Towards a Model for Online Self-Service Telecommunication Service Provisioning

Sherwin Barlow, Janet Wesson and Lester Cowley
Department of Computing Sciences
Nelson Mandela Metropolitan University, P.O. Box 77000, Port Elizabeth 6031
Tel: +27 41 5042323, Fax: +27 5042831
email: {Sherwin.Barlow, Janet.Wesson, Lester.Cowley}@nmmu.ac.za

Abstract-The telecommunication industry is growing rapidly due to increasing numbers of people using telecommunication services, such as the Internet. The telecommunication service provisioning market is becoming saturated as more companies providing similar services are entering the market. Companies are under pressure and need to implement techniques to retain and attract customers. Current systems do not provide effective self-service provisioning for all services offered. Customers are required to have knowledge about services when purchasing a service or have to rely on the assistance of a company expert. This makes the decision making process for customers difficult. The aim of this research is to identify problems in telecommunication service provisioning and propose a model to assist in online self-service telecommunication service provisioning by examining related approaches used to provide customer support, for example expert and recommender systems.

Index Terms- Self-service telecommunication service provisioning, expert systems, recommender systems

I. INTRODUCTION

Self-service provisioning allows customers of a company to purchase a service (defined as the work done by a company for a customer) and also allows the exchange of information without physically interacting with a company representative [1]. A telecommunication service enables users to transfer information through a telecommunication system [2]. Self-service provisioning in telecommunication companies is important as it can improve customer satisfaction, acquisition and decrease business costs by providing customers with a facility to purchase services [3]. Self-service provisioning in telecommunication is, however, not widely available at present and this creates difficulty for companies in attracting and retaining customers [4]. Limited research has been done on improving self-service telecommunications service provisioning [5]. The objective of this paper is to investigate the current situation in telecommunication service provisioning and to describe two approaches that could be used to improve telecommunication service provisioning (expert systems and recommender systems).

Related work on telecommunication service provisioning, expert systems and recommender systems will be discussed in Section II. The requirements for a self-service provisioning system will be discussed in Section III. Conclusions and future work will be discussed in Section IV.

II. RELATED WORK

A. Telecommunication service provisioning

Telecommunication services allow users to communicate and exchange information with other users through voice telephony, fax and the Internet. The Internet is used to communicate via social networks and email [5]. Telecommunication services have been classified in a model developed by Jun et al. [6] according to user types. According to this model, there are six different user types but this research is limited to small to medium enterprises (SMEs) and large enterprises (LEs), as these enterprises are important users of telecommunication services. The services used are conversation, messages, inspection, control and data transfer services. The need for self-service provisioning in the telecommunication industry is increasing as other industries have already implemented this technology due to its positive impact on customer relationships [7]. Telecommunication companies generally provide very limited facilities for customers to purchase services online, in terms of alphabetical lists of products and services available [8, 9]. New customers have limited knowledge about services and require expert assistance before purchasing services online as no online support is provided. Customers find it difficult to communicate with sales representatives about telecommunication services as customer knowledge about services is limited. This can lead to new customers having an unsatisfactory experience as they are required to undergo a lengthy process in order to purchase the services. There is thus a need to provide effective online support for service selection and purchase. Two systems commonly used in e-commerce are expert and recommender systems and these could possibly be used to provide online support for self-service telecommunication service provisioning. These systems are reviewed in the next section.

B. Expert systems

An expert system is a knowledge base system which assists in problem solving and decision making using knowledge of its tasks and logic rules [10]. An expert system emulates the interaction that a customer has with a business expert when making a purchasing decision. Expert systems can be used in the self-service provisioning process to assist users in purchasing decisions. Expert systems provide consistent decision making, but cannot quickly adapt to a changing environment [10].

C. Recommender systems

A recommender system is commonly used to assist users in decision making while interacting with large web-based
information spaces [11,12]. A recommender system can improve service provisioning quality and customer satisfaction as it uses information provided by customers to predict customer preferences and suggest products [11,12]. Recommender systems provide many opportunities for businesses to improve customer satisfaction, loyalty and trust [13]. Recommender systems can be used for self-service provisioning to assist customers in purchasing decisions and improve customer satisfaction. A recommender system is less effective, however, if it does not contain enough decision making data. Further research is required to identify a more appropriate approach for self-service telecommunication provisioning.

III. REQUIREMENTS FOR SELF-SERVICE TELECOMMUNICATION SERVICE PROVISIONING

A. Requirements for self-service systems

Self-service technology can enhance business’s relationships with customers as it allows customers to experience a different form of contact. This is accomplished by allowing customers to interact with the business irrespective of the customers’ location [7]. An online self-service system is required to automate the purchasing process and provide expert assistance to a customer. A self-service system needs to provide enough information about a product or service to reduce the time and effort a customer spends on finding a suitable product or service. Companies are required to provide expert knowledge to customers when assisting them with a purchasing decision [3]

B. Research methods

The main requirements of an online self-service telecommunication system identified in the previous section are to provide a customer with a sufficient amount of information about products and services and to assist customers during the purchasing process, by suggesting appropriate services to a customer. The main objective of this research is to develop a model which can be used to support self-service telecommunication service provisioning process. The existing approaches identified in the related work section will be investigated using a literature review to identify which can best support self-service provisioning in the telecommunication industry.

C. Field study

Interviews and observations will be conducted with a major South African telecommunications service provider to clarify the current service provisioning process. This information will then be compared to the service provisioning processes identified in literature. The objective of the study is to determine current problems experienced in the self-service provisioning process and to develop a set of requirements for the self-service telecommunication service provisioning process from the qualitative data obtained.

IV. CONCLUSION AND FUTURE WORK

This paper has identified the problems associated with telecommunication self-service provisioning and highlighted the need for an improved online self-service provisioning system in the telecommunication industry. The envisaged contribution of this research is the development of a model that can be used to support online self-service telecommunication provisioning.

The next phase of this research will involve requirements analysis. The existing approaches identified in Section II will then be researched, and existing models reviewed in order to develop a modified model which supports online self-service telecommunication service provisioning. A prototype will then be developed based on the model and evaluated to determine the effectiveness, efficiency and satisfaction of the model for self-service telecommunication service provisioning.

REFERENCES


Sherwin Barlow received his BSc honours degree in 2010 from Nelson Mandela Metropolitan University. He is presently studying towards his Master of Science degree in Computing Sciences at the same institution.