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# Concept of Ideal Banking and Realization of it using Ubiquitous Banking

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**Abstract**— A bank is a financial intermediary and creates money by lending money to a borrower, thereby creating a corresponding deposit on the bank's balance sheet. Lending activities can be performed directly by loaning or indirectly through capital markets. After the advent of technology and its penetration to all business fields, the responsibility of banks is enhanced to provide better, speedy, and ubiquitous service to the customers so that it can create more money and hence profit. Banks are formulating various strategies in order to attract more deposits and lend it to genuine customers to get a better return and hence make more profit. Based on such objective of a general banking system, the ideal concept of the banking system is developed. The ideal bank is a system with ideal banking characters. In this paper, a model of the ideal banking system is proposed by considering the ideal characteristics expected under input conditions, output conditions, system requirements, and environmental conditions. The factors affecting these characteristics are identified using a qualitative data collection instrument namely focus group method. Finally, some of the possible technology supported models which support the concept of Ideal banking are identified and analyzed. It is found that electronic banking using mobile devices called mobile banking or ubiquitous banking system has characteristics close to the features of the ideal banking system.

**Index Terms**— Banking innovations, Ideal concept of banking system, Characteristics of ideal banking system, Mobile banking, Ubiquitous Banking.

## I. INTRODUCTION

A bank is a financial intermediary and creates money by lending money to a borrower, thereby creating a corresponding deposit on the bank's balance sheet. A banking system is a group or network of institutions that provide financial services to the society. These institutions are responsible for operating a payment system, providing loans, taking deposits, and helping with investments. Lending activities can be performed directly by loaning or indirectly through capital markets. After the advent of technology and its penetration to all business fields, the responsibility of banks is enhanced to provide better, speedy, and ubiquitous service to the customers so that it can create more money and hence profit. Banking business includes the business of receiving money on current or deposit account, paying and collecting cheques drawn by or paid in by customers, the making of advances to customers, and includes such other business as the Authority may prescribe for the purposes of Banking Act of the country. Banking business includes : receiving from the general public money on current, deposit, savings or other similar accounts repayable on demand or within certain days or with a period of call or notice of less than that period; and paying or collecting cheques drawn by or paid in by customers. Automation of banking processes is present day requirement and networking all the branches of the banks through Information communication technology is essential

for decreasing the cost of the operation. Since banking functions involve the transaction of money between different accounts and due to advents of electronic commerce which need electronic money transactions and payments between different parties, security and authenticity are very important features of present banking operations [1]. The function of banks involves following :

- (1) Payment of money by conducting checking or current accounts for customers, paying cheques drawn by customers on the bank and collecting cheques deposited to customers' current accounts.
- (2) Banks also enable customer payments via other payment methods such as RTGS, Wire transfers or telegraphic transfer, and automated teller machines (ATMs).
- (3) Banks borrow money by accepting funds deposited on current accounts, by accepting term deposits, and by issuing debt securities such as banknotes and bonds.
- (4) Banks lend money by making advances to customers on current accounts, by making installment loans, and by investing in marketable debt securities and other forms of money lending.

Banks have two types of products namely retail banking and business banking. Banks formulate various strategies in order to attract more deposits and lend it to genuine customers to get a better return and hence make more profit. A bank can generate revenue in a variety of different ways including interest, transaction fees and financial advice. The traditionally most significant method is via charging interest on the capital it lends out to customers. The bank profits from the difference between the level of interest it pays for deposits and other sources of funds, and the level of interest it charges in its lending activities. Based on such objective of a general banking system, the ideal concept of the banking system is developed. The ideal bank is a system with ideal banking characters. In this paper, a model of the ideal banking system is proposed by considering the ideal characteristics expected under input conditions, output conditions, system requirements, and environmental conditions. The factors affecting these characteristics are identified using a qualitative data collection instrument namely focus group method. Finally, some of the possible technology supported models which support the concept of Ideal banking are identified and analyzed.

## II. BANKING SYSTEM MODEL

A banking system consist of interconnected many branches and the customers registered in any branch can avail required services in any branch. The banking operations are controlled and monitored by a central bank of the country. A customer can avail designated service either online or physically entering to the bank branch. The simplest analogous model to a banking system is shown in fig. 1. It represents the general banking functions discussed in the previous section by integrating various branches through appropriate

networking technology. Based on networking of bank branches, a customer can avail any service from any branches of the bank. Using the internet and wireless technology, a customer can avail banking services using electronic banking and mobile banking models.

### III. MODEL OF IDEAL BANKING SYSTEM

The conventional model of the banking system can be improved in its performance without changing its objectives and functions using electronic communication technology so that the speed, quality, accuracy and convenience of banking services to its customers will improve to a great extent. To improve any present systems, it is normal practice that such systems have to be compared with a hypothetical, predicted system of that kind called "Ideal system". The word 'Ideal system' refers to the system which has ideal characteristics i.e., perfect in every way. It is what the mind pictures as being perfect. The concept of an ideal engine, ideal switch, ideal voltage source, ideal current source, ideal semiconductor devices like ideal diodes, ideal transistors, amplifiers etc. have been defined and taken as standards to improve the quality and performance of such practical devices or systems. It is found that, by keeping such hypothetical devices or systems in mind, researchers have continuously been improving the characteristics/properties of practical devices / systems to upgrade their performances. Hence, ideal properties of a device or a system can be used to upgrade or improve its properties towards reaching 100% efficiency. By comparing the properties/characteristics of a practical device/system with its ideal counterpart, one can find out the possible modifications in that device /system towards reaching the objective of achieving such an ideal system [2]. Ideal Banking System model by considering various characteristics under 4 categories such as Input conditions, Systems requirements, Output conditions and Environmental & social conditions, and analyzed these characteristics with an objective to achieve the goal.

