Identifying and Analyzing Factors Affecting the Productivity Enhancement of Power Company Employees Based on Artificial Intelligence

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Abstract

The primary objective of this article is to identify and analyze the factors influencing the productivity enhancement of power company employees based on artificial intelligence. The research method employed is qualitative. In addition to document analysis, thematic analysis was conducted using MAXQDA12 software to identify the relevant factors and components. The statistical population of this study included all experts in the field of educational management as well as managers and specialists in the power company. Theoretical saturation was achieved after conducting 14 interviews. The duration of the interviews ranged from 75 to 120 minutes. Ultimately, basic, organizing, and overarching themes were extracted. Based on the semi-structured interviews, 10 dimensions (knowledge and technology management improvement, human resource management reinforcement, organizational process recognition, financial resource process enhancement, smart planning improvement, ethical intelligence, training level enhancement, increased capacity for change and transformation, individual skill improvement, and decision-making improvement), 24 components (organizing themes), and 100 indicators were identified for enhancing employee productivity in the power company based on artificial intelligence. The results indicated that the majority of experts believed artificial intelligence positively influences productivity enhancement, with the most significant contributing factor being the improvement of individual skills.

Keywords: *Productivity, Human Resources, Artificial Intelligence, Power Company Employees.*

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1. Introduction

The current era is characterized by rapid and unpredictable transformations. The state of management in our society reflects a balance between the increasing complexities of organizations and their inability to anticipate and address these transformations and complexities [1, 2]. Organizations, in order to counter environmental threats and leverage potential opportunities, must recognize their capacities and capabilities, rectify weaknesses, and strengthen their strengths [3]. Management issues and challenges have become so intricate and intertwined that diagnosing problems is no longer straightforward, and the human nature of organizations and the complexity of employee behavior have exacerbated these complexities [4]. In such conditions, successful organizations are those that, by acquiring knowledge and strategies and gaining extensive awareness of environmental factors and technological resources, can enhance and improve their organizational growth and performance. One way to achieve this is by identifying efficiency methods and implementing them to optimize human resource productivity [5].

Productivity was first introduced by Quesnay in 1766. Although at that time, the competitive advantage of an organization or a human society was determined by greater access to material resources, the landscape has fundamentally shifted. Today, the primary competitive advantage of organizations lies in the productivity of their human resources [6, 7]. Human resource productivity not only reflects the current state of an organization but also helps shape its future strategy. Productivity specialists consider productivity as a method, concept, or perspective on work and life, viewing it as a culture and a worldview. Productivity can influence all aspects of work and individual and social life and is regarded as a key determinant of a country's per capita income. One of the most crucial tools for improving productivity is the targeted development of human resources through modern methods. Increasing human resource productivity is a means of raising per capita income [8, 9].

Productivity is a broad concept that can be understood as an intellectual process aimed at continuous improvement. Effective and efficient use of human resources, or in other words, human resource productivity, is one of the major concerns of any society [10]. Human capital is more significant than other factors such as financial resources, equipment, and processes in various sectors. For instance, in the electricity industry, increasing productivity in service delivery to customers is closely tied to human capital productivity [11].

The experience of large corporations demonstrates that productivity belongs to organizations that believe human capital is their most valuable asset. These organizations invest in methods to enhance workforce productivity and create the necessary motivation among their human capital. To achieve productivity at all organizational levels, key and influential factors must be thoroughly and precisely analyzed to clarify each individual's role and responsibility regarding productivity. Aligning authority with responsibilities can contribute to productivity improvement [12].

According to data published by the Statistical Center of Iran, the total number of employed individuals in Iran's economy in 2019 was 23,378,613, reflecting a 31.4% increase compared to 2005. Despite this increase in employment, labor productivity growth during the Fifth Development Plan was close to zero, indicating that GDP growth has been proportional to the increase in the labor force. More precisely, the average annual growth rate of employment and GDP during this period was 1.5%. In recent years, the labor force's share of GDP has been 44%, highlighting the importance of improving labor productivity to enhance the total factor productivity index. Based on the latest data from the Asian Productivity Organization (APO) in 2020, Iran ranked eighth in terms of labor productivity (measured per worker) [13, 14].

