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A Study on Impact of Artificial Intelligence on Employee's Performance

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Abstract

The purpose of this paper is to investigate how IT service providers' workers feel about using AI (Artificial intelligence), and how it might affect their performance in a rapidly evolving workplace. This study used a quantitative methodology and analyzed the data using a structural equation modeling (SEM) strategy enabled by the AMOS 22.0 software. It's important to point out that only 290 of the 305 participants really met the criteria for inclusion in the analysis. An employee of an IT services firm in the Bangalore area is the respondent in this study. The findings show that AI significantly improves employee performance.

Keywords: Artificial intelligence, IT sector, employee performance.

1. Introduction

Since the 2000s, "Machine Learning" (automatic learning; machines 'learn' from the datasets offered to them) has emerged as a key component of AI, with its most recent development being "Deep Learning," which is based on neural networks.

When combined with massive data, these AIs are able to outperform humans in terms of speed and accuracy in both routine and complex tasks. These technological advancements have already begun to have an impact on a wide range of industries and services, such as transportation with autonomous vehicles, healthcare with disease detection programs (cancers and other diseases) using Machine Learning and Deep Learning, customer relationship management with conversational agents, natural language processing and automatic email processing by virtual robots, and security with facial recognition and artificial vision technologies.

Employee actions that result in the achievement of organizational goals in terms of quality, quantity, and efficiency on the job are referred to as job performance (Na-Nan et al., 2018). According

Peterson and Ploughman (1953) state that job quality is achieving all of the predetermined goals in terms of resource acquisition, product development, quality control, and customer satisfaction. Product, waste, and sales statistics are all examples of job quantities that result from employee actions (Peterson and Ploughman, 1953). The length of time it takes to execute duties linked to one's job depends on the complexity of those tasks. When products and services are supplied on time and tasks are completed precisely and in a timely manner, employees have met job-time goals (Peterson and Ploughman, 1953).

2. Literature review

Using AI, workers may be able to better understand and deal with complex situations, as hypothesised by researchers. It facilitates decision-making by offering a number of potential courses of action (Bader and Kaiser, 2019). By having someone to bounce ideas off of, workers can hone their creative abilities while using machines for mundane chores. As a result, corporations around the world that have invested in hiring skilled workers anticipate numerous benefits from AI (Hsieh and Hsieh, 2003; Liu et al., 2020).

Major developments in AI, robotics, and automation have benefited a wide range of industries. Hospitality and tourism are two service industries that have been affected by the rise of these technological interventions (Syam and Sharma, 2018). These interventions have been put into use in the hospitality industry for critical management activities, providing answers to the day-to-day operational issues faced by AI and industry 4.0-driven businesses. Concierge services, visitor registration, bartending, virtual voice assistance, and so on are just a few of the many areas where AI has been put to use recently (Kuo et al., 2017; Makridakis, 2017). Airport management systems, such as passenger service counters, have benefited from AI-powered service automation. Having this technical aid take care of a number of boring duties frees up service providers' staff to focus on developing meaningful connections with their clients.

Motivation in the workplace and artificial intelligence. According to Hughes et al. (2019), an AI management system can motivate workers when they are given clear instructions, frequent feedback, and appropriate compensation. Millennials, a generation raised on the Internet and accustomed to its networking tools, are shaping employee involvement in the modern workplace (Kaplan and Haenlein, 2010). To better encourage teamwork and boost morale, more and more businesses are turning to internal social media platforms and apps (Haddud et al., 2016). Employees' use of internal social media increases the company's perceived openness and their sense of belonging to the company, which in turn boosts engagement (Men et al., 2020).

Users' sensemaking, decision-making, and insight-generation processes can all be aided by the analytics capabilities provided by AI technologies for social media marketing (Capatina et al., 2020), which in turn can increase engagement with the platform. In order to interact with customers on social media platforms, businesses are looking to business intelligence for guidance. As a result of digitization, today's commercial centre is more accurately termed a market space (Prentice et al., 2020). The usage of AI technology has a favourable effect on user engagement and conversion, as scientifically tested and further established by Bag et al. (2021). Engagement marketing that is tailored to each individual customer could benefit from the use of AI.Intelligence and productivity in business are both enhanced by AI (Selene and Gong, 2014). To improve productivity and streamline organisational procedures and duties, AI has been studied and written about for their prospective benefits (Arslan et al., 2021). Organisations will need to rely even more on AI to enhance their performance (CIGREF, 2016, 2018; Crews, 2019) in order to increase productivity and develop new offerings. Artificial intelligence (AI) can affect the success of a company's connections with its customers, prospects, and partners as part of the company's ecosystem (Kelly et al., 2019; Rubin et al., 2010). Sustainable electronic, human resource management (e-HRM) systems can boost company performance, according to research by Bag et al. (2021a).

