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Portal Requirement for Senior Citizens Based on Conceptual Knowledge Sharing Framework

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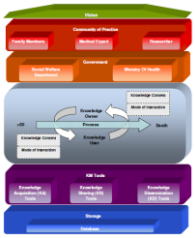
Graphical abstract



Abstract

This paper aims to investigate common problems faced by senior citizens while using computer technologies. It also aims to identify the most popular computer technologies used among this community in order to develop a web based knowledge sharing portal. The literature is reviewed and the Knowledge Sharing Framework is discussed as a guide. The paper finds that specific computer technology requirement and suitable content of a web portal that suits senior citizens is essential so that the older generation who see computers and new technology as what they have the potential to be-a tool for expanding their horizons, learning new skills and finding new interests. The paper has real and immediate practical benefits for senior citizens and the Social Welfare Department in that it provides a guide for knowledge sharing among this community. This will result in bridging the communication gap among this community. For future research, it is suggested that the study about the content of a web portal and the design guidelines analysis of the portal.

Keywords: Knowledge management; knowledge sharing framework; senior citizen

Abstrak

Artikel ini bertujuan mengkaji masalah yang dialami oleh warga emas ketika mengguna teknologi komputer. Ia juga bertujuan untuk mengenal pasti teknologi komputer yang paling popular digunakan di kalangan komuniti ini dalam usaha untuk membangunkan sebuah portal perkongsian pengetahuan berasaskan web. Kajian literatur dan Rangka Kerja Perkongsian Ilmu dijadikan sebagai panduan kajian. Dapatan kajian menunjukkan wujud kepentingan kepada keperluan teknologi komputer khusus beserta kandungan yang sesuai dari portal web untuk warga emas. Ianya supaya generasi yang lebih tua dapat melihat komputer sebagai teknologi baru yang berpotensi menjadi alatan bagi meluaskan kehidupan mereka, mencapai kemahiran dan mencari minat baru. Artikel ini membincangkan manfaat praktikal dan sebenar untuk warga emas dan Jabatan Kebajikan Masyarakat kerana ia menyediakan panduan untuk perkongsian pengetahuan selain dapat merapatkan jurang komunikasi di kalangan komuniti ini. Untuk penyelidikan masa hadapan, dicadangkan supaya dilaksanakan kajian tentang kandungan portal web dan analisis garis panduan bagi reka bentuk portal.

Kata kunci: Pengurusan pengetahuan; rangka kerja perkongsian pengetahuan; komuniti warga emas

1.0 INTRODUCTION

Information and Communication Technology (ICT) continues to be the best hope for developing countries to accelerate the development process, there is an emerging need for all sectors of society to find ways to optimize the opportunities which ICT presents. Knowledge and information produced should be shared and delivered fast and information technology must offer the solutions that are able to fulfill the requirements of the organization. The concept of knowledge sharing arose when people found many challenges in managing knowledge. One of the key challenges in knowledge sharing is how to develop a culture of distributing knowledge within a community.

Different individual has different views with the term of knowledge sharing and the perspective of the term. But, knowledge sharing means a commitment to inform, translate, and educate interested colleagues. It is an active listening and learning process, not a technology-driven panacea. As an individual, all the senior citizens have their own knowledge, which they usually keep within the records of their mind. Besides, there is no specific platform for them to express what they have for sharing purposes. Due to that case, senior citizens are believed do not have a good

interaction between other senior citizens and as a result, they do not gain anything that is stored in the senior citizens' mind.

When people found many challenges in managing knowledge, the concept of knowledge sharing arose. One of the key challenges in knowledge sharing is how to develop a culture of distributing knowledge within a community. The question is: - Why should people give up their hard-won knowledge, when it is one of their key sources of personal advantage? In some organizations, sharing is natural. In others the old dictum "knowledge is power" reigns. Through that, many papers explored the barriers and offer the pointers to overcome them.

To summarize, knowledge sharing means a commitment to inform, translate and educate interested colleagues. It is an active listening and learning process, not a technology- driven panacea. The key to sharing is helping the other party appreciate your context, which is difficult unless the context can be constrained. For example, within a community of practice, there may be agreement on a common language, or there may be sufficient context accumulated in the form of common experience and learning. Information sharing is not only about the technical aspects of the work. Tasks, vision, values, goals, contacts, support, feelings, opinions, problems and questions are all part of the sharing experience [1].

By viewing the importance of knowledge sharing, many organizations move forwards in exploring new technologies and implementing them within their organization in order to raise their operational advantage and competitiveness. Every task needs to be performed fast, innovatively and cheaply without compromising quality.

The objective of this paper is to identify the problems faced by senior citizens while using computer and to identify the most popular computer technologies used among the senior citizens. At present, there is no accessible platform for the senior citizens to contribute all their knowledge. The problem faced internally within them is how to encourage all the members and where do they have to place their knowledge. Most of the community members are more interested in keeping all their knowledge that they have without considering the importance of sharing the knowledge.

2.0 KNOWLEDGE MANAGEMENT

According to [2], most organizations realize that 'knowledge' is a strategic resource that gives them sustainable competitive advantage. It has the ability to provide competitive advantage that is difficult for other organization to imitate because knowledge resources are generally unique to the originating organization. With this realization, they are now attempting to manage knowledge in a more systematic and effective way.

