RESEARCH REVIEW JOURNALS
Volume-04
Issue-01
January-2019

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com[UGC Listed Journal]

Role of IOT Business Model In Indian Public Sector Manufacturing Companies

[1]Madhuri Vangeti, [2]Santosh K Yadav and [3]Vasu Pinnti

[1]PhD Scholar, Department of Computer Science and Engineering, Shri Jagdishprasad Jhabarmal Tibrewala University, Rajasthan
[2]Professor, Department of Computer Science and Engineering, Shri Jagdishprasad Jhabarmal Tibrewala University, Rajasthan
[3]Associate Professor, Information and Communication Technology, Federal TVET, Addis Ababa, Ethiopia

ARTICLE DETAILS

Article History
Published Online: 20January 2019

Keywords
Internet of Things (IOT), virtual, sensors, manufacturing, etc.

ABSTRACT

Industrial revolution took place before 200 years ago, to increase the productivity, which leads to accelerate the economy, where mechanical power replaces human and animal muscle power. In present time, IOT worked with sensors guarantee to give an efficient and robotized method for living. In this paper we explain about recognizable proof of 26 significant variables. Cronbach's Alpha, KMO, Bartlett Test and reduction of 26 variables into nine factors through factor analysis is applied and the Business Model Canvas tool in the advancement of the IoT business model would be clarified. The IoT business model created right now help the Indian Public Sector manufacturing companies to execute it at their Manufacture business for expanded worker profitability, operational productivity and income. The researcher had the option to distinguish 26 variables which were assembled into nine factors through the factor analysis.

1. Introduction

Industrial revolution took place before 200 years ago, to increase the productivity, which leads to accelerate the economy, where mechanical power replaces human and animal muscle power. Internet revolution started in 1950, which depends on networking, computing and communication in order to increase the productivity and boosted global economy much better than industrial revolution [1]. The next revolution that will drive a new thread to increase the productivity is Internet of Things (IOT). IOT is the amalgamation of smart devices, smart systems and intelligent decision-making capabilities [2]. With the help of IOT, all things across the physical world can be connected and communicate with each other.IOT has four main components including sensation, heterogeneous access, processing of data [3], applications and services and in addition, factors such as privacy and security [4].

1.1 Challenges of IOT be overcome by virtual sensors

In present time, IOT worked with sensors guarantee to give an efficient and robotized method for living [5]. Anyway certain

Shortcomings of sensing technology despite everything remain unsolved and demand to be tended to exquisitely. In this, few difficulties of IOT are tended to using properties of virtual sensors [6]. In different applications, sensors present at the remote areas can be utilized to secure information by tracking creature movement design, or the measure of rainfall, or change of topology [7]. A major test is remote access and the executives of these gadgets.

2. Literature Review

Bekker[1] had exhibited a correlation between "Hadoop Distributed File System (HDFS)" and "Cassandra File System (CFS)". The correlation was finished by considering the vital parameters like security, scalability, volatility, read/write efficiencies and so forth. The work gives insights concerning the working and additionally features the favorable circumstances and applications of every one of these files systems. In any case, no exact assessment was done in support of their cases.

Alturjman[2] had built up another arrangement model for IRs sought after hotspots. This was presented since in light of high development in tally of associated gadgets (static or mobile), there expands the volume of traffic. The allotting of IRs specifically district was masterminded however supporting three boss purposes which have planned for limiting the traffic of network, safeguarding a higher headed for the proficient postponement, just as the decreasing of traffic load for every distributer. Further, they have inspected the ability of the IoT design underneath factor behaviors of traffic with the guide of new model in describing the behavior of network, which depended on Content Demand Ellipses (CDE).

Al-Qirim et al. [3] featured the different factors liable for the wide selection of big data technologies and their corresponding benefits. The multiplication of data and information from differed sources has opened new doors for the investigators for the better understanding and producing novel qualities from the data. The different driving factors alongside the difficulties appended with the appropriation of big data apparatuses and systems were the prime focal point of their work.

Baker et al.[4] have built up another multi-cloud IoT administration algorithm named E2C2, which have focused on the formation of energy-aware composition plan that has additionally coordinated the least conceivable IoT administrations. The model was absolutely implied for the satisfaction of necessities of client. They have received an official client necessities transformation, just as change demonstrating with investigation, was embraced for the created algorithm.

