ISSN 2278-3091
Volume 9, No.1, January – February 2020
International Journal of Advanced Trends in Computer Science and Engineering
Available Online at http://www.warse.org/IJATCSE/static/pdf/file/ijatcse01912020.pdf
https://doi.org/10.30534/ijatcse/2020/01912020

Analysis and Design of Web-Based Knowledge Management System for Real Estate Property

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ABSTRACT

The term knowledge management (KM) was introduced in 1986, at the European management conference (American Productivity and Quality Center). This concept then developed rapidly and attracted the attention of many parties. In the last decade knowledge management has become one of the methods of increasing the productivity of an organization, company, or agency. This is understandable because competition no longer relies on natural resources, but instead moves to the optimal use of human resources. Utilization of human resources through the potential for creativity and innovation is done in order to increase the productivity of an organization. One of important knowledge is product knowledge, product knowledge is clearly needed by business people as its main capital in its business activities. The deeper knowledge of the products sold will facilitate the process of marketing the product to the customer. Product knowledge is also one element of good service, because how can we provide the best service if we do not know the advantages or disadvantages of the product.

Key words : knowledge, knowledge management, product, product knowledge.

1. INTRODUCTION

PT Gerbang Duabelas is a property development company that has been domiciled in Pontianak - West Kalimantan since 2013. Marketing is certainly the spearhead of the company in marketing products at PT Gerbang Duabelas. Therefore, all parts must support the marketing activities carried out starting from enriching product knowledge, supporting promotional activities that are held as well as assisting in solving problems that occur by providing the best solutions from previous experience. But not only in marketing but other parts will also experience increased productivity, effectiveness and time efficiency at work if supported by a good knowledge management system**.**

At this time the dissemination of knowledge in PT Gerbang Duabelas is still not well distributed. Its nature is still from individual to individual, and the absence of good documentation. High turnover rates make it difficult for new employees to continue or know the job status of previous employees. That is what causes the gap between employees. The existing knowledge is still tacit or only exists within each individual employee, and is still not well documented explicitly. To provide this knowledge cannot be separated from the use and use of information technology that has a strong influence in supporting the supply of knowledge to the company.

Therefore we need a knowledge management system to manage knowledge at PT Gerbang Duabelas. This is needed to capture the knowledge created, to store the knowledge that has been captured and to distribute it to all relevant sections. Of course information technology can be used to capture, store and distribute it.

2. THEORETICAL FRAMEWORK

Use either SI (MKS) or CGS as primary units. (SI units are strongly encouraged.) English units may be used as secondary

2.1 Product Knowledge

Product knowledge according to Sumarwan is a collection of various information about the product. This knowledge includes product categories, brands, product terminology, product attributes or features, product prices and beliefs about the product [1].

Product knowledge according to Kolyesnikova is an understanding of goods or services / services that may include having obtained information about applications, functions, features, usage and support requirements. A business sales representative is an example of an individual who is usually expected to obtain sufficient product knowledge about the goods and services responsible for selling to consumers [2].

From the above understanding, then by mastering good product knowledge will make marketing able to talk and promote products smoothly and confidently. Therefore marketing must be trained and supported by product knowledge of a product.

2.2 Knowledge and Knowledge Management

Knowledge is contextual, relevant information and can be done according to the needs of the future [3]. Meanwhile, according to Debowski knowledge is the process of translating information (such as data) and past experiences into a set of meaningful relationships that can be understood and applied by an individual. Based on this explanation it can be said that knowledge is contextual, relevant information that changes something or someone so that it can become an organizational competitive advantage [4]. Knowledge is divided into two types based on their nature, namely Explicit Knowledge and Tacit Knowledge [5].

