

A Design of a Reminiscence System for Tacit Knowledge Recall and Transfer

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Abstract. Knowledge transfer is a crucial part of a family firm's succession plan. Knowledge transfer in family firms involves transferring knowledge from a business owner to the younger generation. The process of transferring knowledge in family firms is very challenging because it involves the main source of knowledge who is business owners. The majority of the business owner who are also the founder of the family firm are elderly, whom facing difficulties in recalling their knowledge. This application was developed with the aim to assist business owners in recalling their knowledge using the cue recall technique. Apart from that, it also helps family firms to store the knowledge that has been recalled in a structured way for easy retrieval and use by the younger generation. The mobile application developed should help the business owner in recalling and store their knowledge and promote working flexibility and enhance productivity of the family firms. Successful implementation of the application would help family firms in transferring their knowledge and ensuring the firms' sustainability and competitive advantage in the future.

Keywords: Reminiscence · Family firms · Knowledge recall
Elderly · Knowledge recall system

1 Introduction

In today's world, family firms have been considered as one of the significant elements in the corporate economy. The record of family firm's performance has been proven through their long establishment since decades ago. The successful background of family firms has also been long acknowledged by scholars and practitioners. However, they agree that the reflection of the excellent performance of family firms could be assessed from various angles. Reference [1] stated that, the sustainability of family business is very much dependent on the readiness of the selected successors capabilities in running the business. This would require the successor to have a good knowledge in all aspects of the business. Although some of the knowledge and skills possessed by the successors which is acquired through formal education could be used in many business contexts [2] and enables them to identify business opportunities and implement them [3, 4], some knowledge could only be acquired through years of experience. Reference [5] stated that the successor development process is also closely linked and cannot be parted

with the experience he gained while working with family businesses. It is also crucial for the future successors to have working experience with family firm in order to increase the life expectancy of the family business and also to give a positive impact on the success of the business venture business success [6]. In addition, working experience outside the family business is considered to be a plus point to the successors. By having lots of experience working with other companies and other jobs, the successor is said to have a higher chance of being successful. Hence, it is important for the family business owner to ensure the involvement of the successor in the business operations started as early as possible. This will allow them to learn and understand how to operate the business from the ground and subsequently allow them to acquire the knowledge and experience and later on take over the business and ensure its success [5]. The process of knowledge transfer usually begins immediately after the successor involves in the family business. Apart from that, the main intention of the knowledge transfer process in a family firm is that it must ensure that the knowledge is not only received by the successor, but also the ability to apply the knowledge and skills inherited.

2 Research Background

It has been a long time ago since knowledge has been recognized as a potential source of the asset in an organization. In today's knowledge economy, knowledge has been recognized as one of the most valuable strategic assets that an organization can possess. Apart from that, knowledge also is known to be a significant source of competitive advantage, which empowers an organization to be more innovative and at the same time stay competitive in the market [7, 8]. Knowledge has been defined in many ways, ranging from a social process [9] to an active construct [10]. In addition, reference [11] captured the essence of knowledge concisely when he described it as "know-what", "know-how", "know-why", and "know-who". These types of knowledge include employee talents and skills, managerial systems and routines, experience, insights, values and norms and networks of relationships [7, 12], and accounts for 80% of a firm's valuable knowledge resources. References [15, 16] emphasize the generation of knowledge, the management of knowledge, as well as the transfer of the knowledge from the founder to the successor are important elements in ensuring the intergenerational succession of the family firm will be successful. Although in general, this knowledge could refer to both explicit and tacit forms, this research focused on the nature of knowledge which is primarily tacit.

