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Mobile augmentation's importance in the creation of Mobile applications

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Abstract
The increasing adoption of mobile cellphones and applications has transformed daily activities in both personal and professional contexts, greatly increasing human productivity. Due to the many advantages that mobile applications have over traditional desktop programs—including the potential for countless new business ventures—the majority of corporate and personal applications have now moved to mobile platforms. These days, mobile apps are an essential component of many different kinds of devices running different operating systems, including Windows, Android, iOS, BlackBerry, Symbian, and others. Still, it has grown more difficult for development and QA teams to guarantee error-free mobile apps that operate flawlessly on end customers' mobile devices.

In mobile application development, Android and iOS are the most commonly used operating systems for this purpose. The software can be either preinstalled on the device, downloaded from a mobile app store or accessed through a mobile web browser. Programming and markup languages like Java, Swift, C# and HTML5 are commonly used for this kind of software development.

The creation of mobile applications has emerged as a new market in mobile communication thanks to smartphones. Developers are able to produce a wide range of applications for smartphones that are compatible with the specific application environment. These mobile applications give phones personalized or user-defined functionality. These days, mobile applications are more sophisticated than ever, combining several aspects of mobile computing, including mobile web technology, wireless networks, GPRS, GSM, and more. But as smartphones' capabilities grow, owners of earlier models of the gadget also want to utilize comparable apps on their own phones. With the help of the Mobile Augmentation Architecture, developers of mobile applications can now construct apps that work on networks or platforms that their devices do not support.

This paper aims to explain the function of mobile augmentation in the mobile technology domain. Additionally, it makes recommendations for other mobile computing technologies that might be combined to create mobile augmentation technologies. Rapid improvements in mobile computing technology have led to more sophisticated mobile applications, and users need reliable functionality that can boost mobile devices' capabilities and performance. An integrated technology architecture that can meet this need is provided by mobile augmentation. The paper also describes the Layered Architecture of a Mobile Augmentation Application and how to implement a Mobile Augmentation Application.

INTRODUCTION

Creating software applications that run on mobile devices is known as mobile application development. The past decade has seen a revolution with the advent of mobile devices and applications in various fields. Initially, they were used in advertising, marketing, and various service sectors, but now they have expanded to healthcare and insurance, impacting every industry and organization. With the rapid pace of application development, the research community has taken an interest in understanding all aspects of this niche. The utilization of mobile application technology is increasing rapidly compared to traditional desktop technology, resulting in the regular development of a large number of applications. Among the most widely used applications are social media apps. These applications typically use a network connection to access remote computing

resources. As a result, the development process for mobile applications involves creating installable software bundles, which include code, binaries, assets, etc. It also involves implementing backend services such as data access with an API and testing the application on target devices.
Wireless devices like cell phones have revolutionized the way people stay connected to the world around them, offering unparalleled connectivity from virtually anywhere at any time. As a result, the demand for application development for these devices is set to soar in the coming years. To make the most of the connectivity that these devices offer, network programming plays a crucial role in wireless application development. However, designing mobile applications presents a new set of challenges for application designers, as these applications must be optimized for real-time data and activity visualization on mobile smart
phones. The mobility of these devices has also led to new challenges in providing wireless services and applications that are accessible to both individual users and large organizations.

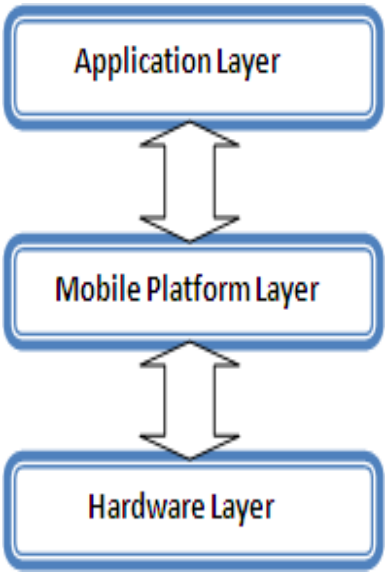
MOBILE COMPUTING
Mobile Computing refers to the field of mobile communication that focuses on how mobile devices can communicate with each other and access the internet from anywhere, anytime. It involves studying wired, wireless, and cellular technology to connect different mobile devices and facilitate communication. With the increasing use of wireless networks, new opportunities have emerged for collaborative activities that transcend time and space. This paper presents ongoing work on designing and implementing a mobile and wireless application to support such collaborative environments. The paper proposes an innovative approach to support the development of mobile applications for smart phones and their users.