An ideal banking system would not only prepare students for the working world but would also prepare them to become empowered to transform the working world to better suit the needs of the people. An Ideal banking system shall have characteristics which can be predicted and classified. Based on various factors which decide the ideal banking system characteristics, a model consisting of the input conditions, output conditions, system requirements, and social & environmental conditions is derived by a qualitative data collection instrument namely, focus group method [3, 4]. The block diagram of such a system is shown in fig. 2.

#### A. Social & environmental conditions

- (1) The Ideal Banking system provides banking services to the entire world rather than a single neighbourhood town /Country and hence, it has an unlimited global reachability.
- (2) The Ideal banking offers services to its customers, which enjoys an inelastic demand in the world market

(inelastic means a service that people need or desire almost at any price).

- (3) The Ideal banking system provides all types of banking services of both retail banking and business banking to all customers irrespective of their age, gender, previous qualification and country of origin.
- (4) The Ideal Banking system provides high-quality banking services to everybody irrespective of their economic, social, linguistic and cultural background.

#### B. Input Banking Conditions

- (5) The Ideal Banking system needs minimum employees in identified areas of operation and must utilize optimum service from them.
- (6) The Ideal Banking system operates on a low overhead. It does not need an expensive location, many branches, and huge amount of infrastructure. Only a few Banks are required to provide quality service to the entire world.
- (7) The Ideal Banking system does not require major investments in equipment and other infrastructure or repetition of a large number of branches in every state and every country. In other words, it does not require huge capital.

#### C. System Requirements

- (8) The ideal banking system is relatively free of all kinds of government regulations or restrictions.
- (9) The ideal banking system is portable or easily moveable. This means a customer registered in one bank should be able to get the services wherever he moves and in whichever city he lives.
- (10) The ideal banking system satisfies its customers' intellectual needs. There are no constraints like minimum amount transaction, to be registered or avail services only in one bank, minimum and a maximum number of services availed per day.
- (11) The ideal banking system leaves enough free time to service providers/bank employees as well as customers. In other words, it doesn't require attention/study of 12, 16, or 18 hours a day.
- (12) The ideal banking system is one in which the income of the bank does not limit by a personal output (Leverage) of the bank workers. In the ideal banking system, a bank can provide any number of customers as easily as can have one.
- (13) The ideal Banking system, customers can do transactions at any time, any number of times and results should be declared immediately. There is nothing like wasting time in queue, travel time to the bank etc.
- (14) The ideal Banking system will provide services to its registered customers anywhere, anytime and any amount of time. i.e., it is ubiquitous.
- (15) In an ideal system, the technology is used in such a way that all services of the banking system should be delivered effectively.
- (16) An ideal banking system provides all customers with not only basic knowledge of banking but also on authenticity and security for financial transactions.

#### D. Output Conditions

- (17) In the ideal banking system, the demand for a variety of services is higher than supply and the efficiency of the system is always 100%.
- (18) In the ideal banking system, the customers have a choice of alternative in terms of service providers.
- (19) The ideal banking system will be sustainable for a long time.

Any banking system which has the above properties is considered as ideal banking system and the conventional education systems called brick and mortar systems have serious drawbacks/limitations in terms of the above properties [5-8].

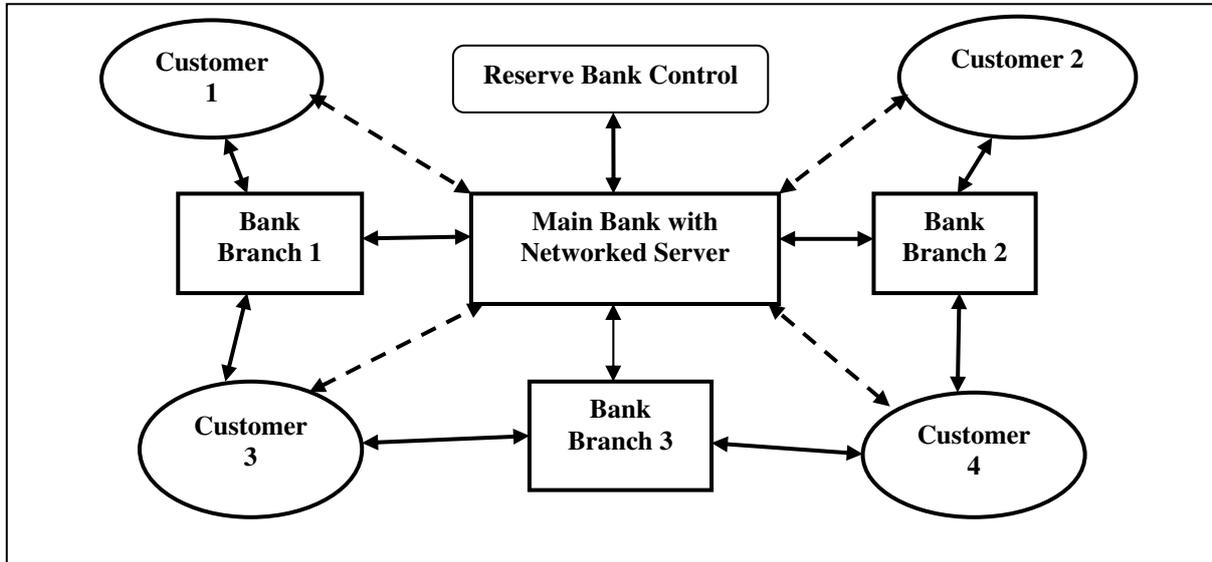


Fig. 1. A General Banking System Model.

