Application and Importance of Machine-To-Machine Communication in Manufacturing Industry

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Abstract

In this modern world technologies have become one of the integral parts of the businesses as this has allowed the companies to stay in the running in the competitive business world. Machine to machine communication technology helps the business to boost their productivity and efficiency of the entire business operation. Apart from that with the assistance of this technology companies ensure effective inventory management and better shipment track that in turn facilitates competitive advantages to the companies. Not only that this also helps the companies to run a cost effective business by managing their resources effectively. This entire study showcases the importance and application of machine to machine communication in the manufacturing industry with the help of right methods and techniques. Secondary data has been gathered from reliable and authentic sources and qualitative research design and inductive approach has also ensured that the research is on the right track. From the results it is evident that M2M communication technology has a great impact on the business and this makes the business into smart business.

Keywords

Business, Efficiency, M2M Communication, Productivity.

INTRODUCTION

In this 21st century technology and its upgradation have impacted the business world and have significantly impacted the overall effectiveness of the business operation.. Machine to machine (M2M) communication is noticeable but the automation applications that include machines and other devices communicating by network without any intervention by human understanding [1]. In other words, M2M is any technology that helps networked devices to transfer and exchange information and perform operations while being supervised by humans. These technologies are helpful for all the sectors especially for the manufacturing sectors as this helps the managers to save the time and effort of a human being. It is essential for the companies to look at the well-being and work pressure of the workers to ensure greater performance of the employees. Automation accelerates the overall manufacturing process and reduces the work pressure of the responsible emissions. This technology is used to reduce the operational time, increase frequency and encourage the automation actions.

M2M technology allows the companies to reduce network bandwidth and that results in better network frequency. In the present days, organizations are dependent on wireless technologies such as cellular networks, Wi-Fi and that have allowed the companies to speed up their operation process. It is evident that M2M is also a crucial aspect of remote control software, traffic control, logistics and fleet management, and robotics. It is considered as the first step to making machines smarter as this M2M is capable of sending and receiving information and making decisions and sending instructions to machines [2]. It is anticipated that M2M is a revolutionary solution in every sector as it is able to perform better work compared to other devices and machines.

It is essential for the business to upgrade their mode of operation to stay competitive and gain the attention of the customers with the help of improved productivity and efficiency. In manufacturing sectors, it has become essential for the business to ensure that the equipment of the customers are fulfilled to stay in the running and ensure rapid growth in the competitive world [3]. Automation and Robotics are the future of the businesses and this has the ability to change the traditional ways of business operations for gaining greater revenue and ensure success in the business operations. As this allows the companies to track the details of shipments, inventory and storage conditions. It is clear that M2M has a great impact on the manufacturing operation and this has also the capability to transform the way of business to a great extent.

MATERIALS AND METHODS

The success factors of a study depend on the method and tools that are used in the studies to ensure success of the overall research. It becomes essential for the researchers to ensure the methods and techniques that have been selected for the sake of the study are capable of providing justification to the subject matter of the study. Inductive approach has been used to make sure the research is in the right direction

and capable of providing sound findings. One of the key advantages of the inductive approach is that it allows the rescuers to generate new theories after exploring all the aspects of the M2M communication and its importance on manufacturing sectors. On the other hand, the qualitative research design has also allowed us to produce reliable findings in a comparatively less time.

There are several advantages of this research design and that has helped to successfully accomplish the study. The major advantages of this design are that it is cost effective and helps the researchers to accomplish the task on time [4]. Apart from that, secondary research types have been chosen to ensure successful and seamless accomplishment of the study. To secure the success of the study in a less complex manner secondary data has been gathered from the peer-reviewed journals and articles. It has also been taken care that no information has been taken that is published before the year 2019 to maintain the authenticity of the study. In addition, it also ensured that no primary data has been taken into consideration for the accomplishment of the study. On the other hand, ethical considerations related to the study have also been maintained for the sake of seamless completion of the study.

