Design of customer knowledge management system for Aglaonema Nursery in South Tangerang, Indonesia

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Abstract. The purpose of this paper is to describe the design of customer knowledge management system to support customer relationship management activities for an aglaonema nursery in South Tangerang, Indonesia. System. The steps were knowledge identification (knowledge about customer, knowledge from customer, knowledge for customer), knowledge capture, codification, analysis of system requirement and create use case and activity diagram. The result showed that some key knowledge were about supporting customer in plant care (know how) and types of aglaonema including with the prices (know what). That knowledge for customer then codified and shared in knowledge portal website integrated with social media. Knowledge about customer were about customers and their behaviour in purchasing aglaonema. Knowledge from customer were about feedback, favorite and customer experience. Codified knowledge were placed and shared using content management system based on wordpress.

Keywords: aglaonema, customer knowledge management, content management system

1. Introduction

Based on South Tangerang statistics [1], aglaonema is an ornamental plant with the fourth largest area after orchids, adenium and philodendron with area 10570 m². Aglaonema plant species together with the type of anthurium is a type of plant that is currently experiencing pressure in terms of marketing and selling prices. The pressure influenced by the growing number of plants are imported from Thailand which is known as a developed country in terms of horticultural crops. This rising pressure require aglaonema nursery to redesign their business model. One possible solution is to focus on the processes of the customers through customer relationship management (CRM) supported by knowledge management (KM). Several studies about customer knowledge management have been conducted. Research by [2],[3] illustrate the use of information technology to provide knowledge support to CRM sub processes (campaign management, lead management, offer management, contract management, complaint management and service management) and KM takes the role of a service provider for CRM, managing the four knowledge aspects content, competence, collaboration and composition to satisfy customer requests within stated budget restrictions.

There are several types of customer knowledge management. They are knowledge about customer, knowledge from customer and knowledge to customer [3]. Knowledge about customer are type of customer-oriented knowledge comprises information about the customer regarding his purchase and
payment behavior, his motivation, buying habits and demands. Knowledge from customer mostly arrives at the company in a direct way, the customer informs the organization about his experiences with products, services, processes or his expectations. Knowledge to customer when the customer shares his with another company this company is knowledge gaps and to further develop the customer’s ‘non-knowledge’ [3]. CRM can provide interpersonal messaging services through the website, analysis of customer purchasing data so that it can be determined who the potential customer is, consultation through the FAQs forum, complaint service and suggestions and delivery of promotional materials to customer email [4]. Management systems can be defined as systems that support the creation, collection, storage, maintenance and deployment of firms and corporate knowledge [5]. Customer knowledge management system was created for Diah Nursery at South Tangerang. The decreasing sales occurred on Diah Nursery in 2015-2016. The purpose of this research was to describe the process of designing customer knowledge management system to support some of customer relationship management activities for an aglaonema nursery in South Tangerang, Indonesia.

2. Methodology
The steps started with knowledge identification (knowledge about customer, knowledge from customer, knowledge for customer) and knowledge capture using in-dept interview to the owner and staff at Diah Nusery, focus group discussion with the aglaonema nursery community and the customer. Knowledge for customer codified using decision tree. Steps are then followed by the analysis and design of system requirement, creating use case diagram and activity diagram and creating content management system using wordpress. Knowledge about customers obtained from sales data entered using the facility of google form connected with the portal. Knowledge from customers also obtained by using the facilities of google form plugin to wordpress.

3. Result and discussion
The result showed that some key knowledge for customers were about supporting customer in plant care and types of aglaonema including with the prices. Knowledge of plant care related to the fertilization process, the treatment process of damaged plants, the preparation process of planting media, the watering process and the process of preparing the plant location. Knowledge of plant selection is packed through a plant decision tree that begins with questions about the desired price range, leaf color and leaf shape.

Table 1. Requirement of knowledge management system and technology support needed

| No | Customer Knowledge Management System Requirement | Web tool |
|----|-------------------------------------------------|----------|
| 1  | A media that can be used to write articles about aglaonema production process and plant care, new product information and gallery (knowledge for customer) | Page management |
| 2  | Media that can be used for knowledge codification and application (knowledge for customer) | Decision tree and decision support module |
| 3  | Media that can be used for discussion among Diah Nursery staff and customer or nursery community (knowledge from customer) | Discussion forum |
| 4  | Media that can be use for customer feedback and survey (knowledge from customer) | Google form plugin to CMS |
| 5  | Media for customer analytics (knowledge about customer) | Google form plugin to CMS |

The result of the user requirement for the development of the aglaonema customer knowledge management portal can be seen in Table 1. The features created enable the process of acquisition, dissemination and storage of knowledge. The acquisition, knowledge sharing and application can be mediated through google form module, forum, page management and decision support module.
In the usecase diagram (figure 1), we know that there are 3 main roles that are guest, customer and admin. Each user has different role in the application. First, guest is the role that has no login information. Hence, guest can only access 5 part of this program that are login authentication, sign up for member, read public article, give a comment in article section and open the gallery. Second, customer is the role that has access to private page. Customer can access 4 part of the program that are read the private and public article, give a comment in article section, open gallery and use the decision tool. Third, admin is the role for maintaining the application. Admin has access to all part of the program. Spesifically, admin can add new user, make a decision tool, input sales data and update the gallery.

Figure 1. Use Case Diagram
Several activity diagrams were created to describe use case diagrams in detail. Create Article activity diagram (figure 2) aims to share knowledge about aglonema production and plant care. This activity is created by admin to be read by the customer. Decision Tool activity diagram (figure 3) aims to assist customers at making decisions in buying process and aglonema plant care.

**Figure 2.** Create article activity diagram

**Figure 3.** Decision tool activity diagram
Customer knowledge management portal (figure 4) was created with the ability to connect to youtube and give link to facebook. It is significant considering nowadays facebook as a tool to market their product.

![Customer knowledge management portal](image)

**Figure 4.** Customer knowledge management portal

Decision tool (figure 5) can guide customer in purchasing process. Decision tree begins with questions about the desired price range, leaf color and leaf shape. The end of decision tree is the name of the type of plant that corresponds to the customer decision option and its price.

![Decision tree of aglaonema selection](image)

**Figure 5.** Decision tree of aglaonema selection
4. Conclusion
Development of customer knowledge management system which is integrated of customer relationship management system and knowledge management system was built for Diah Nursery at South Tangerang. Three types of knowledge (about customer, from customer and for customer) were identified and installed to portal based on content management system. The acquisition, knowledge sharing and application can be mediated through google form module, forum, page management and decision support module.

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