

Information Systems and Electronic Communications in Logistics Management

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ABSTRACT

Telecommunications and Networking Technologies have enjoyed massive investments from the industry and government – resulting into an unparalleled rapid growth in the transmission of voice, video, and data over wired and wireless media. In spite of the advancements made, telecommunications and networking had experienced security problems which had led to the development of various approaches to protect information. This paper proposes to present trends in telecommunications and networking technologies. In addition, it will discuss major applications in Logistics Management.

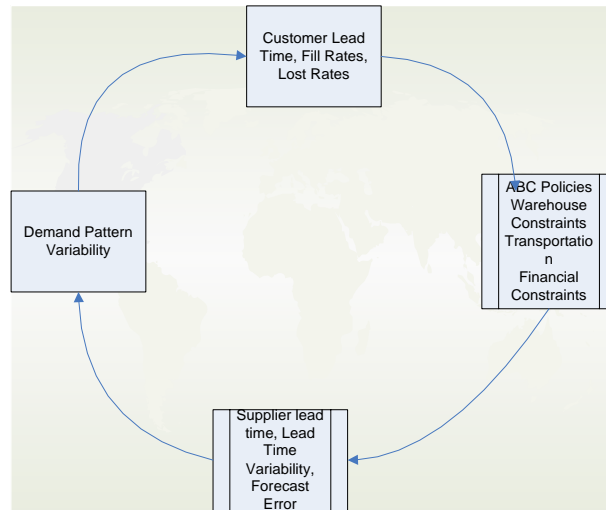
INTRODUCTION

In the evolution of information systems and communication technologies (ICT), the Internet has played a primary role in the explosive growth of the information systems logistics applications [3]. New innovative application such as Voice over IP (VoIP) has played disruptive role to many telecommunication firms' business models that depended on public switched telephone networks (PSTN). The constant reduction of costs for hardware, software, and operating costs have made VoIP, IPTV, videoconferencing, IP multimedia systems as technology of choice to many business including the logistics industry [2]. Additionally new Intelligent Multimedia Knowledge Applications (IMKA) [1] provides new techniques in discovering knowledge from these rich multi-media tools. Both perceptual and semantic multimedia contents are being developed for all types of applications including in logistics operations. Efficient techniques in data mining of these contents are constantly developed. This brief paper will try to ponder on issues related to VoIP and IPTV uses in logistics and the security infrastructure vulnerability and strategies to mitigate such threats.

BACKGROUND

For many decades PSTN has played the role as the backbone for reliable communication technology for many organizations. However, PSTN is now a matured declining technology with the advent of cellular telephony and VoIP. VoIP as a growth technology has not yet attained the technological maturity in

terms of quality, security, and compatibility compared to PSTN. VoIP's infrastructure is based on the Internet and is vulnerable to security threats.



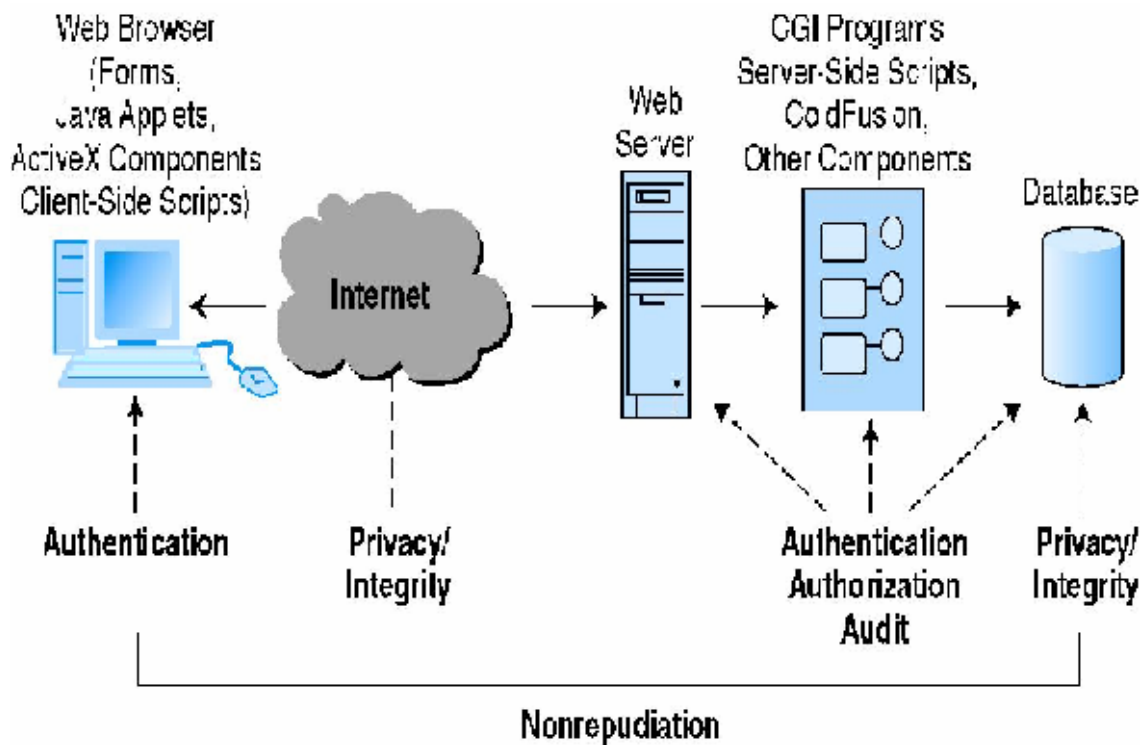
**Adapted from APICS, Production and Inventory Management Journal Vol. 1, No. 1, 1999.*