Table 1: Comparison of Tacit Knowledge and Explicit Knowledge

Tacit Knowledge	Explicit Knowledge
The ability to adapt, deal with new and extraordinary situations	The ability to disseminate, reproduce, access and apply to the entire organization.
Expertise, know-how, know-why and care-why.	Ability to teach, train.
The ability to work together, share vision and send culture	The ability to organize, organize, translate vision into mission statements, becomes operational guidelines.
Training and advises transferring experiential knowledge in one to one, face-to-face basis.	Transferring knowledge through products, services and documentation processes.

2.3 Knowledge Management Roadmap

In this study, the knowledge management system framework used is the 10 step knowledge management roadmap framework written by Amrit Tiwana. Tiwana created a 10-step guide for creating and evaluating KM itself. The 10 steps are divided into 4 phases [7], namely:

- Infrastructural evaluation
- KM system analysis, design and development
- System Deployment
- ROI and performance evaluation

In each phase there are detailed steps that must be used. Details of these steps are illustrated in Figure 1 below:.

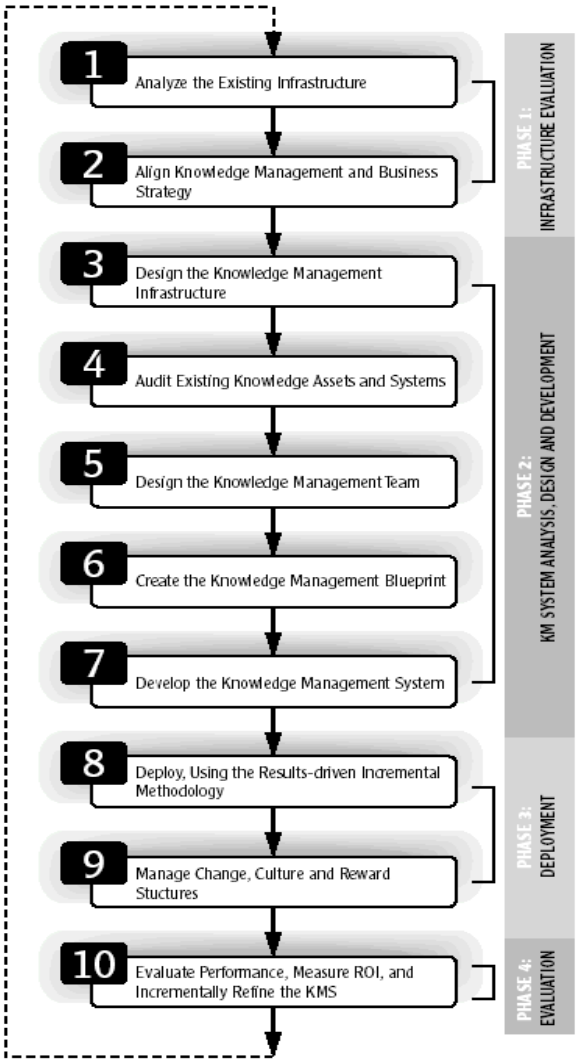

Figure 1: Ten Step Knowledge Management Road Map [7]

3. RESEARCH METHODOLOGY

3.1 Data Collection

To determine the needs of the user, then we need several ways to collect data, as follows:

- Interview
  The interview method is a question and answer process for employees and company leaders involved in the running system, especially the marketing, project and document & legality departments. It aims to get the information needed in designing the Knowledge Management System.
- Observation
  Data collection techniques by making direct observations to the research site at PT Gerbang Duabelas on all activities related to the purpose of conducting research on the running system. Data obtained from observations will be used to be analyzed in designing the Knowledge Management System needed at the company.

- Documentation
  This research was conducted in the form of tracing the documents available from the main activity process that occurred at PT Gerbang Duabelas.

3.2 Infrastructure Analysis

In infrastructure analysis, the author will analyze the infrastructure that is owned by the company, for example, such as existing networks, existing storage, platforms and devices that have been or are being used in the company, and see the existence of existing software whether it can combined into an integral part of the knowledge management system so that existing software can still be used and integrated into one unit.

