Voice-over-IP – Next Generation Communication Infrastructure for Financial Institutions?

IN THE LIGHT OF RECENT DEVELOPMENTS WITHIN THE VOICE-OVER-IP DOMAIN FINANCIAL INSTITUTIONS SHOULD CONSIDER THE FURTHER DEVELOPMENT OF THEIR COMMUNICATION INFRASTRUCTURES TO INCORPORATE FLEXIBLE, INTELLIGENT, AND COST-SAVING SOLUTIONS OFFERED BY VOICE-OVER-IP TECHNOLOGY.

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Imagine the scenario where a financial services adviser is contacted by a customer in order to assist him with some financial transactions. While they still use the "traditional" voice communication channel telephone, with an integrated communication technology their interaction can be enhanced simultaneously by various collaboration tools (e.g. a multimedia whiteboard). Further, through the identification of the customer by the callerID and subject of customer´s question all the relevant customer data can be instantly made available to the adviser. The collaboration tools allow the visualization of information supported by joint interaction possibilities and even a live video stream. In addition, account data and documents can be shared to facilitate an effective discussion and highlight the most crucial points as is the case in a face-to-face meeting. The different investment options can be easily illustrated by the use

of various standard software programs and both, the adviser and customer, are able to work interactively and compare different accounts graphically. For example, should the customer be interested in purchasing shares, the whiteboard is able to display the latest quotes. Furthermore, different stocks can also be selected and further information can be presented; the customer is thus able to evaluate the various investment possibilities and make an informed decision.

In the described scenario the bank interacts with the customer through integrated communication channels with the use of video conferencing, slide presentations, interactive software and internet resources (as shown in Figure 1). This integration of different technologies provides new computer infrastructure services and possibilities for better customer relationship management.

At present the different communication channels (e.g. mobile and fixed phone lines, faxes, emails, video conferencing, instant messaging systems, and other collaborative systems) are separated with only little integration possibilities. This is reflected in the division of the enterprise network into a separate telecommunication infrastructure (represented by existing telephone (voice) communication) and a data communication infrastructure (represented by Internet e.g. web, email, and Intranet applications). However, in the last decade it has become feasible to integrate these two worlds and make the above scenario become reality. This is possible by using Voice-over-IP (VoIP) technology (also referred to as Internet telephony or IP telephony). The objective is to use the Internet as the transmission medium for voice as well as data using only one network, the Internet, rather than the traditional telephone network, also called Public Switched Telephone Network

(PSTN). However, the VoIP users are of course able to communicate with normal PSTN users. At the transmission from PSTN to VoIP a gateway converts the analog signal (voice) to a digital signal (data). The digital data is then assembled into the packets, which are transmitted on the data network using Internet protocols.

In this report we describe the main advantages but also shortcomings of the innovative VoIP technology. An overview is provided of the research work we have carried out to support the broader deployment of this technology by enabling the interoperation of two different VoIP standards (viz. SIP and H323). This is also a measure of protecting technology investments as the risk of incompatibility is eliminated.

Using VoIP technology a number of advantages have been identified such as cost reduction, simplification, and unified message support,
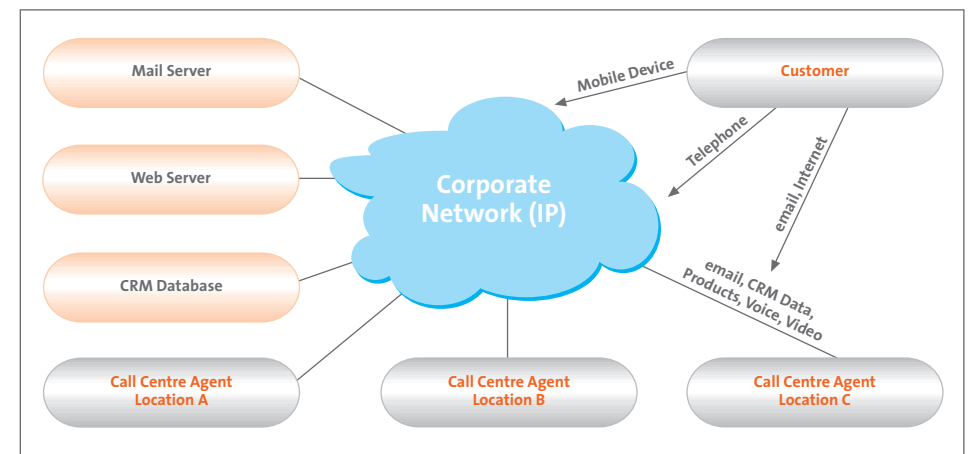

Figure 1: Integration of communication technologies

consolidation, and potentials for developing new services and applications based on the integration of voice and data traffic.