The electricity industry, as one of the most critical strategic and foundational industries, plays a significant role worldwide. In Iran, this industry not only supplies electrical energy to various consumers but also serves as a key driver of industrial activities on a large scale [15]. In a specialized meeting on productivity improvement in human resources, management development, research, and information technology (November 2023), the Minister of Energy emphasized human resource productivity as a fundamental factor in organizational productivity. During this meeting, the President of the National Productivity Organization of Iran stated that neglecting to equip human resources with artificial intelligence (AI) will lead to future setbacks and that integrating AI into human resource management is essential for development and productivity enhancement. Additionally, the necessity of equipping human resources with both hard and soft technologies was highlighted as a factor in organizational capability and competence [15-17].

On the other hand, electricity distribution companies pursue core values such as learning, knowledge-orientation,

and meritocracy while implementing key strategies, including management and productivity strategies and human resource development strategies (such as improving performance evaluation systems and targeted, knowledge-based training). These companies have successfully obtained quality management systems based on ISO 9001, occupational health and safety management based on ISO 45001, environmental management systems based on ISO 14001, and HSE-MS standards. As such, they are committed to continuous process improvement and company performance enhancement in areas such as training and ultimately achieving optimal productivity [8].

Furthermore, having a structured model aimed at optimizing human resource productivity and enhancing task effectiveness has been emphasized by organizations. Studies on human resource productivity and its influencing factors, particularly in assessing the effectiveness of training programs in provincial electricity companies, indicate that some training programs suffer from shortcomings in needs assessment and the authenticity of organizational learning [11]. The presence of a powerful tool, such as a productivity model leveraging AI capabilities, could enhance the needs assessment process, allowing for a more refined analysis and correction of existing gaps. This approach could significantly contribute to organizational agility and dynamism in improving human resource productivity [2, 8, 13, 16].

Artificial intelligence is a branch of computer science whose primary objective is to develop intelligent machines capable of performing tasks that require human intelligence. AI essentially simulates human intelligence for computers, enabling machines to think like humans and mimic human behavior. This definition applies to any machine that operates in a human-like manner and is capable of tasks such as problem-solving and learning [18]. Emerging sciences and technologies have the potential to rapidly replace human labor. The scope of AI and machine learning appears vast, raising the question of whether industry-based organizations such as the electricity sector are sufficiently prepared for changes in workforce development and enhancement. A common issue in this regard is understanding why individuals and organizations either adopt or resist new technologies, making this a critical topic in technology studies [19].

As workplaces prepare for future generations, it is essential for structured systems to plan for the effective development and empowerment of human resources. Human resource empowerment and development programs, including organizational and on-the-job training, are of particular importance due to their fundamental impact. Given the widening gap between wealthy and poor societies and the increasing specialization of organizational activities, there is a global emphasis on revising human resource training programs to ensure they adapt to these transformations. Consequently, continuous review of teaching-learning strategies and designing productivity-focused learning models using AI tools is essential for electricity distribution companies in western Iran. These industries possess extensive knowledge and experience in power generation, transmission, distribution, and consumption, which, if optimized through AI, could significantly enhance productivity and system performance.

This issue is particularly critical for management systems in organizations that resist change and innovation and exhibit slower transformation rates. Given the evolving global landscape, these organizations must plan for transformation and leverage technological advancements. However, previous studies have largely overlooked this aspect. In light of the absence of an appropriate model in this area and considering the impact of AI in the digital era, the primary research question is: What are the factors influencing the productivity enhancement of power company employees based on artificial intelligence?

2. Methodology

This study employs a qualitative research approach. At this stage, indicators, components, dimensions, and factors were identified using thematic analysis through semi-structured interviews. The study participants included experts in educational management, productivity management, and artificial intelligence, as well as managers and employees of the power company who either held relevant academic degrees or had published articles, authored books, or had teaching experience in the field.

The inclusion criteria were as follows: experts with a minimum of three years of academic experience in educational management, productivity, and artificial intelligence; specialists with at least a doctoral degree in educational management, human resources, or related fields; and faculty members from public and private universities. The sampling method was purposive. According to Tashakkori and Teddlie, in this sampling method, cases are selected in a non-random and fully purposive manner.

The interviews were conducted during the summer and fall of 2021. The average duration of the interviews was 73 minutes. After transcribing the interviews, thematic analysis was applied simultaneously with data collection. First, the recorded interviews were transcribed. Then, a copy of the extracted codes was sent to the interviewees for validation. To ensure familiarity and immersion in the data, the transcripts were repeatedly reviewed. Initial themes were identified, and similar themes were grouped into categories, forming the initial classifications. These categories were then merged to develop overarching themes.

