THE DEVELOPMENT OF E-KNOWLEDGE BOX: A WEB-BASED APPROACH TO KNOWLEDGE PRODUCT OUTSOURCING IN THE UNIVERSITY

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This paper describes the development of a reliable web-based approach to knowledge product outsourcing services in the Silliman Online University Learning. The system is called e-Knowledge Box that integrates web 2.0 technologies and mechanisms such as instant messaging, net meetings, and social collaboration. It provides a single platform with a more comprehensive set of technologies that could provide online consultancy (instant messaging, private messaging, document forwarding, video conferencing, online payment.

The Open Source Maturity Model (OSMM) was used in the development of the KPO. The Rapid Application Development (RAD) model was used to develop the online KPO service. The tools and technologies used in the development were limited to the technologies that are most available, accessible as determined by the selection process using the OSMM. Among the tools used are WAMP Server 2.0, PHP, BlabIM, Wordpress 3.0, Video Whisper, Red5, Adobe Dreamweaver CS4, and Virtual Box.

The system was evaluated and found to be no accessibility errors and the average amount of time between failures is less than 5% of the system's operating time. The system was found to have zero (0) high severity vulnerabilities, 13 medium security vulnerabilities, and 3 low security vulnerabilities. The site showed great web usability having excellent rating in functionality, language and content, online help and user guides, system and user feedback, consistency, and architectural and visual clarity. Likewise, the site was rated very good in navigation, user control, and in error prevention and correction.

Subtheme: Future Directions, Spaces and Possibilities in ODeL

Keyword: Knowledge, Outsourcing, Web Development, Knowledge Management

I. INTRODUCTION

Outsourcing refers to contracting-out of services or products to external providers and is usually considered for varying purposes; such as to lower costs or to take advantage of external expertise (Overby, 2007). Outsourcing remains one of the emerging trends in organizations, and can very well be seen in the Philippines as the number of BPOs (Business Process Outsourcing companies) continues to rise. This trend is going to continue and grow as organizations shifts business strategies and opt to utilize external resources to achieve a business function (Ubac, 2010).

One of these external resources includes knowledge products, which is the product or a creation resulting from expertise, experience, and skills in a particular knowledge field. Knowledge products are often shared and exchanged in explicit form, which is expressed in words or numbers. Examples of knowledge products include research papers, essays, software, and music and lyrics. Knowledge products could be concretely illustrated as knowledge in a box. The outsourcing of knowledge product is known as Knowledge Product Outsourcing (KPO), in which knowledge products are provided by knowledgeable people or experts from a different company, this may be in the same country or in an offshore location. This allows organizations to take advantage of expertise outside the organization, which may be costly and takes time to acquire and develop within the organization.

Knowledge Product Outsourcing is different from the widely known Knowledge Process Outsourcing, in that the former is a product-centered approach that focuses on knowledge documents, their creation, storage and reuse in computer-based corporate memories, while the latter is a process-centered approach that mainly focuses on the social communication process of sharing and exchanging knowledge. The difference is very evident in the technologies used, as Knowledge Product Outsourcing focuses on technologies that enable file management, retrieval, and storage while Knowledge Process Outsourcing focuses on using technologies which support socialization like email and instant messaging (Mentzas, 2000). Although this is the case, both are not limited in terms of technologies to be used and could also use overlapping technologies as long as the main technologies used remains intact. An example of this is using email in Knowledge Product Outsourcing to notify a customer of the status of a requested document.

II. MOTIVATION

Traditionally, finding a particular knowledge expert who can provide counsel involves the tasks of locating and going to the employees who work in the knowledge area and inquiring if they can help in providing counsel, tasks which may cost time and money. An example of this is seeking legal counsel wherein one must physically go to law firms and asking if they can help provide legal counsel, costing in terms of fare and time especially if more than one law firm is visited.

