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INDUSTRIALIZED SERVICE INNOVATION PLATFORM BASED ON 5G NETWORK AND MACHINE LEARNING

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Abstract

Based on 5G and machine learning analysis, according to the proposed smart factory, the reference architecture for traditional manufacturing companies, the Smart Manufacturing Workshop is a key component of the smart factory and its application path. Earlier systems stressed that the process of manufacturing innovation did not achieve market success, but most studies considered the importance of technological innovation as part of the service innovation process. The proposed system provides a direction for the organization of the overall innovation platform to achieve organizational excellence in the various production services.Traditional telecommunications networks have provided a variety of services to different customers through a single network infrastructure. Used to study the performance of machine learning technologies and the impact of organizations on the practical manufacturing sector of service innovation manufacturing. The 5G Technology Innovation Services Platform uses machine learning technology to represent practical experience classification to analyze the manufacturing sector.

Keywords:Manufacturing service innovation, industry innovation platform, machine learning technique, and 5G network technology.

1. Introduction

In today's competitive business environment, companies face the challenge of addressing key data issues in order to be more productive and to make faster decisions. Due to the lack of intelligent analysis tools, many manufacturing systems are not yet ready to manage big data. As more and more software and embedded intelligence are integrated into industrial products and systems, predictive technology can combine electronic components and unlimited intelligence to advance smart algorithms. And these technologies are used to predict the degradation of product performance and are independently managed and optimized product service requirements.

In many developed countries, the economic basis for manufacturing has been difficult to transform and revitalize the economy. Emerging markets and the global manufacturing supply chain are at risk. In the manufacturing sector, therefore, and in the pursuit of innovation in manufacturing technology, the focus will be on motives and services. In this way, blurring the boundaries between production and services facilitates the development of manufacturing services.

They emphasize a customer-centric philosophy; the most important factors are combined products, services, support and knowledge. The author also argued that the service industry and the manufacturing sector should aim to develop innovative value-added services and strengthen its core competitiveness in a timely manner. The service-oriented production of Baines' organizational capabilities and process innovations, from product sales to integrated products and services.

2. Related Work

The industry must quickly bring the product onto the market, start with reduced resources and, at the same time, increase the cost of considering the product under constant pressure throughout the value chain. Lean interoperable and sustainable production technologies need to be developed as quickly and efficiently as possible[1]. This study will therefore continue to build on the strategic outlook for asset specificity and research into manufacturing service innovation.It is about creating value for service innovation and finding ways to improve customer engagement, depending on the level of service. Qualitative methods are used in this study. The analysis framework is based on a two-dimensional matrix strategy[2] that includes maintenance depth and breadth.

The manufacturing sector is not exempt from this trend and growth has begun. Digital platforms are designed to offer value proposals that rely on serviced products instead of share transfers of ownership. Most of the current examples in this area are very narrow service providers linked only to the scope or the provision of advanced services; these are specific manufacturing industries (a few processing operations, how many). Specializing in materials, etc.[3] system.To analyze issues related to product/process innovation from different teams and dedicated workshop teams. The development of a new platform with support[4] involves different team collaboration software services, product and process design, maintenance, workshop teams, customers, etc., around which complex assemblies and production lines need to participate in different and innovative processes.

Further, to achieve transformation, support traditional and lucrative manufacturing and enhance the international competitiveness of the industry. Industrial design and domestic development, the local experience of small and medium-sized enterprises/Practical Ningbo, more concretely based on international trends, is characterized by computerization and intelligence[5] in this paper Industrial design service platform promotes it.

Discrimination is a new potential supply for the development of innovative ideas, products and services and cooperation[6] as a traditional manufacturer or an innovative company, creating an environment of mutual trust. It is a subject of investigation, paying particular attention to the development of the trader. Individuals and businesses gathered around the platform, under the guidance of qualified professionals, managing innovation and interacting with customers in the design and development process, seeking to establish an open approach to innovation. They have the potential to contaminate their expertise and experience, as well as new ideas[7].

