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Research Article

Do Iot Improvises The Business Efficiency – An Exploratory Study

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Abstract

The objective of the study was determine the opinion on IoT for business operational efficiency form the business units employing IoT technology. Further to identify the important improvement made by IoT to increase the business operational efficiency. Herein for the descriptive research design was adopted. The data was collected from 67 respondents from 38 different business units who were using IoT. The data were collected using a structured questionnaire. From the analysis carried out it was understood that the respondents' opinion doesn't differ on IoT. They indicate that, IoT significantly contributes to decision making, easy data storage and retrieval, helps in identifying and rectifying the mistakes quickly, Improves operational efficiency and better system monitoring easily. Also it was identified that there is significant relationship between IoT and business efficiency variable such as; Complexity in business operations, Supports decision Making, System monitoring was made easy, Reduced Workload, Easy data storage and retrieval, Better Customers Retention, Creating Competitive Pricing of Products and Helps in Competing in business competitions. From the Pearson Coefficient values, which was positive, it was understood that IoT significant contributes to increase in Business efficiency.

Keywords: IoT, Business Efficiency, India

Introduction

The Internet of Things (IoT) is a concept in which things are capable of categorising, detecting, networking, and managing potentials in order to assign them to interact with one another through the Internet in order to achieve a goal. By improving access to information, the point of contact may improve consistency, sustainability, and efficacy [1]. IoT devices will eventually be ubiquitous, allowing businesses to operate more efficiently. The main strength of the IoT concept is undoubtedly the increased impact it will have on a variety of aspects of daily life and the activities of potential users. According to one potential user, the IoT will have widespread effects in both residential and commercial settings. From the perspective of business users, the most visible impacts will be comparable in sectors such as computerisation, manufacturing, corporate administration, and the provision of products and services. In a study of European companies, it

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was discovered that they are ahead of their foreign counterparts in the research and planning phases of implementing IoT. When small networks of connected things grow into far more sophisticated networks of linked devices spanning across companies, the Internet of Things' full potential will be realised. One of the most common barriers to utilising the Internet of Things is the observation that products or services lack an obvious Internet of Things application. The data was gathered from 67 respondents who used IoT in 38 different business divisions. A systematic questionnaire was used to gather the information. The results of the study revealed that the respondents' opinions on IoT are similar [2].

Businesses will be able to take advantage of the IoT's bright possibilities and, as a result, enhance their company efficiency with the help of an effective IoT strategy. Computing and communications have undergone a revolution in recent decades, and all signs are that technical development and the usage of information technology will continue. The information and communication technology revolution has altered not just our lives but also the way people do business. With today's increasing rivalry, companies are implementing integrated information systems to obtain a competitive edge, improve their economic indicators, work productivity and efficiency, decrease expenses, and gain other advantages. The implementation of such IoT may impact overall business performance by enhancing internal procedures and financial performance of the firm. Analysis of scientific literature, study synthesis, and generalisations have been performed in order to identify concrete and intangible advantages of IoT deployment, as well as their impact on company performance, business processes, and impacted regions. Only businesses that are able to keep up with innovations and adapt to the circumstances by making changes to their business operations can expect to maintain their performance at the necessary level and remain competitive in our fast-paced and constantly changing environment. In recent years, the amount and quality of information technology utilised in a business, as well as the capacity to use that information properly, have become inextricably linked. The significance of the Internet of Things has risen significantly in the last decade as a growing number of companies have adopted it [3]. Without an effective information system, a contemporary organisation would be impossible to conceive. Following many studies, there is no question that implementing an information system in an organisation may provide a number of advantages in dealing with internal and external responsibilities that a business may encounter in day-to-day operations and long-term decisionmaking. Continuous technological advancement not only improved the performance of hardware and software, reduced costs, and provided a wider range of information systems for most companies, but it also aided in the spread of computerised systems throughout the world. An information system that is integrated into an enterprise's business processes is one of the major factors that can improve business performance if it is implemented correctly. However, the benefits of a specific information system can vary from one company to the next, depending on the economic sector in which the company operates and the business processes for which the IoT was developed. Because of the large number of direct and indirect advantages, both intangible and tangible, estimating the potential benefits of an information system is challenging. The primary aim of this article is to determine the effect of an information system deployment on a company from a theoretical standpoint by analysing scientific literature, comparing and synthesising findings. Inadequate business process management and a lack of a systematic approach result in superfluous procedures, increased inefficiency, and decreased competitiveness, all of which have an impact on the company's capacity to operate successfully in the short and long term [4]. Business process automation and a move from functional to process-oriented organisational structures are two of the most important shifts in a company's life cycle. Business process