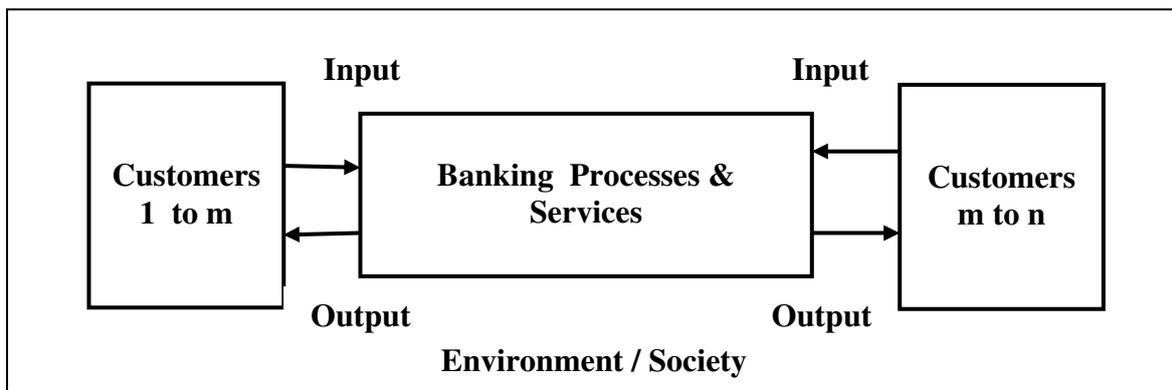


Fig. 2. Characteristics of an Ideal Banking System.

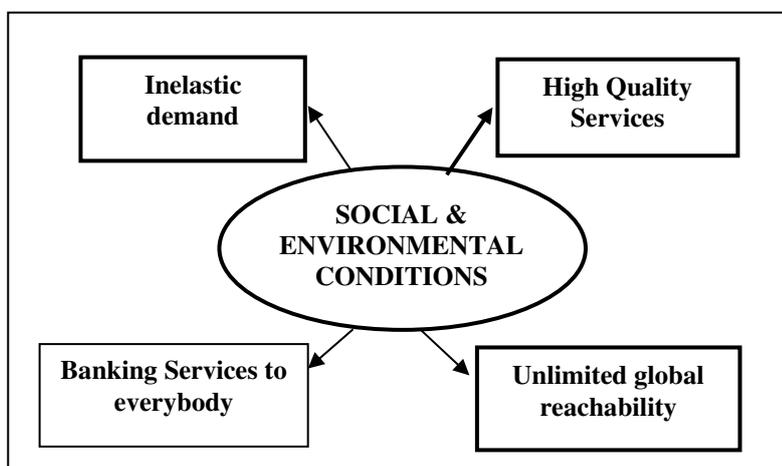


Fig. 3. Block diagram representing Social & environmental conditions.

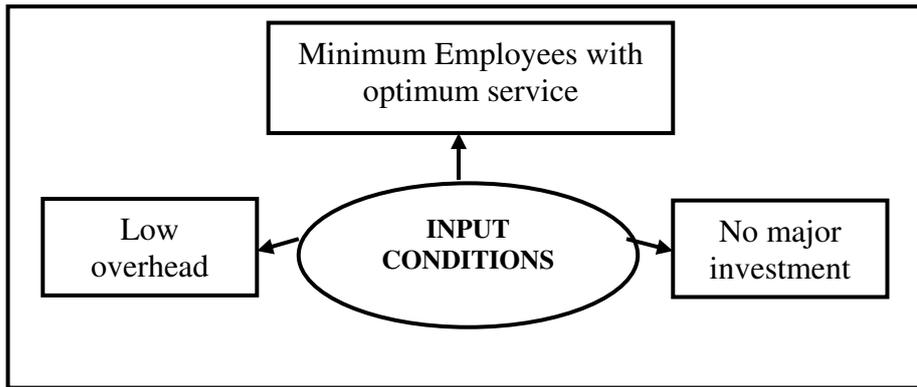


Fig. 4. Block diagram representing Input conditions.