Using Web technology to provide a ready access to Knowledge Product Outsourcing can ease the experience of organizations and employers in locating and contacting outside experts, and can ease costs inherent to finding experts. Using technology in Knowledge Product Outsourcing, allows a customer facing a specific problem to use mere keystrokes to post their issue, and get advice on their issue wherever they may be in the world. This minimizes the amount of time customers spend looking for information and find the right expert using an integrated approach to people, process, technology, and content to connect people.

In the Silliman University Strategic Plan 2008-2016, Knowledge Product Outsourcing is one of the phases under the actions on *eLearning*. *eLearning* as defined in the strategic plan refers to the use of modern information technology to acquire and deliver learning and trade knowledge products remotely, mainly through cyberspace. The first action to build up *eLearning* is setting up the *Silliman Open University Learning (SOUL)* Program. The *SOUL* Program is designed to serve as an umbrella program to eLearning and other related online services in the university. This involves undertaking a series of measures in three phases, the third phase focusing on expanding users and subscribers, and also the number of faculty and staff who can deliver eLearning and knowledge product outsourcing (KPO) services (Kerr, 1993). Currently, KPO service in the university has yet to be developed and implemented which leads to a major motivation for conducting this study which is the development of a reliable and secure KPO using web technology and science available.

Aside from providing online services to customers, KPO also assists in experts in career development, as experts are given the opportunity to exercise, utilize and further develop their knowledge and experience and not to mention benefitted by the supplemental income from the services rendered to the customer.

This paper discusses the design of a reliable web-based approach to knowledge product outsourcing services in Silliman University. Specifically, the design and development of e-knowledge box comprises the following activities in the knowledge product outsourcing, such as: a) Profiling of knowledge providers and experts; b) Matching of expertise during knowledge inquiry and acquisition; c) Actual processing of knowledge, consultancy and payment activity; d) Visibility of the site; and e) User's utilization and web management reporting.
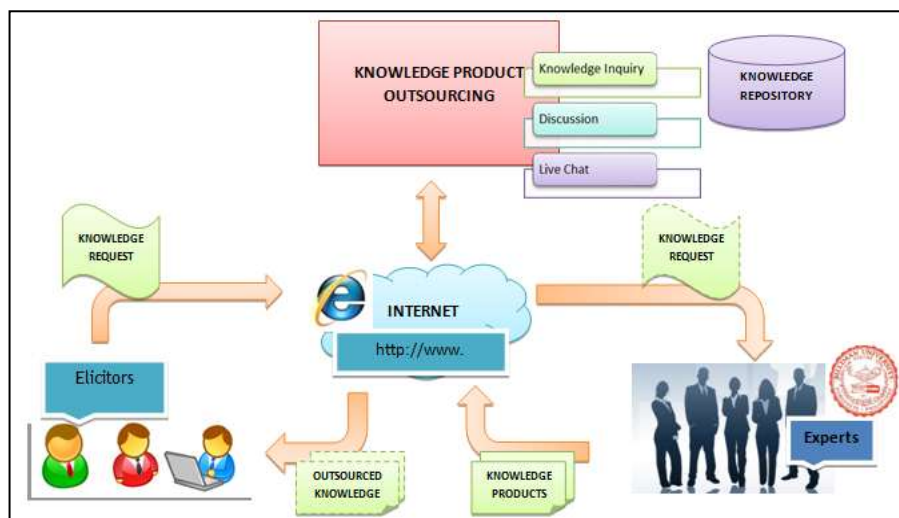

Figure 1. Block Diagram of the Proposed System

Knowledge product outsourcing focuses on the interaction and communication of knowledge requests from the elicitors to the knowledge experts using the internet to connect to the KPO system as a communication channel. The main flow of the knowledge product outsourcing process begins with knowledge elicitors, including but not limited to SMEs or LGUs, posting their knowledge request through the internet in the KPO. This request is received and viewed by various knowledge experts who have experience in the knowledge field the request belongs. Experts then communicate with the elicitors and post their solutions as knowledge products in the KPO. These outsourced knowledge products are then downloaded by the knowledge elicitors. See figure 1 for the block diagram of the proposed system.

