Eliciting Requirements of Order Fulfilment in A Company

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Abstract. The Order Fulfillment Process (OFP) is one of the core business processes in an organisation. OFP in a manufacturing company, the wide range of activities involved is carried out by people from different functional units. OFP is complicated and demands activity elicitation and coordination. Hence, it important for companies to re-engineer their OFPs to support their activities for the better. Oil distribution manufacturing is a company that acts as a manufacturer of Coolant Brake, and Radiator in Indonesia needs an application to fulfilled all its business process activities. In this research, the authors have elicited requirements of order fulfilment in this company used elicitation and collaboration methodology to gain knowledge about the user’s requirement or need. From this research, an order fulfilment application that has been computerised has been produced following their needs to support organisation activities for the better.

1. Introduction

Current technological developments are the trigger for the company to immediately explore the company's potential to improve the company's performance further to generate revenue for the organisations. Order fulfilment application is one of the core business processes in the company [1], [2], [3] to assist in the implementation of daily business operations in overcoming business problems such as company needs, helping management in making decisions. One of the processes in order fulfilment is distribution.

Distribution is the mechanism through which products and services are transferred from producers to end consumers. In other words, the purpose of distribution is to connect producers of a product or service to end-users [4]. This case discusses companies that distribute oil. Oil distributors buy fuel from suppliers and sell it, by a margin, to customers. Besides, they can act as transporters; distribute oil to other people's customers at certain agreed costs [5]. An oil distribution company is a company that acts as a manufacturer of Cooling and Radiator Brakes in Indonesia. Manufacturing industry development more likely towards the developing country [6]. The company's goal is to increase the use of motorised vehicles, heavy equipment and machine tools to maintain the condition of their assets in a prime and resilient condition.

In the Order Fulfillment Process (OFP) in any form, various activities involved are carried out by people from different functional units (e.g. sales personnel to process customer orders, planning personnel to make plans and production schedules, and staff production staff to physical manufacture of products). As a result, OFP becomes very complicated and demands integration and coordination of activities in the company [1], [7], [8]. Hence, it underscores the importance for companies to re-
engineer their OFPs to exploit opportunities to better integrate and cooperate with supply chain partners, thus contributing to SCM.

Companies must always be aware of things that can disrupt the smooth running of business processes such as the availability of inappropriate goods, the accumulation of debt and receivables that cause the operating cash flow system is not good, complaints from customers for dissatisfaction with the services provided by the company and decreased sales due to delays in decision making. It is hoped that the results of this study can be analysed for the current system, identify weaknesses in the current system, provide recommendations for improvement and development an information system need for order fulfilment that is in line with company needs so that organisational activities are better. In this case, only collect or eliciting requirement from stakeholder in an oil distribution company.

2. Theoretical Foundation
2.1. Eliciting Requirement

(1) A condition that is needed by the user to help him solve a problem or achieve his goals;
(2) The ability that must be possessed by an information system or application to meet its needs such as work contracts, quality standards, specifications, or other documents that are formally imposed;
(3) Documented condition and capability representation refer to (1) or (2).

In addition to the statement of requirements, requirements for information systems must contain other contextual information, such as [9], [10]:
- Background information that places requirements in context (e.g., the business needs of the company and system users, the current system or situation, and the reasons for using the new system).
- Domain knowledge is needed to understand the associated OFP system, including glossary and references to other documents needed.
- Definition of information system objectives and scope of requirements.
- A narration that links from one document to various parts of another document.
- Description of the stakeholders involved.
- Other project-specific topics that are important so that stakeholders can fully meet and understand specifications.

Requirement elicitation is the most important thing phase of the software development life cycle (SDLC) [11], [12]. Software development processes consist of many knowledge-intensive processes, among which requirement elicitation is perhaps the most critical for the success of the information system or software. The requirements elicitation process is intended to gain knowledge about the user’s requirement or need [11], [13]. The purpose of requirement elicitation is to understand the problem that arises from the needs of stakeholders, including, but not limited to, customers and end-users and transform it into requirements to define and design the related solution. It covers the capture and discovery of stakeholder needs. Its aim is to identify information determining what features the software system should have [11], [14]. This stage is used to translate the needs and desires of software users who are not precise, incomplete, to complete, precise, and formal specifications as desired by management [11], [15].