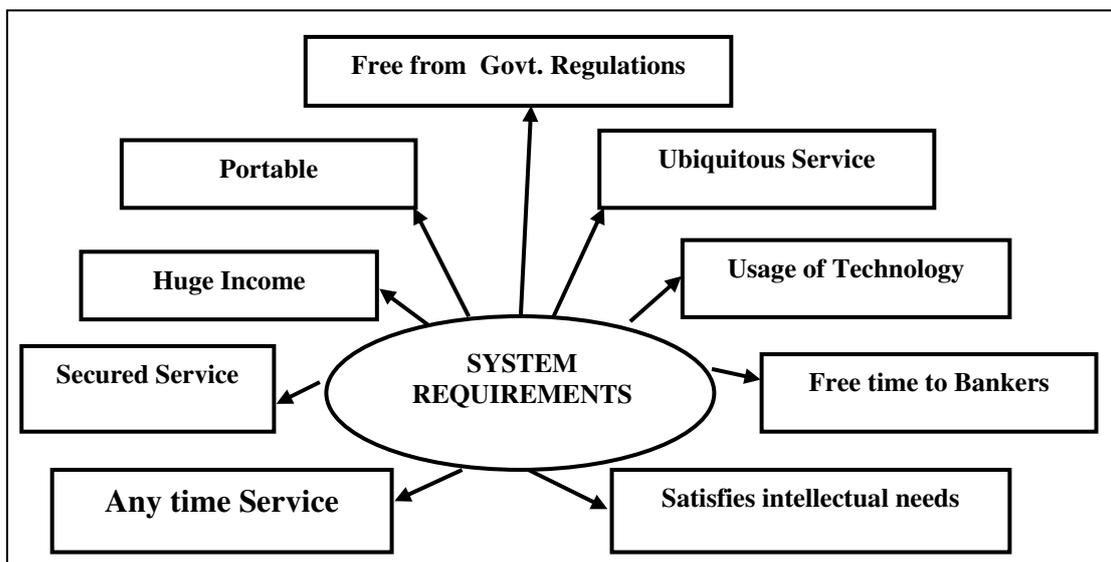


Fig. 5. Block diagram representing System requirements.

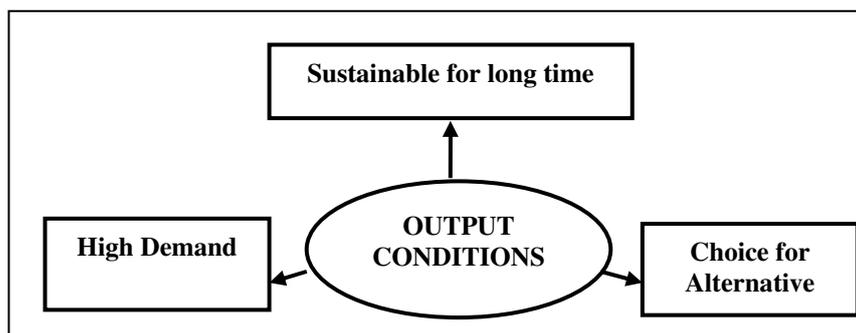


Fig. 6. Block diagram representing Output conditions.

IV. ANALYSIS OF IDEAL BANKING CHARACTERISTICS

The Ideal banking characteristics can be explained based on their effectiveness in improving the qualities of services and customers comfortability of availing it. The characteristics mentioned in ideal banking model are depicted in fig. 3 to fig. 6 and further discussed below [6-7] :

A. Social & environmental conditions

(1) Global Reachability : Any ideal system will sustain for longer period providing services to the larger number of people. The Ideal Banking system provides banking services to the entire world rather than a single neighbourhood town which has only limited number of

customers. Hence, ideal banking system has an unlimited global reachability.

(2) Inelastic demand : The Ideal banking system offers all required and possible banking services with the highest quality and enhanced values to the customers, which enjoys an inelastic demand in the entire world due to their benefits. In the ideal banking system, the benefits of providing banking services to the customers are always more than the cost incurred to provide it. Similarly for the customers, the benefits of the ideal banking services is always much more than the cost of availing it. A banking model can be called as an ideal only if it can decrease the distribution cost, distribution time, advertisement cost and production/servicing cost to a minimum level close to zero and capable of supporting the banking services to achieve inelastic demand. Such banking service becomes very attractive to all segments of global customers so that the customers desire to use it at any price which creates inelastic demand.

(3) Ubiquitous service to every customer :

Ubiquitous means being present everywhere simultaneously or existing everywhere at the same time. The very concept behind this is being everywhere and still being virtually inexistent or invisible. The aim of such banking service is to establish an environment where people can always be on-the-go and still carry information and power to solve their problems at their inconvenience, without being bound by the location of any particular technological device. Ubiquitous banking provides solutions and services at anytime, anywhere, any amount of time to the users. The Ideal banking system provides all types of banking services of both retail banking and business banking to all customers irrespective of their age, gender, previous qualification and country of origin due to its ubiquitous nature. This helps everybody in the world to have access to higher education in chosen area irrespective of his/her origin.

(4) Affordable to everybody :

Ideal banking should be so smart, so simple and so powerful that it works for everybody irrespective of their economic, social, linguistic and cultural background. Development and maintenance of such system should be simple, cost effective with fewer constraints for implementation. Hence, ideal banking is affordable to everybody so that it uses common techniques available in nature and manipulate effectively to the need of human being at an affordable cost. Thus, ideal banking system provides high-quality banking services to everybody irrespective of their economic, social, linguistic and cultural background.

### *B. Input Banking Conditions*

(5) Minimum Employee requirement :

Any system can sustain for a longer period by decreasing the cost. The ideal banking system needs minimum employees with specialized skills and must utilize optimum service from them to provide optimum service to the customers. The ideal banking system needs minimum employees in identified areas of operation and must utilize optimum service from them.

(6) Low overhead cost :

The total cost of any system is the sum of Fixed cost and Variable cost. The fixed cost involves the initial investment on the development of the system and the variable cost includes maintenance cost of the system. By decreasing initial investment without compromising with quality and by minimizing the maintenance and service cost, the banking system can decrease its overall cost. As per our definition, the ideal banking system operates on a low overhead. It does not need an expensive location, big branch building and a huge amount of infrastructure. Only one office in any location is required to provide banking services to the entire world. Hence, the Ideal Banking system operates on a low overhead. It does not need an expensive location, many branches, and huge amount of infrastructure. Only a few banks are required to provide quality service to the entire world.

(7) Low investments :

Out of various resources used in any banking system, capital investment like investment on land, buildings, equipment and other infrastructures need huge capital. On the other hand, the ideal banking system does not require major investments in equipment and other infrastructure or repetition of a large number of branches in every state and every country. In other words, it does not require huge capital.