Knowledge Management (KM) is also used by organizations to encourage the creation and sharing of knowledge that, it is claimed, results in improvements in productivity, innovation, competitiveness, and better relationships among people in those organizations. Nowadays, a question on how can we actually obtain the knowledge? How to create the knowledge? And how do we share the knowledge? All these issues are the vital key of implementing the knowledge management. In the knowledge management itself there are a lot of aspects need to be covered. From the management strategy, motivational issues in creating knowledge sharing culture, sharing communities and a lot more.

Knowledge is posited to provide a competitive advantage through the resource based view because it is one of the resources of the firm that is difficult and impossible for other firm to imitate [3]. Knowledge is the information that comes from the framework of understanding which is owned by someone. This information is the data that gives meaning. Besides data is a register or easy observation without any meaning [4].

In order for knowledge to be utilized as a resource in an organization, the characteristics of the resources should be understood in such a way that organizational members can identify what is and what is not knowledge. According to [5], there are two types of knowledge, which are tacit and explicit knowledge. As for other sources, [6, 7] demonstrate the organizational complexities of attempting to manage the dynamic process of knowledge generation. He defines knowledge as possessing one of two main characteristics–tacit or explicit knowledge. Tacit is subjective and always in the head or mind of a people.

In this ICT Academic Community itself, for example, tacit knowledge is a member's of the communities' experience on their study area which can be used in solving problems. Tacit knowledge is often conferred to other individuals through the observations of actions rather than communication of actions through established media. Mainly, tacit knowledge can be transformed into explicit knowledge through some type of externalization such as writing a report and sharing it in whatever mediums and platforms. It is not easy to be codified and explicated. Explicit knowledge is the knowledge that is based from the regulation that is used to inter-relate the action with the situation [8]. To recognize this explicit knowledge three questions have to be answered, and they are:

- What is the situation?
- Who is involved?
- What are the actions?

Explicit knowledge is being used to design each routine, the operational procedure and the data structure of the record. This knowledge will give the organization gaining the satisfaction level and controlling the operational. It also upgrades the feedback operational. The organization takes up the tacit knowledge to improve the skill and the creation among the staff and absorbed the explicit knowledge to maximize efficiently. This skill will be expanded, renewable and fresh, in all level of staff (workers).

Both tacit and explicit knowledge can further be organized as strategic and operational. The model of transformation of knowledge from tacit to explicit and vice versa can be shown as Figure 1. The knowledge management model attempts to show the cycle transformation of tacit and explicit knowledge towards socialization, externalization, internalization, and the combination of three different contexts. From the model, it helps the organization to identify types of knowledge and how the knowledge transformed from tacit to explicit or vice versa.

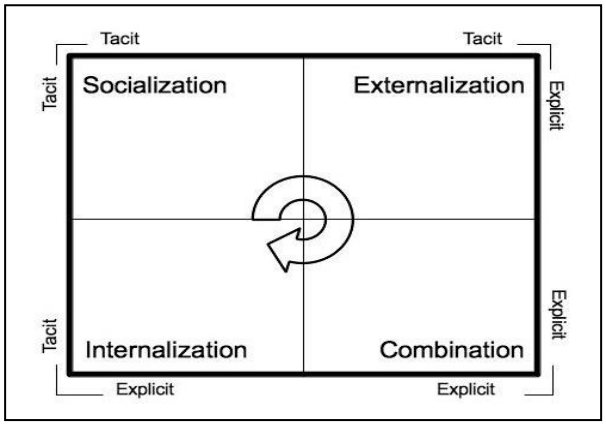


Figure 1 Knowledge management model [9]

2.1 Knowledge Management Components

In a research study, [10] of Xerox utilized a general framework for Knowledge Management Architecture comprised of four components as illustrated in Figure 2 which is important for the study. The simplest architecture for a knowledge management system was provided by [11] who described key components in a knowledge management system comprised of:

- People: Those who produce and those who use knowledge that will be the basis for action.
- Content:. The flow of data, information, and knowledge important to the success of the business.
- Technology:. The technical infrastructure that enables the capture, storage and delivery of content to those who need it when they need it. Many other researchers also include Process as a fourth element.
- The flow of knowledge Using knowledge, competencies and interest maps to distribute documents to people, for example, knowledge attic and knowledge pump.
- Knowledge cartography, Knowledge navigation, mapping, and simulation. These are tools to map communities of practice, work process simulation, domain specific concept maps, maps of people's competencies and interests (yellow pages), design and decision rationale.
- Communities of knowledge workers: Awareness services, capture and access, shared workspace, knowledge work process support and experience capture.
- Knowledge repositories and libraries: Search, heterogeneous document repository, access, integration, and management, directory and links, publishing and documentation support.

2.2 Knowledge Sharing

According to [12] sharing is a process whereby a resource is given by one party and received by another. For sharing to occur, there must be an exchange; a resource must pass between source and recipient. The term knowledge sharing implies the giving and receiving of information framed within a context by the knowledge of the source. What is received is the information framed by the knowledge of the recipient.

Although based on the knowledge of the source, the knowledge received cannot be identical as the process of interpretation is subjective and is framed by our existing knowledge and our identity. In the research done by [13] stated that sharing knowledge defined as the sharing of both implicit and explicit knowledge, as well as any form of knowledge located somewhere on the continuum between these extremes. The label 'implicit' refers to knowledge that cannot be expressed in words, such as skills that are to be observed or culture that is to be 'sensed'. The label 'explicit' refers to knowledge that can be expressed in words, and, hence, can be considered 'information'.