Wamba-Taguimdje et al.'s (2020) research findings highlight these AI benefits in organisations, particularly AI's potential to boost business operations across financial, marketing, and administrative domains. Malik et al.'s (2021) research also found that AI helps with freedom and independence on the job, as well as creativity and invention, and overall performance.

2.1. Research objectives

1. To study the role of AI in IT industry
2. To study the impact of AI on employee performance

2.2. Hypothesis

H_0: There is no influence of artificial intelligence on employee performance of IT sector.

H1: Artificial intelligence significantly influences performance of IT sector employees.

3. Research methodology

Quantitative methods were used for this study. Purposeful sampling and expert judgement sampling methods constitute the non-probability sampling strategy employed in this study. Selecting a purposive sample rather than adopting a probability sampling technique is done for a number of reasons, including the simplicity, rules, and costs of the former compared to the latter. Employees of IT and service providers in Bangalore constitute the sample for this research. In this study, 305 respondents were collected, but only 290 were qualified. The structural model was established on the basis of theoretical ideas and validated using structural equation modelling (SEM). Data analysis uses an approach structural

equation modeling (SEM) supported by program computer software AMOS 22.0 and questionnaire was made on 5 point Likert scaling related to artificial intelligence and employee performance.

3.1 Results and Discussion:

Demographic profile of sample:

Most of the respondents are male which is 58.3% and highly educated respondents are 71%.. Most of the respondents belong to age between 25 to 45 years.

Table 1: Demographic profile of sample (N=290)

Measures	Items	Frequency	Percentage
Gender	Male	169	58.32
	Female	121	41.68
Marital Status	Married	104	35.88
	Unmarried	186	64.12
Education	Secondary board/ Equivalent degree	53	18.25
	Graduates	105	36.21
	Post-graduates	100	34.56
	Doctorate	32	10.98
Age of the respondents (in years)	<25yrs	36	12.33
	25 to 35	123	42.31
	35 to 45	64	22.04
	45 to 55	36	12.51
	Above 55	31	10.81

4. Exploratory factor analysis:

The study has used factor analysis to check the loading of items for each construct. The Kaiser–Meyer–Olkin (KMO) value helpful for supporting the adequacy of data. A high value of KMO (0.930) and small value of significance (<0.05) of Bartlett's Test of Sphericity indicates that data is sufficient for factor analysis. The current study used Principal component analysis with Varimax rotation results in extraction of two factors having Eigen value above 1 and able to explain 72.38% of total variance. Factor 1 is labelled as Artificial intelligence constitutes of seven factors (AI1 to AI7) and factor 2 named as Employee performance made up of six items (EP1 to EP6). As mentioned in table 2, all the items having loadings above 0.5, thus retained for final analysis.

Cronbach's alpha was chosen as the preferred measure of reliability to assess the consistency of the constructs utilized in the data analysis process. According to Nunnally and Bernstein's (1994) findings, criteria that meet or exceed a value of 0.7 are the threshold for reliability. The alpha values reported in Table 2 indicate that the data is reliable, as both factors have alpha values above 0.7.

Factor	Item details	Item loadings	Alpha value
Factor 1: Artificial intelligence	AI1:Artificial intelligence provides accurate data and information	0.763	0.939
	AI2:Artificial intelligence can help me in getting the job done	0.861	
	AI3:Artificial intelligence can protect the privacy of yourself and others	0.797	
	AI4:Artificial intelligence can help display hard-to-measure data	0.844	

	AI5:Artificial intelligence can help me find lost data	0.797	
	AI6:The authorities can easily audit artificial intelligence	0.873	
	AI7:Artificial intelligence can help me in making important decisions in the company	.803	
Employee performance	EP1:The units of output meet organizational expectations	0.803	0.910
	EP2:Products or services meet the expectations of customers	0.808	
	EP3:The units of output under my responsibility correspond to my skills and ability	0.765	
	EP4:Tasks are generally completed on schedule	0.753	
	EP5:Tasks are carried out within a reasonable amount of time	0.780	
	EP6:The delivery of goods or services is conducted in a timely fashion	0.867	

This factor focuses on the perceptions of artificial intelligence (AI) and its capabilities. The high alpha value (0.939) indicates a high level of internal consistency, suggesting that the items in this factor are reliably measuring a common construct.

