

Determination of ordering acceptance using decision support system on metal casting industry in sub-district of Ceper Klaten

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Abstract

The largest center of metal casting industry in Indonesia is located in sub-district of Ceper, Klaten, Central Java. The companies of this region open orders for manufacturing engine spare parts and any other engineering needs. The research aims to provide a media accelerating the process of estimation and decision making on product ordering acceptance in the form of Decision Support System (DSS). The method used in this research was System Development Life Cycle (SDLC) encompassing system analysis, system design, and system implementation. The contrive of application used basic programming language with visual Studio Community 2017 software and Microsoft Access basic database software. The testing result of Decision Support System on consumer ordering acceptance using alpha test method and black box test showed that the application program is proper to use and in accordance to the needs of corporate managers to take decision on ordering acceptance.

Keywords: metal casting, order, DSS, SDLC

INTRODUCTION

Metal casting industry in sub-district of Ceper Klaten keeps to perform improvement and development both physically and managerially to attain efficiency and effectiveness of production. Many companies realized that the main point of company production has been turning around on the continuity of consumer's casting product order. That is why the metal casting industries in sub-district of Ceper Klaten are committed to maintain their customer satisfaction. One of them is by applying some Customer Care principles; those are ontime delivery, Quality Control passed guaranteed, Responsive customer support, Support production plants, dan ISO Certificate.

Marketing department in any company served as spear head of promoting products to customers and, at the same time, accepting orders. In this case, customer ordering acceptance served as early stage of company to determine production needs and also incurred cost. Hence, every order received will undergo the process of making design, if there is no design and requires special specification, then it will be followed by preparation of raw materials, scheduling of production, process of production, and delivery. The accepted orders will result in the planning of raw material supply until the



product is received by consumers. Therefore, any miscalculation in the acceptance of orders could effect to company finance. This will also make the consumers to wait 1 up to 2 weeks for certainty whether the order would be processed or rejected.

Every company has to estimate every accepted order in accordance to company's standards. It is to ensure that it could fund production and non-production cost, and be profitable for company. Production costs, on one side, comprised direct cost of raw material, direct cost of labors, and company overhead cost. On the other hand, company's non-production costs covered promotion and administration cost. However, the changes of fluctuate raw material price will serve as consideration and criteria to take account the cost of orders. Therefore, managements are required to keep up to date on market price while considering the tight price competition among other metal casting industries. In determining cost of goods, metal casting industries set on five components namely raw material prices, labor costs, machining cost, finishing, and transport. Those five components is also added with the percentage of profit equal to selling price for consumers.

The companies of metal casting industry in sub-district of Ceper Klaten had the same history that was originated from home industries. Then, it had developed and incorporated as a legal entity. However, the problems faced by metal casting industries are such administrative and data processing activities, which have been done manually or paper based estimation. Furthermore, the computers are only used for reporting preparation and filling. In addition, the computers have not been used to accelerate the decision making. Thus, It effected on the length of decision making process and certain level of miscalculation.

RESEARCH METHODS

This research was done in the largest region of metal casting industry in Indonesia, located in sub-district Ceper Klaten Central Java Indonesia. It was conducted at administration and order acceptance management for manufacturing metal casting product. Its category was to make the order of the company by case study of CV Sumber Baja Perkasa and PT Batur Arya Yulis. The research used System Development Lifecycle (SDLC) method to develop Decision Support System (DSS). The system covered three main stages i.e. system analysis, system design, and system implementation. The system analysis was to know the procedure of order acceptance process, user parties involved, software and hardware needs. On the other hand, the system design was to contrive the process of decision making and database design of order acceptance. Meanwhile, the system implementation was to realize the design in the form of programming language, configuration of system management database and software testing.

The research final result was a Decision Support System that would be utilized in decision making of consumers order acceptance. The type of data required were primary data through interview with production and marketing manager. The data were about order acceptance system and manufacturing of the order and process of production done by company. The research also focused on administration data and ordering record and the flow of company production. In addition, the study also used secondary data by documentation method from various authorities and related literatures.

The observation was done to review *Standar Operating Procedure* on ordering acceptance till the process of production for manufacturing consumer orders. Decision Support System designed was in the form of private desktop application since it was only used by production and marketing manager in order to decide consumer order acceptance. The development of Decision Support System to order acceptance used Visual Studio 2017 with Microsoft Access as Database Management System. The design of Decision Support System was tested by using White box test to find coding error. Alfa test was also used to find to know the ease of use.

