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| **SyneMobile – White Paper**  Vishal Bhardwaj, Assistant Manager – Software  January 2017 |
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# Introduction

Through Synechron’s relationships with leading customers around the world, it was noticed that increasingly wireless carriers and subscribers were indicating a growing demand for security of their mobile devices, i.e., to protect not only their phones, but also the valuable data and content on the phones (along with a strong technical support).

Nowadays, business is growing dynamically as a digital enterprise and almost every industry conduct their operations using devices that were non-existent a few years ago. Mobile devices also add significant value to people and organizations through increased efficiency and productivity. The world around us is also digitally transforming in a way that is having significant impact on how people and enterprises operate and this is affecting the technology and systems that are designed and built to support them.

However, this era of mobility introduces new risks and challenges to the security of mobile devices and the data it contains. SyneMobile enables secure mobility by providing comprehensive risk management across Android devices to protect against app, network, and device-based threats while providing visibility and control over data leakage.

# Why is SyneMobile Needed?

SyneMobile is an all-in-one protection application featuring Security, Recovery, Content Backup, Health Scan, and advanced support functions such as Telemetry analysis and technical support.

### Problem 1: Secure Data Backup with interminable growth and lengthening retention periods

A growing number of mobile subscribers with an unbounded and broad range of devices to save, protect and access data has developed more complicated data storage systems.This makes it one of the most important assets for mobile users and should be protected without any failure. The challenges of securing and saving inflated amount of customers data can make any enterprise look for solutions that can provide a comprehensive and quintessential cloud data backup program which is capable of managing extensive data distributed across various platforms.

**Solution:**

SyneMobile offers a potential solution for this and allows data (photos, videos and contacts) to be stored and accessed in the most secure manner, which uses a highly compressed, encrypted stream to ensure data confidentiality without sacrificing system(application)performance. It also offers a scalable and centralized management system, leveraging a very simple and automated scheme that is advantageous to the customers.

### Problem 2: Effective and Instant Mobile Technical Support

In this age of customer-oriented industry, providing technical support has become an integral part of any business or service-oriented organization. Technicians are employed to solve problems or a deceptively complex task. Any particular encounter involves multiple layers of non-linear problem solving, or scenarios that are rarely explored, or considered. It might be a case where the problem statement/scenario doesn't even exist or may be incorrect and complying with these kind of requirements do not help resolving the customer problem, but often end up intruding into that task.

**Solution:**

SyneMobile provides a streamlined and simplified approach to customer-agent interactions and helps enterprises to extend productivity through an unmatched customer service.It also allows businesses to manage customer experience and operational efficiency by appointing users to the most proficient and unoccupied agent suitable for the interaction. This can be achieved by -

* Determining what steps to take, in what order, on what device given a very wide range of settings.
* Relying on someone with strong technical background with a complete know how and who can perform right actions.

The application provides a mechanism that allows the tech agents to perform certain actions enabling them to access user's device remotely and operate it. Agents can also draw some basic shapes on the device screen indicating the users to navigate through the settings menu and guide them to solve and fix the issues they are facing This not only ensures that the problem is resolved, but also saves a lot of user’s time spent on interacting with the customer agents.

### Problem 3: Threats to Mobile Security

Security and privacy are the two highly dynamic and fast-paced challenges faced by end users and since mobile phones become user programmable, i.e., they supports app downloads, the scope for device protection extends and is not limited to data-theft. There is also a possibility that a virus-infected or malware app be installed on the device and may harm the device OS and can also act in leakage of user data. Mobile apps are particularly susceptible to reverse-engineering attacks that expose the code and app logic, allowing malicious entities to identify and exploit vulnerabilities.

Threats can be categorized as:

* **Application-level:**

Major threat that falls in this category is malware and side-loaded apps, these apps are commonly repackaged and also distributed through third-party app stores. Sometimes, users also go for processes like jail-breaking or rooting that exposes their mobile devices and makes OS security features ineffective. This makes it easy for the malware apps to break in and get privileged access to the resources on the device.

* **Data or Storage-Level:**

These threats are related to files that we copy or transfer to the device, these can be text documents, or may be an APK (android package) file. Sometimes, these are virus infected and can vitiate the whole storage system.

* **Web-Level:**

These kind of threats do not directly impact devices, but still the users' privacy is at risk from these kind of threats. One of the main web-related threat is phishing, which uses emails and other un-trusted platforms to send across links to a phishing website, which is developed to trick the users into providing sensitive information like user credentials.

