

**IMPLICATIONS OF THE INTERNET OF THINGS ON THE SATISFACTION OF  
EMPLOYEES FROM THE PERSPECTIVE OF PAKISTANI MARKET**

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**Abstract**

A study will be carried out in order to determine the extent to which the Internet of Things (IoT) has a role in predicting the level of satisfaction experienced by employees working in Pakistani online retail establishments. The information will be gathered through the use of a questionnaire, and it will be analysed with SPSS and AMOS. The study will have a total of 365 participants that will take part in it. The research would make a contribution to the existing literature on the internet of things and the satisfaction of employees in marketing literature. With the Internet of Things (IoT) becoming more accessible to the general public, businesses are increasingly considering the implementation of IoT solutions in an effort to boost the level of pleasure experienced by their customers. Additionally, it was discovered that the Internet of Things (IoT) was able to considerably forecast the expectations of employees and mediated the effects that it had on employees' expectations. For the purpose of giving a more comprehensive knowledge of the interaction between Internet of Things and relationship marketing, this study fills a gap in the existing body of literature.

**Keywords:** *Employees Satisfaction, Internet of Things (IoT), Employees Expectation*

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**Brief Introduction**

The concept of the Internet of things (IoT) has received a great lot of attention, which can be primarily attributed to the fact that it is significant in our day-to-day life (Zikria et al., 2021). A similar consensus has been reached about the value of practice to the development of the Internet of Things (Langley et al., 2021). The relevance of the internet of things is well known to

organizations, and as a result, they place a greater emphasis on their positive attitude, which includes the pleasure of their staff. It is being utilized at a rapid pace in virtually every sector of the economy. During lockdowns, employees are able to purchase in a safe and convenient manner thanks to the proliferation of e-commerce platforms. This is despite the fact that contact restrictions are in place. According to Langley et al., (2021) the Internet of Things has a vital influence in the achievement of a higher level of employee satisfaction in the workplace from the perspective of e-commerce. Many people are able to effectively communicate and share their information in a world where the Internet of Things (IoT) is being used. In general, researchers and manufacturers have shown an interest in the rapid pace at which the Internet of Things (IoT) has developed and the information that interacts with a company's everyday operations. Most businesses have implemented new strategies in order to discover innovative Internet of Things solutions in order to recruit more personnel. Internet of Things (IoT) facilitates the production of new ideas and connects businesses with social groups of individuals. According to Nawi et al. (2023), the Internet of Things (IoT) has completely altered the way in which organizations function by facilitating the connectivity of all devices in a seamless manner and fostering an environment that is both productive and efficient. This technology has also expanded its reach to the happiness of employees, as gadgets that are enabled by the internet of things are able to collect useful feedback and insights, which ultimately leads to a better understanding of the preferences and requirements of consumers. As a consequence of this, businesses are able to modify their goods and services in order to fulfill these requirements, which ultimately results in an increase in the degree of worker satisfaction. Not only does this result in increased efficiency and decreased expenses, but it also makes it possible to accelerate response times in the event of disruptions or shifts in demand. In the end, the Internet of Things gives businesses the ability to optimize their operations, increase their efficiency, and maintain their competitive edge in today's market, which is always shifting (Al-Khatib, 2023). In light of the Internet of Things' (IoT) technical advancements in marketing, the purpose of this article is to expand our understanding of IoT in the context of online employee services. In general, the Internet of Things (IoT) has a profound impact on the minds of workers, as well as having a revolutionary impact on how businesses and workers interact with one another (Rajesh et al., 2022).

