

A Brief Study of an Evolution of PBX Phone Systems: From Manual Operators to VoIP Technology

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Abstract: *Private Branch Exchange (PBX) phone systems have come a long way from the days of manual operators, and today's Voice over Internet Protocol (VoIP) technology is a marvel of modern technology. The history of PBX systems is outlined in this article, starting with the introduction of Private Automatic Branch Exchanges (PABX) in the 1960s. It emphasizes the shift in the 1980s from large, operator-dependent systems to automated and portable electronic PBXs. With capabilities like data integration and remote accessibility, VoIP technology was integrated in the late 1990s, transforming commercial communication. The adaptability and affordability of VoIP in today's commercial communication systems are advantages.*

Keywords: PBX phone system, VoIP technology, telecommunication, innovation, telephone operators.

I. INTRODUCTION

When switchboard operators manually operated business or hotels switchboards utilizing cord circuits, the name "PBX" first appeared. The abbreviation private automatic branch exchange (PABX) and private manual branch exchange (PMBX) distinguished them as automated electromechanical switches and subsequently electronic switching technologies eventually succeeded the manual systems. The term "solid-state digital systems" (also known as "EPABXs") has been used to describe electronic private automatic branch exchanges. The term "PBX" is by far the most well-known as of 2021. The acronym is currently used to refer to all kind of sophisticated internal telephone switching systems. (Wikipedia)

Since the early 1960s, private branch exchange (PBX) phone systems have been in use. Large and costly, the initial PBX phone systems needed a specialized operator to handle call management. Usually, only major hotels or organizations used these early systems. PBX phone systems have become more affordable and smaller over time, increasing their accessibility for small and medium-sized businesses/hotels. The 1980s saw the advent of computerized PBX phone systems, which significantly lowered the price and complexity of these systems while improving their use.

Private Automatic Branch Exchanges (PABX) were the initial PBX exchanges, introduced in the 1960s. Hotels could make internal calls using early PABX systems without utilizing an existing phone line. As a result, there was no longer a requirement for a receptionist to transfer internal calls between different network extensions. Additionally, by removing internal traffic from outside lines, this technique reduced the number of lines that firms required.

The original telephone systems known as PBXs were bulky and needed a separate operator. The operator had to manually route calls through the system, which took time and frequently resulted in errors. Even yet, these early systems were far superior to the prior approach of making internal and external calls over telephone lines.



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PABX systems got smaller as they gained in popularity. Electronic switching took the place of the bulky manual boards found in early PABX systems during the 1970s. The systems become more compact and effective as a result. The 1980s also saw the introduction of automated systems, which reduced the size and cost of these systems.

By the 1990s, the term Private Branch Exchange (PBX), which is still in use today, has started to be used to describe PABX telephone systems. By the late 1990s, PBX phone systems were standard with capabilities including interactive voice response, data integration, and auto attendants. Ideas about utilizing hosted providers and packet switching technology started to gain traction. These would be the forerunners of the Voice over Internet Protocol (VoIP) systems we use today. When early users of VoIP ideas started to realize the benefits of applying the same approach for voice transmissions, packet switching technology had been in use for some time for data transfer. VoIP made it possible for hotels to link their Wide Area Network (WAN) and Local Area Network (LAN) using a single internet connection to transfer data and voice.



VoIP technology offers organizations a plethora of advantages over traditional PBX phone systems, including the ability to use a single internet connection for both data and voice communications. With an internet connection, they could now make and receive calls from anywhere in the globe, and VoIP solutions offered many of the features that were previously exclusive to pricey PBX phone systems. hotels now have a wide range of options when it comes to choosing the finest VoIP service. Nowadays, practically all business phone systems are VoIP-based, and companies can buy customized on-premises systems or a range of service-oriented packages from hosted providers. (Wheelhouse, 2022)

1.1 Objectives

To understand evolution of communication system shift in business or hotels using PBX to VoIP

II. LITERATURE REVIEW

The author claims that integrating Artificial Intelligence (AI) technology into Private Branch Exchange (PBX) has significantly improved the customer experience and has the power to bring employees of any firm together. The usage

of an autonomous PBX integrated with a Virtual Assistant (VA), which communicates with the PBX directly by speech and in many languages without the need for keyboards, is one technological application used to improve the customer experience in a call centre. When a customer calls, the Interactive Voice Response (IVR) module connects them to an operator or facilitates automatic processing. With the aid of this technology, organizations can efficiently handle hundreds of calls each day and launch customer care campaigns that swiftly reach a large number of users. **(Nguyen, 2023)**

A Wireless EPABX is a variation of a PBX (Private Branch Exchange), a private telephone network used within an organization, according to the article. It enables free internal calls between users and provides numerous lines for contact with the outside world. GSM SIMs provide connectivity by connecting it to the closest mobile base station. It is a flexible platform that may be used to build value-added services like Interactive Voice Response (IVR). **(Services, 2022)**

On the mitel website, an article describes PBX. A Private Branch eXchange, sometimes known as a PBX, is a hardware device that manages call switching and routing between a business site and the telephone network. The word "PBX" comes from how switchboard operators interact with the public switched telephone network (PSTN); it was originally not a physical object but rather a person.

Even though they can connect to the PSTN, the term "private" indicates that they are apart from it. "Branch" indicates how a PBX integrates into a PSTN: end points that connect to it and handle smaller amounts of traffic are known as branches, and the primary communication circuits are referred to as trunk lines. The term "exchange" describes how connections are passed back and forth across a switching system, allowing more calls to be routed through fewer lines. **(Mitel)**

The characteristics of both IP-PBX functionality and other types of Session Initiation Protocol (SIP) phones are thoroughly examined in this paper, and features like call hold and its retrieval, call group, find me, music on hold, call transfer, call park and its retrieval, among others, are successfully analyzed with various SIP phone features. The majority of the services illustrated in this paper illustrate common features that are most likely to be used with SIP IP telephony in a corporate setting. The following typical telecommunication services are implemented using SIP samples in this document, which also includes a study of the common VoIP protocol. **(Kumar, 2011)**

III. METHODOLOGY

Academic publications, industry reports, social media, internet review sites and databases pertaining to the hotel and travel industries were employed in the study's secondary data gathering.

IV. CONCLUSION

In conclusion, the development of PBX phone systems from manual cable circuits to contemporary VoIP technology is proof of the industry's unrelenting advancement. By doing away with manual operators and lessening dependency on external phone lines, PABX systems, which first appeared in the 1960s, revolutionized internal communications. Hotels of all sizes benefited from enhanced productivity and cost savings as PBX systems evolved from bulky, operator-dependent models to compact, automated electronic systems. With the introduction of computerized PBX systems, which increased functionality while cutting prices, the 1980s saw a critical turning point.

Businesses/Hotels were given a number of benefits, including unified data and voice communications over a single internet connection, when VoIP was used in the 1990s, which completely changed the scene. The widespread use of VoIP solutions today has changed how businesses/hotels interact, offering features like call hold and its retrieval, call group, find me, music on hold, call transfer, call park and its retrieval and cost-effectiveness. The evolution of PBX systems is still happening today as technology develops, with the opportunity for even more innovation and seamless incorporation into the business/hotel environment.

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