automation is an essential stage in a company's life cycle, and it usually entails the implementation of some IoT. Inefficient corporate operations are made more inefficient by automating them. As a result, before implementing IoT or business process automation, businesses must enhance or optimise their business processes. Business procedures enable all elements of a company to work together efficiently and effectively toward a shared objective of better serving consumers [5].

Review of Literature

The Internet of Things is an ideal potential instrument for influencing companies by providing novel increasing data as well as the required computational characteristics for developing new business applications [6]. A sensing framework was created, which provides outstanding opportunities to bring together new essential explanations that help managers make better business decisions. Even if they are not connected to one other, Internet of Things technology enables stakeholders to potentially contribute to company efficiency. Manufacturing companies have effectively utilised the Internet of Things to maintain information systems and boost production [7]. Manufacturing processes may be improved and monitored in the manufacturing sector by connecting objects utilising the Internet of Things through smart tools and data transporters that can operate together with a smart network architecture and information systems. Over the past 50 years, the Internet of Things has developed and matured to the point that you can't imagine or plan a project, company, or other endeavour without it. When we say information technology, we don't only mean computers or smartphones; we also imply sophisticated equipment in factories, the automobile and aviation industries, and a variety of home products. This has, in some manner, not only made our everyday lives easier, but it has also saved us money and time [8].

A quarter of American employees work from home for a significant portion of the year, while another quarter works “mobile” - on the go. This illustrates the enormous potential that IoT and the Internet provide as a tool for deployment in businesses and government agencies. Economists recognise the value of IoT in accelerating company growth, reducing costs, and promoting the finest goods. Globalization and computerization have reshaped the economy, politics, culture, and social order in recent years. Globalization is the process of bringing together economic and cultural organisations. The usage of information technology facilitates this integration. Global computerised networks and the unrestricted flow of commodities, information, and people across national borders are prerequisites for the technology revolution. As a result, globalisation is made feasible by the Internet and worldwide computer networks, which provide a technical backbone for the global economy. Computer networks, satellite communication systems, software, and hardware all connect to help the global economy run smoothly [9].

Companies all over the globe have seen a growing need for information systems in the business sector over the last several decades. It was difficult to overlook the importance of the advantages and the potential for improved company performance as a result of such an investment. It was soon realised that the Internet of Things may help a company save money, gain a competitive edge, and enhance performance, resulting in increased revenues. It is now standard practise to improve company performance with information technology solutions. An improvement in company performance may be thought of as a bridge between information technology and business strategy. The framework of business performance in the information system that sits between a business plan and information technology. This conclusion is supported by the study, which suggests that performance is the consequence of certain advantages provided by information technology solutions or associated services to individual business units and the organisation as a

whole, as measured by various criteria. All advances in IT or information systems have the potential to reduce the cost of corporate operations and enhance the efficiency of worker activities. The above-mentioned solutions help an organization's monitoring and coordination. As a result, the total effect on company performance may be characterised by a study of benefits, both real and intangible, obtained after the installation of an information system. This is a common financial issue for many types of investments, not only IoT. It becomes a problem owing to the complexities involved in evaluating investment impacts on a company's operational success. Such impacts should first be understood and then financially evaluated, according to the study [10].

