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## Research and Implementation of Mobile Based J2ME

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### **Abstract:**

*This research paper pertains to doing E-commerce with the help of mobile by using J2ME. The focus was specifically on the security for mobile-payment system. The appropriate check system was devised to check battery and balance before transaction was made so as to make the mobile-payment easy and secure. The provision was also made of the option to save database for checking the stored data in offline mode. It also updates the new data for your handset if you install this Mobile application. It's allow to see in offline mode of an item and how much of that item have into the store and all details like price, company name and product details etc. Encryption and decryption methods allow the user to relaxing on the time of payment.*

### **Introduction:**

E-commerce has become the basic need of today's world and it keeps on increasing if commercial transactions are made by everyone using the mobile phone. But the biggest issue would certainly be the mobile payment security The central point of immense importance would therefore be as to how to ensure the customers that their payments are safe and their data wouldn't be misused in any way. ;

### **Why everyone don't want to use mobile payment system:**

The Security is the important factor from a marketing metrics perspective and people's point of view about safety and identity theft all the time.

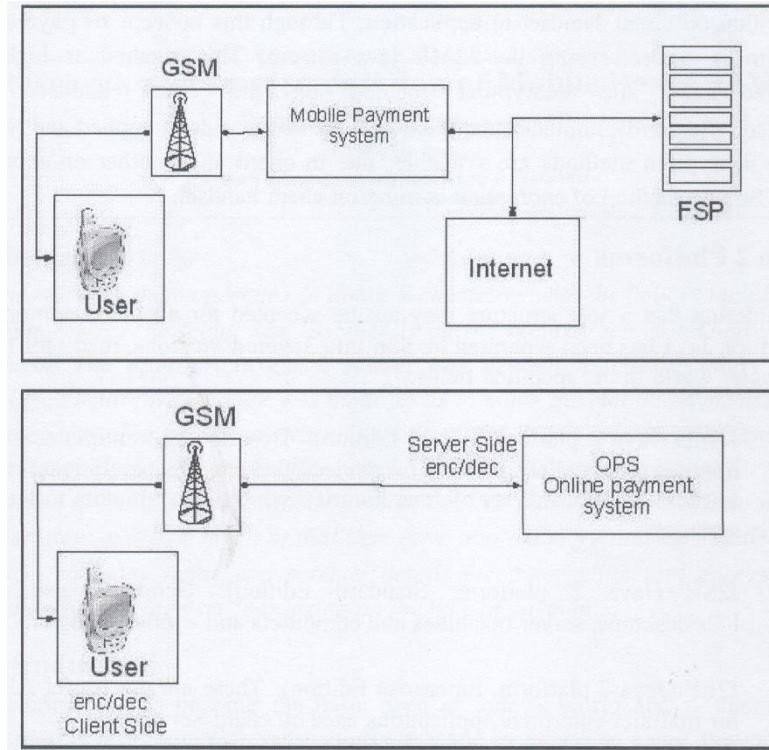
The major issue is security, how to secure the user for the time on payment and how to ensure them about it.

A new logic for the issue of security is proposed; by applying the encryption algorithm on client handset in application. Through this concept of payment system is secured using the J2ME Java system. This method is highly secured. Firstly the encryption method on the client handset is applied. Afterwards, another encryption into the server side is applied and two more decryption methods are available; one in client and another on server side. Simple method of encryption is using on client handset.

## **Java 2 Platforms**

Considering that a sole structure may not be accepted for all the conditions, therefore, Java has been separated by Sun into 3 altered versions, ready for the computer world in the specified fields:

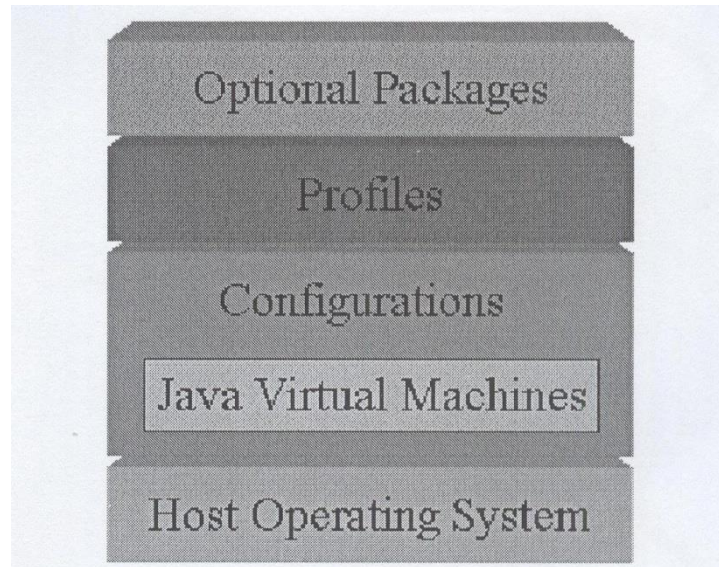
- J2ME (Java 2 platform, Micro Edition): Describe as multiple sets of libraries (also called profiles) for devices that are adequately restricted in providing the full set of Java libraries which also amounts to large storage.
- J2SE (Java 2 platform, Standard Edition): Generally use on PCs/desktops, server machines and computers and similar hardware.
- J2EE (Java 2 platform, Enterprise Edition): These are the useful APIs for multitier enterprise applications used on client-server.



**Fig 1: Simple Block Diagrams:**  
(Evolved by the author)

## J2ME Architecture

J2ME system assembly is found on devices where a class defines specific kinds of devices such as cellular phones and PDAs. J2ME system structures are designed by Sun as modularized that also provides the suppleness and user-friendliness for CLDC devices. J2ME defines the modularization when the complete action is running; the three model layers are constructed in the host operating system on the device. Figure shows four layers of J2ME architecture.

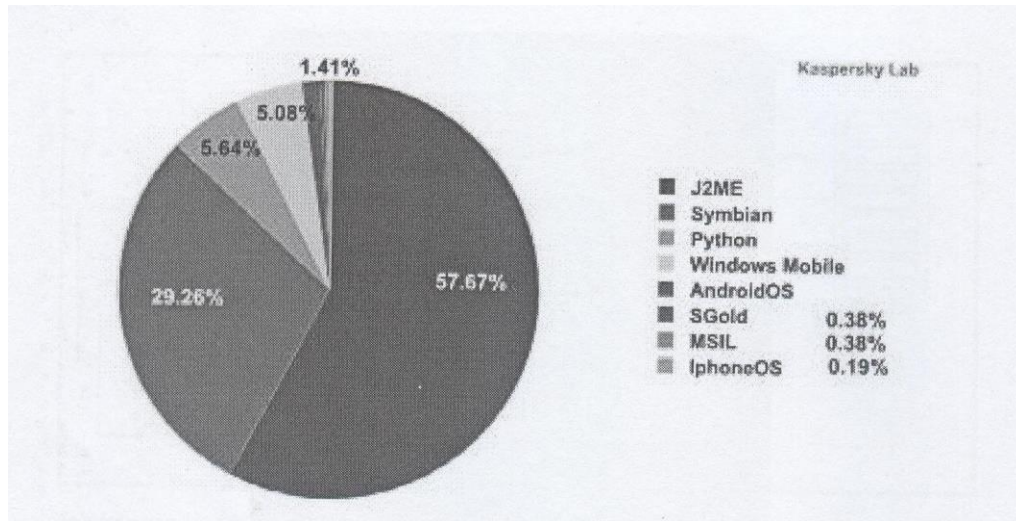


**Fig 2: J2ME Architecture:**  
(Source: Wikipedia.com)

## **Benefits of Using J2ME Platform for the Mobile E-Commerce**

J2ME provides a real advantage of its widespread support across all available platforms consequently making it as one of the most popular technologies of the wireless industry.