RESULTS AND DISCUSSION

Based on the field data, the company determined flexibility in the ordering acceptance policy. The customers were not driven to meet any particular quantity by standard of 30 workdays manufacturing process. It took account on the number of orders, material availability, casting schedule, and machining production process. The order that its mold and specification has already existed in company, the consumers only determined the amount of orders. While for those which have not been made before by company, the consumers have to provide engineering drawing or product sketches ordered.

Designing Decision Support System

Decision Support System for order acceptance required input data composed order transaction data, delivery data, external data such as material price, and internal data such as consumer, product data, and manufacture data. The flow diagram of Decision Support System creation process can be seen in the following figure.

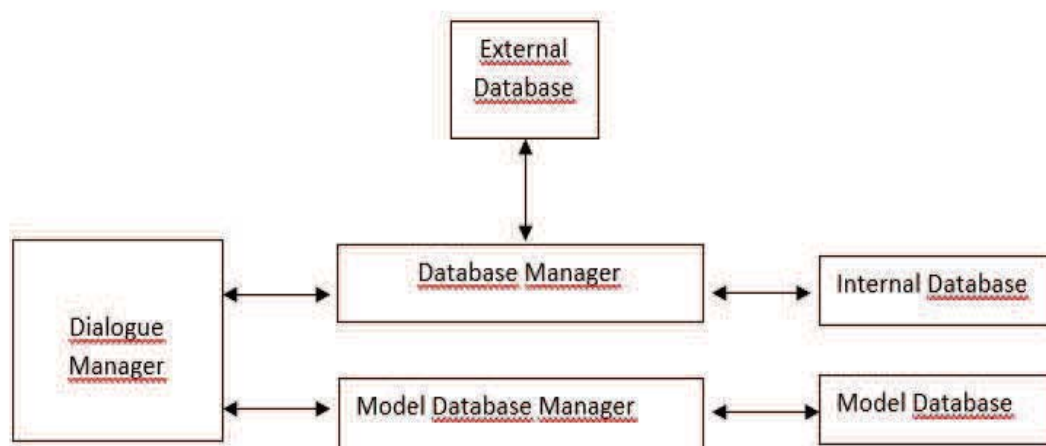


Figure 1. Flow diagram of decision support system data

After customers made their orders via marketing department, the order note was made. If the order was approved, the sales and purchase agreement would be issued. Furthermore, the order specification will be done by company, and it is completed when the shipping note was issued. The data flow of transaction process can be seen in the following figure :