Investments in the design and execution of information systems may be a crucial strategy for a business. This may aid in gaining a competitive edge, enhancing the quality of service provided, and boosting performance in respect to the company's plan. The definition, components, and kinds of information systems should be established initially in order to better comprehend the impact of information systems on company performance. CEOs across the globe are increasingly focusing on business process management as a discipline for enhancing company outcomes. Companies focusing on business process (BP) redesign initiatives at the process level in the 1990s. However, as of the 2010s, the emphasis has moved to strategy or enterprise level, implying that managers have realised that company objectives cannot be met without effective BPM, BPI, or BPR. At the implementation level, this has resulted in the development of Business Process Management Systems (BPMS), which combine procedures, staff skills, and IoT systems into a single entity. Business Process Management (BPM) aims to enhance how businesses perform cross-functional work and guarantees that company-wide skills are available to manage the full business process life cycle effectively. A company plan should be properly crafted as the primary corporate guideline and path to success [11].

Every successful firm pays close attention to developing an effective business strategy, as well as defining the key business goals and responsibilities, as well as how they should be accomplished. Unfortunately, many workers are unaware of the company's vision and purpose, as well as its strategic and operational goals and strategies. As a result, it is critical to establish suitable communication channels with lower levels while developing business strategy, i.e. a system to educate all workers about the company's goals and vision. It is widely known that workers who participate in activities see tasks and objectives as "personal," resulting in increased participation and engagement and, as a result, achieving the objectives. In order to rectify errors and obtain the intended outcomes, strategy designers must establish a measurement system for monitoring strategy execution in the short and long term [12].

The performance of business procedures via the Internet is known as e-business. Buying and selling goods, supplies, and services; serving clients; processing payments; maintaining production control; working with business partners; exchanging information; conducting automated employee services; recruiting; and more are examples of electronic business operations. E-business may include a variety of activities and services, from the creation of intranets and extranets to e-service, which is the delivery of services and tasks via the Internet by application service providers [14].

Major firms are doing e-business to purchase components and supplies from other companies, cooperate on sales campaigns, and undertake collaborative research as they continue to reimagine their operations in terms of the Internet, particularly its availability, broad reach, and ever-changing possibilities. Information technology is one of the important elements that is now assisting companies in breaking into new markets in order to be creative and create new goods and services. As a result, we may conclude that information technology plays a huge role in the development of new goods and services. If a company properly identifies information technology

for its competitive business market and provides suitable software, it will be able to organise and collect the data and information needed to create new goods and services. The internet enabled electronic business via electronic mail, voice mail with videoconferencing, data conference, teleconferencing, and electronic data exchange, resulting in a new boom in rapidly changing markets, economies, societies, and politics through changes in products, services, and consumer behaviour, among other things [15].

Objectives

The objective of the study was determine the opinion on IoT for business operational efficiency form the business units employing IoT technology. Further to identify the important improvement made by IoT to increase the business operational efficiency.

Methodology

Herein for the descriptive research design was adopted. The data was collected from 67 respondents from 38 different business units who were using IoT. The data were collected using a structured questionnaire.

Analysis and Interpretation

Herein analysis was carried to identify whether there is a significant difference in business efficiency due to induction of IoT as per opinions of male and female managers Table 1.

Table No.1: Independent Sample Test – Business Efficiency w.r.t. Gender

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Improved Operational Efficiency	Equal variances assumed	2.338	.131	-1.113	65	.270
	Equal variances not assumed			-1.043	43.098	.303
Creating Competitive Pricing of Products	Equal variances assumed	12.181	.001	-.802	65	.426
	Equal variances not assumed			-.737	38.031	.466
Increment in Sales	Equal variances assumed	.045	.833	.472	65	.638
	Equal variances not assumed			.465	56.712	.644

Better Customers Retention	Equal variances assumed	2.578	.113	-1.193	65	.237
	Equal variances not assumed			-1.129	45.642	.265
Innovation product & Services	Equal variances assumed	.424	.517	-.176	65	.861
	Equal variances not assumed			-.177	62.395	.860
Branding	Equal variances assumed	.755	.388	-.017	65	.986
	Equal variances not assumed			-.017	56.424	.986
Reduced Workload	Equal variances assumed	3.276	.075	-2.136	65	.036
	Equal variances not assumed			-2.051	49.407	.046
Easy data storage and retrieval	Equal variances assumed	7.453	.008	-1.476	65	.145
	Equal variances not assumed			-1.373	41.012	.177
Helps in identifying and rectifying the mistakes quickly	Equal variances assumed	.030	.864	-.549	65	.585
	Equal variances not assumed			-.551	61.143	.584
Reduced Complexity in business operations	Equal variances assumed	1.146	.288	.362	65	.718
	Equal variances not assumed			.359	58.316	.721
Supports decision Making	Equal variances assumed	6.715	.012	-2.207	65	.031
	Equal variances not assumed			-2.021	37.291	.051
System monitoring was made easy	Equal variances assumed	10.858	.002	-2.020	65	.048
	Equal variances not assumed			-1.843	36.406	.074
Decreasing Business Expenditure	Equal variances assumed	.074	.786	-.168	65	.867
	Equal variances not assumed			-.169	60.968	.867
Scope for business expansion	Equal variances assumed	.010	.920	-.751	65	.455
	Equal variances not assumed			-.746	58.817	.459
Helps in Competing in business competitions	Equal variances assumed	.898	.347	-.014	65	.989