2.1 Knowledge Transfer in Family Firms

Knowledge originates in the heads of individuals. It was built on the application of information by an individual which then is transformed and developed through personal beliefs, values, education and experience [15]. Many works of literature claimed that 90 percent of knowledge in most organizations is embedded and synthesized in peoples' heads [16, 17]. The creation of tacit knowledge in a family firm may have happened in two circumstances. Firstly, founders of family firms are viewed as entrepreneurs because they possess the ability to endure and tolerate the risks and

failure that they encounter during the creation preservation of the business. This is considered as vital criteria to the accomplishment of the business success together with the capability to initiate, sees and acts on opportunities, lead, persistent, innovate and ability to live with uncertainty. The success of a family firm is often embedded in the firm's founder, who is most likely the entrepreneur who started and developed the firm [18]. Reference [19] stated that there is a substantial evidence that shows that many business decisions by the founders were made based on their own intuition, the feeling that is indescribable and intangible, sometimes referred to as a gut feeling. Reference [19] further described that, when they were asked about the reason lying behind a particular business decision that they made, entrepreneurs frequently express to how "all of the pieces seemed to be there," or "it felt right". This indicates that most of the time, the decision made was based on the entrepreneur's tacit knowledge. Reference [20] in their research stated that family firm's knowledge is based on the founder's idiosyncratic knowledge, firm-specific and often held tacitly. Therefore, the first source of tacit knowledge in a family firm is the founder himself.

Secondly, reference [21] mentioned that the creation of resources in family firms which were generated through the complex interactions between the family members, the family unit and the business itself has made family firms to be rich in tacit resources. The unique pack of these resources were created through these interactions known as the "familiness" of the firms [22]. Reference [21] stated that to ensure the family firms will survive and prosper in the future, the familiness must be preserved throughout the entire succession process and after. Apart from that, tacit knowledge may have existed and often embedded in the business operation of the firms for example in the business processes, the firm's culture, as well as the firm's structures. Thus, many researchers agree that by definition, it is easier to identify and articulate explicit knowledge, hence explicit knowledge is easier to be transferred compared to tacit knowledge [23–25]. In contrast, tacit knowledge is often embedded in the culture, processes and are more customs to the business. Tacit knowledge is not readily available for codification and generational transfer. The tacit knowledge is often detained by the founder and/or other key individuals in the business. This knowledge has significance for the development and maintenance of a firm's competitive advantage and is more important to the family firm than to non-family firms [21].

Managing tacit knowledge is a real challenge for family firms. This is because the nature of tacit knowledge which is often rooted in the mind of the founder and also in the firm's processes and culture, thus not easily identified. Despite these difficulties, due to its importance, many researchers are still encouraged to study the importance of managing and transferring tacit knowledge as part of the firm's succession plan. Reference [18] emphasized that the process of transferring knowledge from the founder to the successor in a family business is critical to the on-going success of the business. Although many family firms who undergoing the succession process may not experience stages as suggested by researchers, the provision of literature and frameworks for the study of family business succession somehow help in the understanding of succession and knowledge transfer in the family business. Based on this, it is concluded that knowledge in a family firm is a key resource in the firm; and intergenerational knowledge transfer process is one of the crucial parts in a family business succession plan.

2.2 Reminiscence and Cued Recall

Before knowledge could be transferred, it needs to be recalled from one's memory and assembled as a story to be passed on. According to [26], recall is the act of retrieving information or events from the past. In most of the time, the act of recall is carried out without having a specific cue or clue to help the person retrieve the information. When a person recalls something, he is actually reminiscing about something he has previously learned or experienced. Reminiscing involve the active use of a cognitive function in human, which tend to decline as we age, thus transferring knowledge from elderly challenges as they struggle to recall their knowledge due to their cognitive decline.

The reminiscing technique could be applied to a group as well as individual. During the reminiscing process, the intrapersonal reminiscence in turned into interpersonal memory interactions where each group members explore and gradually confront and consider specific memories. These memories create the thematic and interactional content of their experience together [26]. Reference [27] suggests that humans need to retrieve, articulate, and disseminate self-narratives from memories which lay in a form of the building blocks of these narratives. Some factor must initiate this process, a component that is called "triggers" or "cue". According to [28], cued recall is the process in which a person is given a list of items to remember and is then tested with the use of cues or guides.

When a person is provided with cues, he has a higher chances to remember the items the list that he cannot recall earlier without the cues. This can also take the form of stimulus-response recall, as when words, pictures and numbers are presented together in a pair and the resulting associations between the two items cues the recall of the second item in the pair [28]. In addition, reference [29] in their project emphasis on small group activities animated by a range of multi-sensory stimuli such as objects, images, sound and tastes to trigger memories. Stories emerging in the small groups, are then shared with the wider group and explored through dramatic improvisation, song, dance, drawing and writing as well as straightforward discussions. It was found that non-verbal exploration of memories and past skills and interest has the effect of activating and lifting the spirits of the participants and offering them ways of engaging with other, thus improve their memory.

