Research Paper 2 Mobile Connectivity and Mobile Commerce

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A key technology behind mobile payments is NFC

1. NFC is the preferred technology behind mobile payments. Dig into NFC and list several of its advantages in this area of mobile payments over other wireless technologies such as Bluetooth (5 Marks)

Ans. Due to various benefits it has over other wireless technologies such as Bluetooth, Near Field Communication (NFC) is a popular technology for mobile payments. Here are some of the most significant benefits of NFC in the context of mobile payments:

1) NFC communicates across relatively small distances, often less than 4 cm (1.5 inches). Because an unauthorized user cannot intercept the transmission without being physically close to the devices involved, the limited range improves security.

2) NFC transactions are considered extremely safe. They safeguard sensitive data using encryption and tokenization, and the short-range nature of NFC decreases the possibility of eavesdropping. Furthermore, NFC-enabled cellphones frequently need user verification (e.g., fingerprint, PIN) for transactions, which adds an additional degree of security.

3) NFC transactions are often quicker than those of other wireless technologies such as Bluetooth. Because of the fast data transfer speed, transactions are handled quickly, decreasing checkout times.

4) Low Power Consumption: NFC uses less power than Bluetooth, which is advantageous for mobile devices. The decreased power usage aids in the preservation of battery life during transactions.

5) NFC is extensively supported across a wide range of mobile devices, including smartphones, tablets, and wearables. Because of its ubiquity, it is more accessible to a bigger user population.

6) NFC is well-known for its dependability in conducting contactless payments. It always works, and users don't have to worry about interference or connection problems.

7) NFC technology may handle various applications on a single device, including payment, access control, and public transit tickets. This adaptability makes it appropriate for a wide range of applications other than payments.

8) Cross-Platform Compatibility: Because NFC technology is not tied to a single operating system, it is compatible with both Android and iOS smartphones. This compatibility encourages wider use.

Overall, NFC's mix of security, ease, and interoperability has made it the favored mobile payment method. While Bluetooth offers benefits in other applications such as data transfer and music streaming, the characteristics of NFC make it a great choice for contactless payments.

2. One of the reasons that NFC is considered secure for payments is that mobile payment platforms use **tokenization** for each transaction. Research and explain what **tokenization** is and how it works. (5 Marks)

A mobile wallet is an app on your mobile device that stores your payment information.

Ans. Tokenization is a data security procedure in which sensitive data is converted into unique, non-sensitive placeholders known as tokens. Tokenization adds an extra degree of protection to mobile payments by substituting a user's main account number (PAN) with a randomly generated token. Tokenization works as follows:

1) Payment Initiation: When a user begins a payment using a mobile wallet or payment app, the app obtains payment authorization.

2) Token Request: The payment platform sends a request to the tokenization system to produce a transaction-specific token.

3) Tokenization generates a random token that is mathematically unrelated to the original payment data but is tied to it in the system's backend. If nefarious actors intercept the original payment data, this token will render it unusable.

4) Transaction Processing: For transaction processing, the token, rather than the actual payment data, is delivered over the payment network. This prevents critical card information from being exposed during the transaction process.

5) Backend validation: When the token reaches the payment platform's backend, it is validated and compared to the actual account credentials kept in a secure token vault. The actual payment data is kept safe in this vault and is never revealed during the transaction.

6) Authorization and decryption: The transaction is authorized and the payment is executed after successful validation. The token is used by the payment platform to link the transaction to the relevant account for processing.

7) Token Expiration and Uselessness: Tokens are often programmed to expire after a single usage or a predetermined length of time, rendering them worthless to any unauthorized party seeking to intercept and abuse data.

   Mobile payment platforms use tokenization to guarantee that sensitive payment data stays safe during the transaction process. Even if intercepted, the tokens are useless to attackers, lowering the risk of fraudulent activity linked with stolen payment information dramatically. This strategy improves the overall security of mobile payments, giving users trust and boosting the usage of digital payment solutions.

3. Research three leading mobile wallets. Create a grid that lists each of the wallets, their features, strengths and weaknesses, ease of use, and security. (5 Marks)

Ans.

Mobile Wallet	Features	Strength	Weakness	Ease of Use	Security
Apply Pay	Secure NFC payment Integration with Apple Device Support for loyalty cards and rewards	Seamlessly integrated with Apple Devices Convenient for Apple Users	Limited with Apple Devices	User friendly set up	Utilizes biometric authentication. Tokenization ensures secure transaction
Google Pay	Contactless payments Loyalty Programs In-app and online Integration with every android devices	Wide compatibility with android devices Integration with android services	Limited availability at certain retail outlets. Additional setup required for some services	Seamless integration with Google devices	Implementation of tokenization and biometric for authentication
Samsung Pay	NFC and MST technology Integration with Samsung devices	Wide device compatibility Work with both NFC & MST.	Limited acceptance in region Limited compatibility with non-Samsung devices	Simple setup and use.	Knox security connected with tokenization and biometric for secure payment

These mobile wallets each have their own set of features and security mechanisms that cater to diverse user preferences and device compatibility. To guarantee ease and safe transactions, users should consider these characteristics while selecting a mobile wallet.

4. Which of them would you recommend and why? (5 Marks)

Ans. As per our usage, we recommend Google Pay.

1) Google Pay is compatible with a wide range of Android devices, guaranteeing accessibility for a sizable section of the smartphone user population. This means you may use it on several devices without restriction.

2) Google Pay interacts easily with other Google services, making it handy for consumers that rely heavily on Google's ecosystem for services such as Gmail, Google Drive, and Google Photos.

3) User-Friendly Interface: Google Pay provides a simple and straightforward interface that works across all Android devices, delivering a seamless and trouble-free payment experience. Its simple design makes it simple to explore and use, especially for individuals who are new with mobile payment apps.

4) Security mechanisms: Google Pay utilizes a variety of security mechanisms, such as tokenization and biometric verification, to keep your payment information secure during transactions. This provides excellent security against any attacks or data breaches.

5) Google Pay supports a variety of payment methods, including in-app and online purchases, making it a versatile solution for a wide range of transactions, not only in-store payments.

6) Loyalty Programs and Offers: Google Pay integrates with loyalty programs and gives you access to a variety of offers and incentives, allowing you to make the most of your purchases while possibly saving money with unique discounts and promotions.

7) Convenience: With Google Pay, you can effortlessly and quickly conduct contactless payments, removing the need to carry actual cards or cash. Its widespread acceptance at a wide range of stores and online platforms guarantees that you may use it for a variety of transactions with ease.

Given these considerations, Google Pay appears as a handy and safe mobile wallet alternative, particularly for consumers who rely on Android smartphones and use Google's suite of services often. Its simplicity of use, security features, and interoperability make it a dependable and adaptable payment and transaction management solution.

Reference:

[1] *NFC technology - exploring the fundamentals and applications of Near Field Communication*. NFC Forum. (n.d.). https://nfc-forum.org/learn/nfc-technology/

[2] *Displaying 1 – 10 of 15 results for "tokenization+."* Search Results | Square Support Centre - CA. (n.d.). https://squareup.com/help/ca/en/article/search?utf8=%E2%9C%93&q=tokenization%2B&query_id=62a18eb9-5ef0-43b1-b7de-f79f5ae3eafe

[3] *Apple pay*. Apple (Canada). (n.d.). https://www.apple.com/ca/apple-pay/

[4] Google. (n.d.). *Where to use google pay – google pay (CA)*. Google. https://pay.google.com/intl/en_ca/about/where-to-use/

[5] *More than a wallet.* Samsung Electronics America. (n.d.). https://www.samsung.com/us/samsung-pay/