	Equal variances not assumed			-.013	54.439	.989

Source: (Primary data)

The estimated significance value is greater than 0.05 for all the items, meaning the null hypothesis is accepted. Therefore, there is no significant difference in business efficiency due to induction of IoT as per opinions of male and female managers.

Herein analysis was carried to identify whether there is a significant difference in business efficiency due to induction of IoT as per opinions of the managers having different level of experience Table 2.

Table No.2: ANOVA – Business Efficiency w.r.t. Experience

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Improved Operational Efficiency	Between Groups	1.573	3	.524	.625	.601
	Within Groups	52.845	63	.839		
	Total	54.418	66			
Creating Competitive Pricing of Products	Between Groups	.211	3	.070	.110	.954
	Within Groups	40.237	63	.639		
	Total	40.448	66			
Increment in Sales	Between Groups	4.215	3	1.405	1.736	.169
	Within Groups	50.979	63	.809		
	Total	55.194	66			
Better Customers Retention	Between Groups	.558	3	.186	.182	.909
	Within Groups	64.606	63	1.025		
	Total	65.164	66			
Innovation product & Services	Between Groups	3.283	3	1.094	.744	.530
	Within Groups	92.657	63	1.471		
	Total	95.940	66			
Branding	Between Groups	4.840	3	1.613	1.509	.221
	Within Groups	67.340	63	1.069		
	Total	72.179	66			
Reduced Workload	Between Groups	2.205	3	.735	.665	.577
	Within Groups	69.645	63	1.105		
	Total	71.851	66			

Easy data storage and retrieval	Between Groups	.978	3	.326	.624	.602
	Within Groups	32.933	63	.523		
	Total	33.910	66			
Helps in identifying and rectifying the mistakes quickly	Between Groups	.657	3	.219	.321	.810
	Within Groups	43.015	63	.683		
	Total	43.672	66			
Reduced Complexity in business operations	Between Groups	3.800	3	1.267	1.434	.241
	Within Groups	55.662	63	.884		
	Total	59.463	66			
Supports decision Making	Between Groups	.484	3	.161	.242	.867
	Within Groups	42.083	63	.668		
	Total	42.567	66			
System monitoring was made easy	Between Groups	.546	3	.182	.166	.919
	Within Groups	69.066	63	1.096		
	Total	69.612	66			
Decreasing Business Expenditure	Between Groups	1.324	3	.441	.637	.594
	Within Groups	43.661	63	.693		
	Total	44.985	66			
Scope for business expansion	Between Groups	1.339	3	.446	.813	.491
	Within Groups	34.572	63	.549		
	Total	35.910	66			
Helps in Competing in business competitions	Between Groups	3.957	3	1.319	1.169	.329
	Within Groups	71.117	63	1.129		
	Total	75.075	66			

Source: (Primary data)

The estimated significance value is greater than 0.05 for all the items, meaning the null hypothesis is accepted. Therefore, there is no significant difference in business efficiency due to induction of IoT as per opinions of the managers having different level of experience.

Having found there is no significant different in opinion among respondents, herein in the rank analysis was carried to identify the important business aspects increased due to induction of the IoT Table 3.