Wireless cellular telephony with text, video, and voice features is spreading and is being adapted quickly because of the cost and strategic advantages in quickly putting these infrastructures as compared to old online cable based connections of PSTN. Internet based voice applications are becoming a strategic competitive tools in being integrated for electronic commerce such as business to business (B2B), business to commerce (B2C), business to government (B2G), customer relations management (CRM), and logistics applications with features of converting voice into text and text to voice [6, pg 563, 2006] . These types of systems are useful in finding information easily as they are searchable for text based information. Logistics related applications can integrate such features to make the system more effective and can also add language translations capacity that can include global related logistics when the language of operations is different. Intelligent Multimedia Knowledge Application (IMKA) represents the effort to search knowledge from multimedia contents in voice, video, static pictures, and text [2, 4]. It is a promising area that can advance the formation of knowledge from and help business run their operations efficiently.

SECURITY ISSUES in TELECOMMUNICATION

Security is a broad problem in information technology including telecommunication applications. Major security issues in logistics applications include: Authentication, authorization, auditing, privacy, integrity, availability, and non repudiation. The schematic relationships of these factors are shown in Figure 1 [7].

Figure 1 Security Issue in a Network



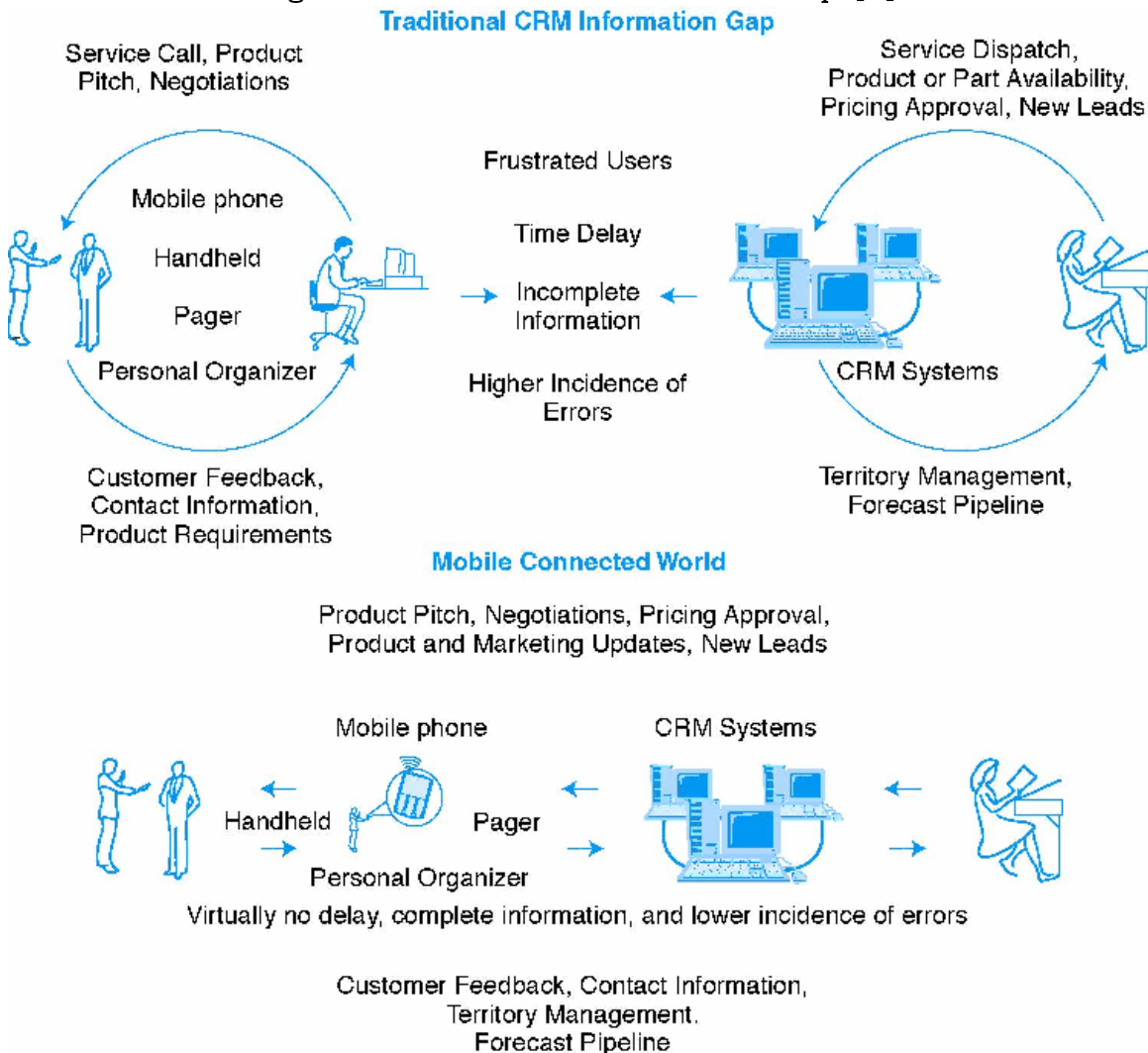
Adapted Scambray, J. e al. Hacking Exposed 2nd New York: McGraw Hill, 2000