To ensure the accuracy of the collected data, prolonged and in-depth engagement with the data was maintained. Additionally, two researchers, besides the primary researchers, participated in data analysis. These researchers reviewed the transcripts to verify the coding and classifications. To enhance confirmability, feedback was sought from the participants. Maximizing diversity in sampling and conducting extended interviews were other methods used to increase data credibility. From the initial interviews, sub-themes and categories began to emerge, and data reduction continued across all analytical units (themes) until the core themes were identified. The interviews continued until theoretical saturation was reached.

Qualitative content analysis was conducted using MAXQDA 25 software. Ethical considerations in this study included obtaining informed consent, maintaining participant confidentiality, and ensuring integrity in transcribing and analyzing interview content.

3. Findings and Results

The views of the study participants indicated that the enhancement of power company employee productivity, based on artificial intelligence, is achieved through 10 dimensions, 24 components, and 100 indicators.

Table 1. Dimensions, Components, and Indicators of Employee Productivity Based on Artificial Intelligence in the Organization

Interviewee Code	Theme Code	To what extent do the following indicators influence AI-based employee productivity in the organization?	Component	Dimension
I4, I8, I5, I6, I13	A 1-1	Ability to share knowledge in the shortest possible time through AI	Knowledge Application	Knowledge and Technology Management Improvement
I5, I11, I4, I3	A 1-2	Expanding the knowledge required by employees using AI		
I1, I2, I9, I7, I5	A 1-3	Increasing the ability to use up-to-date knowledge worldwide through AI technology		
I8, I7, I11, I5	A 1-4	Implementing efficient knowledge using AI		
I7, I3, I9, I10, I11	A 1-5	Ability to execute knowledge management processes to enhance work productivity through AI		
I10, I6, I5, I1, I7	A 2-1	Ability to use the latest information technology (ChatGPT) through AI	Information Technology Application	
I10, I3, I5, I8	A 2-2	Familiarity with cutting-edge IT to accelerate knowledge transfer via AI		
I13, I14, I11, I5	A 2-3	Ability to monitor information by managers and employees in the power organization through AI		
I10, I8, I3	A 2-4	Ability to gather and organize information quickly through AI		
I1, I2, I9, I7, I5	A 2-5	Ability to analyze information for optimizing activities through AI		
I6, I8, I10, I13, I4	B1-1	Selecting and recruiting individuals with high emotional intelligence using AI software	Recruitment and HR Supply	Human Resource Management Reinforcement
I10, I8, I1, I13, I14	B1-2	Selecting and recruiting human resources based on intelligence level using AI-based tests		
I11, I12, I9, I7, I5	B1-3	Selecting and hiring individuals with high specialized capabilities using AI		
I11, I12, I10, I14	B2-1	Strengthening HR knowledge strategies for optimization through AI tools	HR Training and Development	
I11, I9, I14, I4	B2-2	Strengthening knowledge communities by integrating AI and human resources		
I6, I1, I2	B2-3	Developing intellectual capital instead of manual labor through AI technologies		
I11, I7, I10, I3, I1	B2-4	Enhancing employees' individual skills with AI-based knowledge		
I8, I3, I5, I4, I2	B2-5	Improving employees' social skills through AI training, considering job positions and organizational climate		