Within the framework of the retail industry in Pakistan, the contemporary business landscapes consider the happiness of employees to be an important milestone. A highly competitive retail industry in Pakistan necessitates the provision of value-added Internet of Things services in order to facilitate cutting-edge digital revolutions. The absence of real-time visibility into inventory levels and supply chain operations is one of the most significant problems that needs to be addressed. When this occurs, it frequently results in ineffective management of inventories, stock-outs, and delays in the delivery of products. In addition, the high level of competition in the market places pressure on retailers to provide employees with individualized experiences and pricing that are competitive with those of their competitors. On the other hand, if merchants do not have access to the data and insights they require, it will be difficult for them to make decisions that are informed and to satisfy the expectations of their employees. Internet of things solutions, such as optimization, information, and ease of use tools, are becoming increasingly popular among retailers as a means of addressing the difficulties that they face. By effectively utilizing the Internet of Things, retailers are able to optimize the demand and preferences of their staff. Additionally, by analyzing data from a variety of sources, retailers have the ability to develop the expectations of their valued employees and enhance the entire experience of their employees. Because they have these tools at their disposal, Pakistani retailers are able to make decisions based on data and maintain their competitive edge in the market. In this study, which is an attempt to move in this direction, an experimentation employing empirical research is being conducted. The following study questions were included in order to investigate the possibility of causality. Does the Internet of Things have a positive impact on the level of satisfaction experienced by people working in online retail stores? To what extent does the experience of employees operate as a mediator in the link between Internet of Things strategies and employee satisfaction? It is important to note that an appropriate and vital method for fostering employee satisfaction is to execute and maintain employee satisfaction through its antecedents. This is something that should be mentioned. It is possible for managers to successfully benchmark and provides direction for future improvements if they have a comprehensive grasp of the aspects that influence the satisfaction of employees and the online businesses that they choose to shop at (Khan et al. 2023). It has been stated that consumers shop online because they value the benefits that it gives, such as a wide selection of items and reliable employees' expectations (Shaikh et al., 2023; Langley et al., 2021). This is

according to research that was conducted on online marketing. In addition to contributing greatly to enhanced satisfaction (Langley et al., 2021), these elements are also known to contribute significantly to more positive attitudes towards Internet of Things (IoTs) (Al-Khatib, 2023). In a nutshell, the Internet of Things (IoT) has the ability to sway customers and businesses to make significant mental shifts, as well as to win more products through the experience of IoT information employees. By utilizing Internet of Things (IoT) skills to retrieve new products, businesses are able to benefit from a larger consideration of digital services and capabilities, thereby establishing a new approach to connect with their customers. By conducting an investigation into the new ways in which businesses are merging Internet of Things resolutions and relationships for employees' services, the objective of this paper is to shed light on how this study might boost business performance and the obstacles that are associated with attaching with fast disruptive technologies.

This research is the first piece of evidence to indicate the significance of the internet of things. This study investigates how the connections between the internet of things and employee satisfaction are influenced by the experiences of employees working in online retail. In addition to contributing to the current body of literature on the e-service industry, the perfections of how Pakistani e-retail staff experience mediates the Internet of Things and market expansion. In addition, we intend to make a number of contributions through research. In the first place, we prove through empirical evidence that the experience of employees acts as a mediator between Internet of Things and employee satisfaction. As a result of this, we have demonstrated that the Internet of Things (IoT) and the e-services industry continue to protect and enhance pleasant employee experiences while also increasing employee services. In addition, we indicate when Internet of Things approaches can speed up better employee services and when employees might draw pleasant experience from those techniques. As was said, the inclusion of this employee's experience increases the scope of the previous inquiry, which suggested that the employee's experience might be more likely to mitigate the roles of other Internet of Things approaches and the employee's services. The third point is that although there is a need for additional research on Internet of Things strategies in non-Western country contexts (Al-Khatib, 2023), this study focuses on understudied countries such as Pakistan. Demand is particularly growing in Pakistan's healthcare business, as well as in the transportation and energy sectors, as well as in other manufacturing industries. The Internet of Things (IoT) of employees is gaining additional

information to empirically study company processes, which ultimately results in employees' opinions of their experiences being better and happier.