RESULTS

Importance of machine to machine communication in business

Machine to machine communication is considered as the next generation of internet revolution as this has the ability to connect several devices on the internet. Incorporation of this technology results in greater productivity and effectiveness of the business process. The key features of M2M include greater monitoring that eventually allows the companies to detect any events. Apart from that, this is capable of sending and receiving small amounts of data all time to facilitate greater activity. It is evident that M2M acts as a crucial aspect of remote-control software, robotics, security, logistics and fleet management [5]. In business inventory and support chain plays an important role and this directly impacts the effectiveness of the organization. M2M has a great influence on both the aspects of SC and inventory management. This helps the consumer to conserve resources for the companies and at the same time this ensures seamless and hassle free billing.

In short, M2M communication is capable of transferring the business in a smart and upgraded business that is capable of boosting greater revenue. As a consequence business gains competitive advantages and establishes them as an effective and successful business. M2M is widely used to improve productivity and efficiency in numerous aspects such as logistics, transportation, manufacturing and so on. All the sectors are related to seamless manufacturing and an effective business that is capable of achieving goals. M2M communication is utilised for automated data transmission and measurement within mechanical and electronic devices [6]. This provides better opportunities for all the business

sectors and helps companies to measure their energy consumption. It helps the companies to save their resources and ensure success in the long term. It is essential for the business to look into the betterment of organisations and on the well-being of the surrounding to maintain the competitiveness and effectiveness in the marketplace.

It has helped all the sectors to improve to a great extent and achieve competitive advantages. This technology has allowed the companies to improve customer engagement with the help of improved productivity and seamless operations. It is clear that, customer base and their support are essential for a business to succeed in the long term. With the help of M2M automotive manufacturers and dealers can provide best services to their customers that in turn help the companies to gain customer satisfaction. M2M technology does not only help companies to boost their operating processes but at the same time it allows firms to strengthen their customer base and gain customer loyalty [7]. In every sector, customer loyalty is an essential factor and it is directly related to the company's future and existence as well. Apart from that, this also helps companies to make the business robust in terms of greater customer base and effective productivity.

Inventory management and tracking are considered one of the most crucial aspects for the companies as these two aspects determine the effectiveness of the company. It becomes essential for business to look into the capability and the operations of Inventory to ensure proper usages of assets. On the other hand, tracking shipment is a necessity for businesses as this lowers the delays in the process and this helps firms to gain the satisfaction of the customers. M2M communication also allows the management to ensure all the activities of the manufacturing unit are seamless and capable of facilitating competitive advantages [8]. The M2M is rapidly increasing to a great extent and the major reason for the expansion is its advantages that this provides to the business.
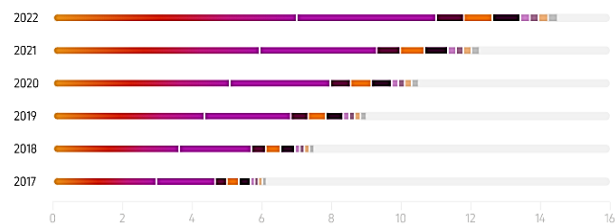

Figure 1: Global M2M connections /IOT growth by verticals

There are new advantages in the area of IoT software development and companies are observing the benefits with the aim to expand their business with the help of M2M technology. One of the key advantages that this technology provides is efficiency and greater productivity and these two are one of the essential elements of business that helps companies to stay in the running [9]. It cannot be denied that with the assistance of this technology communication has significantly improved. Wireless connectivity has an agreed influence on the business as this allows companies to

establish a smart business with great productivity.

Application of M2M communication in businesses

M2M communication is a part of an IIOT ecosystem but the difference is that M2M communication is considered as a direct transformation of particular data to another device that triggers the response of other devices []. IIoT is the comprehensive system of connected devices within an organisation that drives machine intelligence. This also includes sensors, edge devices and ethernet cables. M2M is specific within the two devices or sensors on a particular machine. IIoT has the ability to gather data that has been generated and this also evaluates data against all machines or factor production and provides or delivers trends [10]. With the assistance of machine data platforms companies can effectively optimise their operations for the sake of the betterment of the business.

It is essential for the companies to look into the betterment of the companies and improve the operation to stay in the running and ensure success in the future. M2M helps the manufacturing sectors from every aspect and this secures the growth of the companies. This helps the machine to machine communication helps firms manage traffic for a seamless data management process. Apart from that this technology also firms to possess a greater control on the volume of the data [11]. There are several processes by which this technology manages the volume of the data. One of the ways is delaying data transmission in such a time when the network is less burdened. In addition, this also helps firms to utilise less power and conserve energy and also schedule data transfer and gathering as per the convenience of the system and the companies.