AI1: "Artificial intelligence provides accurate data and information" has a strong item loading of 0.763, suggesting that respondents largely agree that AI is reliable for providing accurate data and information.

AI2: "Artificial intelligence can help me in getting the job done" has a very strong item loading of 0.861, indicating that respondents strongly believe in AI's potential to assist in task completion.

AI3: "Artificial intelligence can protect the privacy of yourself and others" has a strong item loading of 0.797, showing that respondents generally trust AI for privacy protection.

AI4: "Artificial intelligence can help display hard-to-measure data" has a high item loading of 0.844, indicating that AI is seen as valuable for presenting complex data.

AI5: "Artificial intelligence can help me find lost data" also has a strong item loading of 0.797, suggesting that respondents find AI useful for data retrieval.

AI6: "The authorities can easily audit artificial intelligence" has a very strong item loading of 0.873, indicating a high level of agreement that AI can be audited effectively.

AI7: "Artificial intelligence can help me in making important decisions in the company" has a strong item loading of 0.803, showing that AI is perceived as valuable for decision-making in a corporate setting.

Employee Performance

This factor assesses the perception of employee performance and its alignment with organizational expectations. The high alpha value (0.910) suggests strong internal consistency among the items in this factor.

EP1: "The units of output meet organizational expectations" has a strong item loading of 0.803, indicating that respondents believe that the units of output align with organizational expectations.

EP2: "Products or services meet the expectations of customers" has a strong item loading of 0.808, showing that respondents largely agree that products or services meet customer expectations.

EP3: "The units of output under my responsibility correspond to my skills and ability" has a moderately strong item loading of 0.765, suggesting that respondents generally perceive alignment between their skills and the output under their responsibility.

EP4: "Tasks are generally completed on schedule" has a moderate item loading of 0.753, indicating that respondents somewhat agree that tasks are completed on time.

EP5: "Tasks are carried out within a reasonable amount of time" has a moderate item loading of 0.780, suggesting that respondents find tasks generally completed within reasonable timeframes.

EP6: "The delivery of goods or services is conducted in a timely fashion" has a very strong item loading of 0.867, indicating that respondents strongly believe in timely delivery of goods or services.

Overall, the questionnaire demonstrates good internal consistency, and the items seem to effectively measure the constructs of artificial intelligence perceptions and employee performance. The high item loadings indicate that the items are strongly related to their respective factors, and the alpha values suggest that the constructs are reliable.

Table 3: Descriptive and correlations among variables

	Artificial intelligence	**Employee performance**
Mean	4.01	4.25
Standard deviation	0.7369	0.7171
Artificial intelligence	1	0.610**
Employee performance	0.610**	1

The mean value for both the variables above the neutral value of 3 and near the degree of agreement. Further, table 3 also mentioned the correlation coefficients value of the variables. Analysis of correlations indicates association or relationship between two variables. The coefficient of correlation among artificial intelligence and employee performance is 0.610 is positive and significant as p value less than 0.05.

4.1. Hypothesis testing using Structure Equation Model:

SEM allows the examination of a series of dependence relationships between exogenous (independent) and endogenous (dependent) variables simultaneously. The current study conducted SEM analysis by applying Maximum likelihood estimation with artificial intelligence as exogenous and employee performance as endogenous variable. The alternate hypothesis will be accepted when critical ratio value is above 1.96 and p value less than 0.05.