Cost reduction

With VoIP cost reduction can be realised by placing all communication traffic (voice, video, and data) over the same infrastructure using a single integrated platform. The communication costs (which in the case of traditional long-distance calls are charged by minute and greatly vary depending on called country) are within a VoIP infrastructure comparable to a local call. The only billing issue in the case of VoIP is the one between the company and the local Internet Service provider (ISP). Another important aspect is the sharing of equipment and administration costs by eliminating the complexity of multiple networks.

According to Distributed Networking Associates over 85% of enterprises either already have VoIP or plan to install a VoIP system. By 2007, about 19% of all business calls will be made through a VoIP network.

Simplification of Communication and Unified Message Support

With the integration of both networks the communication infrastructure allows more standardization. In large corporations the number of communication channels varies and therefore generate a large overhead. Thus, their integration can become crucial for the organizational success. Commonly, each form of messaging requires separate storage, access, and manage-ment (telephones, mobile phones, faxes, emails). The goal of a unified messaging system is to eliminate the boundaries across these different forms of messaging. The vision is to enable the user to access any type of message from a number of devices in different types of networks so the following scenarios become possible:

- Using a PC to retrieve a voice message left on a mailbox
- Converting to text and reading the voice message
- Using a telephone to retrieve an email message or fax message
- Using a mobile phone to read a voice message as SMS message

While some of these scenarios still remain at a research stage, a large number of scenarios have already been realised, e.g. voice mail can be forwarded as an attachment of an email and the system can decide about the way to deliver the message to the user.

Thus, the deployment of VoIP provides possibilities for implementing a unified messaging system within the same enterprise as the boundaries between voice and data are not there anymore.

Problem Space and Research Work

In order to realise the potential advantages of VoIP, however, a seamless integration within a common communication infrastructure is key. A major issue is that there are two competing standards. The objective of our research was to overcome the problem of interoperability of these different standards. This is not just a technical problem but also an economical issue since missing interoperability of different standards results in uncertainty and represents an investment risk.

The VoIP standard landscape is divided into two different standards for signalling, viz. H.323, and the Session Initialization Protocol (SIP). H.323 was standardised by the International Telecommunications Union (ITU) and describes how multimedia communications occur among devices, network equipment, and services. This standard mainly focuses on telephone functionality and lacks some of the rich feature functionality for supporting multimedia systems. Another established standard is the SIP, standardised by the Internet Engineering Task Force (IETF), which follows an open and more multimedia centred approach.

Our research focused on integrating both worlds. This includes the creation of test-beds to simulate and evaluate the two standard's functionality and to propose a solution for their interoperability.

In summary the research addresses the two major questions:

1) What are appropriate mechanisms to provide cross-domain and transparent usage of comprehensive services in current and future heterogeneous IP Telephony environments?

2) How can these mechanisms be designed and implemented in an efficient and reproducible way that leads to good system quality, scalability, and extensibility?

The objective of this work was to understand the diversity and its implications on the deployment of present and future architectures. The classification in Figure 2 gives an overview of the involved technical and non-technical aspects.

In order to achieve the goal of integrating both worlds, a detailed evaluation of both standards was necessary. Subsequently, we developed a software solution to enable the integration and interoperability of different standards as well as the underlying technology (Figure 3) while maintaining their independency. Apart from a working prototype the result of this work is also a detailed technical analysis and requirements catalogue of VoIP technology, devices, and its application.