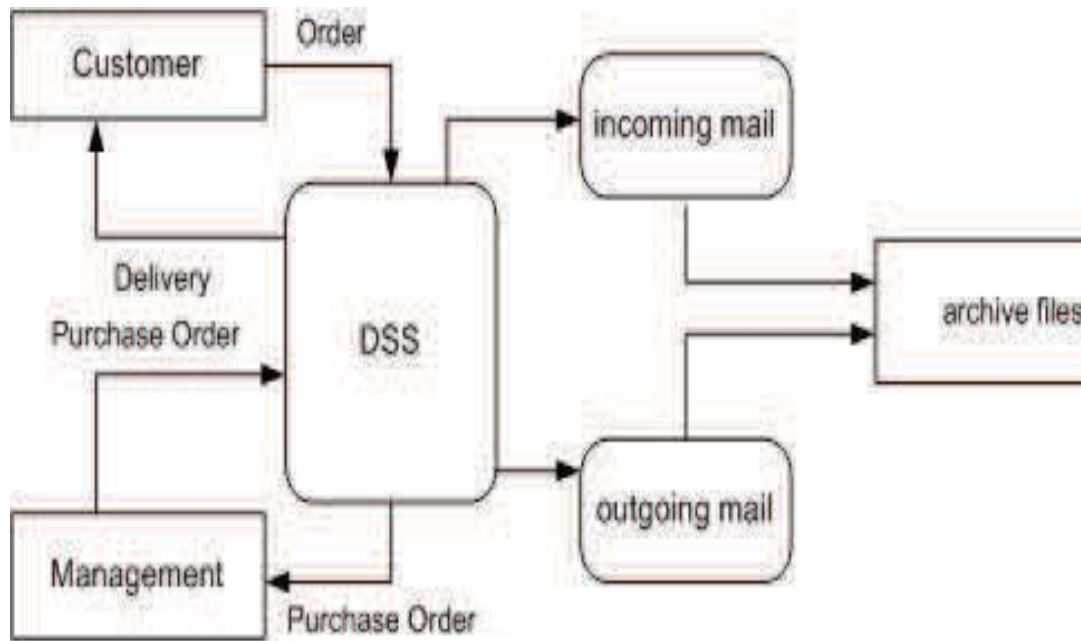


Figure 2. Data flow of diagram decision support system

The Data Flow Diagram DSS showed the relationship diagram among entities which was made in such following picture.

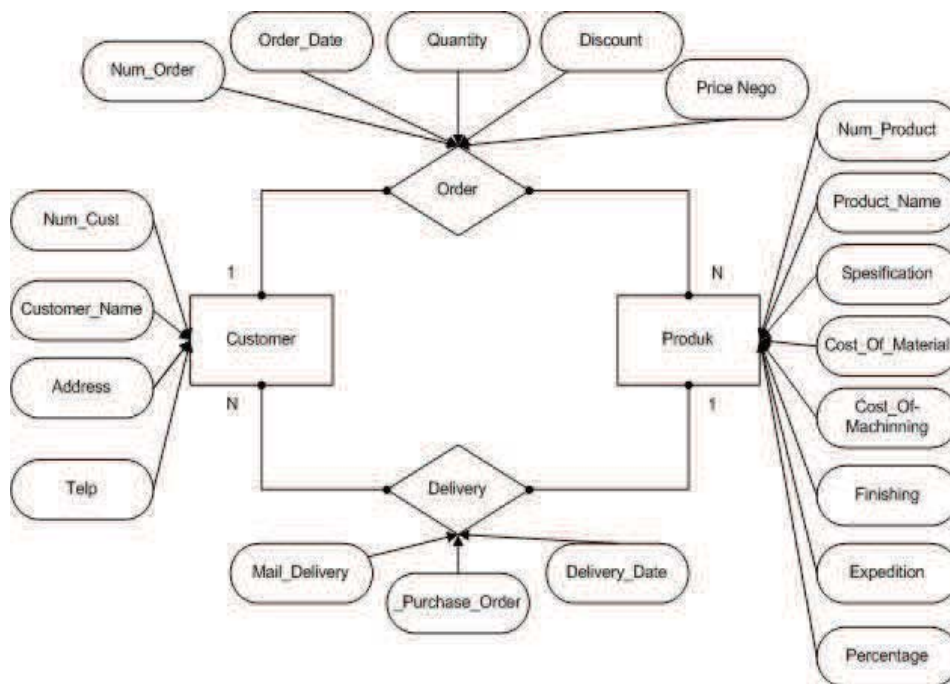


Figure 3. Entity relationship diagram DSS

Dialogue sub-system or interface was made to ease managers in operating application program and printing result. This happened because users did not know about programming language so that bridging menu and display were needed to ease inserting

input and *output*. Here it is the Decision Support System Menu of ordering decision as shown in following figure.