**Solution:**

After speculating all the threats that can exploit a device and make them vulnerable to attacks, along with the limitations of the OS, it becomes imperative to build an application with in-built security controls and also equipped with self-defense mechanisms. SyneMobile implements all this and offers a multilayer protection including:

* Antivirus protection
* Detecting phishing and malware websites, it and alerts the user if they are trying to access it on mobile web browser
* Real-time protection, including intrusion prevention and alerts that an attack/threat is in progress.

### Problem 4: Effective Telemetry and Big Data Analysis

The day a user purchases a mobile phone, the device starts collecting and storing data. Over a period, user starts interacting with various applications and keeps on performing various tasks multiple times. This creates a pattern that the user is not aware of, but can be used to conclude the behavior of the installed apps and can also tell you the health of the device. The major challenge faced is to determine upfront which data is relevant and the variety and volume of the data; hence, gathered should be utilized to provide accurate and timely decision making benefiting the end user.

**Solution:**

Telemetry implementation is an updated approach to the transition of mobile applications and is the need of the day. Based on a deep understanding of the telemetry options and careful data analysis, we have developed a telemetry architecture that enables SyneMobile to process information around user metrics, application data, crash reports, and a lot of other statistics about the device. It also gives the ability to query big data and generate insights (from large scale users data), which is delivered to them via proper channels like notifications.

# Business Opportunity

SyneMobile can furnish multiple business opportunities and can be seamlessly integrated with enterprises dealing into mobility. These can be carrier operators, or big mobile insurance providers who can equip their customers with this application (hard bundled to their mobiles) that can provide a comprehensive mobile solution for their needs and at the same time, be a cost-efficient approach to address business potential and enable business growth. Following can be the business advantages that will be achieved by implementing SyneMobile:

* + Enhance existing customer relationships
* Improve customer experience with efficient and effective tech support
* Provide user-specific data analysis and timely action reports
* Improve availability and stability of business
  + Reduced incident handling cost
* Timely identifying and resolving issues brings down this resource consuming process significantly.
  + Enable growth opportunities
* Support subscriber growth with real-time user experience
  + Business Agility (detect and respond effectively and efficiently)
* Aims toenable understanding, inform decisions, and enhance business agility

# Challenges Faced by SyneMobile

Following challenges were faced while developing/designing SyneMobile:

* We wanted to provide a seamless technical support where a tech agent can remotely access user’s device. We were facing issues to finalize a proper channel that will provide a real-time user experience and at the same time should be secured. After spending a lot of time, we implemented a Remote API channel, which is purpose-built to handle all the complexities of data streams.
* While developing an efficient Telemetry system, it was challenging to determine what kind of reports to generate, how to process them, and deliver it to the user. A lot of business hours were spend on scrutinizing and gathering the real time issues that users face such as app crashes, storage and battery level, to name a few.
* One of the biggest challenge was to cater to a large spectrum of Android devices with different make, models and screen sizes, on top of it, each OS version have specific restrictions. We made sure to have a similar user experience throughout the application with minimum deviation.

# Topic of this paper and its scope

The scope of this paper covers the following:

* Overview of SyneMobile
* Advantages of SyneMobile
* Challenges faced while developing this application
* Business Impact

# Solution Offering by Synechron

Synechron has designed/developed the SyneMobile that is based on the Android/Mobility domain. This application addresses the key challenges enumerated above.

### SyneMobile Workflow – High-Level Architecture

### SyneMobile Workflow – Advance Tech Support

Advanced Tech Support when fully equipped provides a mechanism to allow tech agents to remotely access users device. Launching the mobile application initiates a request to web server for authentication with a unique channel id. After successful authentication, when a tech agent initiate a request for remote access it looks for the same channel id and if its available, same is returned using which a session is initiated on the remote channel.

### SyneMobile Workflow – Telemetry

Telemetry provides a one stop solution for data analysis by exposing APIs which are integrated in the mobile application. All the collected data is transferred to the remote server though telemetry interface(services) and fed to the manger for processing and generating reports. These reports are then dispatched to the cloud for persisting. Telemetry service is responsible for providing the generated reports to the user based on the configuration settings user has opted for.