## **Literature Review**

### **Pakistan (E-Retail Market)**

In accordance with a more easily accessible communication organism, the Internet of Things (IoT) has established itself as a global system configuration that is unique to itself (Rajesh et al., 2022). A lack of real-time visibility into Internet of Things devices and their efficient utilization are the primary problems. When this occurs, it frequently results in ineffective management of inventories, stock-outs, and delays in the delivery of products. In addition, the increasing level of competition places pressure on shops to provide employees with individualized experiences and pricing that are consistent with those of their competitors. However, if merchants do not have access to the essential data and insights, it will be difficult for them to make decisions that are informed and to satisfy the expectations of their employees. Retailers are increasingly resorting to cutting-edge technological solutions, such as tools concerning the internet of things and the pleasure of their staff, in order to meet these difficulties. Retailers are able to make decisions based on data and maintain their competitive edge when they have these tools at their disposal (Mainardes et al., 2023).

### **Employees Satisfaction**

Job Satisfaction, Employees Engagement, Employees Involvement, and Organization Commitment are identified and categorized in the literature as employees' attitudes. Organizations are putting much effort into achieving employees' desired level of attitude. Job satisfaction as an attitude is identified as the most influential and core area for an organization to gain success and ensure the effective utilization of employees. Job Satisfaction is recorded as an important determinant for positive organizational outcomes such as productivity, motivation, and work performance; satisfied workers produce better than unsatisfied; thus, satisfaction at the workplace is essential (Mohammed et al., 2023). Job satisfaction refers as 'favorable emotional condition that arises by assessment of one's employment or professional encounters. Work satisfaction

encompasses multifaceted psychological reactions to one's employment, including cognitive (evaluative), affective (or emotional), and behavioral elements.

### **Internet of Things**

Internet-of-thing is considered newest internet method that could be used to offer different things at the workplace, such as communication, sharing knowledge, etc. (Zikria et al., 2021). Thus, the workplace's satisfaction level could be affected by the IoTs (Zhang et al., 2022). Further, the IoTs describe “technology that enables spread of embedded network of intelligent and autonomous devices with intention of scaling productivity, profitability and efficiency”. By connecting various devices and systems, IoT also promotes automation, reducing human error and increasing accuracy in processes. Furthermore, IoT can lead to cost savings through predictive maintenance and energy management, as businesses can monitor and control their resources in real-time. Additionally, the Internet of Things has the potential to revolutionize employees’ experiences. With the ability to connect with wearable, Smartphone, and other smart devices, businesses can personalize their offerings and provide real-time feedback to their employees. This level of customization not only enhances employee’s satisfaction but also increases employee’s loyalty and retention. Moreover, the IoT can streamline supply chain management by tracking inventory levels, optimizing logistics, and improving the overall coordination of the entire supply chain network. This leads to reduced costs, minimized wastage, and improved delivery times. Overall, the Internet of Things offers numerous benefits to businesses, improving their competitiveness and enabling them to thrive in the digital age.