3 Methodology

This research adopted the System Development Life Cycle (SDLC) model which consists of five phases, which are analysis, design, development, implementation and evaluation. In the analysis phase, data was collected through interview and observation to understand the knowledge transfer practice in family firms. Apart from that, observations session were also carried out to understand the reminiscence and cued recall process. In the design phase, an interview with an expert was conducted to confirm the technique used in recalling the knowledge used in the application is in accordance with the theory. The results from the expert interview were used to design

the system processes for knowledge recall. The details of how the system works are explained accordingly in the following section of this paper.

4 The Application

This application was developed to provide a platform for business owners to recall and transfer their knowledge. The reminiscence system application was developed on a mobile platform to ensure the mobility and flexibility of the users in recalling their knowledge.

4.1 System Architecture

The application was developed based on the Client-Server architecture. However, due to device constraints, the client can only be any iOS devices such as iPad or iPhone. For the database, MySQL database is used because it is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL). As for the server, the PHP web server is being used. PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language. It is also a free and platform independent server. The PHP web server was found as the most suitable web server to be used because the server component offers a function or service to one or many clients, which initiate requests for any services.

When the client (iOS device) sends a simple request, technically the web server (PHP Web Server) will return a response. However, sometimes the request might contain a more complicated request, for example fetching of data that are stored in the database. When this type of request is received, the web server will access the database server as a client. Once the data in the database is accessed and return to the web server, the web server will return the result back to be read and displayed by the client (iOS device). Figure 1 below depicted the system architecture used in the application development.

4.2 The Application and Its Functions

During the application development, the researcher focus on a few main functions that was believed to be important in the intergenerational knowledge transfer. This includes (1) knowledge recall – the use of cue or trigger items to help elderly in recalling, (2) the capturing and storing of the knowledge, and (3) the retrieval of knowledge by the recipient. Figure 2 below illustrates the menu available in the application. For the purpose of prototyping, a repository that contains knowledge about herbs and its medicinal value was created. It was assumed that only one source is transferring the knowledge for one type of user. Thus, the access given to the recipient is not restricted to any type of knowledge. The details of the application are presented in the following sections.

