure | 2 |
| 7 | Streamlining workflows and reducing redundancy | | |
| 8 | Flexible roles and work structures | | |
| 9 | Decentralization and power distribution | | |
| 10 | Knowledge-sharing networks and employee participation | Broad communication and feedback | 3 |
| 11 | Creation of rapid feedback loops | | |
| 12 | Communication with minimal constraints (horizontal–vertical–temporal) | | |
| 13 | Development of a problem-focused culture | Value engineering | 4 |
| 14 | Emphasis on customer value creation | | |
| 15 | Elimination of non-value-adding activities | | |
| 16 | Time management | | |
| 17 | Small group problem solving | | |
| 18 | 5S systems and workplace management | | |
| 19 | Team learning | Coaching and employee development | 5 |
| 20 | Just-in-time training | | |
| 21 | Coaching development | | |
| 22 | Job rotation and enlargement | | |

| | | | |
|---|---|---|---|
| 23 | Setting goals and expected outcomes at all levels | Continuous performance monitoring and management | 6 |
| 24 | Monitoring and identifying performance gaps | | |
| 25 | Follow-up on implemented actions | | |
| 26 | Performance-based compensation | | |
| 27 | Employee voice system | Internal market orientation and value creation | 7 |
| 28 | Optimization of labor relations | | |
| 29 | Monitoring employee expectations | | |
| 30 | Accountability, transparency, and employee persuasion | | |
| 31 | Promoting empathy and mutual trust | | |
| 32 | Creating a safe work environment (job–mental–physical) | | |
| 33 | Self-directed and cross-functional work teams | Employee empowerment and participation | 8 |
| 34 | Team-based decision making | | |
| 35 | Delegation systems and job enrichment | | |
| 36 | Human resource branding and credibility | | |
| 37 | Management of critical and value-generating positions | | |

Based on the tables, the subsequent section elaborates on each dimension of the model.

The lean human resource model in the Iraqi Ministry of Oil is presented in Figure 1.