M2M technology helps the companies to optimise their work process and achieve greater productivity. Monitoring is an integral part of the manufacturing process and in the case of the traditional monitoring process, this used to require constant evaluation of a condition or circumstances. It is evident that the entire process is time consuming and in this fast moving world there is no space for this time taking process. Utilisation of M2M helps machines to transmit alarm and alert so that this signifies that the machine requires some assistance and needs to be repaired or replaced by looking into the condition of the machine [12]. These processes eventually help the companies to improve their internal operations for a better future by securing their existence in the present marketplace. M2M technology is not restricted to machines; it can also be incorporated into pallets, containers and other objects in order to make the shipment process seamless and effective.

This process is a blessing for the highly regulated sectors, at which the materials tracking and health of the product needs to be regulated for the sake of effective business operations. This helps firms to ensure that the temperature, spoilage and other critical parameters are maintained properly for a safer and effective shipment. Looking into the betterment of each and every process that is associated with the business and has a significant impact on the existence of the business, becoming a necessity for companies as this provides competitive advantages to the businesses. Operational efficiency is one of the crucial factors for the companies as this helps companies to maintain their effectiveness in the marketplace [13]. One of the greatest features of M2M communication is that it is not dependent on IIoT and is capable of providing the strength to the company. M2M helps the companies to improve their way of operating by looking into the requirements of the firms.

Figure 2: Application of M2M communication

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This technology allows organisations to focus on the betterment of the machine and this in turn ensures uninterrupted business operations. Most essentially this helps the companies to improve their overall business operations to gain the competitive advantages in the marketplace. It is essential for the companies to ensure that firms possess necessary resources to carry out all the activities and fulfil the needs of the customers M2M technology allows firms to

make sure that the assets are optimum and capable of providing the strength to the firms [14]. This technology helps companies to gather clear data related to the availability of the resources and the expenses of the resources and that in turn helps the companies to boost their overall business and secure their market place.

Benefits of M2M communication in businesses

Companies need better connectivity and M2M communication helps the companies to boost their communications. It is clear that the facilities that this technology provides us are the core reason for its adoption across the globe. [15]. Apart from that there are several other advantages of this process such as faster response time and so on. M2M technology allows firms to collect real-time information and send it to a core point over the internet. This eventually helps firms to respond as early as possible and make the overall process effective. In this fast moving world it is a necessity for businesses to maintain their effectiveness in the competitive world to stay relevant. Apart from that this also allows firms to enhance the productivity and overall services.

M2M helps firms to change the traditional business processes and ensures greater efficiency in the manufacturing process. This technology helps the companies to improve and increase their products to fulfil the demands of the customers. It is essential for the companies to fulfil the requirements of the customers to maintain their effectiveness on the marketplace and stay relevant by providing best services to the customers [16]. As a consequence this allows the companies to gain the satisfaction of the customers. It is essential for businesses to satisfy their customers to gain customer loyalty and boost their competitiveness. It is evident that greater productivity and upgraded service helps companies to generate greater revenue and this ultimately allows organisations to boost their market reputation.

Market reputation is essential for organisations as this not only helps the companies to profit but at the same time this signifies greater customer base. In the case of manufacturing sectors it is important for the management to ensure that the capacity of the organisation is capable of fulfilling the needs of the customers in the most seamless and effective manner without spending more money. It is essential for the business to look into this expanse to ensure greater profit. M2M allows the companies to save the resources by preventing wastage and this in turn helps the companies to boost their profits by decreasing the expense [17]. Carrying out cost effective operations helps firms to stay relevant and efficient in the marketplace by achieving all the goals of the company. This technology is more than able to conserve energy to a great extent as this turns off the machine in case of any issues or inconvenience in the system arises.

