**Original Research Paper**

**Management**

# EXPOUNDING THE IMPACT OF AI ON IOT AND EXPLICATING A CONCEPTUALIZED FRAMEWORK

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**ABSTRACT**
The study was conducted with an aim to attain insight into the impact of AI (Artificial Intelligence) on IoT (Internet of Things). The study adopted conceptual and analytical research methodology. From the reviews, it can be found that; Data security and privacy, the requirement of huge investment, adaptability & interoperability and compatibility & longevity challenges are the major reason contributing to penetration of AI into IoT. Regression analysis on secondary data provides R2 value as 0.8981, which means that the linear regression forecast model is 89.81% accurate in forecasting the future investment on AI-based IoT globally. As per the linear regression forecast, during 2017 investment on AI-based IoT globally is expected to be $5.16 Billon, 2018 it is expected to be 5.78, 2019 it is expected to be 6.4 and during 2020 it is expected to be 7.02.

**KEYWORDS** : AI; IoT; the impact of AI on IoT

## INTRODUCTION

Artificial intelligence (AI) is the intelligence demonstrated by the machine for a specific set of problems. So, Artificial Intelligence can also be known as Machine Intelligence. While the Internet of Things (IoT) is the process of embedding the internet connectivity to the hardware's in the system to remotely monitor and control. When the Internet of Things (IoT) is implemented into the system it collects the data form environment in which it is installed and provides the same to the decision maker to have effective control over the system. Internet of Things (IoT) being data generator and AI being an intelligent stimulant for Machine, their combination is of high demand, because it reduces the burden furthermore for decision makers.

Technical Revolutions are taking place in Artificial Intelligence (AI) and the Internet of Things (IoT). It provides the ability to use technology to enhance customer experience, intelligent automation, restructuring resources, forecast maintenance, and advanced processing capabilities. Companies around the world are always facing challenges due to the changing; economic conditions, technological advancements and consumer expectation, which force a company for the adoption of smart automation solutions.

According to various studies conducted by CMR, most corporate decision makers in key industries are strongly convinced of the need for artificial intelligence and IoT in their sectors. These technologies offer great business value, they believe that performance efficiency will dramatically increase or more profitable growth can be achieved.

### Review of Literature

The Internet of Things (IoT) is a term introduced in recent years to define objects that can link and transmit data through the Internet. 'Thing' refers to a device connected to the Internet and transfers device information to other devices. Smart City and Smart Home, Smart Grid, Smart System, Smart System, Smart Grid, Smart Grid, Smart City, Smart City, Smart Health and Smart Environmental Monitoring. (Lawless, 2019).

A study conducted by (Haugeland's, 1989) illustrated key issues such as; including intelligence in action, imagination, emotions and personality, and their intriguing opportunities for solving. Companies see integrating intelligence insights, especially handling machine tools - improving their web applications and applications, and improving functional efficiency and helping to avoid unplanned unemployment. (Schatsky, 2017).

As a company that boasts itself to provide evidence-based guidance to its customers which provide the most value for technology and vendors, it's felt hard about doing this research and believe that the results will be beneficial for prospects based on their results information. (Safoian, 2018).

Real-time public safety - video camera analysis lookup for an example - Vehicle, Face, and Other Visual Forms and quick response by the emergency services. Microsoft's intellectual cloud/intelligence Edge announced its vision in May. Azure IoT Edge low-power devices maintain containers, maintain artificial intelligence internally, and maintain cloud connections for management and modelling. To review and evaluate vendors and solutions, artificial intelligence and the Internet should be consolidated for better machine learning and intelligence (Brunkard, 2018).

### Objectives
1. To study and understand the concept of AI and IoT in business context prevailing in the current scenario.
2. To enumerate the factors that are penetrating AI into IoT.
3. To analyze the impact of AI on IoT.
4. To estimate the trend of IoT.
5. To suggest a conceptualized framework for IoT using AI subsystem for the betterment of business operations.

### Methodology
The study is based on secondary data collected from various sources. The study adopted a conceptual and analytical research design approach.

### Factors Penetrating AI into IoT
• **Data Security and Privacy**
IoT is designed to provide data about the system, later it is been programmed for restricted access. Hereby the data theft and data security is a key issue with IoT. Further, the data being transmitted via the internet through many nodal points there is likely a very high possibility of data access by an unauthorized person illegally. In order to avoid such circumstance, AI has to be embedded to the IoT for better protection of data through encryption and while transmitting.

• **The requirement of Huge investment**
Unlike any other software available in the market, the IoT is costly, also adding AI to IoT makes the implementation process more complex and furthermore costly compared to any other system software. This is due to the fact that IoT required integration of every hardware within the system to monitor and control the

environment, while integration being a costly process adding this with AI makes the company to think less on decision making, which greatly reduces the operational time and increases the operational efficiency. So, IoT, when integrated with AI, will compensate the investment thought as it decreases operational time and increases the operational efficiency.

- **Adaptability & Interoperability**

Like every other complicated software's, it requires extensive training for the user to effectively use IoT. But, Ai based IoT is not just a decision support system, but a decision-making system, so care shouldn't be much taken to ensure everything is working as per the company's algorithm using IoT.