Summary

In summary it can be said that VoIP enables integrated communication to support scenarios as the one given above. It can have positive effects with respect to communication cost as well as in relation to customer services. However, in order to realise these advantages the new technology has to be stable, robust, error-free, and secure in its operation. The systems must perform at a carrier-grade of service and interoperate with numerous compo-
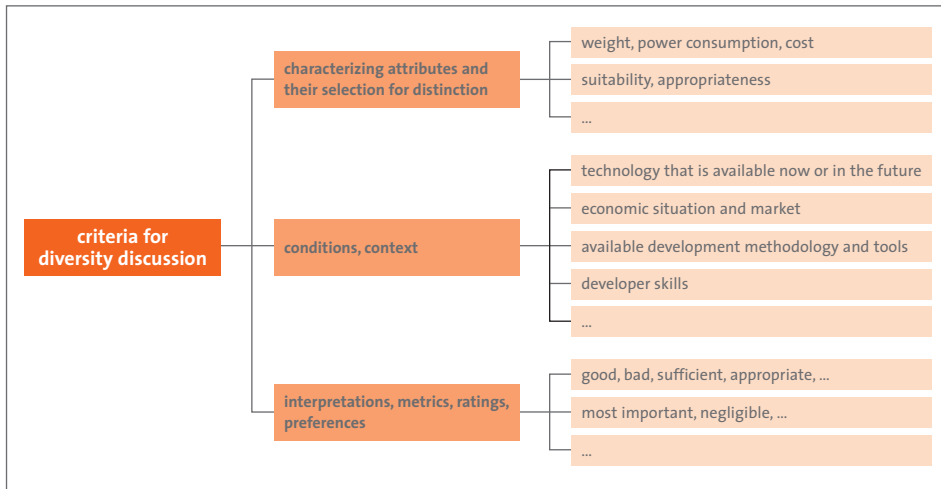
Figure 2: Heterogeneity aspects

nents provided by different vendors. Today's VoIP services are on the way of achieving this. The interoperability issue can also be overcome (as shown through our research). However, in order to migrate from existing infrastructures to an integrated communication technology several points have to be considered. Firstly, a detailed analysis of the existing communication infrastructure within a financial institution is required. Secondly, quality of service (QoS) has to be ensured within the IP network. Thirdly, the design should be future-proof to provide extendibility and allow for the integration of new and customised services. Last but not least a feasible roll-out road-map is crucial for the success of such an undertaking.
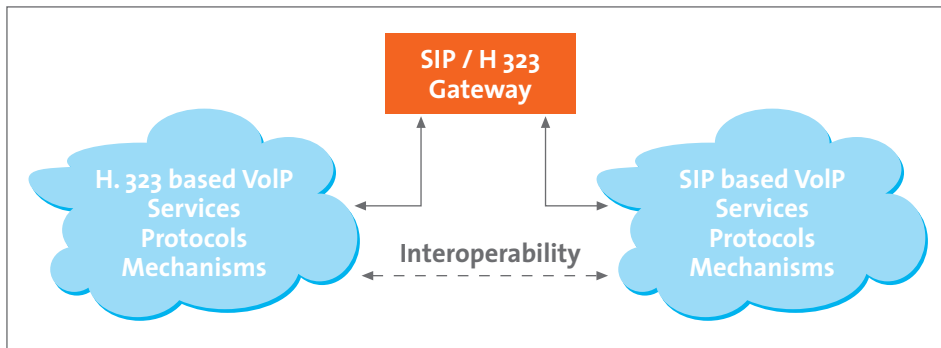

Figure 3: Gateway for interoperability of SIP and H.323 protocols

Evaluating the Impact of the Online Sales Channel on Customer Profitability in the Financial Services Industry

MULTI-CHANNEL STRATEGIES OFFER OPPORTUNITIES TO BOOST A BANK'S PROFITABILITY

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Problem Definition

So far only few studies exist which have evaluated the performance of online sales channels. These studies have all used a simple mean comparison between the average profitability of customers using the offline or online channel. The result of these studies was that online customers are more profitable than offline customers.

Based on these findings sales channel managers concluded that customers become more profitable as soon as they start using the online channel.

They therefore suggested to foster the development of the online channel and to migrate as many customers as possible to the online channel in order to increase the overall profitability of the customer base.

The problem with these simple profitability comparisons is that they neglect one very important question: where do the profitability differences really come from?

These studies simply inferred that the higher average profitability of online customers is due to the impact of the online channel. But this assumption might be wrong and lead to erroneous channel management strategies and to inefficient resource allocation. The resulting question therefore has to be whether online customers are more profitable because they started to use the online channel or whether they have always been the more profitable customers?

Aim of the Article

This article will explore two possible explanations for the profitability differences, which have contrasting strategic implications for the management of multiple sales channels: (1) a profitability increase due to the usage of the online channel (channel effect) or (2) self-selection of profitable customers towards the online channel (self-selection effect) (Figure 1).

A channel effect is present if customers become