It analyses the structure of the system and builds a dynamic connection between the enterprise and[8] based on the technical, theoretical basis of the metamodeling of the network service description domain ontology. Technical pathways and theoretical structural models of the system have been established and algorithms for the combination of autonomic computing services have been used[9]. It[10] provides a professional RP (Rapid Prototyping) service interface and an entrepreneurial platform that effectively manages small business enterprises.

The level of enterprise computerization may change the style of production, consumption and circulation of cluster production[11] and may have a significant impact on the competitiveness of enterprise information technology. Computerization permeates the entire product life cycle, such as the organization of orders, business activities and development[12]. Industrial design is now considered to be an important pillar and development plan for Ningbo. Based on the context of Computer-Aided Industrial Design (CAID), this study focuses on the establishment of an advanced service platform for the design of industrial innovations characterized by computerization and management. [13]

In addition,[14] to promote the development of traditional lucrative manufacturing and to make the transformation from the strengthening of the international competitiveness of the industry a reality. Ecosystem From an ecological point of view, it can be divided between the scope of the project and the scope of the project. It has been found that the scoping phase is defined by strategic policy and strategic ecosystem analysis activities[15]. Activities during the planning phase include the design of ecosystems, the preparation of ecosystems, the recruitment of actors and the provision of physical infrastructure[16]. Activities for co-creation capacity can be coordinated through five stages:Product Development, Product Manufacturing, Marketing and Management, Value Disposal and Feedback Generation Strategies.

Therefore, it is common among subsystems to collect cost information separately from all enterprise subsystems only if the cost information of the enterprise can be realized[17]. However, these modules cannot always achieve independent analysis and integration of information, and the results of the execution of business are focused on the company's subsystems, so that the full integration of information systems cannot be achieved. Design is the soul of a manufacturing company, and modern design is based on design knowledge, just like intensive knowledge-based work [18].

The aim of technological innovation is to create valuable ideas and create commercial value by turning them into the reality of a customer-centric market. This is difficult to achieve for most companies due to the lack of methods and tools for systematic and innovative thinking[19]. This work involves using a similar project[20] stream workflow to achieve model-based run-time control and optimization methods. Network production is an advanced mode of production.Application Service Provider (ASP) platform aims to develop and implement

network manufacturing solutions for small and medium-sized enterprises (SMEs). The business needs for services are based on an analysis of the applications of the information system [21] in the textile industry. It tends to increase in the improvement of highly customized products, final disposable products and various services. The service systems of these service products shall be delivered together. Building on product-service systems, manufacturers and businesses[22] need software platforms that can support the product life cycle to ensure long-term customer value.

3. Materials and Methods

The manufacturing industry is undergoing major changes globally with new management and development approaches to 5G network and machine learning technology products and processes and high customer expectations. It is therefore a service innovation by introducing new services, combining new service products, manufacturing methods and service-oriented service innovations that it longs for. Research on the impact of manufacturing on service innovation is becoming more diverse as companies understand trends in how service-oriented solutions require a broader perspective.From a theoretical point of view, manufacturing service innovation will help to shift the paradigm of service innovation and identify the service-centric, multidimensional perspectives and roles that require customer service. Create a shift away from the commodity-.