Sharing knowledge is one of the first cultural roadblocks we run into when implementing a KM project or program. The common recipe reads: "A corporate intranet with technology to allow people to create their own home pages encourages sharing". Real sharing implies opportunity for feedback, acceptance of critique, willingness to engage in deep dialog, and the expectation of reciprocity. Sharing requires a level of trust. It is a two way process and forms an integral part of relationship building.

Knowledge sharing means a commitment to inform, translate and educate interested colleagues. It is an active listening and learning process, not a technology driven panacea. The key to sharing is helping the other party appreciate your context, which is difficult unless the context can be constrained.

For example, as stated by [12] within a community of practice, there may be agreement on a common language, or there may be sufficient context accumulated in the form of common experience and learning. Information sharing is not only about the technical aspects of work. Tasks, vision, values, goals, contacts, support, feelings, opinions, problems and questions are all part of the sharing experience.

Quality sharing is closely tied to personal identity– your perception of the value of your information, your social standing in the community and your motivation for engaging in negotiation and exchange. To share knowledge, people must find meaning that all can accept and build enough contexts to allow information to be used efficiently. If sharing is to become a way of life, a marker of the corporate culture, there must be active participation and example from top management. It takes time, experimentation, resources, and commitment to have knowledge sharing to take place. There are existing barriers where employees need not worry whether significant sharing is deemed as appropriate "work" or not [1].

2.3 Process of Knowledge Sharing

Processes of knowledge sharing take place between and within the various knowledge levels, mentioned in section 2.2. This process of providing and obtaining knowledge between the three levels, takes place in two directions. Individual knowledge can become group knowledge when an individual shares his knowledge with other group members. In the other direction, group knowledge becomes individual knowledge when knowledge individually acquired from the group, combined with an individual stock of knowledge, becomes new individual knowledge.

In addition to these processes of knowledge sharing between various levels, knowledge is shared within the distinguished levels as well. An individual can share his knowledge with one other person, which can result in new individual knowledge for the latter. Sharing knowledge between different groups may lead to new group knowledge. On the organizational level, these processes seem less easy to conceptualize as knowledge sharing between organizations does not take place in one organization.

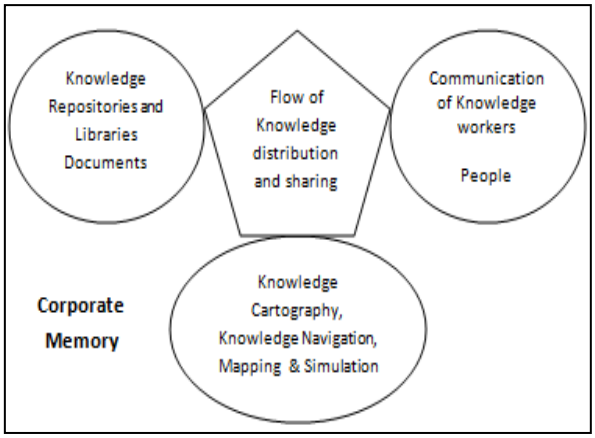


Figure 2 Knowledge management architecture [10]

In the beginning stage, distinction between implicit and explicit knowledge have been made. The processes of knowledge sharing this distinction means that implicit or explicit knowledge can become implicit or explicit knowledge within the same level or at another higher or lower level been applied. Between and

within two levels it is expected to find four different sub-processes of knowledge sharing. The following sub-processes are derived from different types of knowledge conversion, developed by [7]. These four sub-processes of knowledge sharing are derived from four types of knowledge conversion. Figure 2 attempts to shows the knowledge management architecture which plays an important role as blueprint for corresponding knowledge sharing framework. As the researcher described at the knowledge management model adopted from [7] in Figure 1, the quadrants involved are in the context of socialization, explication, implication and the combination of all contexts.

2.4 Theory of Knowledge Sharing

There is no knowledge sharing theory as such, but different views on what knowledge sharing is, what the barriers and enablers for knowledge sharing are, and suggestions for overcoming these barriers. Knowledge sharing is accepted to yield sustainable competitive advantage, since the process identifies and applies a better practice for exploiting knowledge that the organization already possesses or has access to. In Penrosian view knowledge sharing is, hence, a valuable resource that is difficult to imitate. Creating the valuable resource is, however, difficult, since organizations often lack a definition of what knowledge sharing is, what the purpose of knowledge sharing is, and how to evaluate and adjust the processes of sharing knowledge. The literature on knowledge sharing addresses two basic problems: What are the barriers for knowledge sharing, and how do organizations deal with these barriers in order to enable knowledge sharing–or, in other words: what are the enhancers for sharing knowledge? Barriers and enhancers go, basically, hand in hand–the literature that highlights certain barriers for knowledge sharing also offers some enhancers for overcoming these barriers. Broadly speaking, knowledge sharing–as the process of reducing the invention of the wheel–encompasses four pairs of barriers and enhancers:

- The stickiness of knowledge [7]
- No sharing of identity [1]
- No relation between the receiver and sender of knowledge [2]
- No knowledge of knowledge [14]

3.0 COMPUTER USAGE AMONG SENIOR CITIZENS

In a survey conducted by [15] in year 2007 with the purpose to investigate the current situation of ICT usage among senior citizens, resulted that the usage of computer among the selected community of practice is very low. This was achieved by conducting a survey in the Central Finland area during the spring of 2007. The major purpose of the survey was to examine the access to and use of ICT, reasons for not adopting certain technologies and problems that elderly users have with technology. Based on the survey results, senior citizens in Central Finland are rather well acquainted with ICT.