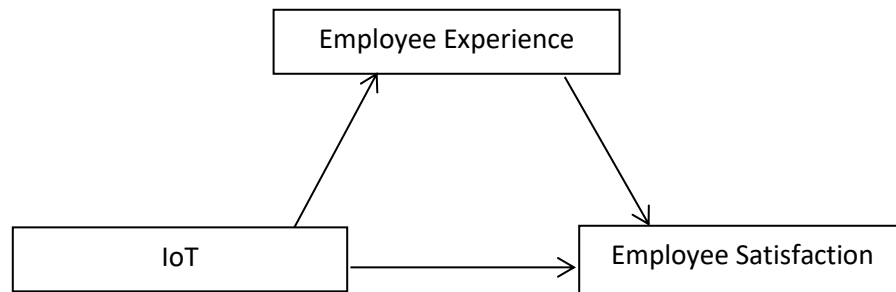


Figure 1- *Conceptual Framework*

**IoT (Such as Internet of Things and Employees Satisfaction)**

Main reasons why the Internet of Things (IoT) has a positive impact on employees' satisfaction (Ding et al., 2023) in e-retail stores is the enhanced convenience it provides. With IoT devices (Jaspers & Pearson, 2022), employees can easily connect and control various aspects of their shopping experience, such as accessing real-time product information, tracking deliveries, and managing their orders. This seamless integration of IoT technology not only saves time but also improves the overall shopping experience for employees, leading to higher levels of satisfaction. Additionally, IoT enables personalized recommendations and targeted advertising, which further enhances employees satisfaction by providing tailored and relevant content based on individual preferences and needs (Asadi et al., 2022; Ding et al., 2023). For example, with IoT technology, retailers can analyze employee's data and behavior to understand their preferences and shopping habits. This allows them to offer personalized recommendations, suggesting products that employees are more likely to be interested in. Furthermore, targeted advertising ensures that employees are presented with relevant promotions and discounts, increasing the likelihood of making a purchase. Overall, IoT technology revolutionizes the shopping experience by making it more convenient, efficient, and tailored to individual needs. By analyzing an individual's browsing history and purchase patterns, IoT technology enables retailers to provide a seamless and personalized shopping experience. Through the use of smart devices and sensors, employees can receive real-time notifications about product availability, price changes, or even personalized discounts when they are near a store. This level of convenience and personalization not only saves time but also enhances employees' satisfaction, fostering brand loyalty and repeat purchases. Ultimately, the integration of IoT technology in the retail industry enhances the overall shopping journey, making it more enjoyable and fulfilling for consumers. Additionally, the integration of IoT technology allows retailers to gather valuable data on employees' preferences and shopping habits. This data can be analyzed to gain insights into consumer behavior, enabling retailers to make informed decisions about inventory management, product placement, and marketing strategies. With this information, retailers can tailor their offerings to meet the specific needs and desires of their employees, further enhancing their shopping experience. Ultimately, the use of IoT technology in the retail industry creates a win-win situation for retailers and consumers, driving sales and employees' satisfaction to new heights. Thus, hypothesis



**Hypothesis-1: Internet of Things Positively Affects Employee's Satisfaction to E-Retail Stores**

**Employees Experience, IoT and Employees Satisfaction**

The internet of things (IoT) has revolutionized the way employees interact with e-retail stores. With the ability to connect various devices and sensors, the IoT has paved the way for a more personalized and seamless shopping experience. However, the success of these IoT-enabled stores ultimately hinges on the satisfaction of their employees. Employees experiences (Golf-Papez et al., 2022) play a crucial role in mediating this relationship, as they directly impact the level of satisfaction and loyalty employees feel towards e-retail stores. Positive employees' experiences can lead to repeat business and word-of-mouth recommendations, driving continued success for IoT-enabled stores. These experiences can be enhanced through personalized recommendations, tailored promotions, and real-time inventory updates made possible by IoT technology. Additionally, gathering and analyzing employees' feedback can help identify areas for improvement and ensure the ongoing satisfaction of employees, further solidifying the relationship between IoT-enabled stores and their clientele. Ultimately, prioritizing employees' experiences is essential for the long-term viability and growth of e-retail stores leveraging IoT technology (Bonfanti et al., 2023). By leveraging IoT technology, e-retail stores can revolutionize the way they interact with employees. Through personalized recommendations based on previous purchases and browsing history, employees can discover new products that align with their preferences, enhancing their shopping experience. Furthermore, tailored promotions can be sent directly to employees' devices, ensuring they are aware of the latest deals and discounts, further increasing employee's satisfaction. Real-time inventory updates provided by IoT technology can also prevent disappointments due to out-of-stock items, improving employees trust and loyalty. Additionally, IoT technology enables retailers to offer personalized recommendations and suggestions based on employees' previous purchases and browsing history. This not only helps employees discover new products but also enhances their overall shopping experience by providing them with relevant and targeted suggestions. By leveraging this data, retailers can better understand their employees' preferences and deliver more personalized and tailored promotions, resulting in increased employees' satisfaction and loyalty. Overall, the integration of IoT



technology in retail not only improves inventory management but also enhances the employees experience, making it a win-win situation for both retailers and consumers. This technology allows retailers to track and analyze employee's behavior, such as their browsing history and purchase patterns, in real-time. With this information, retailers can offer personalized recommendations and promotions based on individual preferences, making the shopping experience more enjoyable and efficient (Ahamad et al. 2022). Additionally, IoT technology enables retailers to optimize their inventory by monitoring stock levels and automatically placing orders when supplies are low, ensuring that employees have access to the products they want when they want them. Hence,

### **Hypothesis-2: Employees Experiences Mediate the Relationship Between Internet of Things and Employees Satisfaction In E-Retail Stores**

#### **Data Collection**

The study will use quantitative method which present in questionnaire. Quantitative method could cover large number of responses in short time (Pandey& Pandey, 2021). The method will be analyzed using statistical package (SPSS) and AMOS for this study. The research used a quantitative approach (Bonfanti et al., 2023).