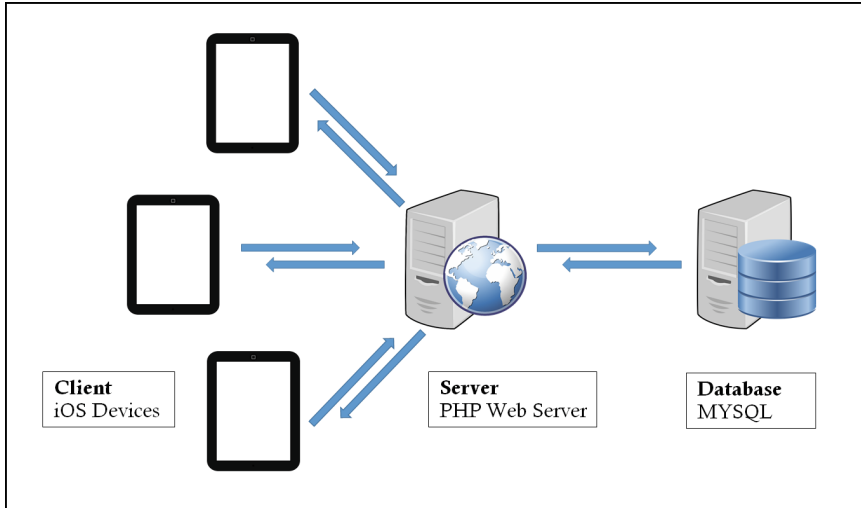


Fig. 1. System architecture

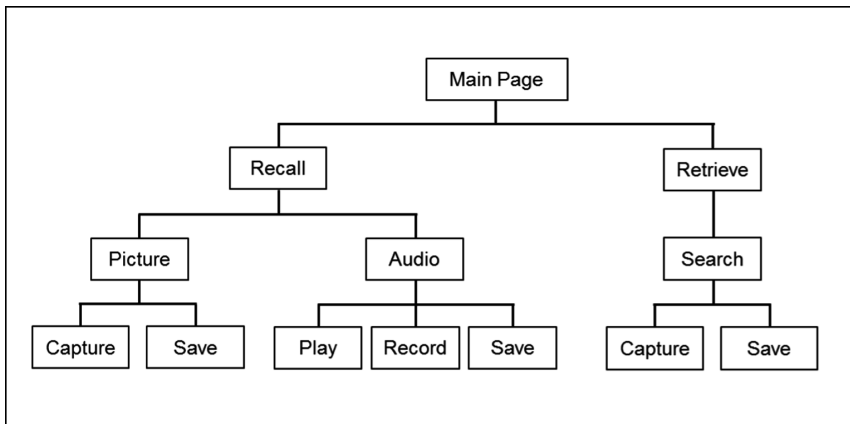


Fig. 2. The menu structure of the system

The Main Page

The application started with the main page which displays the menu where the user can select based on the function he wishes to perform. This application has two main functions, which is “Recall” and “Retrieve” the knowledge. The user can select which function he would like to perform by selecting either one button on the main page. When the user choose either one of the functions from the Main Page, he will be directed to the relevant pages that allow him to further perform the selected function. Figure 3 below shows the sequence diagram for the Main Page.

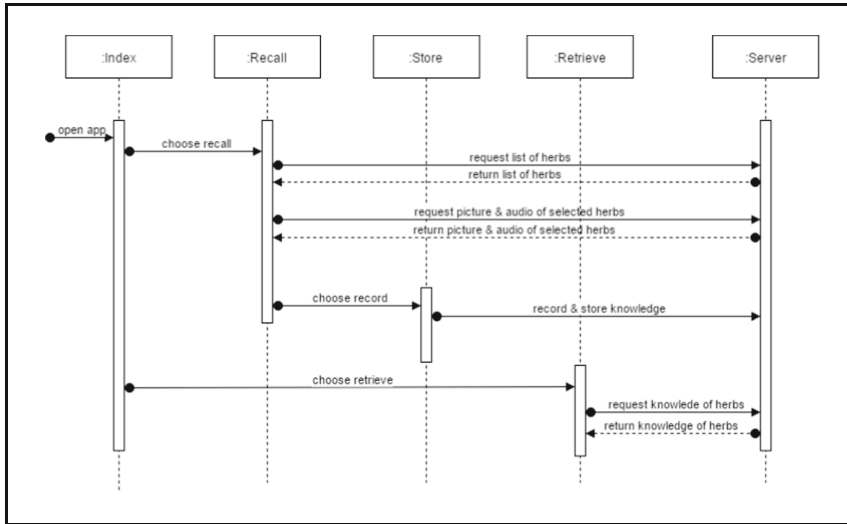


Fig. 3. Main page sequence diagram

The Recall Function

From the main page, the user can select to use the first function, which is the recall function. When the user selects the “Recall” button, he will be directed to the Recall page. This page is divided into two sections, which are “Picture” and “Audio” section. The different sections refer to the use of picture and audio as the trigger or cue item to help the user to recall their knowledge. In the Picture section, first, the page will display a picture which is used to help elderly to recall. At the bottom part of the picture, there are buttons labelled as PREV and NEXT, which allow the user to navigate back and forth through the pictures of various herbs that are stored in the database. When the user views the picture, it acts as a trigger item that helps the user to recall knowledge related to the picture. Apart from that, the user also can listen to the audio related to the picture displayed. The audio also acts as a trigger item to help the user trigger their knowledge about the picture displayed. To listen to the audio, the user can click the button labelled PLAY located at the bottom of the Audio section. Buttons PREV and NEXT allow the user to navigate through the audio files stored in the database. The information at the top of the button displays the audio number that describes the picture. For one picture, there could be more than one audio recorded and submitted by a different person. This shows that the user can collaborate to help each other in the collective recall.