I1, I2, I9, I7, I5	C1-1	Accelerating administrative processes through AI	Recognizing Structural Processes	Organizational Process Recognition
I3, I9, I5, I4, I2	C1-2	Reducing administrative delays and procedural fatigue through AI		
I4, I8, I15, I6, I	C1-3	Familiarizing new employees with organizational processes via AI-based training		
I5, I11, I4, I3	C1-4	Directly informing employees by connecting to diverse databases, leveraging AI capabilities		
I1, I2, I9, I7, I5	C2-1	Optimizing and aligning organizational processes through AI	Recognizing Development and Advancement Processes	
I8, I7, I11, I15	C2-2	Aligning organizational processes with AI		
I4, I8, I5, I6, I3	C2-3	Supporting organizational processes for productivity using AI		
I5, I11, I4, I3	C2-4	Reducing the total time required by employees to complete tasks through AI		
I1, I2, I9, I7, I5	C3-1	Identifying better processes to achieve organizational goals through AI	Recognizing Organizational Corrective Processes	
I8, I7, I11, I15	C3-2	Gaining a comprehensive perspective on organizational processes with AI via organizational charts		
I7, I3, I9, I10, I11	C3-3	Ability to adjust supportive activities for advancing work processes through AI		
I10, I6, I5, I1, I7	C3-4	Increasing organizational agility when modifying processes to respond to external changes using AI		
I10, I3, I5, I8	D1-1	Automating organizational financial resources with AI	Financial Knowledge	Financial Resource Process Improvement
I13, I14, I11, I5	D1-2	Rapidly analyzing financial data with AI		
I10, I8, I3	D1-3	Tracking the organization’s daily, weekly, monthly, and annual income with minimal errors through AI		
I1, I2, I9, I7, I5	D2-1	Familiarizing employees with financial reporting systems using AI	Financial Resource Application	
I6, I8, I10, I13, I4	D2-2	Advanced accounting		
I10, I8, I1, I13, I14	D2-3	Full automation of accounting processes through AI tools		
I1, I2, I9, I7, I5	D2-4	Improving the organization’s operational budgeting processes through AI		
I11, I12, I10, I14	D2-5	Enhancing the organization’s financial budgeting processes		
I11, I9, I14, I4	E1-1	Improving short-term planning and eliminating ambiguities using AI	Type of Planning	Intelligent Planning Improvement
I6, I1, I2	E1-2	Improving medium-term planning and eliminating ambiguities using AI		
I11, I7, I10, I13, I1	E1-3	Improving long-term planning and eliminating ambiguities using AI		
I8, I3, I5, I4, I2	E2-1	Enhancing decision-making for organizational individual planning through AI decision-making processes	Applying Planning in Decisions	
I1, I2, I9, I7, I5	E2-2	Strengthening individual development plans in the power organization using AI		
I3, I9, I5, I14, I2	E2-3	Enhancing group development plans in the power organization using AI		
I4, I8, I15, I6, I	E2-4	Adopting modern global planning systems through AI tools		
I5, I11, I14, I3	F1-1	Increasing transparency in organizational decisions using AI	Organizational Ethics	Ethical Intelligence
I1, I2, I9, I7, I5	F1-2	Fostering organizational justice in line with professional ethics through AI		
I8, I7, I11, I15	F1-3	Building organizational commitment and trust among employees		
I4, I8, I5, I6, I3	F1-4	Drafting organizational ethical charters and policies via AI while adhering to organizational standards		
I5, I11, I14, I3	F1-5	Rejecting governmental dominance and coercion in the organization		
I1, I2, I9, I7, I5	F2-1	Promoting honesty in the organization through AI-based organizational intelligence	Individual Ethics	

