Design of web-based goods ordering information system in manufacturing companies

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Abstract. The purpose of this study is to describe the design of information systems for ordering goods in manufacturing companies and can facilitate the company's operations, especially in marketing products to customers. The method used in this paper uses a descriptive method, a method that presents a complete picture of the situation related to several variable situations that are examined. The results of the design and research show that a web-based goods ordering system is useful to help customers order items without having to come directly to a manufacturing workshop. This research was conducted by discussing the system of procurement of goods, processing of goods and shipping of goods carried out by the company using its website service.

1. Introduction
Manufacturing Company is an industrial branch which in its operations processes raw materials or raw materials so that they become finished goods and then sell them to consumers. Heizer et al., explained that manufacturing comes from the word manufacture which means processing raw materials by hand (manual) or by a machine (automatically) to produce something [1]. Edwin and Chris, argue ordering in the general sense is an order agreement between 2 (two) or more parties [2], the order agreement can be in the form of an agreement on ordering a room, goods, materials, property and others, at certain times and accompanied by products his services [3], then O’brein and Marakas, explained that system design is an activity of designing and determining how to process information systems from the results of system analysis that has been done so that it can meet the needs of users, including interfaces, data and processes [4], therefore, the ordering system for goods using the web can increase company income and profits.

Research conducted by Xiao Guang, Liu, Ye Jin and Jung Tong xi, concluded that Web-based services could influence Operations in Manufacturing companies, one of which is the discovery of Tele-Manufacturing services, namely Services that implement RP (Rapid Prototyping) Technology, namely technology that helps The designer can spend the ideas issued to be implemented quickly into a product prototype that has a certain structure and function, thus the development of new products will become faster so that it can bring innovations in the manufacturing world [5]. Research conducted by Martin Gaedke, Johannes Mienecke and Martin Nussamber concluded that the Aspects of Goods Procurement Services on Web-Based Information Systems by utilizing the website Engineering portal could facilitate aspects of the procurement of goods and raw materials needed by Manufacturing Companies [6]. Then Research conducted by Guihe Wang, Ligang Qu, Limin Fan, Tianbiao Yu and Wanshan Wang
concluded that web-based services as information technology emerged as communication applications had the potential to change the way companies and industries disseminate information and provide services, information about development and improvement Products can bring benefits to both parties both Producers and Customers, as Manufacturers can enable them to increase their Market network coverage [7]. Whereas Dennis Castel and Hiroshi Tsuji explained a web-based information system that was analyzed using Conjoint Analysis which is an Analysis Technique that can be used to determine the level of relative importance based on customer perceptions brought by a particular product and the usefulness value contained in the product attribute attributes [8]. Then Lizhang Zhuang and George Burns explained the Integrated Manufacturing Information System, which is a Manufacturing Information System in which there are manufacturing procedure procedures that are integrated with Information Technology, in this system there are several procedure modules such as procurement of materials, product processing processes, Product Distribution Processes, marketing processes Products, Product Sales Process and product payment process, from the procedure module there are data for company operations that will be accommodated in the Database [9]. And then Hendy Setiady in his research discusses Web-based Ordering and Sales Information Systems in this system there are several procedures for selling a product that has been integrated with the Web or Web-based, in the website there are several menu options such as catalog pages that contain several products that are ready to sell and there is a Payment menu that is used by the Customer for the transaction process of the items to be ordered, thus allowing the Customer who orders the items to be increased because of this flexible, effective and efficient system [10]. From some previous understanding and research, it can be concluded how important Information Systems that have been Web-based, especially in ordering and selling so the purpose of this study is to design a web-based goods ordering information system, with prototype system development methods and structured system approaches such as flow map, context diagrams and Data flow diagrams are expected to be able to help its manufacturing-for-operational companies.

2. Method
The research method used in this study uses a descriptive method which is a method that provides a complete picture of the situation associated with several variable situations and the data examined, while the system development method in this study uses the prototype method because using this method has several advantages that can be easily evaluated, and carried out in stages, can be seen in (Figure 1).

![Figure 1. Model prototyping.](image)

3. Results and discussion
System design is implemented in several methods such as Flowmap, Context Diagram, Lv1 Dfd and lv2 DFD, the initial stage in designing and designing the system is to compile a Flowmap for ordering procedures for goods and procedures for payment and shipping of goods. This stage begins by describing the procedure as follows:

- Customers send Purchase Orders, then enter order data sourced from Purchase Orders
Administrators print invoice offers for the deposit process by customers
After the deposit payment is received, then the Administrator updates the payment data into the Database
Administrators print reports for orders to Owner

The ordering procedure described can be implemented into flow map, can be seen in (Figure 2).

![Ordering Flowmap](image)

**Figure 2.** Ordering flowmap.

Payment and Delivery Order Procedure
- The administrator sends a repayment invoice to the customer
- The customer immediately processes the payment of the payment for the order that has been submitted
- Administrators receive order payment data, then update payment data in the Database
- Administrators print travel documents & tax invoices so that they can send goods ordered by the Customer
- Customers print Proof of receipt of Order results so that they can be sent to the Administrator
- The Administrator receives Proof of receipt of Order Results, then updates the Data Order on the Database
- The Administrator prints the Order Report completed and validated the Report so that it can be submitted to the Owner.

From the Payment and Delivery Procedure the order described can be implemented into a flow map, can be seen in (Figure 3).
In this stage, we begin designing a Context Diagram, a diagram consisting of a process and describing the scope of a system. This Context Diagram is part of the highest level of DFD (Data Flow Diagram) that describes all inputs to a system or output from the system. He will give an overview of the whole system, so in this stage, we can implement the order, payment and delivery procedures for our orders, and then we implement them into the context diagram, can be seen in (Figure 4).

Figure 3. Payment and delivery order.

Figure 4. Context diagram.
After going through the context diagram stage, we can implement the system into the next stage, namely the Dfd lv1 stage, which is a large circle representing the small circles in it. Is a solution from the Context diagram to the Zero diagram. In this diagram contains data storage, then after we implement the ordering procedure, order payment and shipping into the Flowmap then implement it again into the context diagram then we implement it into DFD lv1, can be seen in (Figure 5).

![Data flow diagram lv1](image)

Figure 5. Data flow diagram lv1.

After finishing making DFD level 1, then the next step is to detail each process in DFD level 0, so that every event in a process can be described in more detail in a DFD again, called DFD level 2. DFD level 2 aims to give a more in-depth view of the whole system. The main processes that exist will be broken down into sub-processes. The data store used in the main processes is also identified in DFD level 2, so at this stage, we can implement the system described in the procedure Ordering into DFD Lv2, can be seen in (Figure 6).
Same as the previous stage after we implemented DFD lv1, to deepen the flow of the system, especially in the Payment and Delivery Procedure, we can implement in DFD Lv2, can be seen in (Figure 7).

Figure 6. Ordering data flow diagram.

Figure 7. Payment and delivery data flow diagram.
4. Conclusion
With the implementation of the Information System, ordering web-based goods that makes it possible to facilitate the manufacturing company in carrying out its operations, especially in selling processed products in the form of products to its customers, then by implementing this system, it can facilitate customers to order goods or items without the need to directly come to the company workshop to order goods according to their needs wherever the customer's position without limiting space and time, besides that, the Customer can more easily order items according to the specifications required, thus allowing the Company's Customers to increase which will affect the increase in Company Profit and Profit.

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