Mobile telephones are used by 90 per cent and digital receiving devices and computers by two thirds of the respondents. Several problems and barriers in technology access and use were identified. Many of these obstacles could be eliminated by involving senior citizens in the design of technology.

It is particularly important to develop technology that fits the lives of old people living in rural areas. They need to be motivated to use technology so that they are not excluded from the Information Society. The respondents who had experience of computers were asked about the purposes for which they use a computer. Computers were most commonly used for word processing and e-mail and online banking services. The Internet was mainly used for information seeking in general and particularly for checking opening hours, schedules and other specific information. Other information that the respondents searched for related to health, current affairs and local events, hobbies and services for elderly citizens.

There was also some of the senior citizens said that they used a computer for watching photos or videos or listening to music and play computer games. Some of them even booked or purchased tickets online and used library services with the help of a computer. Other than that the senior citizens also used a computer as a tool for a hobby, such as genealogy and shopping online.

3.1 Reason For Not Using Computer

Based on the same survey that was conducted by [15] with the purpose to explore the reasons that the elderly people have for not adopting various ICTs. The seniors without prior experience of computer usage had several reasons for their lack of use. A relatively large group of senior citizens in that survey stated that they had never used a computer whereas some of them even said that they were not interested in learning to use it either. In contrast to these respondents, they were also some computer-using senior citizens who said that they wanted to learn more about computers. The results also suggest that age, education and place of living are significant factors in determining whether an older person makes use of ICT. Most of the non-users were in the older age groups. Another similarity among the non-users was the environment in which they lived: there were less computer users in sparsely populated area than in towns and other more densely populated areas. In addition, gender did not have a significant effect on computer use.

3.2 Problems with ICT Among Senior Citizens

A survey conducted by [14] on a group of respondents to identify the problems with ICT among senior citizens. In this survey the senior citizens were asked to describe the problems they have encountered while using ICT. The responses concerned with technology in general or related specifically to computers, digital television, or mobile phones. Most of the senior citizens mentioned one or two problems that they had observed. Five general categories of problems were identified. The categories are as follows:

- Elements of technology
- Attributes of users
- Skill requirements
- Management of technology
- Technical problems

The first category of problems relates to the elements of technology. Many respondents said that technology was too complicated and the devices and applications had too many features and functions. Specific software that caused problems included operating systems and antivirus software. A problem linked particularly with mobile telephones and remote controls, was that buttons were too small. It is difficult for the elderly to see the symbol or text attached to the button and it is also difficult to hit only the correct button.

Second category of problems relates to attributes of the user. Many respondents stated that their age was the source of problems. In their experience, particularly deteriorating eyesight and motor functions were causing problems. Also, using

technology set too much strain on their cognitive capabilities. They were forgetting details and felt that they were not able to think as quickly as the computer required.

Third category of problems concerns with skills required of the user. One common problem stated by the respondents was that they did not have the necessary skills to use technology. Moreover, they felt that they were required to constantly learn new skills. They also mentioned that they had problems because instruction manuals were too complex or provided confusing and incomplete information. Overall, the technological jargon caused problems. The respondents did not understand functions and features of technology or the terminology used in instructions. Especially problematic was the lack of language skills. Some respondents did not have English language skills that would help them understand instructions, software functions and the content of the Internet.

Fourth problem category concerns with the management of technology. The technology develops so rapidly that it is difficult to keep up with it. The required hardware and software updates can also be expensive. Furthermore, learning new skills is required in order to use the new advancements. Installing new devices causes problems as well. An added problem emerges when appliances and their various versions do not function together because of compatibility issues.

Fifth category includes diverse examples of technical problems. Some typical examples are problems with network and mobile telephone connections as well as computer crashes. The respondents did not know how to solve problematic situations or how to get help. They also said that many problems require expert advice which can be costly and difficult to obtain.

4.0 METHODOLOGY

The authors used both mixed method approach by combining quantitative and qualitative methods. Using multiple approaches can capitalize on the strengths of each approach and offset their different weaknesses [16]. This study relies on developing a prototype and studying knowledge sharing framework which deals with the senior citizens. Field work and data collection were undertaken to identify the main aspects of the study.

On the basis of qualitative data analysis and collection we formulated our research interest as: investigating the information and explore deeper concept of developing a prototype of knowledge sharing portal for the senior citizens. To pursue this line of inquiry we have built on our own studies, the existing outsourcing literature, and lessons learned from senior citizens point of view. The study also aims to highlight the knowledge sharing framework for senior citizens as a guide to the portal development.

Data collection among the senior citizens has been carried out using direct observation, open-ended interviews and by conducting survey. Interviews were done among the targeted community to identify the portal requirements which is done after the analysis of the results. Multiple sources of evidence have been used to validate the findings. Besides that, a user acceptance test was also carried out among a group of senior citizens to evaluate the knowledge sharing portal.