When the user recalls the knowledge, the user presses the REC button and starts to record the knowledge that he recalled. Since the users of this application are the elderly, the researcher finds that it is more suitable to use voice recording rather than text input to record the knowledge. Once he finishes, the user can stop the recording and press the SAVE button to store the file in the database. The use of client-server architecture using mobile technology allows the whole recalling process to be carried out simultaneously by more than one user location at different dispersed places. With this user does not need

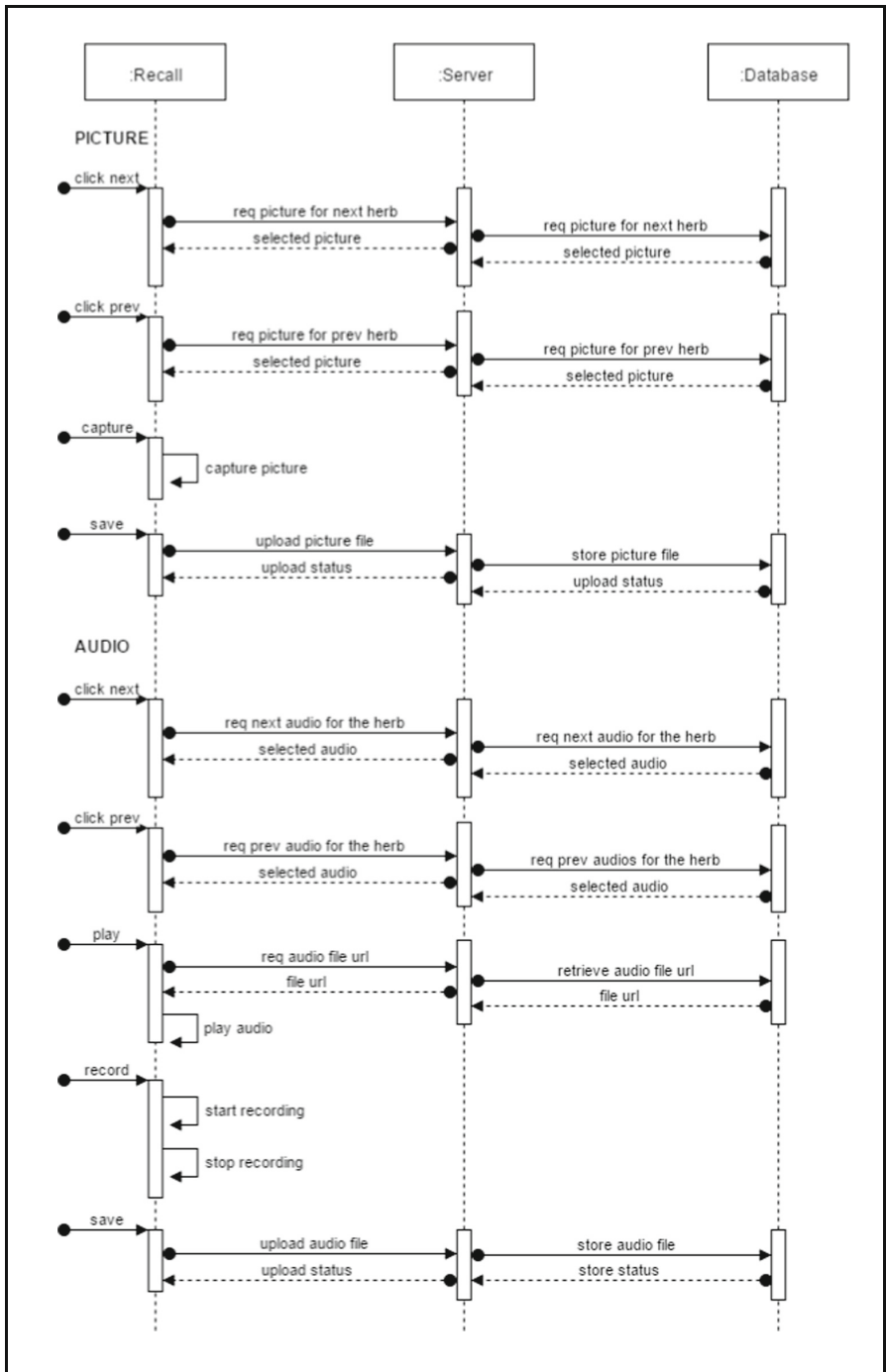


Fig. 4. Sequence diagram for recall function

to be physically together to transfer knowledge. The knowledge that has been stored in the repository can be retrieved by the recipient anytime they need to. Figure 4 below depicted the sequence diagram for the recall page that explains the whole process.