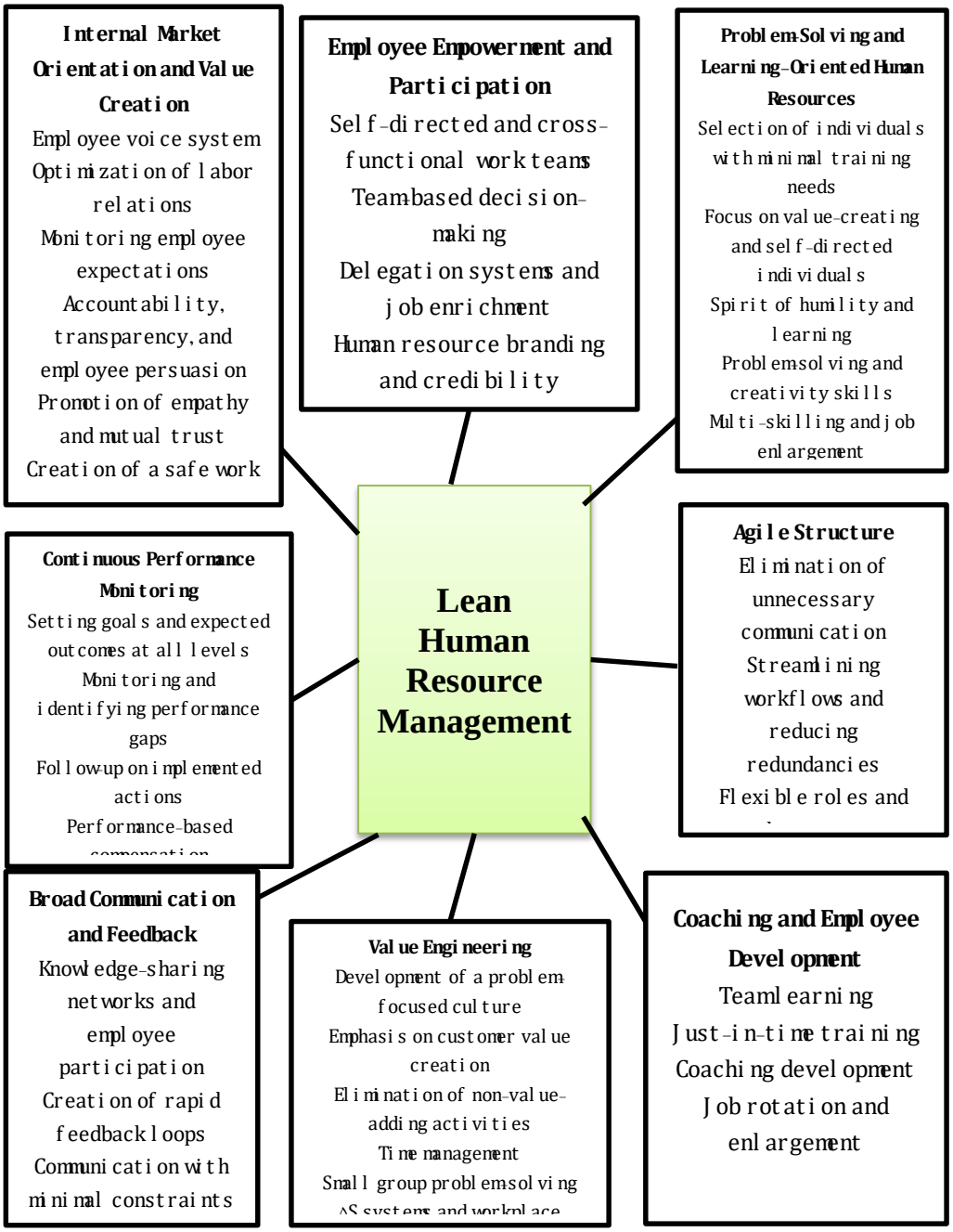


**Figure 1. Lean Human Resource Components Model in the Iraqi Ministry of Oil**

## Discussion and Conclusion

The aim of this study was to identify and categorize the core components of Lean Human Resource Management (LHRM) applicable to the Ministry of Oil in Iraq through a systematic review of the academic and practitioner literature. Based on the results, 36 initial codes were extracted from relevant sources and categorized into 8 major lean HR components: (1) problem-solving and learning-oriented human resources, (2) agile structure, (3) broad communication and feedback, (4) value engineering, (5) coaching and employee development, (6) continuous performance monitoring, (7) internal market orientation and value creation, and (8) employee empowerment and participation. These components offer a comprehensive and contextualized model for lean HR deployment in a complex public sector setting.

The first category, "problem-solving and learning-oriented human resources," includes the selection of individuals with minimal training needs, an emphasis on creativity, cross-functional skills, and a growth mindset. This finding is consistent with prior studies that argue lean HR must begin at the recruitment stage by attracting self-directed, value-driven employees who can operate in dynamic environments (1, 2). According to (12), lean leadership capabilities are closely tied to the professional development of such employees, fostering an agile workforce capable of rapid adaptation and continuous learning.

The second category, "agile structure," highlights the importance of reducing bureaucratic redundancies and fostering flexibility in work design. Practices such as role versatility, decentralization of authority, and minimization of unnecessary communications reflect structural reforms aligned with lean principles (3, 13). (10) emphasizes that such structural shifts are vital during digital transformations to avoid inefficiencies and digital waste. In the oil sector, where hierarchical inertia can hinder performance, adopting agile work structures can streamline operations and increase responsiveness.

The third category, "broad communication and feedback," encompasses systems for knowledge sharing, horizontal and vertical communication, and fast feedback loops. These systems are critical for identifying performance gaps, learning from errors, and supporting a lean culture (4, 14). In particular, (17) emphasizes the role of feedback in student mental health support systems using Six Sigma, reinforcing the transferability of lean feedback mechanisms to public service institutions. (11) also identified psychological barriers to voice behavior in lean teams, underscoring the importance of safe communication environments.