5.0 RESULTS

5.1 Knowledge To Be Shared

The first section of the findings is about what kind of information and knowledge respondents would like to have, on the other hand what information or knowledge they are willing to give. Each respondent has been asked to answer all the questions in this section which comprise of question about:

i. Interest to find information about computers.
ii. Interest to find information related only to senior citizens from the internet.
iii. Interest to find other information besides information related to senior citizen from the internet.
iv. Interest to find information about senior citizens portals from the internet.
v. Interest to find information on latest events about senior citizens from the internet.
vi. Interest to find information about senior citizens lifestyle benefits from the internet.
vii. Interest to use internet as a medium to find out about a place before I make a visit to the place.

Through designing of the question, it was divided into three parts. First part focused on the kind of knowledge or information needed by the senior citizens. This first part of questions is to meet with the one of the objectives of this study which is "To identify the appropriate requirements needed by senior citizens". Figure 3 illustrates the findings for interest of senior citizens finding information using computer.

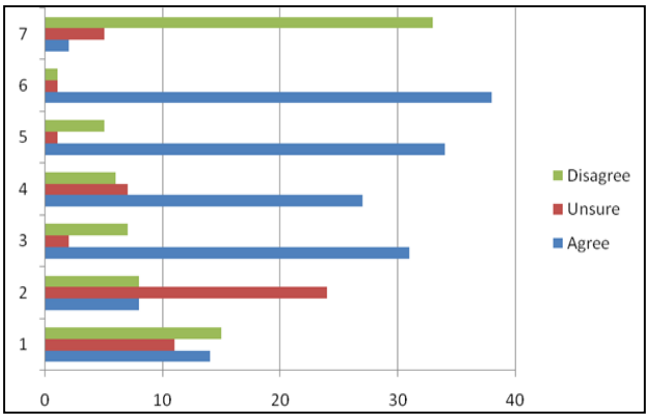


Figure 3 Interest of using computer

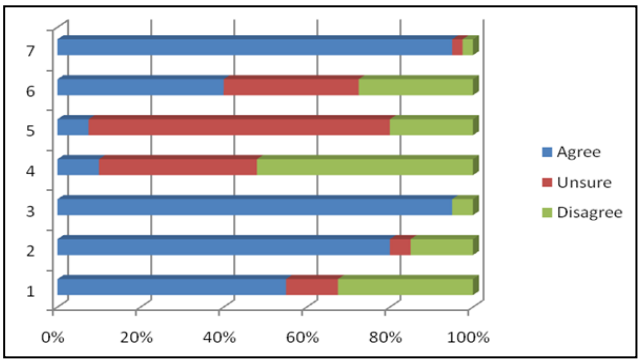


Figure 4 Willingness to share knowledge

The second part is to identify if the senior citizens are willing to share their experience and knowledge with others. As the third part is to identify what are the information or knowledge they are interested in looking for. The Figure 4 shows the percentage of the respondents answers. From the answers given by respondents, it is shown that they are willing to share most of the knowledge among the others but still does not agree on going to the extent of

travelling to get vast knowledge for any related information needed. This is shown clearly in Figure 4, where most of the respondents are not sure or disagree to travel to gain knowledge. But almost all of them are willing to share their problems with others and get opinions from other parties when they want to.

5.2 Analysis in Identifying Problem While Using a Computer for Senior Citizens

In this section, questions were asked about the senior citizens' problems when they use a computer, as well as the problems they face when visit any website in the internet. In the beginning of this research, respondents were asked about the problems they faced using a computer in their daily tasks. The other questions were focus on the problems they are being confronted when they want to visit a website for information seeking purpose or any other purposes. From Figure 5 we can see that the senior citizens are facing various problems when using a computer.

5.3 Age Related Functional Limitations

Getting older can result in several problems such as vision issues. These include decreasing ability to focus on near tasks, changes in color perception and sensitivity: blues/greens become harder to see then reds/yellows and dark blue/black can be indistinguishable, reduction in contrast sensitivity as well as reduction in visual field. From the survey, almost 91% of the respondents are vision impaired is having trouble in reading without glasses most of the time.

Besides vision, hearing loss is also a common problem with the older age people. 43% of the elderly people are having hearing loss and not all of them are using hearing aid. Motor skill impairment is also identified as another problem where seniors are merely to have Parkinson–tremor, rigidity, slow movement, impaired balance and co-ordination and arthritis (the leading cause of disability in those over the age of 55).

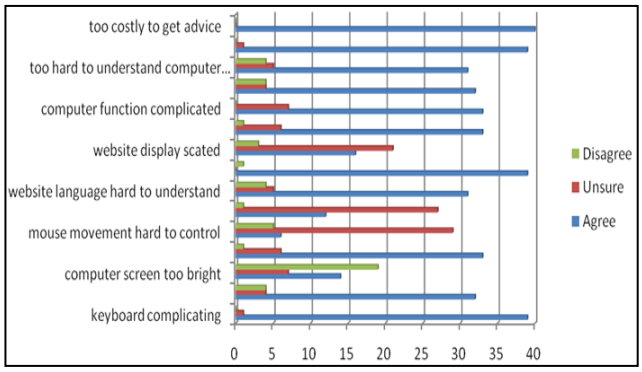


Figure 5 Common problem faced by senior citizens when using computer

These age people also prone to cognitive decline where there will be decline in the ability to encode new memories of facts and decline in working memory. Aging may affect memory by changing the way the brain stores information and by making it harder to recall stored information. This will effect on either short-term or long-term memory loss. 27% of the respondents agreed that they are affected with cognitive decline.