3.3 Alignment of Strategy

To build a good Knowledge Management System it must be aligned with the needs of the company, in this study, one of which is to support product knowledge in marketing in order to improve the ability to present products.

- SWOT Analysis
  To find out the state of the company's own business where you will find out about the strengths, weaknesses, opportunities and threats that exist in the company. This evaluation can help as a foundation for building a new KMS. The new KMS must be in accordance with the business conditions of the company so that existing problems can be resolved appropriately.

- Zack Framework
  To find out the difference between the business strategy gap and the knowledge gap itself, the author will use the Zack Framework with a scheme like in Figure 2 below.

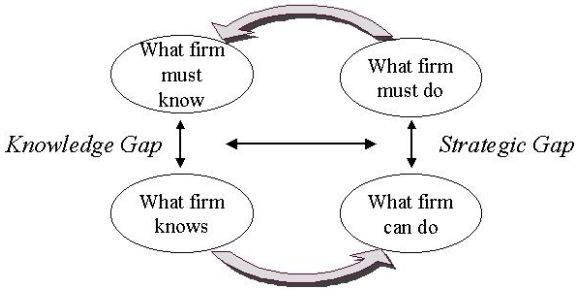

Figure 2: Zack Framework [7]

3.4 Classification of Knowledge

The author will conduct an analysis of the domains of knowledge and identify components in the layers of knowledge, after knowing tactical matters will be prepared also regarding the infrastructure needs to be used in the future.

3.5 Audit KMS

The author will conduct an audit where existing systems are feasible integrated into the new system or instead replace it with a new system. This KMS audit is needed in building a new KMS, existing knowledge must also be audited whether it has been available beforehand and whether the desired knowledge of employees already exists or is not yet available, this stage is a determination for making features that will later be made in the new KMS design.

3.6 Arrangement of KMS Team

The writer will arrange a team in making KMS prototype. Here will begin to be determined from who the source of knowledge is obtained and who will use the knowledge later. In addition to resources related to knowledge, the IT team must be involved in designing new KMS, such as storage, interfaces, etc.

3.7 Making prototypes

The author began designing the blueprint / prototype. Including making interactive designs for users, designing performance, planning implementation, scope to be built and designing for the future starting from the flow of KMS, rights of each user, website sitemap and website interface design.

3.8 Building a KMS

To build this new KMS, it will be integrated with an existing website at the company itself, which addresses at www.hokiland.com so that later it will be added directly to the sub-domain, namely at www.kms.hokiland.com. For websites that currently use a codeigniter framework as a back-end PHP and bootstrap as the front-end and MySQL as the database, so the author must adjust to an existing website.

4. RESULT AND DISCUSSION

4.1 Analyze the Existing Infrastructure

At present the company has 1 internet network, 1 firewall, 2 modems, 1 mail server and 1 data server managed through CPanel, 7 printers, 12 personal computers, 3 laptops, ± 60 smartphones. With the following scheme:

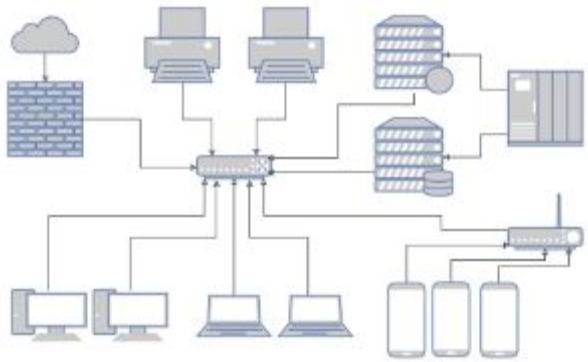

Figure 3: Infrastructure PT Gerbang Duabelas

4.1 Align Knowledge Management and Business Strategy

Before aligning the business strategy with the making of KMS, the writer conducted interviews with several employees of the company to find out what strategies have led the company so far 6 (six) years. From the results of the interview, the company's strategy still refers to the vision and mission that was set at the time the company was formed with the vision "Being a Property Developer No. 1 in West-Kalimantan "and with the mission of best-selling, best service, Hi-Tech, skilled HR, the best work atmosphere and employee welfare.