The fourth component, "value engineering," includes practices aimed at maximizing value for internal and external stakeholders. Activities such as time management, small-group problem solving, and elimination of non-value-adding tasks reflect a commitment to continuous improvement and customer orientation (8, 20). (21) finds that integrating lean and sustainability management significantly enhances supply chain performance, suggesting a broader implication of value-focused lean practices in public sector efficiency and accountability.

"Coaching and employee development" emerged as the fifth major theme, comprising just-in-time training, mentorship, job rotation, and team learning. These elements are strongly advocated in the lean literature as essential for building workforce agility and long-term capacity (7, 25). According to (5), lean HR 4.0 must leverage technology to enhance continuous learning and prevent talent attrition, especially amid disruptive labor market conditions. In the Iraqi oil context, where specialized skills are vital and hard to replace, fostering internal learning ecosystems is critical.

The sixth dimension, "continuous performance monitoring," relates to setting measurable goals, identifying performance gaps, and linking rewards to output. This is consistent with (1), who emphasized integrating HR performance indicators with lean operational metrics. (24) also supports the use of structured monitoring through multi-criteria decision-making in lean environments. A robust performance management framework, aligned with strategic goals, enhances accountability and encourages lean behavior across the organization.

"Internal market orientation and value creation" captures the internal branding of HR, responsiveness to employee expectations, and optimization of labor relations. These practices signify a shift from transactional HR to a more strategic, value-driven approach (6, 8). The lean HR model outlined by (2) supports this orientation by emphasizing customer value—both external (service recipients) and internal (employees)—as a central metric of success.

Finally, "employee empowerment and participation" emerged as a critical category, encompassing team-based decision-making, job enrichment, delegation of authority, and the development of self-directed teams. These practices not only align with lean's participative ethos but also address key motivational and psychological aspects of work (4, 9). (22) also emphasizes the necessity of participative mechanisms in implementing lean systems in highly regulated industries like pharmaceuticals, which parallels the operational complexity of oil ministries.

Importantly, the study also found that lean HR practices must be contextualized to the organizational culture and national governance environment. (23) suggests that lean principles are best adapted through incremental integration rather than wholesale transformation in public healthcare, which has clear implications for public sector oil institutions. Additionally, (19) notes that the circular economy and lean integration must be harmonized with institutional realities for long-term sustainability, underscoring the broader systemic considerations involved.

Overall, this research contributes to the literature by offering a tailored, empirically grounded model of lean HRM applicable to a high-stakes, resource-rich public institution. By synthesizing prior studies and contextual findings, it reinforces the idea that lean HRM, when properly implemented, can substantially enhance performance, adaptability, and strategic alignment in public sector organizations.

This study is not without limitations. First, the research relies on a systematic literature review and qualitative content analysis, meaning it does not empirically test the proposed components in practice. Consequently, the generalizability of the model to all oil ministries, even within Iraq, is limited. Additionally, the reliance on English and Persian sources may have excluded relevant literature published in Arabic or other regional languages. Furthermore, given that the research draws from secondary data, there is potential for bias in source selection and interpretation despite efforts to adhere to established protocols.

Future studies should consider conducting empirical validation of the proposed lean HR components through case studies or surveys in the Iraqi Ministry of Oil or similar institutions in the MENA region. Comparative studies between public and private sector lean HR applications would also be valuable to identify context-specific enablers and barriers. Moreover, exploring the role of digitalization, artificial intelligence, and predictive analytics in advancing lean HR practices—especially in resource-rich but bureaucratically complex environments—would offer meaningful insights into Lean HR 4.0 strategies.

Practitioners in public institutions, particularly within Iraq's oil sector, should prioritize leadership development to foster lean mindsets among mid- and senior-level managers. Introducing pilot projects focused on lean HR practices can help test feasibility and build internal advocacy. Additionally, aligning HR metrics with strategic performance goals, simplifying communication structures, and investing in employee training and empowerment programs can yield long-term gains. Finally, tailoring lean initiatives to local culture and institutional realities is essential for sustainable and scalable transformation.

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## Authors' Contributions

All authors equally contributed to this study.

## Declaration of Interest

The authors of this article declared no conflict of interest.

## Ethical Considerations

All ethical principles were adheried in conducting and writing this article.

## Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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