#### **Sampling Procedure**

Convenience sampling will be applied regard to cheap, efficient, and simple to implement (Gupta & Raman, 2022; Golf-Papez et al., 2022).

#### **Questionnaire Construct**

The internet of things constructs items, including attitude toward using IoT (Venkatesh et al., 2012) 3 items adopted and employees' satisfaction 4-items adopted (Khalifa& Liu, 2007) and employees experience (7 attributes) sub element of trust and ease of use adapted (Lee &Turban, 2001; Gefen, 2003). All study variables were measured by a five point of Likert scale ranging from (1) strongly disagrees to (5) strongly agrees. Questionnaire forms were distributed online. The questionnaires utilized in this study were changed and altered from previous studies to align with the specific contextual requirements.

**Table 1**

Construct	Items	Cronbach's Alpha
Attitude toward IoT	4 - (Venkatesh et al., 2011)	.82
Employees satisfaction	5- (Lee & Turban, 2001)	.86
Employees experience	7- (Khalifa & Liu, 2007)	.91

### **Analysis Procedures**

To support the proposed study structure and measurement model, the researchers used structural equation modeling (SEM) in AMOS 24.0. According to Al-Khatib (2023). AMOS is a powerful data analysis tool that can perform both factor analysis and regression analysis simultaneously. SEM is run in AMOS for this reason. AMOS may also handle complex connections, such as mediation. The complicated relationships between mediations were examined in this study using SEM in AMOS. SEM was employed in earlier studies on large data management (Venkatesh, 2022;) in order to verify the findings of those studies. To evaluate the generalizability of the data for the primary analysis, this study performed a variety of data screening tests, including those for outliers, missing values, and multicollinearity.

### **Results**

#### **Correlation & Descriptive Analysis**

The results of the square root of average variance extracted (AVE), intercorrelations, and descriptive statistics are shown in Table 2. The findings provide preliminary support for earlier ideas in the predicted directions.

**Table 2 Mean, Standard Deviation, and Inter-Correlation**

	<i>M</i>	<i>S.D</i>	<i>IOT</i>	<i>CS</i>	<i>CE</i>
<i>IOT</i>	2.88	.94	(0.82)		
<i>CS</i>	3.54	.95	-.12**	(0.86)	
<i>CE</i>	3.34	1	-.14*	.70**	(0.91)

Source: Fornell and Lacker criterion

### **Confirmatory Factor Analysis**

Confirmatory factor analysis, or CFA, is a method for assessing a theoretical model's validity and reliability using numerical measurements in measurement models. The survey employed in the current study also satisfies Cronbach's alpha's reliability level of 0.70. To evaluate the convergent and discriminant validity of all latent constructs, CFA (confirmatory factor analysis) is required. The CR value (.60) and AVE value (.50) should both be present, according to Hair et al. (2010).

**Table: 3 Measurement Model Assessments**

<i>Items</i>	<i>Indicator</i>	<i>F.L</i>	<i>C.R</i>	<i>AVE</i>
<i>Internet of things</i>	<i>Iot-1</i>	0.77	0.81	0.88
	<i>Iot-2</i>	0.78		
	<i>Iot-3</i>	0.76		
<i>Employees Service</i>	<i>CS1</i>	0.80	0.82	0.87
	<i>CS2</i>	0.86		
	<i>CS3</i>	0.84		

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	<i>CS4</i>	<i>0.84</i>		
<i>Employees expectation</i>	<i>CE1</i>	<i>0.87</i>	<i>080</i>	<i>0.84</i>
	<i>CE2</i>	<i>0.91</i>		
	<i>CE3</i>	<i>0.77</i>		
	<i>TCE4</i>	<i>0.76</i>		
	<i>CE5</i>	<i>0.75</i>		
	<i>CE6</i>	<i>0.74</i>		
	<i>CE7</i>	<i>0.73</i>		