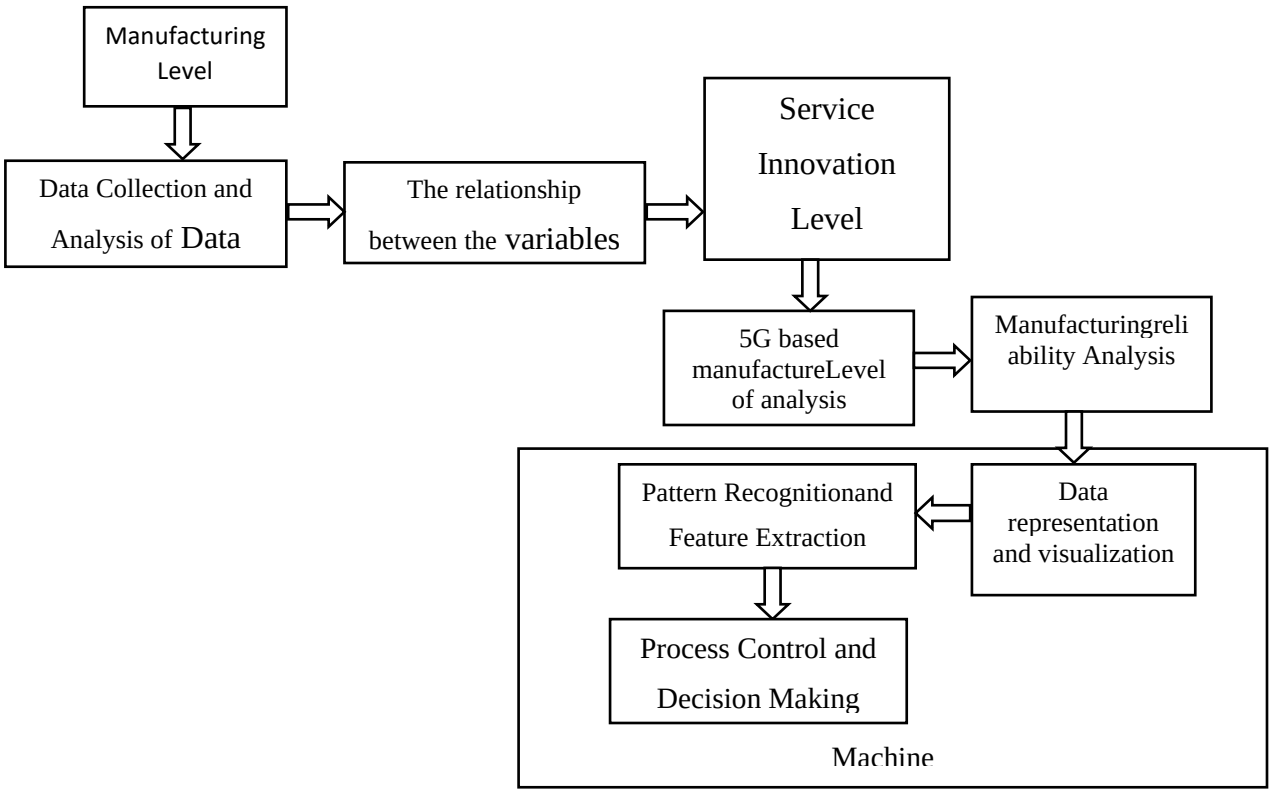

Figure 1 Proposed System Block Diagram

Figure 1. considering this study defines innovations in new value proposition services created from a machine learning perspective by creating or developing existing or new practices and resources through integrated behavior to apply the latest concepts and resources in a new way.To gain a competitive advantage and stay on the cutting edge, this group will realize the 5G initiative in all three factories to overcome the business challenges described below.

Step1: The availability of plants is low due to various production losses.

Step2: Low due to ergonomics and unbalanced factory layout with poor line work efficiency. Low product quality due to process defects.

Step3: Increased input costs to rate hikes on materials, electricity and fuel prices.

Step4: Increased labor costs and high cost of capital. It has a high setup time and preparation time because it has low volume and does not match the market demand for high variety.

Step5: There is pressure from various regulators to maintain safety, health and environmental standards.

3.1 Data Collection and Analysis of Data

Using simple, random and convenient machine learning techniques, 500 percent of the interviews chose to study as a sample production service innovation platform. It took about a month to get the survey from the respondents. The questionnaire was randomly distributed in offices and stores in a number of interviews with various banks and disciplines.

Test the study model used to confirm the relationship between the variables and study the analysis of the covariance structure through the AMOS analysis. In order to analyze the study data, structural models were used to verify the legitimacy and integrity of the construct and, in confirmation, to measure the model when testing the hypothesis.