### SyneMobile Workflow – KIA

KIA provides a mechanism where tech agents can create an update articles based on category and products which are processed and stored on server and can be delivered to the users on request. When a user search for a keyword on the application a service call is made to the search engine looking for all the articles matching the same. If articles are available they are delivered to the user in form of web pages.

# About SyneMobile

SyneMobile is a complete mobile solution tool whose objective is to provide data management and advanced customer support features such as backup and restore contact and content data; recovery options like locate, lock, wipe, and alarm; security options such as antivirus and malware detection; and advanced mobile technical support services. The application can enhance user experience and deliver exceptional value to its subscribers by using state-of-the-art tools and analytics to provide a one-stop shop for not only resolving device issues, but also assisting the users on how to manage their content and become more productive with their digital devices.

In order to achieve these objectives, the product is developed as a comprehensive program consisting of the following key modules:

### Module 1: Data Backup

This tool provides a backup system that is smart enough to take back up of that data, which has not been backed up. There is a complete algorithm that ensures to cross-check the numbers and types of files on the cloud and on the device, storage space, network restrictions, OS settings, and other user-defined configurations, before initiating a backup. Apart from these stringent configurations, the tool ensures that the data transfer occurs in a secure manner and offers enhanced security options including data encryption.

It includes the following features:

* Backup - Backs up and restores contacts on mobile devices automatically.
* Sync - Synchronizes automatically or manually from device to website and vice versa.
* Manage - Provides server side management for contacts, such as add, edit, and import.

### Module 2: Device Protection & Security

The application enables secure mobility by providing risk management across Android devices to protect against network, app, and device-based vulnerabilities while providing visibility and control over data breach. It includes a comprehensive suite that enables the users to leverage its capability to provide security against malware, viruses, phishing sites, Trojans, etc. It also has a feature that warns the users against a possible phishing or malware website, if they are visiting any URL on the device browser.

The app is powerful enough to detect threats and risks, such as:

* Malware and Trojans that can extract data from the device
* Side-loaded app behaviors that pose threats
* Man-in-middle attacks
* Jailbreak or deleterious root

### Module 3: Device Recovery

Recovering a device is another integral aspect for a complete mobile solution as it enables the users to have full control of their device even if it's not with them (in case of theft or misplaced). This functionality consists of the following features:

* Locate - Locates a missing phone with GPS
* Alarm - Sounds an alarm to find a misplaced phone, even if it's on silent or vibrate
* Lock - Remotely locks a missing phone to prevent unauthorized use
* Wipe - Remotely erases contacts from a missing phone to secure your privacy

### Module 4: Device Health Monitoring

One of the most important thing that always keeps a user engaged to an application is the way it lets you know how healthy your device is. SyneMobile enables the users to scan through the apps and data storage to gather information and run a complex algorithm to conclude the device and battery performance, which might be helpful in identifying and resolving battery-related issues. It also indicates the users about the apps that are running high on memory, ones who use a lot of storage space and also about the ones who consumes a lot of battery.

### Module 5: Telemetry and Data Analysis

Mobile device telemetry data is a main information source for personalized engagement and it measures the real-time user experience. We then use unique, big data analytics to associate the anonymized device data with customer context to generate reports and enable personalized engagement that is timely, relevant, and actionable for the users.

This is how the data is collected (high-level) and sent across the servers:

Telemetry data is uploaded from the device to a cloud-based analytics system. Collection and transmission of device telemetry are optimized to balance frequency of collection for obtaining up-to-date information with minimizing battery drain and data volume. We practice the following key principles of collection and optimization:

* Personally Identifiable Information (PII) is not collected from the device and device identity is anonymized.
* All data is compressed on the device to minimize data transmission costs.
* The device can be configured to send data only when connected to Wi-Fi or only when the device is charging.
* Payloads are as small as possible.

The users can also configure the settings on how they want to transmit collected data or if they wish to switch it off, they can also do that. These are the properties that can be configured:

* Frequency of transmitting the generated reports
* Maximum size of the report, in bytes
* Maximum number of reports to store

### Module 6: Advanced Technical Support with Live Chat

SyneMobile provides flexibility to the users to opt for instant tech support or go for live chat depending on the urgency and complexity of the issues they are facing. They can chat with care agents and communicate the problems they are struggling with or they can contact tech agents who can remotely access their device to fix issues and provide expert tech assistance and resolution.