Borgia[5] had been depicted about the key highlights of IoT technology where blend of different angles and technologies from various methodologies were used, well-suited for the difficulties confronted today. The fundamental

point of consolidating different computing and different technologies together is to make a symbiotic association and association between systems of genuine and digital worlds. This could be accomplished, since IoT vision is supported by smart article.

3. Objective

To identify digital enablers responsible for increased operational efficiency and employee productivity in today's manufacturing business. To develop an IoT business model for increasing operational efficiency and employee productivity in manufacturing business.

4. Research Methodology

Research methodology (RM) is needed to make in a proper manner to collect the data in an efficient way [8-10]. Steps of RM is given as follows:

4.1 Research design

We study about recognizable proof of 26 significant variables for RO1, Cronbach's Alpha, KMO Test, Bartlett Test and reduction of 26 variables into nine factors through factor analysis. The factors distinguished from the different literature alongside the utilization of the Business Model Canvas tool in the advancement of the IoT business model would be clarified.

4.2 Data analysis

Factor analysis will be utilized to distinguish the huge factors. Accessible software (SPSS) will be utilized for Factor Analysis Variables, having factor loading more noteworthy than 0.3.

4.3 Data collection

Essential data would be gathered through1) Mailing the questionnaire 2) One to one interaction (Questionnaire strategy) and filling up the questionnaire 3)online mode (GoogleDOCS).

5. Result and Discussion

The researcher has recognized 29 key digital empowering variables. In view of the result of the semi-organized interview of 15 respondents, till data immersion occurred, the accompanying three variables were precluded while the rest 26 variables were considered for study:

- **Sensor and hardware producers-** Tie-ups must be set up with Service Providers for IoT reception.
- **Mass market-** Scalability of IoT reception will address the more extensive mass market over some stretch of time.
- **Market share-** IoT develops the market share for Indian manufacture business by adding more customers to the individual Company/Outlet.

The inner consistency was checked utilizing Cronbach's alpha Test; on the off chance that it is more than 0.70, then it is viewed as a reasonable level of inward consistency; the outcome is appeared underneath in Table 1. The 26 variables were settled through face legitimacy.

Table 1 Reliability statistics

Reliability Statistics	
Cronbach's Alpha	No. of Items
0.920	26

The Cronbach's Alpha worth turned out to be 0.920 which demonstrated the scale to be very dependable. This outcome has been approved through Convergent legitimacy. The ampleness of the sample size was checked utilizing the KMO test; in the event that it is more than 0.60, then it is viewed as worthy. In the flow research, the KMO score turned out to be 0.715 as delineated in Table 2; this was satisfactory to continue with Factor Analysis. It has been approved through Construct validity.

Table 2 KMO and Barlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.715
Bartlett's Test of Sphericity	Approx. Chi-Square	3791.459
	Df	325
	Sig.	.000

Both the KMO and Bartlett tests were worthy for factor analysis to be taken forward. The Principal Component Analysis (PCA) procedure was used to break down the recognized 26 variables. It is seen that 68.7% difference is clarified by the 9 factors as delineated in Table 3.

Table 3 Total variance explained through PCA

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative%	Total	% of Variance	Cumulative %
1	5.24	20.162	20.162	5.24	20.162	20.162	3.82	14.69	14.69
2	2.71	10.432	30.594	2.71	10.432	30.594	2.04	7.862	22.552
3	1.96	7.552	38.146	1.96	7.552	38.146	2.02	7.785	30.337

4	1.86	7.154	45.3	1.86	7.154	45.3	1.91	7.347	37.684
5	1.46	5.595	50.895	1.46	5.595	50.895	1.78	6.849	44.533
6	1.3	5.006	55.901	1.3	5.006	55.901	1.78	6.844	51.377
7	1.2	4.605	60.506	1.2	4.605	60.506	1.6	6.165	57.542
8	1.09	4.176	64.682	1.09	4.176	64.682	1.58	6.077	63.619
9	1.05	4.026	68.708	1.05	4.026	68.708	1.32	5.088	68.708
10	0.94	3.601	72.309						
11	0.87	3.332	75.641						
12	0.75	2.9	78.541						
13	0.65	2.513	81.054						
14	0.6	2.323	83.377						
15	0.59	2.251	85.628						
16	0.57	2.176	87.804						
17	0.51	1.972	89.776						
18	0.43	1.67	91.447						
19	0.4	1.519	92.966						
20	0.35	1.357	94.323						
21	0.32	1.247	95.57						
22	0.29	1.122	96.692						
23	0.26	1.015	97.707						
24	0.25	0.979	98.686						
25	0.19	0.733	99.419						
26	0.15	0.581	100						