### *C. System Requirements*

(8) Free of Government Regulations :

The ideal banking system is relatively free of all kinds of government regulations or restrictions. Many conventional business systems are facing problems due to Government regulations based on the nature of service provided, the environmental issues and the neighbouring community issues. These regulations sometimes make the banking systems as a nonprofit or to shut down. An ideal system is relatively free of all kinds of government regulations or restrictions so that it can do sustainable services for a longer period.

(9) Portability :

The ideal banking system is portable or easily moveable. This means a customer registered in one bank should be able to get the services irrespective of the location of the bank. A good business model should have characteristics to run the business location independent. The business should have the same level of difficulty and performance in terms of productivity, efficiency, effectiveness and hence revenue and profit even if it is performed any corner of the world irrespective of its location and the physical, geographical, political, economical and technical environment. The ideal banking should be perfectly portable or easily moveable from one location to other location based on the interest of its owner and should have the same level of difficulty everywhere. This means the bank should be able to provide the specified services anywhere to its customers irrespective of its location.

(10) Satisfying intellectual needs of stakeholders:

The ideal banking system satisfies both its owners and customers' intellectual needs. There are no constraints like minimum amount transaction, to be registered or

avail services only in one bank, minimum and a maximum number of services availed per day. There should be an opportunity for the owner to develop new services and the customers to surf new services like online trading for investment.

(11) Less time consumption :

The ideal banking system leaves enough free time to service providers/bank employees as well as customers due to the fact that all banking service decisions are automated and artificially controlled. In other words, it doesn't require attention/study of 12, 16, or 18 hours a day. In addition, the customers and employees need not waste their time for unproductive activities like travel etc.

(12) Potential opportunity for high income :

The ideal banking system is one in which the income of the bank does not limit by a personal output (Leverage) of the bank workers. In the ideal banking system, a bank can provide any number of services to any number of customers as easily as can have one. The banking systems must have profit for further progress. There is nothing wrong in expecting huge profit for honest efforts. One of the advantages of ideal banking system is the possibility of ensuring large profits. This is mainly due to intangible nature of banking services and scalability.

(13) Ubiquitous Service :

The ideal Banking system, customers can do transactions at any time, any number of times and results should be declared immediately. There is nothing like wasting time in queue, travel time to the bank etc.

(14) Anytime Service :

The ideal Banking system will provide services to its customers anywhere, anytime and any amount of time. i.e., it is ubiquitous so that customer need not wait either in the branch or in an online queue to avail service.

(15) Usage of Technology :

In an ideal system, the technology is used in such a way that all services of the banking system should be delivered effectively without any defect.

(16) Secured Service :

An ideal banking system provides all customers with not only basic knowledge of banking but also on authenticity and security for financial transactions. There will be no malpractice or miss function of any processes.

#### *D. Output Conditions*

(17) High Demand :

In the ideal banking system, since the quality is 100% and defects are zero, the demand for a variety of services is higher than supply and the efficiency of the system is always 100%.

(18) Choice for Alternative :

In the ideal banking system, the customers have a choice of alternative in terms of service providers so that the customer satisfaction will be 100%.

(19) Sustainable for a long time :

As per the definition, the ideal banking system will be sustainable for a long time with infinite demand, infinite serving ability, and infinite profit.

#### V. ADOPTION OF COMPUTERS AND ICT IN BANKING SYSTEM

Information Technology (IT) in banking supports the automation of various processes, controls, and information production using computers, telecommunications, software and ancillary equipment such as automated teller machine (ATM) and debit/credit cards. It covers the harnessing of electronic technology for the information needs of a business at all levels of the organization. Irechukwu (2000) [9] lists some banking services that have been revolutionized through the use of ICT which includes account opening, account managing, customer account mandate, and transaction processing recording and intimating to customers. ITC has provided self-service banking facilities to the prospective customers to open a new account online. It also assists customers to validate their account numbers and receive instruction on when and how to receive their cheque books, credit, and debit cards. ICT deals with the physical devices and software that link various computer hardware components and transfer data from one physical location to another [10]. ICT provided various electronic products and services in the banking industry which include Automated Teller Machine, smart cards, telephone banking, electronic funds transfer, electronic data interchange, electronic home and office banking, SMS banking etc. ICT is effectively used in core banking system. A core banking system is the software developed and installed in a bank to support its most common transactions like making and servicing loans, opening new accounts, processing cash deposits and withdrawals, processing payments and cheques, calculating interest, customer relationship management activities of the bank, managing customer accounts, maintaining minimum balances, interest rates, number of withdrawals allowed, intimating each transactions to the customers, establishing interest rates, maintaining records for all the bank's transactions etc [11].

#### VI. INNOVATION IN E-BANKING : MOBILE BANKING AS UBIQUITOUS BANKING

##### *(A) Mobile Banking – A new distribution Channel*

Providing financial transactions through mobile devices is a new distribution channel for financial institutions. Using this new distribution channel, they can add further value to their financial services. One of the industries which seem to be more affected after inventing the internet and mobile communication technology is retail banking. It holds all the opportunities and threats connected with the mobile devices and the mobile communication technology. Many retail banks have a dense branch network, close relationships with their customers, and are mostly local businesses operating in one country or part of a country or selected locations of the country only. However, their core services are perfectly digitizable and the new technology, therefore, has a potential for transferring all their banking business to mobile banking. This availability of new distribution channel is advantageous for banks for following reasons due to possibility of

improving operation effectiveness and service differentiation :

1. The mobile banking distribution channel can offer the customers better service output online in the form of a broader and deeper assortment, less waiting time and higher market decentralization. This may attract new customers [12], increase the revenue of the innovative firms and consequently lead to higher profits to the bank over a long period of time.