From the results of observations and in-depth interviews obtained, the corporate strategy can be formulated above. For further analysis the authors conducted a SWOT and zack framework analysis.

Table 2: Company SWOT

Strengths:	**Weakness:**
Having experience for 6 (six) years of work. Have a clear and strong vision. Having a directed mission in achieving the company's vision. Have good trust for the West Kalimantan community.	High level of resign. Writing interest is lacking. There is a lot of important documentation that is not written. There are still many systems that are managed manually.
Opportunity :	**Threat :**
The property world will not be lonely, as long as people grow, the property business is still a prospect to run. Prospects for subsidized housing are still relatively good going forward.	Regulations that do not benefit the developer. Many developers continue to emerge as rivals. Employee loyalty, for example, moving to another developer.

From the SWOT data that the author has obtained several important points by highlighting the weaknesses of the company, including the high resign rate. With this situation the company must quickly find a way so that the existing knowledge in each employee does not just disappear or commonly called a knowledge walkout and must be documented, besides that many documentation is not written in hardcopy or softcopy. This problem led to a proposal to create a KMS. With KMS that has best practice features, this feature will help companies to overcome the current situation.

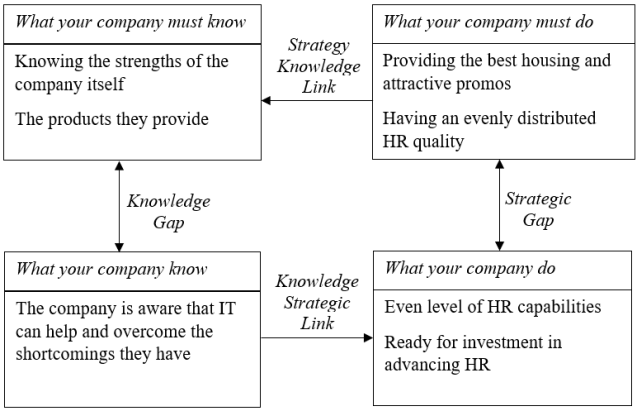

Figure 4: Zack Framework PT Gerbang Duabelas

So that a conclusion can be drawn companies must know the products provided, know the advantages and disadvantages of the company, the existing market share, the possibilities that occur due to market turmoil or regulation from the government. In addition the company must provide the same good human resources in other words the ability of every professional is the same. Therefore there is a need for assistance from information technology in the form of KMS that can help companies to provide the best service and overcome weaknesses owned by the company.

4.3 Design the Knowledge Management Infrastructure

Table 3: Summary Classification Knowledges

#	Divison	Required knowledge	Tacit Knowledge	Explicit Knowledge
1.	*Marketing*	Process booking	Bring prospective customers to the marketing office	Prepare documents as equipment for booking requirements Terms and Conditions for the booking process
		Sales Commission	Get a commission from the sale	Requirements for receiving a commission

		Event	Hold monthly events	Where the event is held What promos are offered during the event
		Promo	A promo program organized by marketing	Terms and conditions of the promo apply Promo period
		Property Education	Educating prospective customers of what individuals understand	Educational Video Image with educational content
		Housing quality	Hear about the construction of the project division	Development video Building specifications and materials used
		Closing technique	Hear how the mentor / leader closes	Steps in closing
		Complain	Receive consumer complaints and proceed to project division	Write it in the complaint form
2.	Documents & Legalities	Mortgage Application Requirements	Information heard about the requirements in the mortgage application process of another individual	Obtain mortgage requirements from related banks and share to all related divisions
		Credit Process	Get information from other individuals	Obtain steps and requirements of credit card processing at each bank or notary as each bank / notary may have different requirements, and can then be shared with all related divisions.
		Building readiness	Ask the field supervisor	Receive development progress report from project division
3.	Project	The stages of the consumer mortgage process	Receive information from marketing or documents & legalities	*Time schedule of each consumer's mortgage process and development stage*
		Sales amount	Receiving sales information	Sales reports in order to prepare stock buffers for high sales numbers
4.	Operational	Project Material	The supervisor requested the material	It refers to the progress of development progress
		Design	Housing design requests, billboards, banners, business cards etc.	*Internal memo regarding request design*
		Software	There are complaining divisions and they need software to support their day-to-day activities	Make requirements for software requirements