2.2. Order fulfilment Process (OFP)

OFP starts with receiving a customer's order and ends by sending the final product. This includes activities such as order processing, stock checking, purchasing decision making, supplier selection, a purchase order (PO), planning component manufacturing, and final product assembly and delivery of goods. In different companies, OFP is run differently according to their unique business characteristics (for example operating modes: make-to-stock, make-to-buy or order, engineer-to-order by service, and assembly-to-order), they fulfil two requirements for a common goal, including:
(1) Delivery of products to meet customer expectations at the right time, the right place, the right amount, and the right price; and
(2) Acquisition of agility to deal with uncertainty from the internal and external environment of the company [16], [12].

Unbalanced and unstable integration of manufacturing and transportation systems which weakens the competitiveness of the supply chain. Especially in dynamic situations and environments, production
and transportation systems must be well integrated so that efficiency, responsiveness, and flexibility can be achieved and maintained properly [13], [17].

3. Research Method
Research on Eliciting Requirements of Order Fulfillment uses quantitative and qualitative method approaches to answer research questions, conducting document reviews and surveys to oil distribution companies for collecting relevant data for the development of an application. Base on Figure 1 Steps of elicitation and collaboration methodology [18]. The methodology used in this research is to prepare for elicitation until manage stakeholder collaboration for developing information systems of OFP.

![Figure 1. Steps of methodology elicitation and collaboration [18].](image)

1. Prepare for elicitation.
Step one at this stage, ensuring that stakeholders have the information needed for analysis and ensure that they understand the nature of the activities they will undertake. It also establishes a set of objectives for the activity. At this area, also identify or prepare research resources to be used.

2. Conduct elicitation.
Step two at this stage, elicitation is carried out to understand the needs of stakeholders and find the best solution that can meet those needs. Excitation is done by direct interaction with stakeholders, conducting research, or conducting experiments.

3. Confirm elicitation results.
At this stage, ensuring that stakeholders have a shared understanding of the results of elicitation, the information obtained is properly recorded, and that business analysts get the information sought from elicitation activities.

4. Communicate business analysis information.
Provide information needed by stakeholders when they need it. Information is given in a format that gives those benefits and uses the right concepts.

5. Manage stakeholder collaboration.
And the final stage is collaborated with stakeholders in analysing business processes as a whole and ensuring the business analysis process gets the desired results.

4. Discussion and Analysis
The following is the analysis that we did for the eliciting requirements of OFP in a company using the methodology elicitation and collaboration. The stages of the method can be seen in Figure 1.

4.1. Prepare for elicitation.
Included are understand the scope of elicitation, select elicitation techniques, Set up logistics, secure supporting material and Prepare stakeholders. Output form this stage are scheduled all resource can be people and equipment from OFP process. Notify appropriate parties of the plan included in this phase, prepare questionnaire and distribute to stakeholders in oil Distribution Company.

Understand the scope of elicitation, the first step we did before elicitation is to determine and understand the scope of the elicitation activities. This aims to respond if the activity deviates from the intended scope. The scope of the elicitation development OFP consists of:
- The process of the purchase order and sales order transactions as the main data source.
• Important data such as user data, finished goods data, customer data, distributor and retail price data, raw material data, auxiliary material data, and supplier data.
• Financial reports such as profit or loss, balance sheet, journals, etc.

Select elicitation techniques, the next step after determining and understanding the scope of elicitation activities is to determine the elicitation technique. We used elicitation techniques by surveying, interviewing and studying data in the company that is related to scope. Choosing the right techniques and ensuring each technique is performed very important to the success of the elicitation activity.

Set up logistics, Logistics is planned before elicitation activities. The logistics we prepared for each elicitation activity are to identify the objectives of the activity, the participants and their roles, the scheduled resources, including people, rooms, tools, locations, communication channels, techniques, languages used by stakeholders (oral and written) and agenda-setting.