2. The mobile banking distribution channels are more cost effective than telephone and branch based networks, and lower cost may lead to lower prices for the consumers. In such cases, seemingly loyal customers may change to the mobile banking distribution channels, and the banking firms that have invested in the wrong channels may end up with channels that turn out to be useless, i.e., investments which may be difficult to recover.

3. The mobile banking distribution channels may change the way in which financial institutions interact with their customers and may facilitate direct marketing, relationship marketing, and mass customization, thus increase customer loyalty.

4. The demand for usage of mobile banking channel is likely to increase in the future due to the increase in literacy and the availability of mobile phones at cheaper rate and fall in the cost of mobile communication charges. This will change the optimal distribution channel structure for the most retail banks and the mobile banking channel is going to be most preferred banking channel due to its ideal characteristics [13-14].

#### *(B) Features of Mobile Banking*

M-banking is not just e-banking without fixed connections, but it is an entirely new way of designing and deploying a wide range of systems and solutions that are :

- Personal.
- Convenient.
- Easy to use.
- Always available.
- Accessible in real time.
- Location sensitive.

Various drivers moving mobile banking revolution forward include :

*(1) Advancements in network technologies* – Mobile network operators around the world are investing large sums of money in licenses and in building a new generation of networks. Network technologies that can support always-on connectivity will allow users to immediately send and receive voice and data services. At the same time, business investment is continuing apace in innovation at other levels of the network. Device manufacturers are creating prototypes of the products that might exist in the near future, and the race is on to create new standards for operating platforms.

*(2) Falling costs for airtime and wireless devices* - The cost of mobile devices and basic services such as voice and short messaging service (SMS) have plummeted. No longer is the mobile device a status symbol. It is becoming an intrinsic part of everyday life for millions of people.

*(3) The ability to link elements in different value chains, in real time, to provide a dynamic, personalized service*

- Businesses those link services, many of which already exist independently, will streamline their customers' transactions. For example, linking aeroplane ticket purchases, car rental bookings, and hotel reservations, then communicating all the information via messaging to mobile devices, would make travel planning easier. In order to offer these new services, businesses are beginning to enter into new alliances and partnerships, both within and outside their industries. This process in itself creates new possibilities and new business opportunities. M-business raises critical questions about strategic adaptation for every organization. It will herald the emergence of entirely new value chains and business models, not to mention new levels of personalized service. It will lead to new business alliances and a wave of convergence between industries. At a fundamental level, it will enable organizations to dynamically reconfigure their value chains and develop new relationships with employees, suppliers, customers, and competitors.

*(4) The ability to tailor services to end-users' various needs* — Taking one-to-one marketing to a higher level will become a new source of competitive advantage. By changing the nature of communication and interaction, customer relationship management will take on a new dimension. M-business will also facilitate efficiency gains through workforce management. Mobile technologies offer the potential for tasks to be scheduled for the right worker, with the right set of tools, at the right location and at the right time. They also increase the likelihood that customer enquiries can be resolved on the first port of call.

The following value proposition attributes [15-16] differentiates m-banking from e-banking :

*1. Ubiquity* : Mobile devices offer users the ability to receive information and perform transactions from virtually any location on a real-time basis. M-banking users will have a presence everywhere, or in many places simultaneously, with a similar level of access available through fixed-line technology. Transactions can take place independent of the user's location. The advantages presented from the omnipresence of information and continual access to availing and providing banking services are exceptionally important to time-critical applications. Mobile banking, for example, can leverage this value proposition by providing alert notifications, inquiries, and the information on financial transactions through SMS to users mobile device. As such, the real-time, everywhere presence of m-banking will offer capabilities uniquely beneficial to users. Financial services that are time and location sensitive, like any time purchase through credit card/debit card or any other electronic authentication system, are likely to benefit from businesses exploiting this value-added feature of mobile banking.

*2. Convenience* : The ability and accessibility provided from wireless devices will further allow m-banking to differentiate its abilities from e-banking. Customers should be no longer be constrained by time or place in accessing e-banking services. Rather, m-banking could

be accessed in a manner which may eliminate some of the labor of life's activities. For example, customers waiting in line or stuck in traffic will be able to pursue favorite Internet/SMS based banking activities or handle daily transactions through m-banking applications. Customers may recognize a special comfort which could translate into an improved quality of life. One opportunity to increase value lies in m-banking capabilities that allow customers to shop at where they are not located. This ability to obtain information and conduct transactions from any location is inherently valuable to bank customers. Hence, m-banking offers tremendous opportunities to banking service providers to expand a client base by providing value-added services to customers. By making services more convenient, the customer may actually become more loyal. Consequently, communication facilities within m-banking are key applications for the delivery of convenience.

3. *Localization* : Knowing the location of the mobile user creates a significant advantage for m-banking. Location-based offerings, via global positioning technology, are available on all mobile devices. Through GPS technology, financial service providers can accurately identify the location of the user. Utilizing this technology, m-banking providers will be better able to receive and send information relative to a specific location. Since mobile devices like cell phones are almost always on, vendors will know the location of their customers and can deliver promotions based upon the likely customer demands for that location. Location-specific information leverages the key value proposition of m-banking over traditional e-banking by supplying information relevant to the current geographic position of the user. M-banking providers will be able to both push and access information relevant to the user's specific location. Mobile websites may serve as points of consolidation of customer information and disseminate the relevant information for a particular location based on profile data built on the user's past behavior, situation, profile, and location. As such, real-time offers may become the "killer application" for M-banking.