I8, I7, I11, I15	F2-2	Increasing responsibility for safeguarding public funds through AI transparency and reporting methods		
I7, I3, I9, I10, I11	F2-3	Avoiding personal biases in work using AI		
I4, I8, I5, I6, I3	F2-4	Improving work discipline by evaluating employees through AI		
I5, I11, I4, I3	F2-5	Responding to upper management regarding assigned responsibilities via AI		
I1, I2, I9, I7, I5	G1-1	Recognizing intelligent training systems through AI for all employees	Recognizing Training Systems	Increasing the Level of Education
I8, I7, I11, I15	G1-2	Familiarizing all employees with AI-based virtual training decisions		
I7, I3, I9, I10, I11	G1-3	Identifying emerging educational disciplines through AI for all employees		
I10, I6, I5, I1, I7	G2-1	Training employees in crisis-time decision-making via AI	Types of Training	
I10, I3, I5, I8	G2-2	Motivational training for all employees through AI		
I13, I14, I11, I5	G2-3	Ongoing managerial training in strategic decision-making through AI		
I10, I8, I3	G2-4	Training through mass media using AI for all employees		
I1, I2, I9, I7, I5	H1-1	Embracing change by employees who trust AI	Recognizing Change and Transformation	Increasing the Capacity for Change and Transformation
I6, I8, I10, I13, I4	H1-2	Welcoming changes proposed by AI due to its reliability and minimal error		
I10, I8, I1, I13, I14	H1-3	Striving for transformation through AI-recommended solutions		
I1, I2, I9, I7, I5	H1-4	Adapting flexibly to changes through structured decision-making strategies		
I11, I12, I10, I14	H2-1	Improving operational planning with attention to transformations	Planning Aligned with Change and Transformation	
I11, I9, I14, I4	H2-2	Identifying and determining useful strategies for change		
I6, I1, I2	H2-3	Paying attention to emerging global patterns through AI		
I11, I7, I10, I3, I1	H2-4	Transitioning from past decisions to future-oriented decisions based on global changes using AI		
I8, I3, I5, I4, I2	H2-5	Planning to utilize current opportunities		
I11, I12, I9, I7, I5	H2-6	Planning to create new innovations		
I3, I9, I5, I14, I2	J1-1	Realistic goal-setting	Skill in Intelligent Goal-Setting	Improving Individual Skills
I4, I8, I15, I6, I	J1-2	Awareness of competitors' goals when setting objectives		
I5, I11, I4, I3	J1-3	Defining the organization's main strategies		
I1, I2, I9, I7, I5	J1-4	Facilitating the implementation of strategies in goal-setting		
I8, I7, I11, I15	J1-5	Developing goals based on the market and the organization's performance responsibilities		
I4, I8, I5, I6, I3	J1-6	Tracking and monitoring organizational objectives		
I5, I11, I14, I3	J2-1	Intelligent opportunity-seeking	Environmental Intuitive Thinking	
I1, I2, I9, I7, I5	J2-2	Creating a systems perspective using AI		
I8, I7, I11, I15	J2-3	Understanding situations based on employee learning with AI		
I7, I3, I9, I10, I11	J2-4	Training and improving employees' cognitive concepts through AI		
I10, I6, I5, I1, I7	J3-1	Defining strategic decision objectives through negotiation and agreement with managers	Social Intelligence	
I10, I3, I5, I8	J3-2	Planning how decisions will be executed at the organizational level		
I13, I14, I11, I5	J3-3	Gaining consensus among responsible parties and identifying important priorities or necessary activities		
I10, I8, I3	J3-4	Collecting and analyzing information to understand trends, transformations, and to evaluate the current and future needs of one's job role		

I1, I2, I9, I7, I5	J4-1	Developing managerial policies in society through AI	Policy-Making	
I6, I8, I10, I13, I4	J4-2	Improving organizational regulations to meet the needs of employees and the organization using AI		
I10, I8, I1, I13, I14	J4-3	Enhancing macro-level policy-making with AI capabilities		
I1, I2, I9, I7, I5	J4-4	Improving motivational policies for employees using AI-based employee resumes		
I11, I12, I10, I14	J4-5	Enhancing participatory policies by leveraging AI solutions		
I11, I9, I14, I4	K1-1	Selecting work-related strategies	Presenting Related Strategies	Improving Decision-Making
I6, I1, I2	K1-2	Identifying challenges facing recognized strategies		
I11, I7, I10, I3, I1	K1-3	Swiftly offering key strategies in employee decision-making		
I8, I3, I5, I4, I2	K2-1	Access to a variety of key strategies	Strategy Diversity	
I1, I2, I9, I7, I5	K2-2	Prioritizing strategic approaches based on the type of decision-making		
I3, I9, I5, I14, I2	K2-3	Coordinating common strategies in the work domain		
I4, I8, I15, I6, I	K3-1	Improving decision accuracy by categorizing various topics	Strategy Accuracy	
I5, I11, I14, I3	K3-2	Developing solutions to challenges facing each decision		
I1, I2, I9, I7, I5	K3-3	Saving time for managers and employees in decision-making		

Dimension 1: Knowledge and Technology Management Improvement: The results indicate that leveraging artificial intelligence (AI) to enhance knowledge management and advanced information technologies plays a pivotal role in improving employee productivity. Participants highlighted the ability to share knowledge quickly, implement efficient knowledge processes, and adopt state-of-the-art AI tools (e.g., ChatGPT) as key factors. This dimension emphasizes the importance of facilitating knowledge application and organization-wide technological adaptability.

Dimension 2: Human Resource Management Reinforcement: Findings show that strengthening HR management contributes significantly to productivity by selecting and recruiting employees with high intelligence and emotional competence through AI-based systems. Additionally, participants underscored the necessity of improving HR training and development strategies, fostering knowledge communities, and expanding intellectual capital via AI technologies. This dimension underlines the vital role of AI in attracting, developing, and optimizing the workforce.