3.2 Service Innovation Level

Still quite a consensus in the production of service innovation. Analysis of the development of the following three different aspects of service innovation research: (1)

assimilation method, transmission theory and product innovation method for new business development; (2) business perspective; treatment service innovation is perspective The nature of the combination of three-dimensional criticism and product innovation characteristics; and (3) It's different. The latter multidimensional view of technological innovation is based on a new one.

3.3 5G based manufacture Level of analysis

5G networks provide manufacturers and operators with the opportunity to build smart factories and make full use of automated control, artificial intelligence, troubleshooting and augmented reality. Although there are similarities between the two manufacturing innovation processes, there are significant differences in the specific elements of each innovative product development model at a particular level. These differences ultimately cover the structural differences between the two innovative product development models.The eight-element strategy, product innovation, product portfolio, concept map, support system, process innovation, product launch, service innovation, etc. are all part of these two models. It shows whether it is organizing the development of new products in a particular process order.5G network technology has a direct impact on product innovation. Product innovation has a direct effect on the product mix. The roles of the other five factors (management innovation, market innovation and behavioral innovation) have shown significant differences between these two models. At the top of the organization, the only highest level of management innovation is observed.However, both management innovations and market innovations observe the formation of co-driven manufacturing strategies for this organization.

3.3.1 Manufacturing reliability Analysis

The network capabilities provided by 5G technology are essential for production. Low latency and high reliability are required to support critical applications. High bandwidth and density of connection ensure ubiquitous connections. Manufacturers of these requirements are currently relying on fixed-line telephone networks. Mobile 5G technology enables more flexibility, lower costs and faster delivery for the restructuring of factory floor production, layout changes and changes. In market research, it was decided that the most important use of category 5G production would enable operators to address this issue. These include industrial control and automation systems, planning and design systems and field equipment.

3.4 Machine Learning Technique Based Data representation and visualization:

The sensor system communicates data to the database in real time. Energy budgets and bandwidth often present significant challenges to the efficiency and effectiveness of data transmission. For example, 5G Network Technology Battery Porting SUPs generally face energy budget and bandwidth issues. It needs a compact representation of the data on manufacturing services. For example, Fourier's analysis represents a signal as the sum of sine waves in different frequency bands. The wavelet transformation is supported locally or represents a sensor signal in a combination of base vectors.Compact 5G means eliminating the need to store large amounts of raw data, but store-critical Fourier transforms or wavelet coefficients for compression and transmission purposes. This compact 5G representation also features prominent extraction easily in smart manufacturing, and the underlying PAT-tern is more prominent in the transformation domain. Data visualization is also key to end users by presenting important information and patterns in an easy-to-understand manner.For example, a custom GUI "dashboard" allows users to find important information of interest, such as key performance indicators, energy use and machine parameters. Network visualization also helps to characterize and represent the "things" of interconnected manufacturing networks, thus facilitating the formation of cyberspace in 5G network technology.

3.4.1 Pattern Recognition and Feature Extraction

Data representation and visualization help transform the original data in order to replace structural domains such as frequency domains, wavelet domains, and state-space domains. The next step is to learn and recognize hidden patterns using machine learning techniques and pattern recognition. Also, the extraction key features and prominent patterns are functionally systematic quantification of information.

3.4.2 Process Control and Decision Making

Once the manufacturing process is controlled, the next step is to take the best possible action to control the recovery of the system. The Action Plan relies on a number of steps, such as the diagnosis of root causes, prognosis and optimization of the system. Machine learning techniques are used to diagnose root causes, including engineering-led statistical models (e.g. mutation analysis, probability model graph flow), or to analyze failure modes and effects. Physically driven models can also be formulated on the basis of specific failure mechanisms

within the production system.However, they are often not very well matched to actual production data, as they are not sufficient to predict system failures and to identify the root cause. The data-driven model lever sensors are based on the essential process characteristics and model degradation behavior of 5G network signals. A significant advantage is the transformation of high-dimensional sensor signals into low-dimensional decay into manufacturing and service-specific conditions.