4. *Personalization* : Mobile devices are typically used by a sole individual, making them ideal for individual-based target marketing. Mobile offers the opportunity to banking service providers to personalize messages to customers of various segments, based upon time and location. New developments in information technology and data-mining make tailoring messages to individual consumers practical and cost-effective.

5. *Conditions of Usage* : In the m-banking model, the mobile user may be engaged in another activity, like traveling, meeting people, etc., rather than sitting in front of his/her desktop terminal.

6. *Adaptability* : Mobile banking applications should be adapted to the environment of their clients. Adaptability is possible along various dimensions including the type of the device in use, the currently available communication bandwidth as well as location and time.

7. *Broadcasting* : Some wireless infrastructures, such as cellular architectures and satellite networks, support

broadcasting (i.e., simultaneous delivery) of data to all mobile users inside a specific geographical region. Broadcasting of banking information offers an efficient means to disseminate information to a large customer population. This mode of operation can be used to deliver information of common interest to many users such as variation in interest rate, variation in stock prices, or for advertising new banking offers.

The security for the online financial transactions at both client side and the banks server side must be very important for foolproof transactions. It is estimated that the lack of security and the high level of fraud is made the people doubt on encashing advantages of online banking services. The security threats on the client side may be due to the poor platform integrity, the multitude of default authentication and the arcane user interface. The security threats on the server side may be due to various system attacks like password cracking, screen emulators, data diddling, malicious code, distributed denial of service, physical perimeter penetration, and wireless intercepts. Compare to the internet based online banking, the online banking through the private network of mobile service providers and the user's personal mobile device is more secured. Hence, the primary concern on present day usage of mobile banking applications is due to the limited size and poor user interface of mobile devices than the security. Authentication between mobile phone users is indirectly provided by the calling and called party numbers and confidentiality of the transmitted information can be provided by encrypting the information flow between the communicating parties. Network operators are authenticating the users for billing purposes and to avoid fraud which will also help secured mobile banking through such networks. Users and banking service providers are interested in authenticating each other to avoid fraudulent transactions [17-18].

The various advantages for banks [19-20] by offering mobile banking distribution channel for their customers are :

- (1) Banks can cut down their costs of providing service to the customers substantially.
- (2) This new channel gives additional opportunity to the banks to cross-sell their other complex banking products and services such as vehicle loans, credit cards etc.
- (3) Mobile banking distribution channel offers the next surest way to achieve their growth. In developed countries, where mobile penetration is nearing saturation, mobile banking is helping banks to increase revenues from the now static subscriber base.
- (4) The banks get an opportunity to simplify the complicated services and to make the usage easy to attract new customers and retain old ones.

Presently, many banks offer following services through mobile banking channel :

1. Account Balance Enquiry
2. Account Statement Enquiries.
3. Cheque Status Enquiry.
4. Cheque Book Requests.
5. Fund Transfer between Accounts.
6. Credit/Debit Alerts.
7. Minimum Balance Alerts.

- 8. Bill Payment Alerts.
- 9. Bill Payment.
- 10. Recent Transaction History Requests.
- 11. Information Requests like Interest Rates/Exchange Rates.

These services are classified as Push and Pull services with respect to the bank server. 'Push' service is when the bank sends out information to customers based upon an agreed set of rules. 'Pull' service is when the customer explicitly requests a service or information from the bank, so a request for last five transactions statement from a customer is a Pull based offering.

Another type classification is also used as Enquiry based service and Transaction based service. A request for customers bank statement is an enquiry based service and a request for funds transfer to some other account is a transaction-based service. Table 1 shows the difference between such categories of mobile banking services.

Table 1. Classification of mobile banking Services

	Push Based	Pull Based
Transaction Based	-	Fund Transfer Bill Payment Other financial services like share trading.
Enquiry Based	Credit/Debit Alerts. Minimum Balance Alerts Bill Payment Alerts	Account Balance Enquiry Account Statement Enquiry. Cheque Status Enquiry. Cheque Book Requests. Recent Transaction History

*(C) Characteristics of Mobile Banking System*

- (1) The mobile banking system can provide banking services to the entire world rather than a single neighbourhood /Country and hence it has an unlimited global reachability.
- (2) The mobile banking offers services to its customers, which enjoys an inelastic demand in the world market due to its inelastic expandable capability, and low expenditure to both service providers and customers. (inelastic is refers to a service that people need or desire almost at any price.)
- (3) The mobile banking provides all types of banking services of both retail banking and business banking to all customers irrespective of their age, gender, previous qualification and country of origin.
- (4) The mobile banking system provides high-quality banking services to everybody irrespective of their economic, social, linguistic and cultural background.
- (5) The mobile banking system needs minimum employees in identified areas of operation and must utilize optimum service from them.
- (6) The mobile banking system operates on a low overhead. It does not need an expensive location, big building for customer service and the huge amount of infrastructure. Only a few branches are required to provide quality service to the entire country/world.
- (7) The mobile banking system does not require major investments in equipment used in bank branches and other customer supporting systems provided in bank

branches or repetition of a large number of branches in every city and villages. In other words, it does not require huge capital.