Figure 1: Structure model

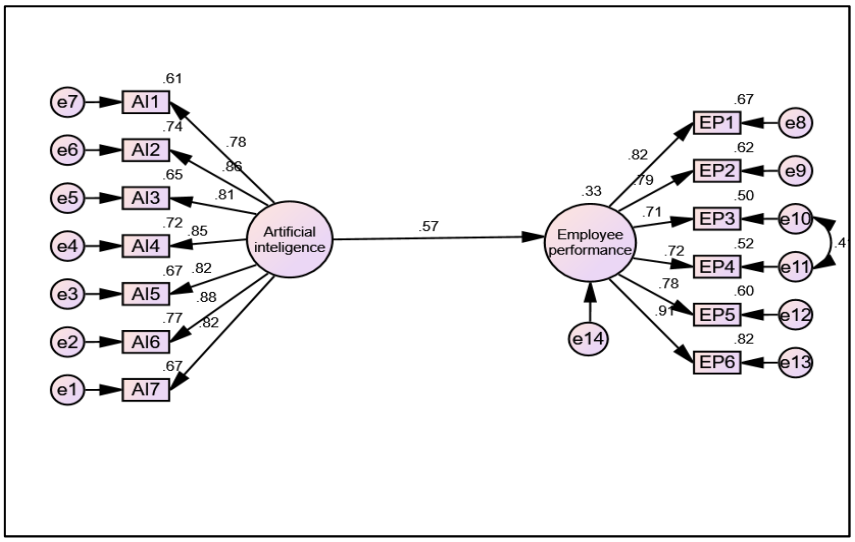

Table 4: Path coefficients and hypothesis of research model

Hypothesis	Path	C.R.	P	Path coefficient (β)	Determination coefficient (R^2)	Result
H1	Artificial intelligence →Employee performance	9.164	***	0.572	0.328	Accepted

Note: CR- Critical ratio, *** = p<0.000.

The path coefficient is referred to as standardized regression weights, indicates strength of impact of independent variable on dependent variable. After referring structure model and path coefficient table 4, it is confirmed that artificial intelligence positively and significantly influences employee performance, since the path coefficient (β) value 0.572 with p=0.000, which is less than 0.05, therefore there is sufficient evidence to accept research hypothesis H1 i.e., artificial intelligence significantly impacts employee performance.

The coefficient of determination (R^2) value 0.328, revealed that 32.8% of variance in employee performance explained by artificial intelligence.

Model fit indices for structure model measured through: CMIN (2.192), RMSEA (0.064), CFI (0.974), GFI (0.932), AGFI (0.901), TLI (0.967) and NFI (0.953). The value of good indicator indices (GFI, CFI, NFI, AGFI) is near 1 or above the recommended criteria. The value of the bad indicator, i.e., RMSEA, is below 0.08; therefore, the SEM model has an absolute fit.

The study's findings have important practical consequences, including the apparent confirmation that the role of change leadership improves employee performance and job engagement levels in the context of AI and its technology adoption. Some

Experts claim that within a few years, all leaders will need to work in an online working environment as a result of technological changes in communication, and that a leader's role will shift from that of a traditional leader to that of a leading interweaves who takes part in online collaboration supporting employees in various networks (Miller, 2005). Companies also need to discover ways to train and support their executives and staff in the use of AI technology, as well as providing access to AI-based platforms and tools. Accompany not only the new AI-induced operation modes but also significant changes in the role of leaders at different levels by providing preparation and training in the specificities of AI transformation; employee recruitment and retention of the new talent needed for AI; managing changes in employment and skills in the company.

Implementing AI and its technologies in the IT sector has many advantages, including the following (as cited by Wamba-Taguimdje et al., 2020): automating transactions by quadrupling the number of transactions processed; estimating revenue growth; expanding financial services customer base;

The role of AI adoption is to support customer acquisition through a focus on new digital services; to reduce delays for the deployment of new mobile applications; to foster innovation by limiting software costs through a corporate licence agreement; to improve customer experience; to decrease operating costs through a variety of customer service and operational improvements; to raise revenue through better service while decreasing customer service costs; to detect and combat fraud; and to improve the overall customer experience. Accelerating the process of collecting and analyzing social media data; increasing the likelihood of detecting threats and alerting security or law enforcement in time to intervene; providing better coverage of the social media world, with a broader range of data sources; providing a sharper view of the context of individual messages; and increasing productivity for its customers are all benefits of implementing AI and its technologies in the service industry to improve employee and firm performance.

5. Conclusion and limitation

Artificial intelligence (AI) and its associated technology can greatly improve the efficiency with which an organization manages its digital information assets, including time and money. The administrative process is extremely time-consuming because of the sheer number of tasks involved. But digitalization-related activities have the potential to lighten the load on professionals, boost performance, and add to the volume of work that would otherwise be done by hand. The limitations of this study could be addressed in follow-up studies. First, the study's narrow focus on the Bangalore area raises doubts about its ability to be representative of the entire population. Participants in this survey are all employed in the information technology and service industries. In order to have a better grasp of the topic at hand, it would be beneficial for future researchers to take a broader sample than just individuals working in the services and IT industries and to broaden the scope of their investigation outside the city of Bangalore.

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