- **Compatibility & Longevity Challenges**

Technological changes being rapid. Thought of business individuals that, better technology than IoT based on AI technology would come into existence at a cheaper cost, hence investing on AI-based IoT for long run would deplete the company's important resource named money. Further even if implemented will the AI based IoT would compatible with new coming machines if another question. So, compatibility and longevity were been an important factor. On considering AI based IoT programme they are very dynamic, customizable and expandable unlike any other software, so they actually possess high compatibility and longevity.

### Conceptual Framework for AI-based IoT
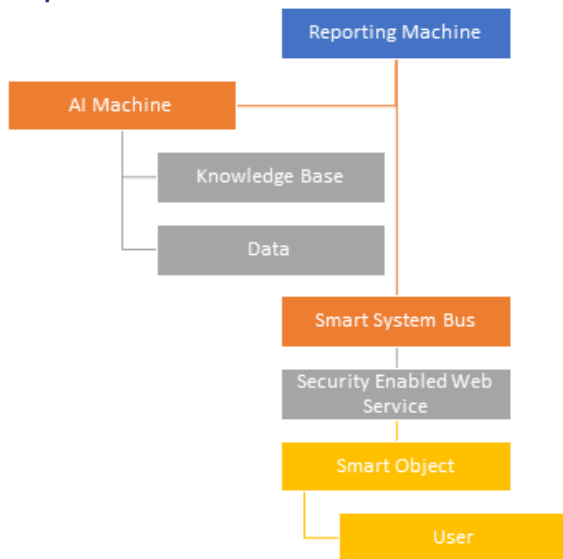


As per the conceptual model proposed, the Artificial Intelligence System collects every data from the reporting machines. Based on the collected data the Artificial Intelligence System provides a range of action plan that can be performed for the situation to its user. The user can access the information provided by the AI system after security check for better data privacy. Herein the user can manually select the action plan or action plan suggested by the AI system. In case, if the user doesn't have selected any course of action within the required time. The AI system will execute the best course of action from its knowledge base.

### Analysis and Interpretations

| AI & IoT - Global market share Sub - Sector wise data | Percentage |
|---|---|
| Smart Cities | 26 |
| Manufacturing Industrial | 24 |
| Connected Health | 20 |
| Smart Homes | 14 |
| Connected Cars | 7 |
| Smart Utilities | 4 |
| Wearables | 3 |
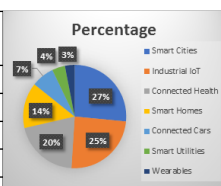


Source: G-GrowthEnabler, 2017

*Interpretation*

From the data it can be interpreted that, AI-based IoT is majorly used in Smart cities, Manufacturing Industries, Healthcare segments and at Smart homes.

| AI-Based IoT deal distribution county wise | Percentage |
|---|---|
| U.S. | 75 |
| Canada | 4 |
| U.K. | 3 |
| Israel | 2 |
| Germany | 2 |
| Other | 14 |
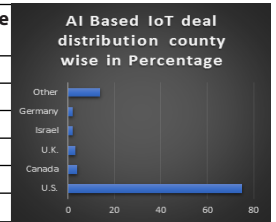


Source: (G-GrowthEnabler, 2017)'

*Interpretation*

From the data, it can be interpreted that, it is the U.S. country which is using AI-based IoT followed by Canada and U.K.

| Period | Year | Global Investment on AI-based IoT in Billion $ |
|---|---|---|
| 1 | 2012 | 2.4 |
| 2 | 2013 | 2.2 |
| 3 | 2014 | 3.2 |
| 4 | 2015 | 4.2 |
| 5 | 2016 | 4.5 |
| 6 | 2017 [Forecasted] | 5.16 |
| 7 | 2018 [Forecasted] | 5.78 |
| 8 | 2019 [Forecasted] | 6.4 |
| 9 | 2020 [Forecasted] | 7.02 |
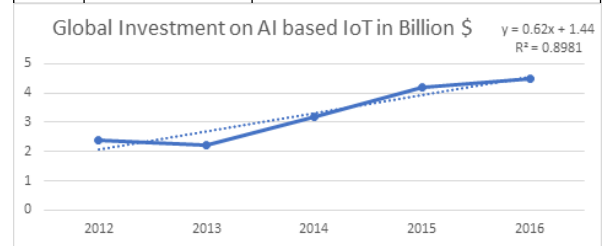


Source: (Secondary data)

**Interpretation**

The calculated $R^2$ value is 0.8981, which means that the linear regression forecast model is 89.81% accurate in forecasting the future investment on AI-based IoT globally. As per the linear regression forecast, during 2017 investment on AI-based IoT globally is expected to be $5.16 Billon, 2018 it is expected to be 5.78, 2019 it is expected to be 6.4 and during 2020 it is expected to be 7.02.

**FINDINGS & DISCUSSION**

IoT being a customizable software and AI being a dynamic programme, there is a huge scope for AI-based IoT system in mere future. Also, the analysis confirms that during 2020 there is likely a very high possibility of an increase in global investment on AI-based IoT system. As technology being updated and upgraded at every point of time, the consumers may opt for better system approach than AI based IoT, but in reality from the reviews and opinion collected, one can confirm that the technology existing right now especially AI based IoT has a high possibility for getting retained for next few decades. So, there exists a significant Return on investment [ROI] for AI-based IoT for companies and consumers.