III. FEATURES OF E-BOX

The KPO in Silliman University integrates web 2.0 technologies and mechanisms such as instant messaging, net meetings, and social collaboration. It provides a single platform with a more comprehensive set of technologies that could provide online consultancy (instant messaging + private messaging + document forwarding + video conferencing + online payment). Having a single platform to perform online consultancy without needing to open a separate program for each service provides for a more productive and efficient environment.

Another unique feature of the KPO in Silliman University is that the knowledge provider and expert registration is open only to bona fide university professionals, thus ensuring that expert advice is of quality Silliman standard. Expert registration is simple and effortless, allowing the forwarding of existing employee profile with a click of a button, consequently eliminating the need and hassles to re-encode the same profile. This is done using the existing MySilliman system as the platform for employees to opt to forward their employee information to the KPO.

The following are the features of the eKnowledge Box:
a. Net meeting and interaction application

KPO is aims to provide an enhanced and innovative knowledge service to anyone seeking professional counsel and support. Using communication tools to provide real-time online interaction, it supports the exchange of instructions and knowledge products between experts and knowledge elicitors, and facilitates agreement.
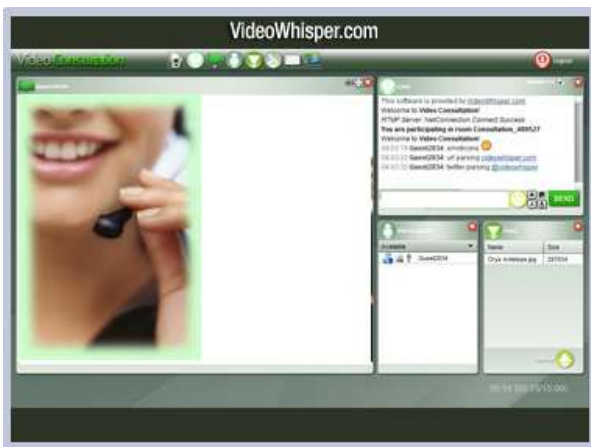

Figure 2. Net Meeting Feature – Video Conference feature

Figure 3. Net Meeting Feature – Instant Messaging feature

b. Online private messaging

Using communication tools, KPO allows interaction between experts and knowledge elicitors, even if one of them is offline. This further facilitates and hastens agreement.
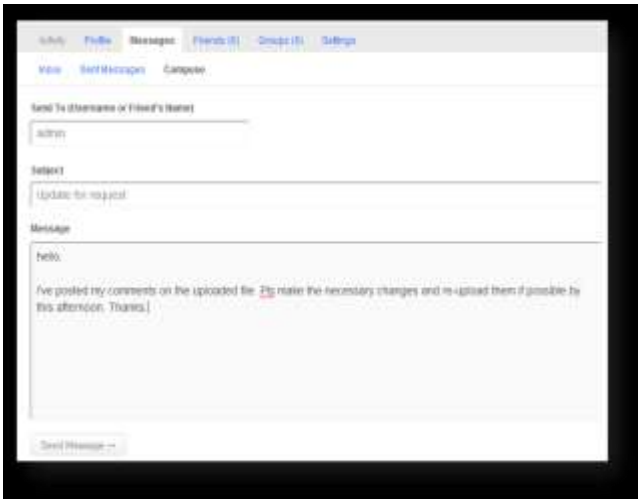
Figure 4. Online Private Messaging feature

Figure 5. Knowledge exchange and sharing feature

c. Knowledge exchange and sharing

As a knowledge exchange, KPO provides professional consultancy services to SMEs, Local Government Units, and small organizations.Experts are able to upload their knowledge products to be available for download for the respective elicitor. Download is restricted and made available as a link to the appropriate elicitor only. As an alternative, experts could use the send document function of the site to email documents directly to the elicitor in the form of attachments.

d. Online Payment

KPO allows customers access to payment gateways which facilitates the trade of knowledge products and payment. Financial transactions from experts to elicitors are processed by the system, and then transaction details are then forwarded to the payment gateway, Paypal, where the transaction could then be completed. Transactions are tracked and recorded by the system to provide a history of transactions.