Table 3 shows that the total of the variance depicted by all the components equivalent 100% of variance. The principal component involves 20% of the absolute variance, the second component 10% of the variance, the third 7.5%, the fourth 7%, the fifth 5.6%, the 6th 5%, the seventh 4.6%, the eighth 4.17% and the ninth 4% variance. It is gathered that the nine factors represent 68.7% of the whole variety in the 26 variables. In the underneath referenced Figure 1, it is seen that there is a sharp drop in the bend toward the start; thereafter it turns out to be level after the ninth factor. This demonstrates sums of nine factors are sufficient to address the variety in the 26 variables.

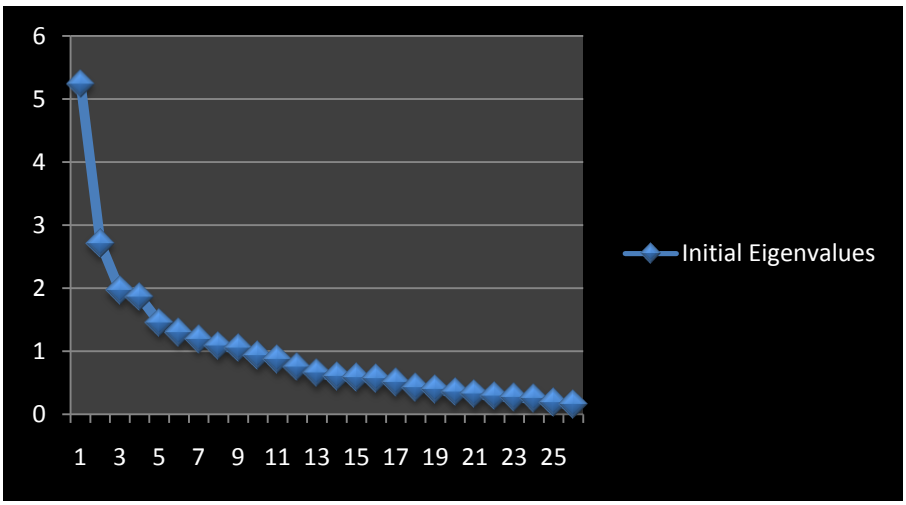

Figure 1 Scree Plot

The pivoted component matrix was thereafter acquired utilizing the Varimax with Kaiser Normalization procedure as portrayed in Table 4 underneath.

Table 4 Total variance explained

Rotated Component Matrix									
	Component								
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9
Data security				0.779					
Faster decision making				0.748					
Customer insights								0.755	
Security risks						0.727			
Customer experience	0.697								
Connecting customer's mobile phones to manufacture items						0.603			
Increased in-store sales from formerly items-only customers						0.404			
Convenience									0.493
Customer expectation	0.587								
Relations with Stakeholders	0.791								
Brand value	0.866								
Workforce at Outlets	0.713								
Marketing	0.635								
Return on Investment		0.808							
Automation of manual processes		0.509							
Cost Optimization		0.673							
Efficient new method for performing existing tasks					0.618				
Cashless transaction					0.709				
Process Optimization	0.461								
Generation of New revenue stream			0.787						
Competitive Advantage			0.79						
Application Service Provider									0.815
Wearables							0.811		
Sensors							0.705		
Asset Optimization						0.516			
Business value				0.561					

It is construed from the turned component matrix gave in Table 4 that every factor stacks significantly on just one factor. The varieties are circulated similarly among the nine factors through the varimax revolution. In the wake of getting the turned component matrix it has been approved through Content validity gave. All the 26 variables were viewed as significant as they were having factor stacking more noteworthy than 0.3. It has been approved through Criterion validity gave.

6. Conclusion

We can say that the IoT business model created right now help the Indian Public Sector manufacturing companies to execute it at their Manufacture business for expanded worker profitability, operational productivity and income. The researcher had the option to distinguish 26 variables which were assembled into nine factors through the factor analysis. The researcher has built up an IoT business model for Indian Manufacture business using the Business Model Canvas tool whereby the 26 recognized variables were incorporated under the 9 building blocks dependent on the reactions received from the respondents through the study.

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