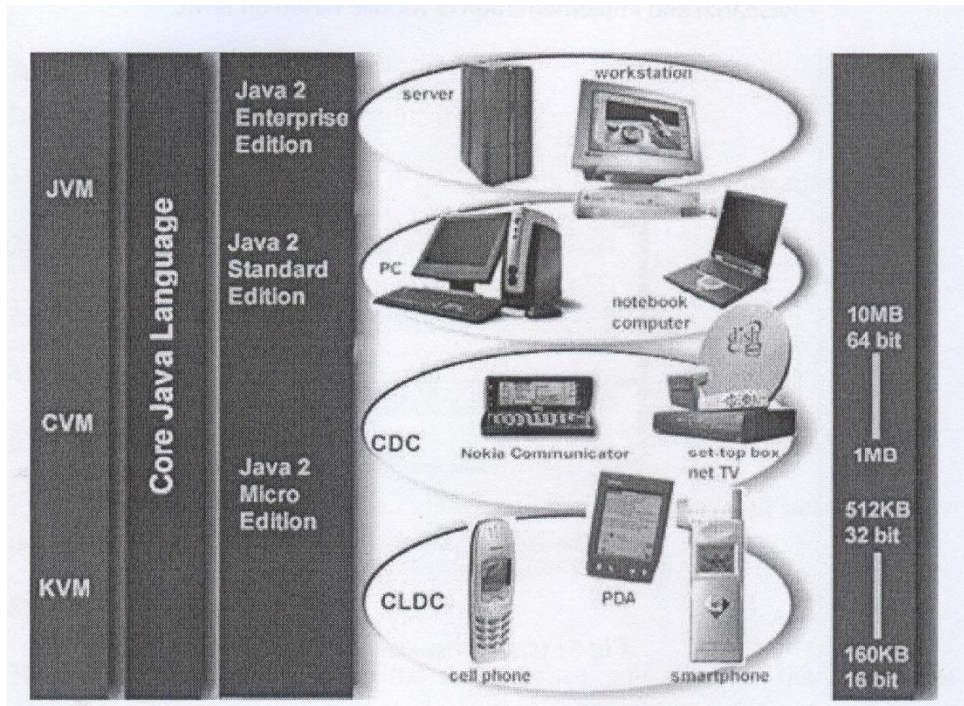
The immediate requirement is to complete the requirements of a customer to provide security and provide reliable specialized services relating to the development of J2ME applications. A developer may benefit from J2ME application development and can gain from the easier interface, easy application navigational functionality, advanced networking competences and enhanced security.



**Fig 3;** (Source: Kaspersky Lab)

### J2ME Based Services:

- Progress of customized J2ME applications are easily adoptable to majority of the mobile phone models.
- J2ME designed programs for devices provides explicitabilities.
- Formulation of solutions based on initial understanding of requirements from general concept to complete J2ME development solutions.
- J2ME's software development assessment on or other mobile platforms.
- Combination of increased usability and worthy functions
- Increasing of security and secrecy in J2ME and in mobile platforms.



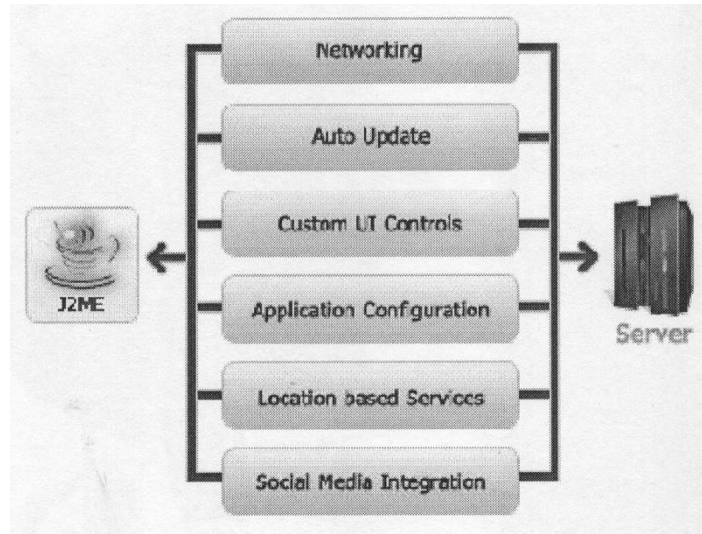
**Fig. 4: Structure of Java 2 platforms**

(Source: Zhuang Cheng (2010), "Research and Implementation Of Mobile Phone Dictionary System Based on J2ME")

### Basic Diagram of Mobile Payment:

The given diagram is describing the basic structure of mobile-payment system. There are four parts which clearly define the mobile-payment system.

