Chapter 12

Architecture for the Reengineering of Legacy Point of Sale Terminals through Web Services for the Reduction of Transaction Fees

Erik-Jan Monshouwer
Yacht, The Netherlands

Raul Valverde
Concordia University, Canada

ABSTRACT

With the conventional legacy POS payment transaction method, vendors are bound to a payment institute in their region and can only use relatively expensive dedicated or slow dial-up lines to their financial institute. This chapter covers the work to produce an architecture that shows how to reengineer traditional point of sales terminal payments in order to adapt these for payment over the Internet through Web services. With the use of Web services for payment transactions, vendors will get more freedom to choose their provider and the services they take without having to throw away their legacy applications. Given the globalization of the economy, vendors can negotiate services and fees with payment providers all over the world. Literature research and prototype tests and evaluation in this project show that transactions fees and performance of POS terminal payments transactions through Web services can be competitive to conventional payment transactions methods and create flexibility for vendors POS terminal application. Vendor’s available Internet connections and the Web services standards in the market can be used for payment transactions. With Web services, the system can be created and changed relatively quickly and simply if the right skills are available.

DOI: 10.4018/978-1-4666-0155-0.ch012
1. INTRODUCTION

This research delivers a web services architecture for the integration of legacy point of sale (POS) terminals with financial institutions. Businesses are interested in the freedom that this may offer because vendors can select payment providers from all over the world to find the best fee and services.

With the conventional legacy POS payment transaction method, vendors are bound to a payment institute in their region and can only use relatively expensive dedicated or slow dial-up lines to their financial institute. To design a web service, structure is needed to implement and support the system. For this, an architecture will be provided in this chapter. Different sources describe the needs of business for integration and the use of an architecture. OMG (2009) describes the needs in a RFI (Request for Information), especially the endorsements in the document. Via the RFI, OMG asks their working group what they like to see in the standard architecture.

The next section will describe the research methodology of the project. After, the literature review describes the conventionally payment processing method, web services and architecture frameworks with significant attention. Following good information systems practices, this paper will describe the architecture and the prototype with system’s specification and design, implementation, test and evaluation. The last section expresses the conclusions and future research.

2. RESEARCH METHODOLOGY

Various approaches can be used for the research. The advantages of each methodology depend on the environment of the application and organization (different domain and focus). A variety of research methods are used in most information system research projects. The information system research approach used in this project is based on the method described by Burstein and Gregor (1999) because it presents a group of research methods. They demonstrated the importance of recognizing the “System Development” approach and relevant criteria for guiding the validity and worth of such work. Following the “System Development” approach form Burstein and Gregor (1999), Figure 1 (Nunamaker et al.1990, cited by Burstein et al. 1999) is used.

This form of research can be regarded as an action research which is suitable for this project because “System Development” recognizes other research fields next to system development, supports rapidly changing environments, the use of the prototype and the natural way of approach. The term “action research” is used because the researcher is an active participant in the SD process. Burstein and Gregor (1999) point out that the result of action research is usually associated