4.4 Audit Existing Knowledge Assets and System

For existing situations the author divides into groups for knowledge assets and systems.

Company knowledge is currently only available on the company's website which is a company-provided information service managed by the admin section, sharing is one of the medium of knowledge transfer that the company has. The knowledge transfer that employees often do is either direct or face-to-face and there is no definitive documentation of agreed upon steps or actions.

The existing system is also a website built with Codeigniter's back-end framework with one domain namely www.hokiland.com with MySQL database, 2 GB hosting capacity and unlimited bandwidth.

Currently the KMS to be built can be integrated with existing webite. This was done to reduce the existing expenditure as it is now owned by companies such as hosting, domain, and space for additional website uploads to the new sub-domain at www.kms.hokiland.com for the creation of this KMS. The possibility is that you will have to increase the cost of adding space hosting if needed.

4.5 Designing the Knowledge Management System

For the KM team itself there are 2 (two) teams:

- Team IT

The IT team is responsible for designing and building a website KMS that will integrate with the existing website. The IT team is made up of just one person.

- Knowledge Contributor Team
  For the team of contributors there are 2 required levels in the company assigned to contribute knowledge which is Manager and Head of Division. In addition to these two levels there are also teams that are already formed for the activity knowledge sharing that occurs once a month. Also when there are partners.

4.6 Create the Knowledge Management Blueprint

The creation of the blueprint will be designed into several sections including:

- Sitemap Website

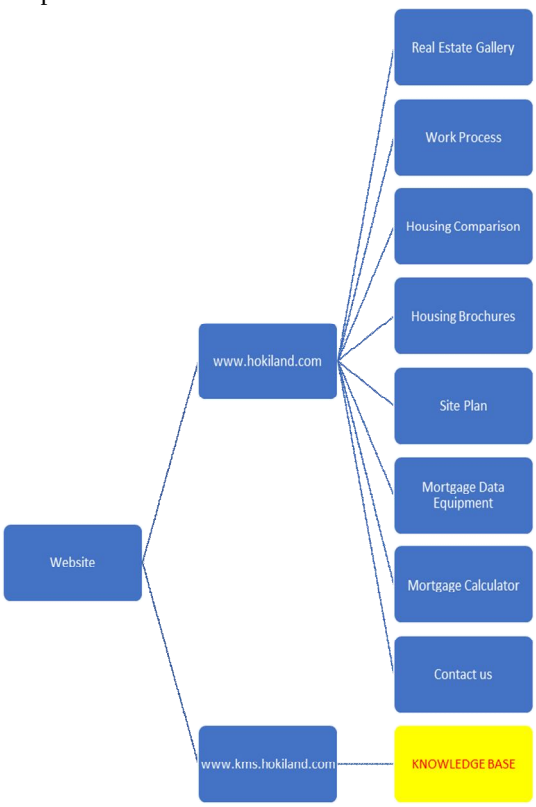

Figure 5: Sitemap Website PT Gerbang Duabelas

- KMS Planning
  The design of this study using UML began with the use of the KMS Public Knowledge use case as shown in figure 5. KMS Public Knowledge has 3 actors sharing between external users where this user has no login or private knowledge access or discussion forum. The second user is an internal user where this user has login to log in to the website so they can access the private knowledge / knowledge base and discussion forum. The last user is an administrator, in which case this user has access to all menus and has the right to add, subtract or edit existing knowledge.