5.4 Current Portal Weaknesses and Comparison of Proposed Portal

The aim of the website is to provide information on the services that are specially designed to assist them. It is generally known that the website functions as an intermediary media and a two-way communication channel for faster and easier distribution of information. In view of the widespread use of information technology, websites have opened a new avenue as an alternative channel for all levels of society.

Although there is a website to spread the relevant information to the targeted community, but the senior citizens still face many problems. Among the problems faced by them are there is no information on the useful resources such as ;caregivers resources, health, housing, money and taxes, retirement, and traveling.In order to have a good idea on what the knowledge sharing portal should have, the researcher came up with some solutions for the problems faced by the senior citizens when they use the current senior citizen portal. Table 1 below shows these weaknesses and problems that exist in the current senior citizens portal and also the solutions that are suggested for those problems.

5.5 Analysis on Portal Recommendations

In identifying portal recommendations, the respondents have been asked about their opinions in identifying elements and features to include them into portal website. These features are important because they support communities. They also encourage the senior citizens to communicate through the use of the internet. Ease of usefulness was considered the main element when analyzing the results given for the options set.

This part of question probed on the suitability of the portal content, which will be developed based on the opinions gathered from the community members. The suggested content of the portal follows along the expectation of senior citizens in assisting them in formal or informal issues. Both issues are important as they can be used for their daily tasks without going through any hassle. The characteristics for this type of portal, as explained below:

- Manage documents and critical information in digital manner.
- Easy related-information finding and accessing.
- A medium for collaboration and sharing.

Majority of the findings show that 52% senior citizens agreed that a working online portal is needed rather than just using emails as the sole medium. Majority of the senior citizen which are 23% fairly answered that the portal must integrate some characteristics that support collaboration and sharing activities, emails, and communities, 95% senior citizens totally agreed that the portal must be made available online. When the respondents asked if they think that "web-based system is sufficient and useful to support knowledge collaboration and sharing among senior citizens", 20% were disagreed and 74% agreed. Figure 6 shows contrarieties in their opinion given by the respondents of this survey for the development of the portal page by the researcher.

Table 1 Senior citizen department of community welfare association of johor bahru website problems and the proposed solutions

	Senior Citizen Department of Community Welfare Association Website Problems		Knowledge Sharing Portal for Senior Citizens (Proposed Solution)
1	There are no sharing tools such as forum or chat.	1.	KSP will help the senior citizens to discuss their problem during using forum under right category he or she choose, and use chat room to share knowledge in a synchronized manner.
2	Information on useful resources provided by Department of Welfare Association is presented in general and not much information is available which is not very helpful for seniors needs.	2.	Useful information on the resources needed by the senior citizens provided to assist the users in getting necessary knowledge.
3	The Language used in most of the pages is Bahasa Melayu.	3.	KSP used only English Language at current in order to make the website readable by all the communities regardless the race. But the option to have the KSP in Bahasa Melayu should also be upgraded in future.
4	There are no online services such as online counseling that can be helpful for the senior citizens to get opinions or views from the experts.	4.	KSP will have online chatting for the registered users to get feedbacks from the experts.
5	There is no information about government benefit for this community of practice.	5.	KSP will have link to all the government agencies that provides benefits for the senior citizens.
6	The download links that are available are not related to senior citizens uses.	6.	KSP will have link for useful downloads for the senior citizens to have useful resources that are related to them.

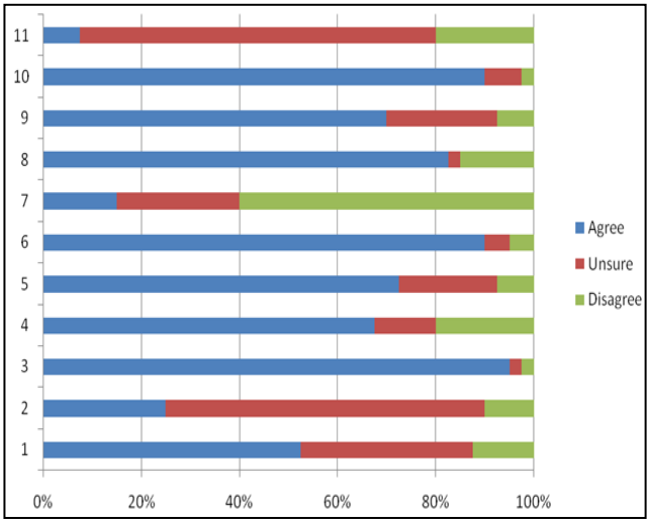


Figure 6 Portal recommendation

6.0 KNOWLEDGE SHARING FRAMEWORK FOR THE COMMUNITY OF SENIOR CITIZENS

The author has adapted the knowledge sharing framework proposed by [17]. However, not all the parts that were mentioned in that framework were fully adopted in the current framework of this project. In this study, it is more concerned about the senior citizens. Therefore, Figure 7 shows the needs for the case study the researcher have chosen which the senior citizens.