Dimension 3: Organizational Process Recognition: Participants emphasized that identifying and streamlining organizational processes with the help of AI is essential for boosting productivity. Recognizing structural processes includes accelerating administrative tasks and reducing procedural fatigue, while recognizing development and advancement processes involves aligning activities and shortening task completion times. This dimension highlights the importance of using AI to map, optimize, and refine organizational workflows.

Dimension 4: Financial Resource Process Improvement: Results reveal that applying AI to financial resource management can automate and enhance accounting and budgeting processes. Rapid financial data analysis with minimal errors and advanced accounting practices supported by AI were cited as key benefits. This dimension stresses how AI-enabled financial systems and analytics can provide accurate, real-time insights, ultimately optimizing resource allocation and budgeting.

Dimension 5: Intelligent Planning Improvement: The study indicates that intelligent planning, facilitated by AI, strengthens short-, medium-, and long-term strategic preparations. Participants mentioned that AI-driven decision-making frameworks improve clarity in planning and reduce ambiguities across all time horizons. This dimension underscores how AI-based tools can refine both individual and group development plans, fostering more informed and adaptable organizational strategies.

Dimension 6: Ethical Intelligence: Findings suggest that AI can support the cultivation of ethical values and professional conduct within the organization. By promoting transparency in decisions, organizational justice, and

responsible behavior, AI tools help establish trust and commitment among employees. This dimension highlights AI's potential for clarifying ethical guidelines, encouraging honesty, and preventing personal biases in workplace processes.

Dimension 7: Increasing the Level of Education: Respondents stressed the significance of AI in enhancing training and development. Recognizing intelligent training systems, providing virtual learning solutions, and identifying emerging educational fields are deemed crucial for continuous employee growth. This dimension underscores the need for ongoing, AI-supported education programs that range from crisis-time decision-making tutorials to motivational training for all levels of staff.

Dimension 8: Increasing the Capacity for Change and Transformation: The data show that AI-driven organizational change initiatives encourage employees to embrace transformation more readily. Participants noted that trust in AI output, coupled with minimal errors, fosters a positive attitude toward new processes and solutions. This dimension emphasizes adaptive planning and strategy development, with AI informing how organizations respond to external changes and global trends.

Dimension 9: Improving Individual Skills: Participants identified the importance of individual competencies, particularly in intelligent goal-setting, environmental intuitive thinking, and social intelligence. AI aids in realistic goal formulation, opportunity-seeking, and establishing a systems perspective on work. This dimension focuses on how AI-based training and feedback mechanisms support employees in refining personal performance strategies and cognitive abilities.

Dimension 10: Improving Decision-Making: Finally, the results highlight how AI can enhance the decision-making process by providing rapid access to diverse strategies and accurate categorization of information. This dimension covers selecting relevant work strategies, identifying potential challenges, and developing solutions swiftly. As participants noted, AI-driven insights save decision-makers time and improve the overall quality of organizational decisions.