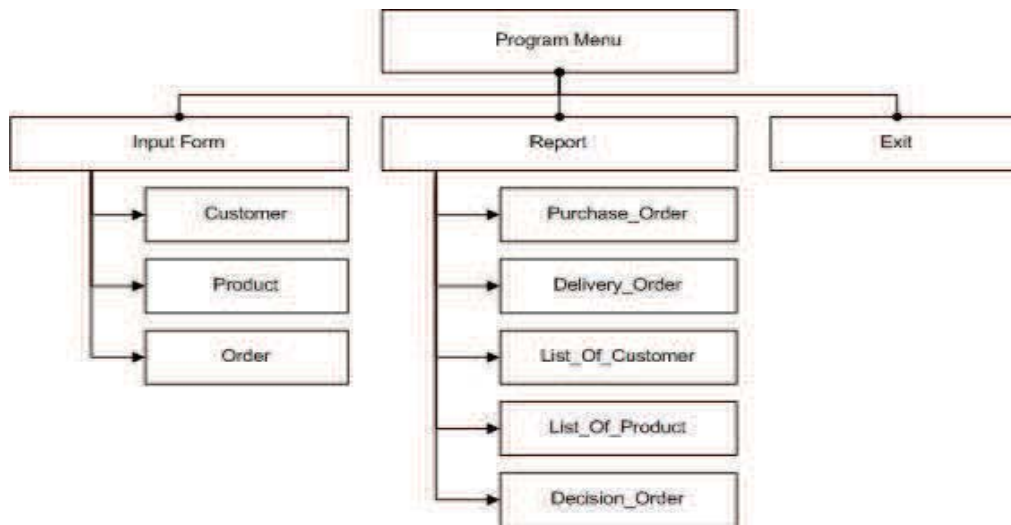
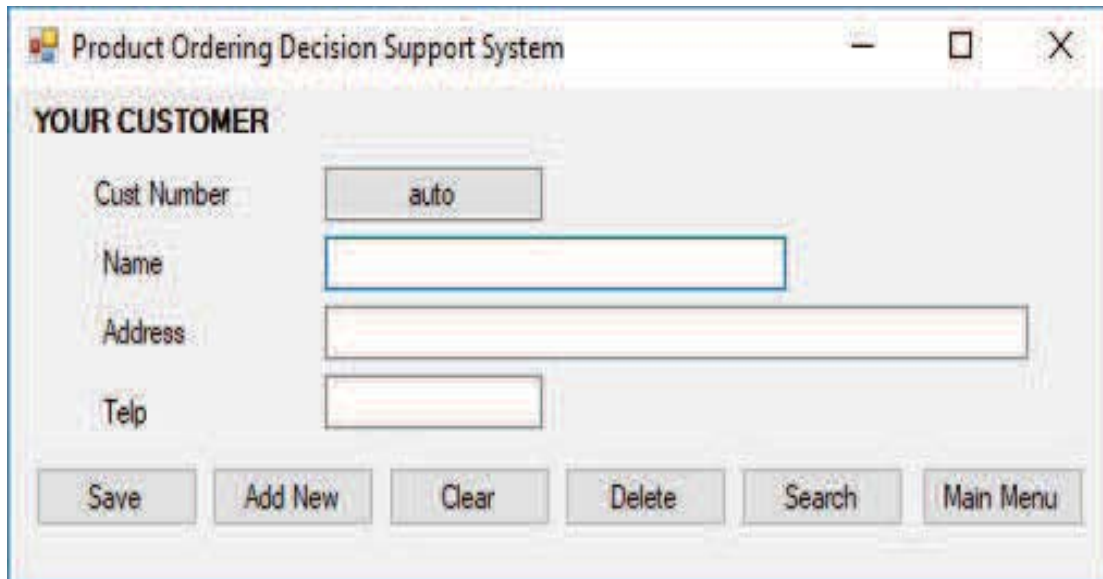


Figure 4. Decision support system menu program

Human interaction to computer was eased by creating Decision Support System interface to perform either inputting data or displaying result as listed in figure below.