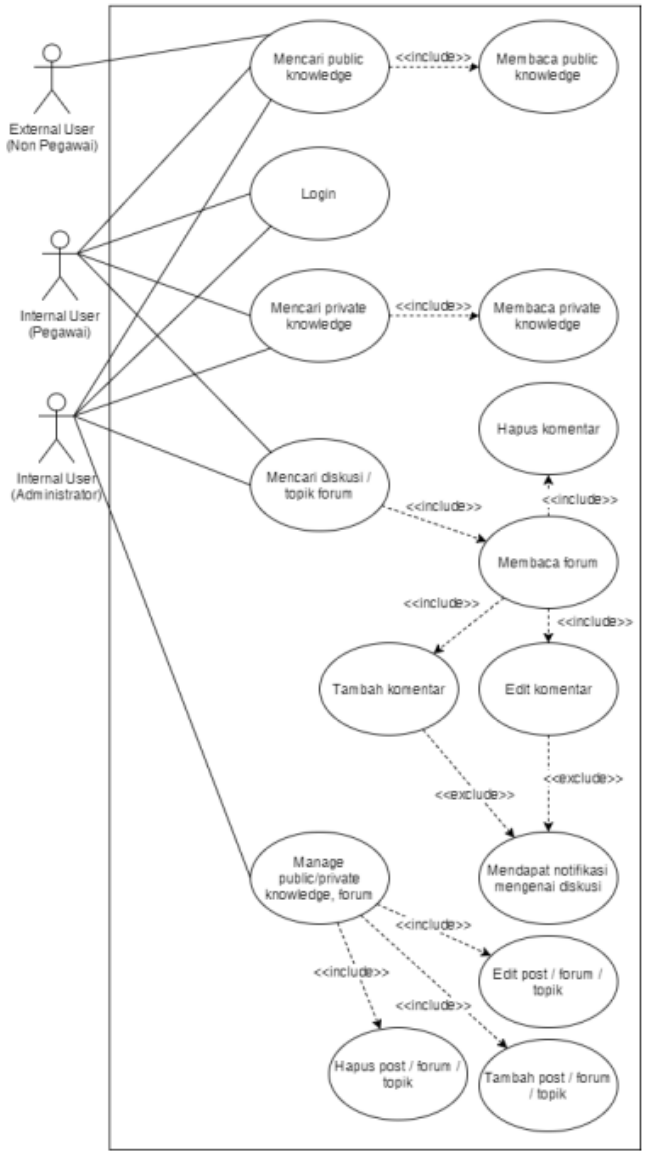

Figure 6: Use Case KMS

4.7 Develop the Knowledge Management System

Development website uses backend codeigniter, frontend bootstrap and MySQL database. This website will be integrated directly with the company's website. Since this website is still in development phase it will be done in sub-domain. So in the event of a fatal error it does not disrupt the company's main website. Then for home page interface design can be seen in figure 7. Where there are 3 main menus: public / private knowledge, articles / forums and questions and knowledge search menu, sign up and login. But for private knowledge menu only accessible to logged in user:

Figure 7: Website Homepage Design

5. CONCLUSION

The conclusions obtained from the design of KMS in the company as follows:

- The company can classify the knowledge that already exists in the company. The company knows a lot of knowledge that can be developed, stored and can facilitate the transfer of knowledge between employees and between departments.
- Product knowledge is one of the important knowledge and can support the marketing department in enriching their knowledge of each product they market.
- The KMS design made with the step-by-step guidance from Amrit Tiwana was successfully made with the public knowledge feature to share knowledge with website visitors, private knowledge to share knowledge between internal employees in the company, the knowledge base as a knowledge asset for the company in the form of best practices or tips and tricks that are saved and can be used or used in the future, a question and answer feature that can be accessed by website visitors or employees and feature articles / forums to document discussions that have been there or for virtual discussions without meeting face to face.

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