The Retrieve Function

To retrieve the knowledge, the user first selects the “Retrieve” button from the Main Page. When the user selects the “Retrieve” button, he will be directed to the Retrieve page. In this page, two buttons are provided for the user, which are HERBS and MEDICINAL VALUE. This allows users to retrieve knowledge in two perspectives, by the herbs and also by their medicinal value. When the user clicks the HERBS button, he will be directed to the search page. Using the search page, the user can search knowledge about particular herbs by typing the herb’s name in the search box provided. The search results will be shown in a visualization form to allow the user to view all the information related to the herbs easily.

The other button which the MEDICINAL VALUE button works the same way to display the knowledge in terms of the medicinal value of the herbs selected. The use of repository allows the knowledge to be stored and avoid knowledge from lost especially when the elderly retire. The mobile technology used to enable the user to retrieve the knowledge anytime and anywhere. This encourages knowledge to be transferred more efficiently and effectively. Figure 5 below depicted the sequence diagram for the Retrieve page that explains the whole process.

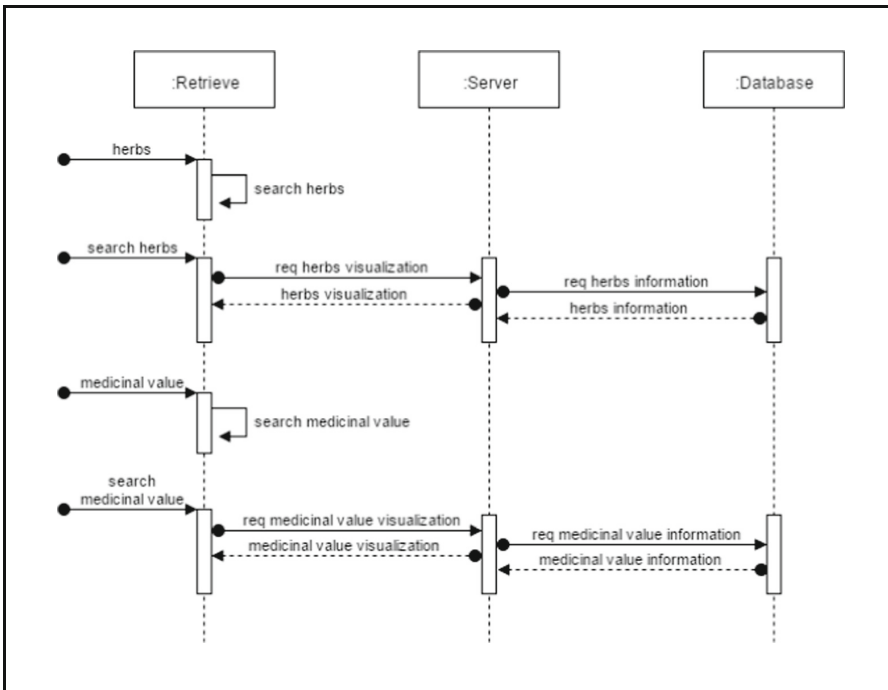


Fig. 5. Sequence diagram for retrieve function

5 Conclusion

Tacit knowledge created and owned by an individual need to be managed and transferred to others for the knowledge to be continually used. In a knowledge-centred organization like a family firm, transferring knowledge to its business successor is crucial in ensuring the continuity and sustainability of the business. The development of this mobile applications contributes to the practice of knowledge transfer in family firm as it provides a technological platform to facilitate and assist family firms in transferring their valuable knowledge and at the same time address the issues of difficulties in knowledge recall faced by the business owners. The development of the mobile application also promotes mobility and flexibility to knowledge recall and knowledge transfer in the family firm. Thus, it is hoped that the development of the reminiscence system could help the family firms to transfer their knowledge more efficiently and ensure the sustainability of their business in the future.

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