This technology allows companies to prevent losses and save the assets of the organisations for the betterment and the existence of the companies. M2M technology helps companies to track all the records of their stock by managing their inventory effectively. There are several automated machines that have the ability to gather information about inventory and transfer it to the company to ensure seamless business operations. This in turn helps companies to measure their stock availability and ensure success in the business process by saving resources and energy to a great extent. On the other hand, M2M is able to reduce the human assistance from certain factors and that in turn helps firms to minimise their expenses [18]. This technology is also capable of tracking the data of the customers, which eventually helps firms to identify their needs and act accordingly. As a consequence this allows the companies to boost their net profit and gain the attention of the potential customers and secures their future to a great extent.

DISCUSSION

Technologies are an integral part of business and in the past few years this has changed the traditional way of business operations. In each and every aspect technology is allowing the business to stay relevant on the marketplace and make profitable business by maintaining their effectiveness on the marketplace. Machine to machine communication technology helps all the sectors to boost their efficiency from the core of their business and this also facilitates competitive advantages. In manufacturing sectors M2M technology plays a critical role and helps companies to stay in the competitive marketplace with the help of their productivity and efficiency. Productivity and efficiency helps companies to sustain in a comparative business world as these two aspects are essential for securing market position. Effectiveness of the company can be seen from the market value and the generation by the companies. Whenever companies incorporate technologies within their business operations this in turn allows firms to boost their productivity and work ability to a great extent.

It is clear that this technology has the ability to make the business into a smart business and that eventually allows firms to make greater revenue. M2M technology is capable of improving all aspects related to the company and provides the strength to sustain in the global marketplace. Inventory management and tracking shipment are one of the essential features of the technology that helps the managers to run the business in a most cost effective manner. On the other hand, this helps firms to manage their resources to save money and ensure effective business. Apart from that it is also important for the businesses to make sure that the needs of the customers are fulfilled. As this in turn allows companies to gain the loyalty of the consumers and secure their market position. With the assistance of the M2M technology firms increase their productivity and as a consequence companies ensure that the demand of the customers is fulfilled.

On the other hand, this technology allows the companies to reduce their operational cost and earn more revenue. This technology is able to track the utilisation of energy sources and this also helps the companies to conserve them by turning off the connection in case of emergency. Additionally, this also helps the companies to improve the quality and

frequency of the service to stay competitive in the marketplace. Whenever companies save energy and keep track of the availability of the resources this results in more effective business and this also allows firms to maintain their market reputation. M2M technology helps the companies to improve their entire business operation by boosting their efficiency with the help of greater connectivity. This technology makes all the business processes seamless and effective and this eventually results in greater revenue. Cost effective operations does not help the companies to or save their money but at the same time does this allow businesses to conserve resources for future use.

CONCLUSION

In this murdered generation technology plays an essential role and this has the ability to change the overall process to a greater great extent. Upgraded technologies help the business to make profit by transforming traditional business into smart business. In the case of manufacturing infrastructure machine to machine communication technology plays a significant role and with the assistance of this technology firms boost their production. It is essential for the companies to focus on the products to ensure growth and success in the business process. M2M helps the companies to improve their wireless connectivity and improve entire work. This process helps the companies to reduce the excess work pressure from the human individuals and that in turn allows the companies to secure their resources in terms of human resources. Additionally, this also helps the companies to boost the performance of the entire business to a great extent.

M2M technology helps the companies to ensure seamless operations and effective inventory management. Inventory management is one of the essential factors of a business that even helps the companies to prevent financial loss and ensure greater availability of resources. It is clear that with the assistance of the M2M technology helps the companies to reduce the operational time with the help of the greater productivity and efficiency of all business activities. This technology is capable of transferring the data with the assistance of wireless services and this ultimately helps the companies to strengthen their connectivity and communications.

There are several advantages of M2M that are increasing the tendency to adopt this technology within the business. Assistance tracking, inventory management, shipment tracking are just examples of the benefit of the M2M communication technology. All three help companies to improve the revenue of the company and secure their market position. On the other hand, this also helps the companies to secure their future by upgrading their overall business operations seamlessly. Whenever firms look into the betterment of organisations; and all the aspects that allow companies to gain better business opportunities, these results in more effective business. M2M technology allows the business to prevent losses and ensure utilisation of resources as required. Apart from that, this allows the companies to

gain better facilities with the help of a strong customer base and strength of the workers. On the other hand, upgraded service and better products are consequences of the greatest productivity and this facilitates customer loyalty and customer satisfaction.

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