Vision

"To give the senior citizens an opportunity to share and get knowledge in effective way."

Community of Practice (CoP)

CoP is defined as groups of virtual or local members with similar interests. In order to practice an effective knowledge sharing, there is a need to identify community that cares about topic and enhancing their ability to think together, stay in touch, share ideas, generate new knowledge and connect with other communities [18].

Thus, the researcher identified three community of practice. The communities are Family Members, Medical Experts, and Researchers. The identification of these CoPs is due to their direct involvement in knowledge among them.

These communities are communicating among each other to help solving any problems faced by these people and in the same time this community will be utilized through exchange the information, experience, and expert among them, and also share their knowledge enhance their daily life.

Knowledge Process

Basically, knowledge is flow from knowledge owner to knowledge user. In this framework, senior citizens and communities of practice (as describe previous) can be as a knowledge owner and knowledge user. Generally, Knowledge user is a person who acquiring knowledge while knowledge owner is a person who provides knowledge. They are responsible to keep that knowledge up-to-date. However, they may or may not be the author or creator of the specific content.

The community of senior citizens with the age range of 60 years old and above will start the process of knowledge sharing among the community of practice which will end for them when they meet death. Along this path, the senior citizens can store their knowledge in the knowledge sharing portal to be used by the visitors of the portal. The process of sharing will not end even when the knowledge owner dies because the knowledge content in the portal will be available for the users at anytime.

There will not be an expiry on the content of the knowledge that is stored in the database. The knowledge content that is shown the framework is the type of knowledge that is shared by the knowledge owner and knowledge users that is verified by the administrator. The researcher get the idea of the type of knowledge content to be fitted in the knowledge sharing portal by distributing questionnaires as well as having informal interviews with the respondents of the study.

The mode of interaction is referred as time duration in order certain knowledge arrived at knowledge user side. Mode of interaction is divided into two types i.e Asynchronous and Synchronous. Communication is called synchronous if all participants engage in it at the same time, as for instance in a telephone conversation. In asynchronous communication, by contrast, participants are separated by time. An obvious example for it is by email. The mode of interaction influences the selection of knowledge sharing tools besides the other requirements that is discussed previously.

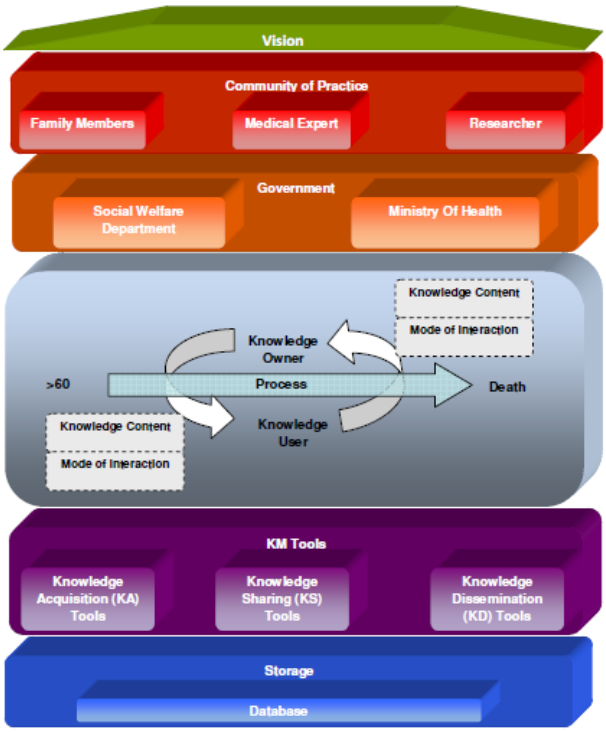


Figure 7 Proposed knowledge sharing framework for senior citizen

KM Tools

Knowledge Acquisition tools can be identified through distribute questionnaire among the respondents. After the questionnaire gathering and analyzing, we can understand what kind of information and knowledge they need. After the problem identify, we need to use one of the ICT application to help senior citizens in overcoming of those problems. The Knowledge Sharing Tools proposed in this situation is to use knowledge sharing portal with features inside it that will help senior citizens to acquire and share their experience, information, and knowledge. For the knowledge dissemination aspect, this process is performed in order to attract people in practicing knowledge sharing. Based on the literatures that were done, knowledge dissemination needs to be done first, in order to make CoPs and related government agencies notice the existence of the knowledge. Thus, this knowledge sharing activity may become as a routine practice.

Storage

Database for the knowledge contents and senior citizens, who are going to participate to share their knowledge.

■7.0 PROPOSED SYSTEM

The development of this Knowledge Sharing Portal (KSP) has taken into consideration all users requirement especially user-friendly criteria. However, the concept basically is based on user and software requirement specification. The main function of the prototype is to allow members to exchange views and ideas that they have on any matters submitted into the portal. The prototype portal allows users to visualize the solution. The user would have a screen for them to input information and interact with.

Following that are the logical sequences that provide them whatever related information. In addition, a good and detailed plan should be implemented before proceeding in implementing a new portal. Research on the portal should also be carried out to avoid false interpretation towards the real one. On the final stage of developing the portal for every module, testing should be done to keep minimizing errors and bugs. The portal development will start off with units, followed by modules and finally the overall portal. Phase-based development will make the portal requirements easy to understand and errors made could easily be detected. This phase involves coding which transform the logical design to specific instructions using the computer.