- (8) The mobile banking system is relatively free of all kinds of government regulations or restrictions except Reserve/Federal bank regulations.
- (9) By certain extent, the services of the mobile banking system are portable or easily shiftable. This means a customer registered in one bank should able to get the services wherever he moves and in whichever city he lives.
- (10) The mobile banking system satisfies its customer's intellectual needs. There are no constraints like minimum amount transaction, to be registered or avail services only in one bank, minimum and a maximum number of services availed per day.
- (11) The mobile banking system leaves enough free time to service providers/bank employees as well as customers. In other words, it doesn't require attention/duty of 12, 16, or 18 hours a day.
- (12) The mobile banking system is one in which the income of the bank does not limit by the personal output (Leverage) of the bank workers. In the mobile banking system, a bank can provide any number of customers as easily as can have one.
- (13) The mobile banking system, customers can do the transaction in any time, any number of times and transaction takes place immediately through banks main server. There is nothing like wasting time in queue, travel time to the bank etc.
- (14) The mobile banking system will provide services to its registered customers anywhere, anytime and any amount of time. i.e., it is ubiquitous.
- (15) In the mobile banking system, the technology is used in such a way that all services of the banking system should be delivered effectively.
- (16) Mobile banking system provides all customers with not only basic knowledge of banking but also on authenticity and security for financial transactions.
- (17) In the mobile banking system, the supply of a variety of automated services is instantaneous and is equal to the demand and the efficiency of the system is always 100%.
- (18) In the mobile banking system, the customers have a choice of alternative in terms of service providers.
- (19) The mobile banking system will be sustainable for a long time due to its advantages and benefits to customers and service providers.

*(D) Comparison of Mobile Banking Characteristics with Ideal banking Characteristics*

The ideal banking characteristics are used to compare mobile banking features with the features of conventional brick and mortar branch banking system and are listed in table 2. Based on the comparison, it can be accepted that ubiquitous mobile banking shows almost all features of ideal banking except few exemptions.

Table 2. Comparison of Mobile Banking Characteristics with Ideal banking Characteristics

S.No.	Ideal Banking Characteristics	Traditional Branch Banking	Mobile Banking
1	Unlimited global reachability	No	Possible
2	Banking services enjoy inelastic demand in the world market	No	Possible within a country
3	Provides all types of banking services to all customers.	Possible with limitations	Possible
4	Provides high-quality banking services to everybody irrespective of their economic, social, linguistic and cultural background	Not happening	Possible
5	Uses minimum employees in identified areas of operation and must utilize optimum service from them.	Not possible	Possible through automation
6	Operates on a low overhead.	Operational expenditure is high	Due to automation of services, overhead expenditure is low.
7	Does not require huge capital.	Requires comparatively huge capital	Due to automated online services, it requires comparatively less capital.
8	Relatively free of all kinds of government regulations or restrictions.	Govt. and RBI/FB regulations are applicable.	Govt. and RBI/FB regulations are applicable.
9	The services of ideal banking system are portable or easily shiftable.	Not possible	Possible
10	Satisfies its customer's intellectual needs.	No. Due to constraints of Physical bank branches.	Yes.
11	Leaves enough free time to service providers/bank employees as well as customers.	No free time	More free time due to automated services.
12	The income of the bank does not limit by the personal output (Leverage) of the bank workers.	Not applicable	Applicable due to automated online services
13	Customers can do transactions in any time, any number of times without wasting the time.	Not possible	Possible due to automated online services.
14	provides ubiquitous services.	Not possible	Possible due to automated online services.
15	All services of the banking system are delivered effectively.	Not possible	Possible using proper technology.
16	Provides all customers with not only basic knowledge of banking but also on authenticity and security for financial transactions.	Difficult to implement	Possible using proper technology.
17	The demand for a variety of services is higher than supply and the efficiency of the system is always 100%.	Always supply is less than demand.	Supply of variety of automated services is instantaneous and is equal to the demand and the efficiency of the system is always 100%.
18	The customers have a choice of alternative in terms of service providers.	Not much alternative.	The customers have choice of alternative.
19	The system is sustainable for a long time	Change is inevitable.	Sustainable for long time due to its advantages and benefits to customers and service providers.

## VII. UBIQUITOUS BANKING AS IDEAL BANKING

The mobile banking system which is ubiquitous i.e., services available to the customers anytime, anywhere, any amount of time irrespective of a number of customers availing the service at a time, using wireless electronic/optical technology made the conventional brick and mortar banking system as ubiquitous banking. The automated banking services using computer technology and information technology supports to make banking services ubiquitous. Due to the massive growth of banking technologies with the aid of 5G mobile technology [21], the mobile banking services becoming more authenticated and secured. This has increased the confidence of the common man to use such services in a day today's life. While referring table 2, it is understandable that major characteristics of the ideal banking system are comparable with the characteristics of the ubiquitous mobile banking system. Thus, ubiquitous nature of mobile banking system made it as the ideal banking system. The advents in wireless technology became a boon to provide ideal banking system to the

mankind. Even though we could not realize ideal engine, ideal technology, and ideal education system in practice, we have almost reached the goal of the banking system by elevating ubiquitous mobile banking system close to the ideal banking system.

## VIII. CONCLUSION

Banks are formulating various strategies in order to attract more deposits and lend it to genuine customers to get a better return and hence make more profit. Based on such objective of a general banking system, the ideal concept of a banking system is developed. The ideal bank is a system with ideal banking characters. In this paper, a model of an ideal banking system is proposed by considering the ideal characteristics expected under input conditions, output conditions, system requirements, and environmental conditions. The factors affecting these characteristics are identified using a qualitative data collection instrument namely focus group method. Finally, some of the possible technology supported models which support the concept of Ideal banking are

identified and analyzed. Based on our analysis and discussion on comparing the features, ideal banking characteristics, and mobile banking characteristics are almost matching and hence it can be concluded that ubiquitous banking system based on mobile banking technology is a perfect model to realize ideal banking system.

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