Figure 5. Product input display

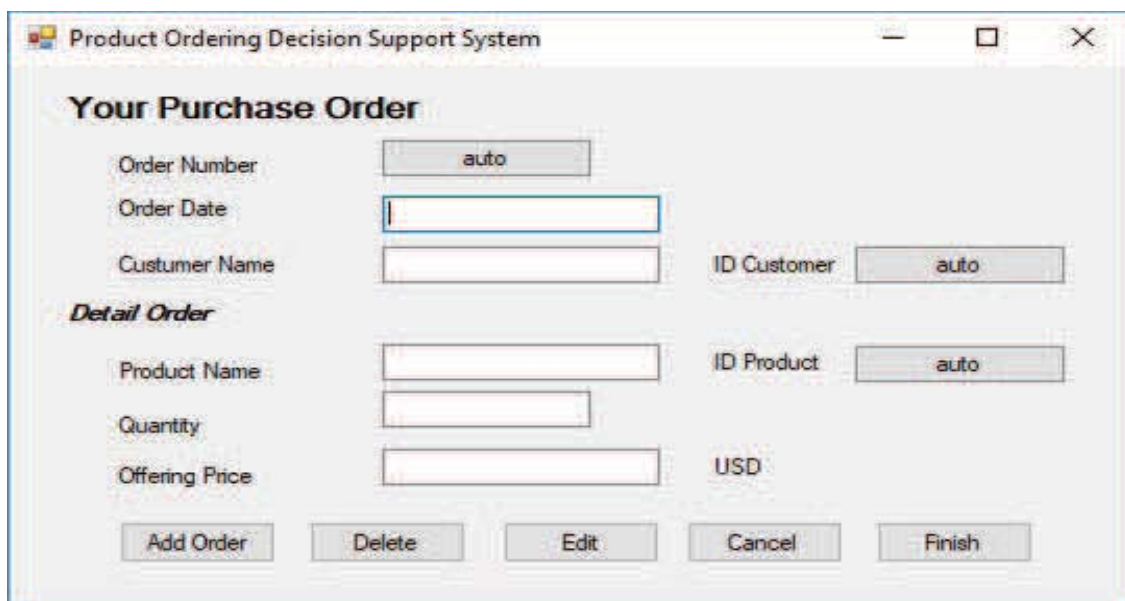
Product input menu was used to add product in database while to add customer was through customers menu as shown in the below figure.



The screenshot shows a window titled "Product Ordering Decision Support System". Inside, there is a section titled "YOUR CUSTOMER". It contains four input fields: "Cust Number" with a dropdown menu showing "auto", "Name", "Address", and "Telp". Below these fields is a row of six buttons: "Save", "Add New", "Clear", "Delete", "Search", and "Main Menu".

Figure 6. Customer input menu

Customer order addition was filled through order menu as seen in following figure.



The screenshot shows a window titled "Product Ordering Decision Support System". Inside, there is a section titled "Your Purchase Order". It contains several input fields: "Order Number" (dropdown with "auto"), "Order Date", "Customer Name", "ID Customer" (dropdown with "auto"), "Product Name", "Quantity", "Offering Price", "ID Product" (dropdown with "auto"), and "USD". Below these fields is a row of five buttons: "Add Order", "Delete", "Edit", "Cancel", and "Finish".

Figure 7. Order purchasing menu

Within this menu, managers could immediately notice cost of products and unit price, and made decision on customer offering wheter accepted or rejected based on cost of product and profit percenteage received.

Decision Support System application program provided final report in the form of customer offer and transaction and customer ordering acceptance decision, as seen in the following figure.

DECISION SUPPORT SYSTEM REPORT								
Order Number	32/ON.SBP.CP/V/18		(insert your code)					
Customer	CV Bina Utama							
Address	Jl Diponegoro Km 25 Solo							
Telp	0271-646334							
Detail Order								
No	Product	ID Product	Spesification	Quantity	Unit Price	Offering Price	Profit	Decision
1	Grating A	GA	500 x 380 x 40	30	160.000	180.000	600.000	Accepted
2	Grating B	GB	500 x 390 x 40	30	180.000	200.000	600.000	Accepted
3	Grating C	GC	600 x 380 x 40	25	210.000	230.000	500.000	Accepted
4	Manhole A	MHA	600 x 600 x 120 T	15	800.000	825.000	375.000	Accepted
5	Manhole B	MHB	600 x 600 x 120 F	15	830.000	850.000	300.000	Accepted
TOTAL				115			2.375.000	
Number of Product : 5								

Figure 8. Decision support system report

From Decision Support System Report, managers could immediately notice the result of offer done by customers whether it would be accepted or rejected. To the rejected offer, company might contact its customer for further renegotiation.

Decision Support System test result on customer order was offered by Black Box method to find out some bugs and faulty syntax. It showed that 100% of program had run well in accordance to the designed algorithm. Meanwhile, the result of alpha test was to know the level of user's operation. Surprisingly, it resulted in 45% of very good and easy to use, it was almost 55% regarded as user friendly. Based on those test results, it was concluded that Decision Support System application program could meet the managers need in helping them to determine customer order acceptance.

CONCLUSION

Based on the result of analysis and discussion, it is concluded that Decision Support System application program for customer ordering provision was proper to use. In addition, it could help managers in supporting decision of customer ordering acceptance. The resulted Decision Support System could accelerate the process of estimation and ease company transaction management through computerized database.

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