Table No. 3: Rank Analysis – Business Efficiency

Rank Analysis			
	N	Mean	Rank

Improved Operational Efficiency	67	4.3134	4
Creating Competitive Pricing of Products	67	3.4328	11
Increment in Sales	67	2.8358	12
Better Customers Retention	67	4.2687	6
Innovation product & Services	67	4.0299	9
Branding	67	2.7612	13
Reduced Workload	67	3.8209	10
Easy data storage and retrieval	67	4.3881	2
Helps in identifying and rectifying the mistakes quickly	67	4.3731	3
Reduced Complexity in business operations	67	4.0896	8
Supports decision Making	67	4.4478	1
System monitoring was made easy	67	4.2836	5
Decreasing Business Expenditure	67	1.9851	15
Scope for business expansion	67	2.3881	14
Helps in Competing in business competitions	67	4.2090	7

Source: (Primary data)

From the rank analysis carried using the mean score it was found that IoT significantly contributes to decision making, easy data storage and retrieval, helps in identifying and rectifying the mistakes quickly, Improves operational efficiency and better system monitoring easily.

Herein correlation analysis was carried to identify the important business effeicinceny factors that has significant relationship with IoT Table 4.

Table No. 4: Correlation Analysis – Business Efficiency and IoT

Correlations		
		Requirement of IoT
1. Improved Operational Efficiency	Pearson Correlation	.006
	Sig. (2-tailed)	.965
	N	67
2. Creating Competitive Pricing of Products	Pearson Correlation	.247*
	Sig. (2-tailed)	.044
	N	67
3. Increment in Sales	Pearson Correlation	.045
	Sig. (2-tailed)	.716
	N	67
4. Better Customers Retention	Pearson Correlation	.355**
	Sig. (2-tailed)	.003
	N	67
5. Innovation product & Services	Pearson Correlation	.105
	Sig. (2-tailed)	.397
	N	67
6. Branding	Pearson Correlation	.106
	Sig. (2-tailed)	.394
	N	67
7. Reduced Workload	Pearson Correlation	.349**

	Sig. (2-tailed)	.004
	N	67
8. Easy data storage and retrieval	Pearson Correlation	.473**
	Sig. (2-tailed)	.000
	N	67
9. Helps in identifying and rectifying the mistakes quickly	Pearson Correlation	.153
	Sig. (2-tailed)	.217
	N	67
10. Reduced Complexity in business operations	Pearson Correlation	.313*
	Sig. (2-tailed)	.010
	N	67
11. Supports decision Making	Pearson Correlation	.404**
	Sig. (2-tailed)	.001
	N	67
12. System monitoring was made easy	Pearson Correlation	.601**
	Sig. (2-tailed)	.000
	N	67
13. Decreasing Business Expenditure	Pearson Correlation	.106
	Sig. (2-tailed)	.392
	N	67
14. Scope for business expansion	Pearson Correlation	.050
	Sig. (2-tailed)	.690
	N	67
15. Helps in Competing in business competitions	Pearson Correlation	.455**
	Sig. (2-tailed)	.000
	N	67

Source: (Primary data)

From the correlation analysis made, the estimated significance value is less than 0.05 for item no. 2, 4, 7, 8, 10, 11, 12, and 15, meaning the null hypothesis is rejected, that there is significant relationship between IoT and business efficiency variable such as; Complexity in business operations, Supports decision Making, System monitoring was made easy, Reduced Workload, Easy data storage and retrieval, Better Customers Retention, Creating Competitive Pricing of Products and Helps in Competing in business competitions. From the Pearson Coefficient values, which was positive, it was understood that IoT significant contributes to increase in Business efficiency.

Findings and Conclusion

From the analysis carried out it was understood that the respondents' opinion doesn't differ on IoT. They indicate that, IoT significantly contributes to decision making, easy data storage and retrieval, helps in identifying and rectifying the mistakes quickly, Improves operational efficiency and better system monitoring easily. Also it was identified that there is significant relationship between IoT and business efficiency variable such as; Complexity in business operations, Supports decision Making, System monitoring was made easy, Reduced Workload, Easy data storage and retrieval, Better Customers Retention, Creating Competitive Pricing of Products and Helps in

Competing in business competitions. From the Pearson Coefficient values, which was positive, it was understood that IoT significant contributes to increase in Business efficiency.

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