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The findings indicate that the AVE, CR, and Cronbach's alpha lie within a range that is acceptable. Therefore, it can be stated that the best metrics for examining the connections between latent variables like PCB, organizational citizenship behavior, and supervisor trust are AVE, CR, and Cronbach's alpha. AMOS-SEM techniques were used in the second step to evaluate the research (Kline, 2012). In the beginning, structural equation modeling was evaluated in order to determine metrics for model fitness. Initial model fitness indices, such as CMIN/DF= 2.12, GFI=.97, NFI=.93, CFI=.94, and RMSEA=.07, showed good agreement with the data. The fact that CMIN/DF was under 5 and RMSEA was equal to.08 is additional proof that the model fits the data correctly.

**Hypothesis-1: Internet of Things positively Affects Employees Satisfaction to E-Retail Stores**

**Structural Model**

A model (figure 1) was utilized to examine the proposed connections. The study found that the first hypothesis, which suggests that IoTs and employees' satisfaction positively related ( $\beta=.141$ , significant), is supported. This finding has significant implications for businesses and organizations that utilize IoT technology in their employee's service practices. It suggests that implementing IoT devices and systems can lead to increased employees' satisfaction. Furthermore,

this result aligns with previous studies that have highlighted the positive impact of technology on employee's satisfaction.

**Mediating Effect Results**

Through our utilization of the Bootstrap method in Amos, we have confidently identified that IoTs directly impact employee's satisfaction (b=.08, 95% CI: 0.06, 0.54). Our findings, as presented in Table 4, also reveal that employee's expectation has indirect impact and significant related (b=.42, 95% CI: 0.24, 0.71) and that the total effect is significant (b=0.17, 95% CI: 0.084, 0.51). The findings support idea, that employee's expectation partially mediates the relationship concerning internet of things usage and employee's satisfaction. These results suggest that IoTs have a direct positive impact on employee's satisfaction, as indicated by the positive coefficient (b=.076) and the confidence interval (0.06, 0.54). Additionally, our study reveals that employees' expectations play a significant role in mediating this relationship, with a coefficient of (b=0.42) and a confidence interval of (0.24, 0.71). Overall, these findings provide support for the notion that employees expectations partially mediate the relationship between IoT usage and employee's satisfaction.

**Table 4: Mediation by Bootstrapping (Hayes and Preacher, 2014)**

<i>Effect</i>	$\beta$	<i>S.E</i>	<i>LL 95%</i>	<i>UL 95%</i>
<i>Direct</i>	-.08	.06	-.18	.06
<i>Indirect</i>	-.42	.03	-.13	-.01
<i>Total</i>	-.17	-.06	-.25	-.01

**Conclusions**

The current study intent to indicate the impact of IoT on employees' satisfaction through direct way. Moreover, findings also suggest that employees' expectations play a significant role in mediating the relationship between IoT usage and employee's satisfaction. The structural model analysis shows a positive relationship between IoT usage and employees' satisfaction, with a beta

coefficient of 0.075. The mediation analysis conducted through bootstrapping also confirms that there is a significant indirect effect of IoT usage on employee's satisfaction, mediated by employees' expectations. Therefore, it can be concluded that employees' expectations partially mediate the relationship between IoT usage and employee's satisfaction. This finding suggests that as employees use IoT devices more frequently, their satisfaction levels increase. However, this relationship is not solely dependent on usage alone. The mediation analysis reveals that employees' expectations play a crucial role in enhancing employees' satisfaction. It implies that the more employees expect from IoT devices, the more satisfied they are likely to be with their overall experience. Hence, organizations should focus on managing employees' expectations effectively to maximize the impact of IoT usage on employee's satisfaction

### **Limitations**

The existing study is limited to Saudi nationality thus, the further study could be conducted at different public sector instead of Saudi Port Authority within pay attention to the generation such as generation X and baby boomers. In addition, longitudinal sectional study could be applied instead of cross-sectional study

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