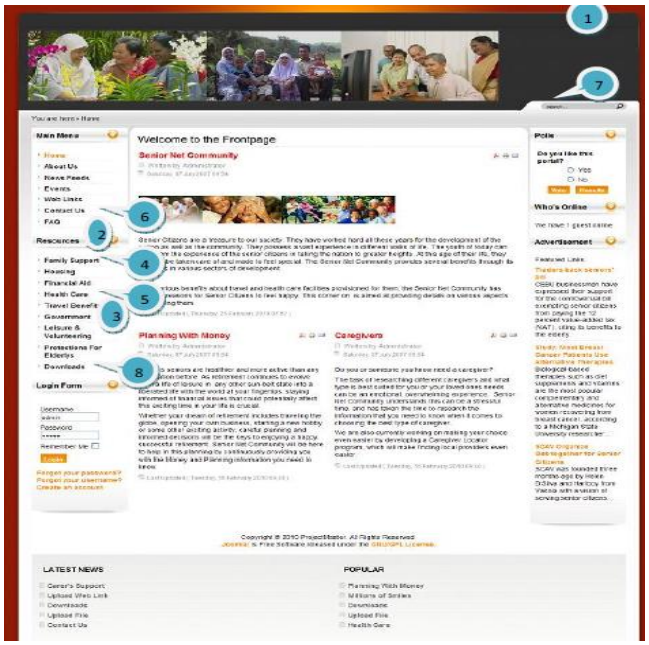


Figure 8 Portal home page

Figure 8 shows the main page of the prototype portal with the features chosen by the respondents of this study. In order to help the users to see the content in larger or smaller font size, the portal has the option of text resizer (1) as shown in the figure below. Useful information on the resources needed by the senior citizens provided to assist the users in getting necessary knowledge is fitted in the resources menu (2) as shown in figure below. The government agencies that provide benefits to senior citizens are shown in (3). As for the community of practice as extracted from the revised framework, the family members (4),

medical experts (5), and researchers (6) contribution in the portal is also shown here. KSP will have link for useful downloads (7) for the senior citizens to have useful resources that are related to them. Lastly, the search engine (8) plays big role for the senior citizens as well as the visitors to search any related information from the overall portal.

7.1 Service Providing Module

Providing Service is the module that has been developed with the intention of providing a platform for the senior citizens and visitors to get information as much as possible about the events and issues that might interest the senior citizens. According to the knowledge framework, community of practice gets best services from the portal.

Consequently, the interaction between the senior citizens or visitors through opening connection channel will improve the satisfaction among the senior citizens and visitors as well as can enhance its services based on the senior citizens/visitors feedback by offering polls and contact illustrated supporting the knowledge framework through placing the resources upon the service provider component. That sequence of ordering shows that the users of portal depend on the users to have the knowledge they need. To categorize the service for senior citizens needs, the portal has three main categories.

First, the Main Menu. Second, is Resources and Third section is providing support services sections. The service providing section is the main part of the portal that is developed to help the senior citizens for knowledge sharing purposes. Service like online chatting, forum as well as document sharing are the main services provided in this portal for the users.

7.2 Document Sharing Module

This module was made for sharing documents that are uploaded by senior citizens. This module can be considered as download documents center for the senior citizens. If user would like to find document, he/she can search for a particular document and download it. The administrator job here is just to check out if documents are valid or not. If administrator find document not valid or not appropriate to be published among the senior citizens, he/she can delete it immediately. Figure 9 show screen shot for the download documents. According to the knowledge sharing framework, the database needs to be accessible for registered senior citizens in order to download or upload documents. Besides that, the author of knowledge sharing framework was right when she mentioned that the storage part should be in the last layer of her framework to indicate that the database includes all knowledge and information transaction among the knowledge owner and knowledge user.

Figure 9 Download documents

8.0 FUTURE WORK

This portal should have integration and adaption with other senior citizens websites. This integration is to share and exchange different features of the system with the other services. For example, senior citizens could query about loans from this portal or ask regarding tax benefits online and so on. As for the content of the portal, it should be available in both English and Bahasa Melayu language. Background color selection as well as text color selection should also be added in the features of the portal to help the users who are visually impaired. If possible, the portal should be available in mobile applications as well. There is suggestion for refining the prototype system further and designing a complete system. It needs more enhancement and regular maintenance so that the information in the system is up to date and free of any bugs as much as possible.

9.0 CONCLUSION

Computers are becoming pervasive throughout society. Since several years, a trend towards an increased distribution of vital information via the Internet can be observed and this trend is unlikely to stop in the near future. With the current work the researcher can understand why older citizens do not use the computer or other ICT technologies. Additionally, some answers are sought as to how individual socioeconomic background determines the likelihood of the technology usage among the older adults. Overall, the analysis done provides a root for the researcher to get preliminary understanding of the problems that are faced by senior citizens when using a computer as well as in identifying the ICT requirements that suits this community. The proposed knowledge sharing framework can be adapted and changes can be done to suit the community of senior citizens. The researcher hopes to look into the criteria of contents in a website especially for the senior citizens and design the guidelines to be followed to be used for the next study. Applying web accessibility for this community of practice should be taken into consideration and further research should be included on this criterion for the next study as well.

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