MOBILE APPLICATION DEVELOPMENT
The development of mobile applications can utilize various technologies including J2ME, Android, and iPhone. In this particular case, we have chosen to use Java technology with an augmentation technique due to its platform independence. This approach allows the application to be used on a variety of devices, such as desktop computers, Java-enabled cellular phones, and PDAs. J2ME is a platform designed specifically for mobile application development, and we have utilized it to create an application capable of controlling a desktop computer or server via an HTTP Connection. In addition to the benefits of code portability, we also see advantages in using web technology. Designing mobile applications presents unique challenges for application designers, as mobile smartphones offer real-time magnification and revelation of data and activities.

ARCHITECTURE FOR MOBILE APPLICATION
The mobile application developer creates a mobile application which interacts with the mobile platform, as depicted in figure 1. The mobile platform, in turn, interacts with the mobile hardware. This architecture is fundamental to programming devices. To communicate with user applications, the device hardware requires an operating software platform. A simple mobile application consists of three logical layers.

1 APPLICATION LAYER (TOP LEVEL)
The application serves as a means of communication interface through which users can interact with their mobile devices. As a mobile developer, it is necessary to design

interactive screens as per user requirements. To communicate with the Mobile Platform Layer, the programmer uses a suitable programming API available on the platform.



2 MIDDLE LAYER (MOBILE PLATFORM)
The Middle Layer refers to a software layer that is constructed on top of the device hardware to enable communication with the hardware. It functions as an operating system, offeringa wide range of features for interacting with the hardware.

3 MOBILE LAYER (MOBILE PHONE)
The Mobile Layer refers to the hardware component of a mobile device that enables communication. Modern mobile hardware devices are equipped with a wide range of functionalities, including cameras, multimedia players, GPRS, GPS, and more.

MOBILE AUGMENTATION
Mobile augmentation is a technique used to enhance the functionality of mobile components. It represents a new era in mobile application
development where the limitations of mobile phones and wireless technologies such as GSM, GPRS, WiFi, and Bluetooth can be surpassed. With the concept of mobile augmentation, smartphones can perform functions that were previously impossible with the existing cellular network features. Essentially, mobile augmentation serves as a layer between the application layer and the mobile platform, acting as a middle layer.

PROBLEM DEFINITION (STREAMING FOR 2G NETWORK)
Smartphone mobile platforms are constrainedby limited memory usage, processing power, and a limited API, which makes it impossible to build any Windows application as a mobile application. The greatest challenge in mobile application development is figuring out how to create an application when the API required for a particular process is not available. For instance, the JMF API in JAVA is available for the PC environment, so it's impossible to build a mobile streaming application using the JMF API. While the JAVA ME MMAPI provides functionality for multimedia playback, it lacks the ability to stream media. Unfortunately, there is no API available in JAVA ME for building a streaming application.

PROPOSED ARCHITECTURE TO SOLVE A PROBLEM. (MOBILE AUGMENTATION)

The augmentation layer serves as a virtual layer sandwiched between the mobile platform and the application layer, and it is one of the four layers in mobile augmentation applications. These layers include the application layer, the augmentation layer, the mobile platform layer, and the mobile hardware layer. In the augmentation layer, it is necessary to establish the underlying architecture for a required functionality and modify the communication protocols to make it suitable for the given functionality. It is possible that using the augmentation concept may result in a decrease in the quality and performance of the application. However, it is important to note that the application is designed to work within an architecture that is not actually available. Mobile augmentation interacts with the mobile platform, extends its functionality, and utilizes the hardware components of the mobile device.

CONCLUSION

In this paper, the focus is on the significance of mobile augmentation in the realm of mobile computing and mobile application development. We explore various technologies related to mobile computing and mobile application development that are utilized to develop mobile augmentation applications. Additionally, we present the layer architecture for mobile augmentation and demonstrate how different mobile computing technologies and web technologies can be integrated mobile augmentation layer is a virtual layer that can be implemented by the application layer. A GPS, wireless network, and mobile application with an augmentation layer are required to create a Mobile Augmentation application. Finally, we provide an example of how to implement a mobile augmentation streaming application for the J2ME platform.to create a mobile augmentation application. Our conclusion highlights the potential of mobile augmentation to enhance the features of mobile technology. We emphasize that the

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