4. Result and Discussion

This section describes manufacturing for research organization performance service innovation, and customer satisfaction plays a role in determining whether to mediate the relationship between service innovation and organizational performance. The results of machine learning technology show that 5G combinations and service innovation have a positive and significant impact on organizational performance.

Table 1 simulation Parameters

Parameter	Value
Number of industry data set	10
Type of data	Data files
Execution time	0-60 minutes
Front End	.Net
Back End	SQL Server 2012
Tool	Visual Studio 2012

Table 1 shows the resources used in the proposed system. The result and discussion describe the comparison of existing methods Fast Branch-And-Bound, Naive Bayes. This section

describes the various parameters: 1) Manufacturing Service Innovation Analysis: Customer Satisfaction as Mediator 2) Time Complexity 3) Bandwidth utilization performance Level.

Table 1 Manufacturing Service Innovation Analysis: Customer Satisfaction as Mediator

Model	β estimate	t-value	p-value
Model 1	0.077	1.48	0.049
Model 2	0.069	1.79	0.068
Model 3	0.089	1.96	0.089
Model 4	0.090	2.29	0.18

The assumption of table 2 shows that if all the first three models are achieved, then manufacturing innovation mediation testing would be possible.

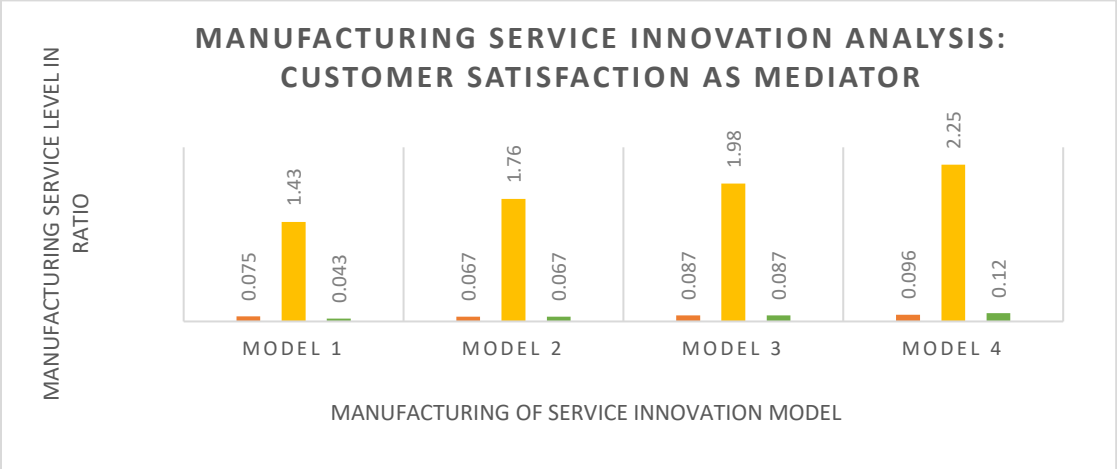

Figure 2 Manufacturing Service Innovation Analysis: Customer Satisfaction as Mediator

Now that the model is satisfactory, but the conditions are not met, arbitration is one of the parts when deciding whether to manufacture a complete or partial mold. All mediation believes that all four models should be met. Figure 2 manufacturing analysis diagram of service innovation.