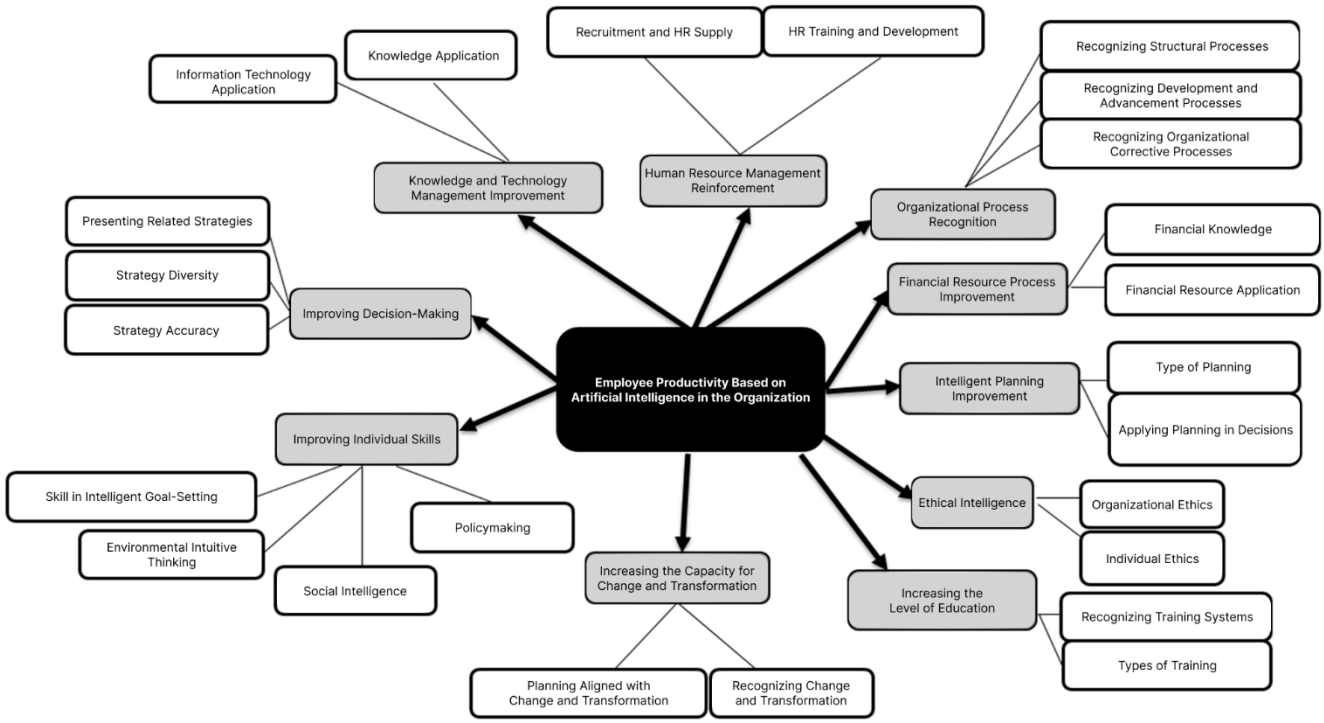

Figure 1. Conceptual Model of the Research

4. Discussion and Conclusion

One of the most critical resources in any organization is its human resources. Proper recruitment, deployment, retention, and development of human resources to achieve higher productivity is among the fundamental

responsibilities of human resource management in organizations. A skilled and efficient workforce is the most valuable and significant asset of any organization. Many organizations, despite having abundant resources, fail to utilize them effectively due to poor human resource allocation or a lack of competent and qualified personnel. In recent years, the relationship between productivity and work quality has also attracted the attention of global management research communities [12, 18].

Since ancient times, humans have sought to maximize the efficient and productive use of their abilities, resources, and available means. In the modern era, this concern has gained more significance than ever before. Limited resources, population growth, and increasing human needs have led economic, political, and management stakeholders in societies and organizations to prioritize productivity enhancement in their strategic programs (Taheri, 2015). In today's world, human resources play a vital role in managing crises to prevent irreversible damages. Human resource managers have a crucial function in production activities and organizational performance. Enhancing human resource effectiveness is one of the most important objectives of contemporary organizations [17]. Therefore, organizations must consistently and continuously focus on improving human resource effectiveness [2, 11].

In this context, analyzing the dimensions, components, and indicators of AI-based productivity enhancement for power company employees becomes crucial. To achieve this objective, it is first necessary to identify the dimensions, components, and indicators of AI-based productivity enhancement and then implement proper management and planning strategies to facilitate productivity improvement through AI, ultimately leading to enhanced productivity quality. Given these considerations, studying the enhancement of power company employee productivity based on AI holds significant importance. This article has attempted to define the general concept of AI-based productivity enhancement for employees and explore its applications in the energy industry. The primary focus of this research is to examine the challenges faced by managers, policymakers, and researchers in the context of AI-based productivity enhancement for power company employees.

The aim of this research was to introduce changes that improve individual skills in the power industry. Ultimately, by identifying the components and indicators of AI-based productivity enhancement for power company employees, an initial conceptual model was designed. This model consists of 10 dimensions, 24 components, and 100 indicators. Several studies have reported findings aligned with the results of this research. For instance, studies [14, 15, 20] concluded that individual skills play the most significant role in employee productivity when supported by AI, which is consistent with the findings of the present study. Individual skills and competencies can be defined as the ability to delegate clear responsibilities to others, guide them in performing assigned tasks effectively, and motivate them toward achieving desired goals. In this regard, the findings of the current study are also in alignment with prior findings [13, 16, 17].

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

All procedures performed in this study were under the ethical standards.

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