Secure supporting material, we identified the sources of information needed to carry out elicitation activities. Information needed for elicitation is people, systems, historical data, material, and documents. Prepare stakeholders, the final step before elicitation is that we educated stakeholders about how elicitation techniques work or what information is needed. We prepared stakeholders by asking them to review supporting materials before elicitation activities to make them as effective as possible.

4.2. Conduct elicitation consists of guide elicitation activity and captures elicitation outcomes.
Guide elicitation activity, after we finished preparing for elicitation, we began to do elicitation. During the elicitation activity, we continued to supervise and provide guidance to stakeholders to ensure that elicitation activities are focused on producing intended information at the desired level of detail so that the results of the elicitation are following the expected requirements.

Capture elicitation outcomes, In addition to supervising and providing guidance, we recorded and responded to the results of the elicitation obtained to ensure that the information produced during the elicitation activities is under the expected requirements. Results of conduct elicitation are including documentation appropriate from the technique and capture the information provided by management.

4.3. Confirm elicitation
Confirm elicitation results consist of compare elicitation results against source information and Compare elicitation results against other elicitation results; Confirmation is done by comparing information received with other information to look for inconsistencies or gaps.

Compare elicitation results against source information, after we did elicitation, information is needed to answer existing requirements. However, the information needs to be re-confirmed. We did this by comparing information received with other information to ensure accuracy.

Compare elicitation results against other elicitation results, in addition to comparing the results of elicitation with other information, we also compared the results of elicitation with other elicitation results to ensure that the information is consistent and accurate. Technique this stages are interview and observation concern all participant in these organisations.

4.4. Communicate business analysis information.
Communicate business analysis information consist of Determine the objectives and format of communication and Communicate business analysis package. Input for business analyst information is any kinds of information at any level of detail that the information system of development OFP.

Determine the objectives and format of communication; after we got accurate elicitation results, we processed the information to answer existing requirements. Then, the information was conveyed to stakeholders and in a format that can be used to continue the change activities.

Communicate business analysis package, the next step is that we communicated the information with stakeholders so that they can understand it. We provided stakeholders with the opportunity to review packages, ask questions about information, and raise concerns about whatever they may have.

4.5. Manage stakeholder collaboration
Manage stakeholder collaboration consist of gain agreement on commitments, and monitor stakeholder engagement and collaboration. Gain agreement on commitments, after communicating the information with stakeholders, we explained the importance of working together to involve them in the overall business analysis process to provide the results that are needed. Then, stakeholders and we identified and agreed on commitments about expectations and desired outcomes from shared commitments.

Monitor stakeholder engagement, after agreeing to a shared commitment, we monitored the participation and performance of stakeholders to ensure that experts and stakeholders participate effectively, the attitudes and interests of stakeholders remain constant or increase, the results of elicitation are confirmed promptly, agreements and commitments are maintained.

Collaboration, the last step we did is collaborating with stakeholders to encourage the flow of information, ideas, and innovation. In addition to making it easier to solve problems and achieve the desired results. Table 1. Summary Stakeholder Management Plan, to show members department of stakeholder in the company about elicitation requirement of development OFP.

| Stakeholder | Interest | Influence | Goal | Contribute | Best Way To Manage |
|-------------|----------|-----------|------|------------|--------------------|
| IT          | 2        | 1         | Systemized High-level milestones | Will delegate | More specific Occasional in-person meetings |
| Purchasing  | 3        | 2         | Priceless Will delegate | | Coordination with others |
| Marketing   | 1        | 1         | Promotion Very little, but want to be informed | | Not Spending Money Careless |
| Finance     | 1        | 1         | Budget Compare data with manually | | |
| Logistic    | 1        | 1         | Timeline Daily lead | | |

Interest: How much does project affect them? (1 = high, 2 = middle, 3 = low)
Influence: How much do they have? (1 = high, 2 = middle, 3 = low)

5. Conclusion
Based on the analysis of the order fulfilment application that has been running at the company, it can be concluded that every activity on the fulfilment order which exists, starting from purchase order and sales order transactions, recording user data, customer data, supplier data, price data, raw material data, data on supporting materials, finished goods data, making financial reports, and reporting on financial statements were still done manually. The company needs an application to fulfil all its business process activities. From this research, an order fulfilment application that has been computerized has been produced by their needs to support organisational activities for the better.

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