Users can seek assistance for issues like-

* Advanced troubleshooting on their devices
* Optimizing settings on devices to maximize battery performance and extend battery life
* Backing up and transferring contacts, pictures, videos, and other personal content
* Removing unwanted programs and adjusting settings
* Troubleshooting viruses, spyware, and malware

### Module 7: KIA (Know It All)

KIA is a knowledge-based value-added feature that enables the SyneMobile users to get tips and other articles with relevant information they might be seeking about their device or it may be related to any technical issue they are facing with their mobile phones. They can also perform a search for anything related to their device, ranging from security settings to Bluetooth or Wi-Fi connection issues and if available, a content-rich article will be provided to them containing step-by-step details.

The added advantage of this feature is that it will gather the data across its users’ base, and with a complex algorithm, generate articles/tips that will be a combination of device make and model, OS version, and provide them to specific users only. So, for example, a user having a mobile with a particular make, model and OS version will receive articles/tips that will be specific to that device only.

# Use Case - Telemetry

To better understand the Telemetry functionality and flow, let us consider a scenario where a user is running on low storage and how SyneMobile generates insights based on this data-

**Decision Logic**:

* + Is the free space less than X% of the overall device storage?
  + Has the user received a notification about low storage recently?

**Recommendations**:

* + Uninstall applications that are not in a frequent use.
  + Remove unwanted photos/videos.

The data is used to generate rich HTML content and deliver to the user.

# Case Study

### Context

Nowadays, mobile applications are the key to the success for any organization. Their portability is their greatest advantage, but at the same time, it is also vulnerable for data and security breach, making them easy targets for external entities. As enterprises move to look for comprehensive plans to protect their customer’s interest and provide business continuity, they often search for a solution, which can provide a broad range of services and have a strong potential to be a market winner. After a deep and thorough analysis of the existing mobile enterprise businesses and its shortcomings, we have eclectically designed and developed SyneMobile which will provide an extensive mobile solution to the end users.

### Objectives

The overall product initiative is to create a compelling application which is an integration of cloud services, device security and protection, device recovery, health monitoring and advance technical support services and deliver an all-in-one mobile solution offer. In addition, SyneMobile will enhance mobile experience and satisfaction and provide value-added services for the end users.

### Solution

SyneMobile comes as an all-in-one package to provide a cutting-edge mobile solution offering unique capabilities and broad ranging functionalities to its end users. It not only helps in securing users' personal content on their devices but provide advanced troubleshooting options too.

### Salient Features

* Cloud data backup - with a customizable cloud storage it’s easy to backup photos, videos and contacts
* Device Protection and security - provides instant access to device protection levels
* Device recovery and health monitoring - provides access to key diagnostics such as device location and battery or storage levels
* Advanced technical support with live chat - provides a one-click access to the expert tech agents who can help you handle your issues right from your app.
* Telemetry and big data analysis - provides personalized tips to better manage your smart devices, data and more.
* Know-It-All - provides a knowledge based value-add feature

### Conclusion

With its robust analytics, rules engine, and services, SyneMobile will differentiate from other competitors and enable any enterprise to be established as a reputed partner for their customers. The combination of all the functionalities and services will equal an excellent product that is inimitable and uses latest technology to provide value to its users.

# About Synechron

Synechron, Inc. is a wholly owned subsidiary of Synechron Holdings, Ins., a British Virgin Islands International Business Company. Synechron, Inc. US was founded in 2005 and is headquartered in Sunrise, FL. Synechron is one of the fastest growing IT companies, specializes in Insurance, Capital Markets, Mortgage Banking, Energy and Commodities and Digital Media & Technology space. The company offers Information Technology Strategy & Architecture, Application Development & Maintenance, Mobile Application Development, Business Intelligence & Data Warehousing, Cloud Computing, QA Service Offerings, Business Process Management (BPM), Remote Infrastructure Management, and Business Process Outsourcing Services. It has significant presence in the US, Canada, the UK, the Netherlands, Ireland, UAE, Singapore, Hong Kong, Japan, and state-of-the-art Development Centers based in Pune, India. Synechron currently employs approximately 5000+ professionals globally.

# About the Author

Mr. Vishal Bhardwaj, ([vishal.bhardwaj@synechron.com](mailto:xxxx.xxxx@synechron.com)) is Assistant Manager – Software, Mobility and Android application development expert with deep technical and architectural knowledge in SyneMobile development including expertise on design and implementation of this tool.