- 1- End user
- 2- FSP (financial service process), which verifies the users and dealers.
- 3- Mobile runner provides communication medium for mobile-payment.
- 4- The platform of mobile payment connects the mobile user and financial agent.



**Fig 51** (Source: Wikipedia.com)

### Implementation of J2ME:

Steps to implement J2ME are:

- 1 - Open an HTTP connection
- 2- Configure HTTP request.
- 3- Establish HTTP connection.
- 4- Encryption and decryption will be on client side and also server side to operate input/ output data.
- 5- Disconnect HTTP connection

By using these 5 steps one can use JDBC database.

## **Application Work:**

Basic steps used by user for application.

- 1) Visit all the items which are displayed with the necessary details
- 2) Connect to the application
- 3) Append with the card
- 4) Choose the items
- 6) Give the basic information
- 7) Application would check the balance and battery of user handset for the purpose of successful transaction
- 8) Make the payment

This application also allows the user to see any item in the store. The application has an option Where ever you go and give the barcode or capture the barcode through barcode a unique id is obtained which allows us to further search the details about that item from the database retrieval. If someone buys an item from store and another user wants to buy the same, simply go to the menu select search item from barcode. You will be able to see how much of that item have into the store. This is a best way for the marketing of your store this application is being run in Java supported mobile phone or PDA.

## **Bid:**

This is another option in which the application provides an added option to the user; if user does not want to use mobile payment, the application allows the user to select an item and bid on it. The item will be stored for that particular user. The concerned person could visit the store, informing the User Id and could collect the item which was bided. This bid have some terms and condition depends on the store owner. For example if user bids on an item which is the last item in the store, he could not be able to bid on that particular item. Items should be 50 plus in the store for the bidding. Users can pick the

item within 24 hours along with the payment, otherwise user id will be deleted. Because the mobile phone user are increasing day by day, everyone uses the SMS caster for marketing. If you are going marketing on the based on mobile but coming from different way .By implementing this structure, one is able to give new offer on the main page of the application where the user logs in at the welcome screen.

### **Database saved on client handset**

Whole database file in .XML format is provided to the user of good so that it can be used in offline mode for various purposes by the customer, for example:

- 1) By inserting the barcode of every item, the customers can find out the inventory of the items and their prices
- 2) The customers can also get the information about all items in the inventory and their respective prices

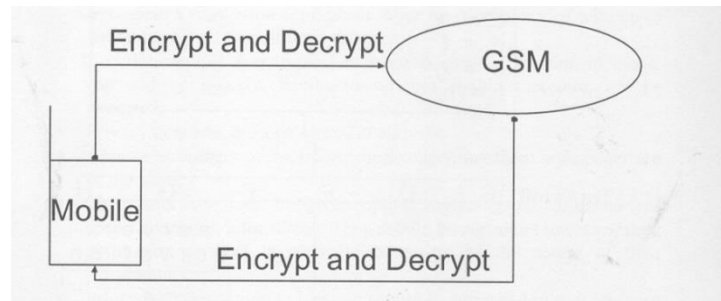
This .XML file will be updated into the user handset when user come online mode update popup message will be generated by the program for upgrade the database file for latest information and changing in inventory. So user will be updated from the store. This application will generate popup messages or highlights the new offers or new brands which introduces from the store. This can be help also into the marketing for the store.

### **Security:**

The online payment system (OPS) has been made highly secure for all users who connect to the OPS and are going to make transactions through the OPS. The encryption and decryption methods used for fool-proof secured transactions are two sided providing security on client side as well as on server side.

### **Encrypt and Decrypt:**

In this application. We are using the encryption and decryption method to secure the mobile payment system. In this we have 2 encryption and 2 decryption methods. One is a simple method because we are not getting long time from user to purchase anything. So we are using simple method into the mobile handset on client side programming for any request which generated from user and should be in encrypted form from client hand side, not on server side. Because if anyone reading your data in mobile handset through WIFI And Bluetooth, so encrypted method is applied before the sending data to server, providing us a highly secure our data which no one can read. And another method which use one server side and main server between them.