The discussion that follows will focus on security issues to VoIP only. Telecommunication infrastructure include hardware, software, supporting services such as Transmission Control Protocol (TCP), Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS), Internet Protocol (IP) and VoIP protocols [1] . Any of these protocols can be maliciously attacked to disrupt the system by compromising the authentication, privacy or simply make the server unavailable by overwhelming with bogus page requests. For example, one recent common application that is widely being used is the VoIP networks. The attacks on VoIP can range from disruption, malicious attacks to degrade its integrity, spamming and eavesdropping. Any or all of these disruptions can make VoIp ineffective, since Internet telephone connectivity should be instantaneous to compete with switched telephone network. A few milliseconds delay in the connection can heavily degrade the suitability of using VoIP or IPTV for voice or video supported communications. Quality of service (QoS) and reliability of these systems is in the order of 99.999 percent. System wide strategies to minimize any sort of disruptions have to be developed, if Void is to be the choice of technology for customers and compete with legacy systems.

FUTURE TRENDS

The telecommunication community is constantly looking for ways to develop new technology that will allow the integration of multimedia contents and develop tools for example, sensor generated data such as from GPS, RFID and other telemetric sources, Intelligent Multimedia Knowledge Application (IMKA), that search knowledge from multimedia contents. This is a very difficult problem since voice, video, and other similar content media are not easily searchable their original contents based on a specific data or information as it would to text based. Future research in this rich field is to incorporate multimedia contents from different sources and use context to improve application performance of logistics and supply chain information exchanges in the network [5]. New application on the Internet provides voice to text and text to voice conversion. This medium will enhance in information search tremendously [6].

Figure 2 Traditional CRM Information Gap*[6]



- Adapted from Turban pg. 564

Current trends as shown in Figure 3, is to connect logistics application, CRM, customers, manufacturing, sales force marketing and demand estimates using mobile connected tools. The mobile phone, hand held RFI readers, palm systems, personal organizers, pagers, etc., are directly connected with the CRM with virtually no delay. These efficiencies bring complete and accurate information in real-time to make necessary inventory and manufacturing schedules adjustments. Older systems were not accurate and speedy due to the necessity to re-enter data at a later time because the CRM system was not compatible or not seamlessly integrated with the various productivity devices such as hand held organizers, pagers and other devices.

CONCLUSION

This paper briefly touched issues related to telecommunication applications specifically VoIP use in logistics and supply chain and associated risks in security loopholes. Applications that are easily hacked and disrupted are not only risky to the organization but may increase its liability to customers whose personal information was compromised. Recent examples that made headlines such as hacking data bases with millions of credit cards account information, Veterans Affairs personnel social security numbers and other personal information, make the security threats of VoIP based systems more daunting. Software designers should make great efforts to mitigate and control such threats if VoiP technology is to be embraced for sensitive business applications such as logistics.

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