Figure 6. Payment feature

e. Search Engine Optimization

Search Engine Optimization leads to the increase in the website's online visibility allowing it to be listed consistently as one of the top sites during related searches in search engines like Yahoo! and Google. This ability leads to more traffic in the site and increases the number of potential customers.

Figure 7. SEO features - Web feeds – Email link and RSS

Figure 7. SEO features – SEO URLs

IV. METHODOLOGY AND APPROACHES

This research is primarily aimed at defining a pragmatic model that could be quickly understood and emulated in similar institutions, thus it is imperative that the technologies used in the KPO be readily available, accessible, in addition to being reliable and offering a good performance. The selection process and assessment in defining the KPO technologies used involve several factors to determine the appropriateness of different open source technologies.

In this research, the Open Source Maturity Model (OSMM) is used to define the set technologies used in the development of the KPO, as described in the website of OSS Watch. [6]OSSM is a framework that has been developed to help in IT assessment and selection of open source software. This can help determine the appropriateness of particular software technologies in specific situations, in this case, developing a KPO service. Several criteria areas were considered when selecting the software. These include the technology's reputation, support, and documentation. OSSM also takes into account the skill set of the user in implementing the technology and also the project development model that the technology adheres to.

In the developmental phase of the research, the Rapid Application Development (RAD) model was used to develop the online KPO service. RAD is the most practical approach in this case since the actual research and development occurs almost at the same time, and to allow the faster development while facilitating changes easier in a research with a tight schedule constraint. (Maurer, 2002 and Kerr, 1993)

V. DEVELOPMENT TOOLS

In designing an online KPO, many available technologies, as well as combinations of these technologies, could be used. Although this is the case, the tools and technologies used in this research were limited to the technologies that are most available, accessible as determined by the selection process using the Open Source Maturity model. Accessibility of technologies used in development and implementation was very much emphasized as this research aimed to provide a paradigm for others to use and follow. Specifically, the research utilized these set of technologies as follows: 1) OS Platform; 2) WAMP Server 2.0; 3) PHP; 4) BlabIM; 5) Wordpress 3.0; 6) Video Whisper; 7) Red5; 8) Adobe Dreamweaver CS4; and 9) Virtual Box.

VI. SYSTEM EVALUATION

A Web Usability Survey is conducted using a standardized questionnaire, consisted of questions that rate the website's aspects in Navigation, Functionality, User Control, Language and Content, Online Help and User Guides, System and User Feedback, Consistency, Error Prevention and Correction, and Architectural and Visual Clarity. The respondents consists of a mixture of technical and non-technical individuals that visited and used the site going through several scenarios such as registering, creating a new request and applying for a request. After using the site, the individuals will be asked to do a survey online. The questionnaire ranks usability of several aspects which may range from 10 –Excellent to 1 – Poor.

Based on the results, the site showed great Web usability: having Very Good rating in Navigation (8.98), Excellent rating in Functionality (9.03), Very Good rating in User Control (8.97), Excellent rating in Language and Content (9.02), Excellent rating in Online Help and User Guides (9.07), Excellent rating in System and User Feedback (9.01), Excellent rating in Consistency (9.06), Very Good rating in Error Prevention and Correction (8.97) , and Excellent rating in Architectural and Visual Clarity (9.01).

VII.   RECOMMENDATION AND FUTURE WORKS

It is the hoped that the proposed system will be fully utilized starting in the school year 2012-2013. It is highly recommended that a rigid users training should be conducted. For the improvement of the system, another evaluation should be conducted particularly on the acceptance among the users.

VIII. ACKNOWLEDGMENTS

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