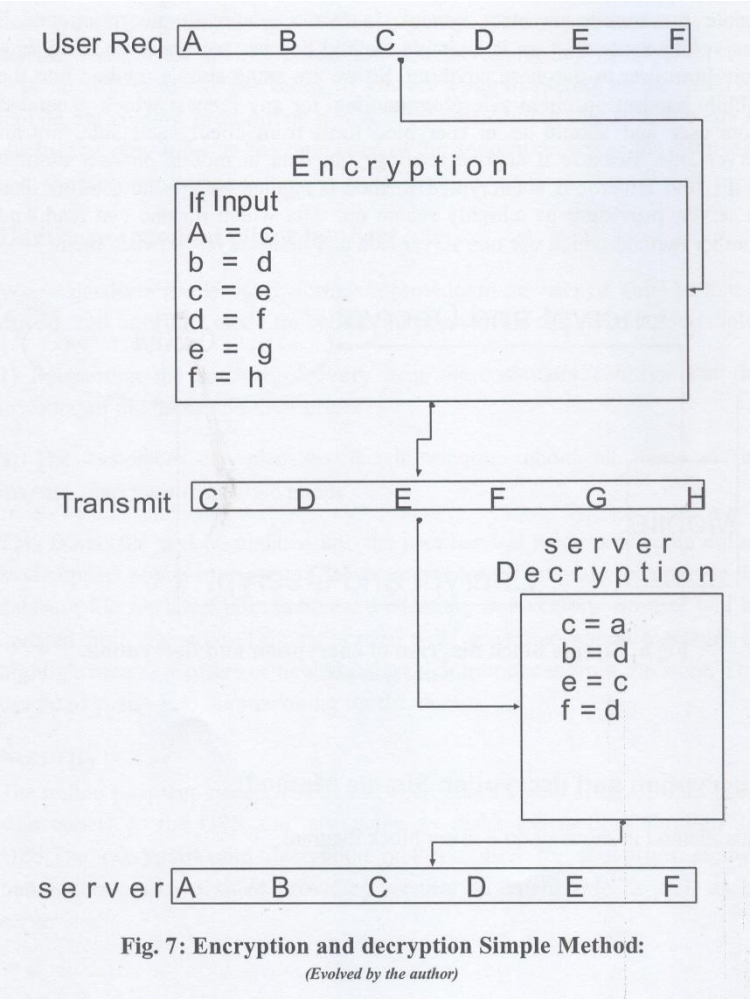


**Fig 6: Simple block diagram of encryption and decryption.**

*(Evolved by the author)*

### **Encryption and decryption Simple Method:**

This method is showing on a given block diagram.



**Fig. 7: Encryption and decryption Simple Method:**  
(Evolved by the author)

## **Recommendations & Guidelines:**

Guidelines for designing location-based services:

- Unavailability of services must be handled in a graceful manner. For many reasons the user's location may not always be available
- The device is cut off from any of the location for the methods supported by the device in a tunnel or on an airplane, for instance.
- Permission to release the information is withheld by the user.
- Location provider supported by the device is not available at all.
- Relying on the method utilized, it may take longer span of time to determine the location. Undue delay may jeopardize the end result, for instance in a navigation application. User must be provided with up to date information from time to time.
- Location service fees, typical of network-assisted location methods, can add up quickly. Fee-based services should therefore, not be overused.
- Privacy concerns must be sensed attentively.
- Apprise customers of the information concerning them with proper use of the same.
- The customers must be given option regarding the disclosure of specific location information. They should be permitted to review their permission profiles in order to be aware of the nature of their permission.
- Information pertaining to location should be protected in order to keep the location beyond the access of the person who are not authorized.

One should also take full advantage of the MIDP 2.0 security framework, which restricts the application's access to location data to cases in which the user explicitly confirms permission.

## **Conclusion:**

There is a great demand of mobile e-commerce as the world has become a global village. E-commerce is getting popular day by day and the main issue for implementation of it is the security to convince and ensure the customer that the transaction will be safe and there is no harm for using it. The assurance that no one can get customer's personal information from mobile will play major role. The method of this research work is to provide the highly secure transaction and encryption and decryption method is adopted on both

sides of client and server know that no one could either hack it or break it. The transaction will be done successfully with full security.

### References

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