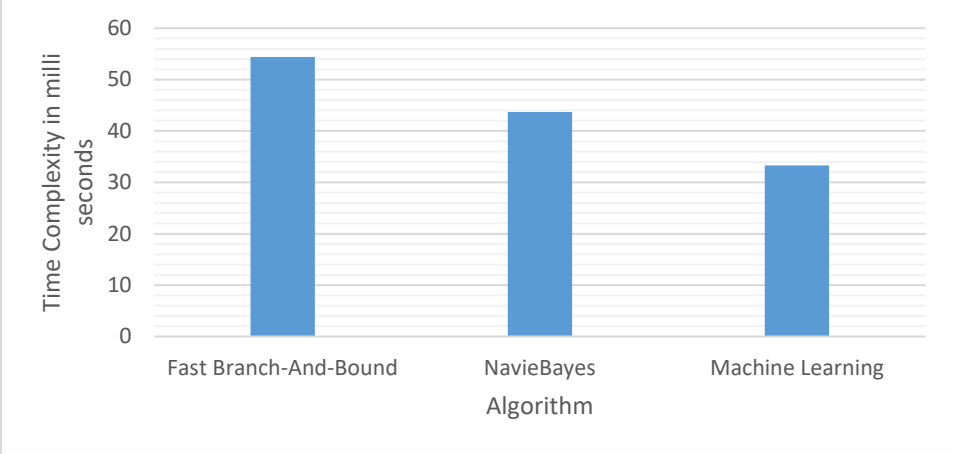

Figure 3 Time Complexity

Time complexity= (N*(N-1))/ (Total processing time)

Where N=number of the manufacturing data.

A time complexity analysis of the proposed and existing method is shown in Figure 3. The proposed method Machine Learning takes 28.4 ms less time to identify in the manufacturing innovationcompare to the existing algorithm Fast Branch-And-Bound 54.4 in ms, Naive Bayes 43.7 in ms.

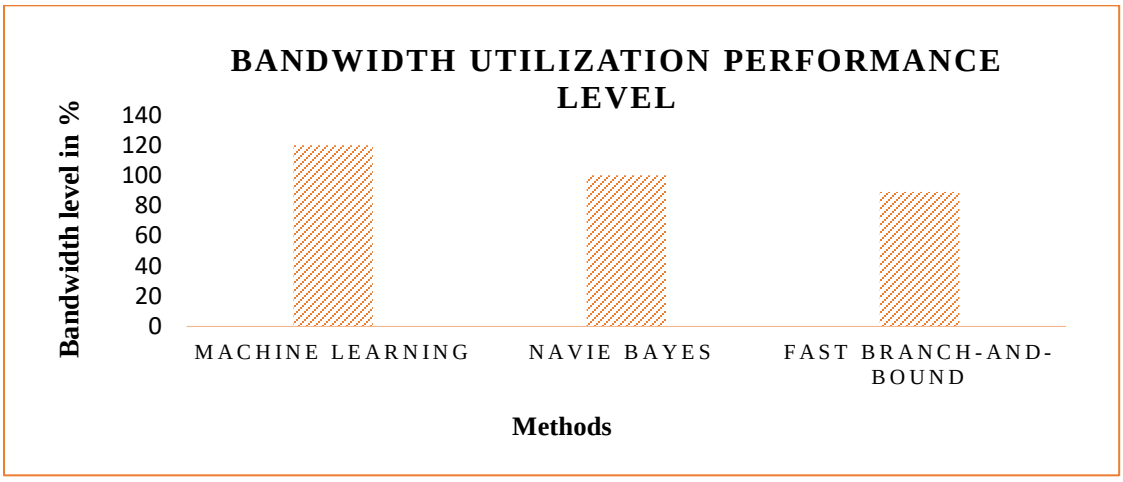

Figure 4Bandwidth utilization performance Level

Figure 4 shows that the 3 Bandwidth utilization performance Level analysis in existing method Navie Bayes in 100%, Fast Branch-And-Bound in 89% and the proposed Machine Learning 120%.

5. Conclusion

This study manufactures service innovation in customer satisfaction and assesses the impact of mediating the relationship between customer satisfaction service innovation and organizational performance. 5G findings show that organizational performance is determined to some extent by service innovation and customer satisfaction. However, to evaluate that service innovation does not have a significant impact on customer satisfaction. Therefore, through machine learning technique mainly servicing to improve service platforms and supply channels and improve manufacturing performance with techniques to continually update and create positive customer experiences that lead to customer satisfaction.The manufacturing innovation service should be used to pay special attention to its own process service.

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