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## The Role of Information Technology in Lean Management in Enterprises

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### **Abstract:**

*Lean management is only mentioned as a method and strategy to improve business performance. Many studies on over the world assess the level of lean management implementation at different levels based on the approach angle. The study considers information technology as a lean practice. Then, the impact of this technology on lean management in business was studied.*

**Keywords:** *Lean management, lean practice, information technology*

### **1. Summary**

Technology is now widely available to all organizational levels. The goal of connecting all systems on the Internet, applications developed in the context of the 4.0 technology revolution are a clear premise to minimize wastes related to space, time and waste and a goal in streamlined management. The paper focuses on assessing the current situation of information technology applications in enterprises in general as well as in lean management in particular. At the same time determine the role and relationship between this technology and the system lean in the enterprise.

### **2. Introduction**

Information technology is gradually becoming an important foundation in all activities of human life. Organizations increasingly rely on information technology to improve supply chain processes (Wu et al., 2006). Applications deployed on information technology platforms are becoming more and more inevitable, replacing the obsolete types and modes of operation. Over the past decade, the use of information technology in managing supply chain processes and improving company results has continued to be a top priority for many businesses (Yeniyurt et al., 2019). Many of the information technology-based systems used in enterprise operations are found to have a positive impact on firm performance, such as supply chain management systems (Yeniyurt and others 2019), shared economy (Li et al, 2019); information communication system (Wu et al., 2006). In summary, the role of technology in general and information technology in particular for business operations of enterprises is indisputable. For management, information technology acts as a tool and solution to help businesses standardize processes, reduce time and cost. Since then, information technology has been used as a solution for lean businesses' systems, becoming an important tool for this management philosophy.

### **3. Technology**

Information technology is the research, design, development, deployment, support or management of computer-based information systems, especially computer hardware and software applications (Workforce, 1998). Applications developed on information technology platforms help ensure the operation of organizations, improve operational results, productivity as well as performance of the business.

In the context of technology development at the new age, nearly every company, operating in all industries, from a software design company, to the largest manufacturer, to the smallest shops, Information technology applications are needed to keep business operations running smoothly.

According to (Workforce, July 2003), Career-related jobs in this area focus on security, software outsourcing, office support, Enterprise Thinking, collaboration, consulting, and soft skills, Intensive and General (Contracting and Consulting), non-traditional certificates (Nontraditional Degree Paths). Based on the trend of human resources demand in the information technology industry, it is possible to imagine the need for solving problems in the operation of businesses through tools based on information technology. The prominent main trends still confirm that security as well as data mining for business and management is still a key and essential need.

### **4. Lean Management**

The streamlined concept developed in the Japanese automobile industry as an effective management strategy. This concept came from the Toyota Production System (TPS) after World War II. Leanness is defined as the degree of acceptance and implementation of the lean philosophy within an organization (Cortes et al., 2016). TPS uses a number of

techniques such as Just in Time (JIT), continuous improvement, reducing time and inventory, improving processes and eliminating waste to improve customer satisfaction and improve quality. quality, effectiveness, and flexibility of the organization. (Garza-Reyes, 2015).

From the lean philosophy, the lean strategy is a model / concept that creates a system of improvement and eliminates all wastage that may arise from the supply chain and production processes in turn to improve. Improve product quality, reduce costs for businesses and increase benefits for customers (Duarte and Cruz-Machado, 2013)

Based on Toyota's lean manufacturing system, Lean Management was proposed by a set of experts and scientists in 1990 at Massachusetts Institute of Technology (Jing et al., 2020).

Developed in the context of manufacturing industry, lean has quickly formed and developed as a philosophy, which has been applied in many different contexts and areas of activity. The many instances of entities achieving success in lean management have shown that this model plays an important role in enhancing corporate governance innovation (Jing et al., 2020). Lean management is currently being applied effectively in many different fields, not only in the manufacturing sector but also in the fields of restaurant, hotel and personnel service activities. In every context, philosophy Lean management applied in management plays a role in increasing business efficiency for enterprises based on the principle of reducing unnecessary waste while ensuring the results.

The role of information technology for lean management

Technology is now widely available to all organizational levels (Nordin and Othman, 2014). One of the current topics of interest in technology is the role of information technology in promoting lean manufacturing (Riezebos and Klingenberg, 2009). The applications of information technology in general management as well as streamlined management are increasingly being expanded. This shows the important role of information technology in this field. These applications serve a wide range of activities, from non-traditional application areas to accelerating the adaptation of automated production systems, increasing the efficiency and compatibility of training programs. create employees, improve productivity through computerized tempo control, and assist executives to decide the next step in the innovation process towards lean manufacturing (Riezebos and Klingenberg, 2009).

Information is data organized in a certain system that makes sense for users (Turban, 2005). In other words, the quality of data is a prerequisite to ensuring the quality of information, which is an important factor that influences business decision making. According to Braun (2015) the usefulness of data is directly proportional to data mining. In other words, ensuring data and information quality becomes the cornerstone of extracting accurate management information, supporting the business management process and producing better operating results. Indeed, Lapp (1997) has also identified the important role of information quality as a basic component of innovation, a goal of lean management.

Lean manufacturing technology systems are useful to ensure the production process in a production company operates smoothly without interruption (Nordin and Othman, 2014). Lean-oriented enterprise innovation requires a good information system to collect, store and process data to create useful governance information. That goal can only be achieved based on information technology applications. LaValle et al. (2011) also asserted that the ability to quickly process / analyze larger volumes of data allows organizations to make more accurate and faster decisions than their counterparts. competitors. The evidence is to apply lean principles in different fields, variations of management methods have been developed and formed famous techniques, such as Kanban, Kaizen, SMED and 5S ... Technology Information has been used to develop these variants (Riezebos and Klingenberg, 2009).

The role and direction of using information technology in the application of lean principles has also changed (Riezebos and Klingenberg, 2009). With the traditional view, the function as well as the use of information technology applications are considered as the focus and determine the success of the application project. However, taking a new perspective, the difference leading to the success of information technology projects is not in the type or level of advanced technology that is applied. in the role of humans when using and controlling technology (Riezebos and Klingenberg, 2009). Changing the management method towards lean is influenced by the manager's perception of the quality of information (through the process of collecting, storing and analyzing to obtain quality valuable information). supported and explained by technology acceptance theory and technology acceptance and use theory (extension of technology acceptance theory). Basically, the success of information technology systems requires not only technology-savvy users, but also more social, behavioral and cultural factors, which can hinder or facilitating change, when users interact with technology, such as lean manufacturing systems (Nordin and Othman, 2014). Davis (1989) also identified the usefulness of technology as one of the factors affecting technology adoption and use.

## 5. Conclusion

In the context of enterprise management, many empirical studies have found evidence of overall information technology competencies positively related to an organization's performance, while showing potential. Bring significant competitive advantage to companies (Sanders, 2007). Many of the information technology-based systems used in enterprise operations are found to have a positive impact on firm performance... In summary, the role of technology in general and information technology in particular for business operations of enterprises is indisputable.

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