# An Integrated approach for Banking GIS

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## Abstract

*Access to reliable data across an enterprise means valuable intelligence for strategic decision-making. When it comes to retail banking, competition to attract and keep customers is fierce. Deregulation of the banking industry has lowered competitive entry barriers and competition is coming from both within and outside the industry. Technological advancements and the growth of the Internet have lowered geographic barriers and brought information to customers' fingertips. Changing lifestyles and technological sophistication have heightened customers' expectations and lowered their loyalty. Speed of information transmission has led to commoditization of banks' products and services—thus eroding profits from product and services. To survive and succeed, banks are looking for ways to increase customer satisfaction and retention— while containing costs, improving efficiency and maximizing return on their technology investments. To accomplish these measures, banks need to integrate disparate systems, need to adopt advanced technologies like Geographic Information System (GIS), develop more effective marketing programs and overcome the difficulties of translating strategy into actions. This paper focuses on an integrated approach in developing a GIS based integrated system that helps banks in achieving their business objectives*.

## Introduction

In recent years, the banking industry has been undergoing drastic changes, reflecting a number of underlying developments. Significant advancements in communication and information technology accelerated and broadened the dissemination of financial information and financial services and also increased the complexity. Another key impetus for change has been the increasing competition among a broad range of domestic and foreign institutions in providing banking and related financial services. Regulations are forcing the banks to adopt better operational strategies and upgrade their skills. All these factors throwing more challenges to banking sector.

A customer-centric business model can help address these challenges. A bank's primary function is to deliver financial services and products to the customers. Banks, today, need to be market driven and market responsive. The success of such an institution depends on its approach to data management, customer relation management. Banks manage a world of information about customers, customer profiles and so much more. By adding a component called "***Location***" to their database, banks can gain

enormous advantage in many ways. Long range planning mixed with geographic modeling will yield tangible benefits to the Banking /Financial institutions community.

### How GIS can benefit banks

GIS plays an important role in various functional areas of banking in achieving the various business objectives of banks such as

1. **Expansion of Customer base**
2. **Improvement in Quality of the Services**
3. **Increased Customer Satisfaction**
4. **Consistent Business Growth**
5. **Increase in Profitability**

GIS helps in banks various functional Areas by providing support in decision-making and strategic planning. Some of the major areas are discussed below.

### Market Analysis

In today's highly competitive Business environment, Marketing is a customer-orientated operation that is essential for business success of any bank. Marketing departments of the banks face real problems in fully understanding their markets and the potential customers for their finance products and services. GIS based Marketing analysis proves relevant and useful in this context

In general, marketing is a question of demand (customers) and supply (Financial products, Financial services, Customer services through branches and ATMs). Both demand and supply are easy to pinpoint to a geographical location. Therefore, these factors are interesting to analyze with the help of a GIS.

The development of GIS technology has made a new approach to the marketing analysis imperative. It also reveals the importance of geo-demographic research to marketing. All kinds of market segmentation techniques are being developed to define more precisely the target group of customers.

## Customer Analysis

This analysis answers the queries, where are our customers located? What are their characteristics (market segmentation, classification of residential areas)? Catchment area for the branches can drawn and areas, which are not served, can be easily identified. Spatial analysis using the socio-demographic information may give indicative patterns.

## Competitor Analysis

This analysis answers the queries, where are our competitors located?. This analysis identifies the competitors and their customers on the Map, analyze the reason for existing performance.

## Focused Marketing

GIS based solution can provide specific information on products and the areas they are well received. Therefore allowing specific advertising to take and thus reducing large advertising bills. Banks can now advertise in region media specific products, rather than major national media campaigns. Scheme's introduction and advertising those scheme's can be targeted to the more appropriate group (Specific income group, Some specific category like NRI account, Current Account…etc). GIS can help in identifying those target groups spatial distribution.

## Business Expansion Planning

Finding the best new bank location for business expansion is really a challenging task as it requires substantial capital investment and with so much money on the line, management wants to feel sure that they have selected the right expansion site. The solution should allow the management the ability to understand the big picture for their concept, providing insight for strategic planning.

### New Branch / New ATM Location

Business expansion planning needs modeling location-relevant data and providing fast and cost- effective site analysis to confidently and reliably select a new bank branch/ATM location and shorten the cycle for time to market. It is also necessary to assess the likely performance of new branches/ATMs based on the presence of key decision variables, such as Concentration of commercial areas, traffic patterns, workplaces or homes of customers whose demographics and purchase behavior match a bank's target customer profile. GIS based solution helps to understand how a potential new branch would perform based on the performance of a bank's best matching existing branches as well as compare how one of its branches is performing relative to other branches.

Banks seeking sites for location for expansion, also need information from localities, land costs, building availability and suitability, construction costs, local and state taxes, local and state development incentives, availability and cost of energy, transportation costs to customers and from suppliers, as well as such factors as the availability and quality of medical care in the area, the location and market areas of competitors, the availability of other infrastructure such as telecommunications, sewer, and water, as well as factors related to quality of life. Using GIS, these diverse information elements can more readily be identified and integrated. Additionally, the ability to display this information in map formats enables economic developers to demonstrate pictorially and comprehensively that a site or sites meet specified criteria.

Using GIS based solutions banks can determine the maximum number of branches a market, region is capable of supporting. This leads to more focused growth strategies, more efficient Banks can use GIS based solutions to rank service areas within a market according to viability for the concept. Based on the bank's criteria, the analysis can consider competition, cannibalization, demographics and other concept factors to help prioritize options.

### Branch Performance Monitoring

Using GIS Banks can analyze the performance of the banks. Monitoring the Branches performance using spatial component will have a greater advantage. Potential customer zones can be drawn in based on the spatial distribution of the customers. The GIS component of a branch review involves defining a trade

area around the branch, measuring the market potential within that trade area, and identifying the nearby competitors. The banks can determine the products that are being purchased by particular socio demographic groups. From that information, banks can determine other areas with similar influences to target specific advertising.

**Decision support for Strategic Planning**

Banks need decision support while carrying out strategic planning. GIS based solutions help banking industry with What - if" scenarios. GIS based tools examine the interrelationships between land-use factors, infrastructure capacities and proximities (such as railroads, water and wastewater facilities, major highways), and economic growth. This has the potential of increasing the profit margins by allowing the effects of major decisions to be estimated prior to their execution. Former methods were more of a guestimate nature than accurate predictions. What if scenarios provide the means to determine the effects of branch closures, or relocations Furthermore, they allow banks to check the effect different changes would impose upon their markets. For example a bank could determine the extent of lose of clients if the minimum balance of their basic savings account was increased. This is only feasible when the banks have input data regarding their client's accounts

## Bank Asset Management

Modern banks have now various physical assets such as ATMs and other electronic equipment in door as well as outdoors to manage and monitor. Bank management needs to monitor vast amounts of information over an ever-changing inventory of physical assets. From installation to replacement, the condition of an asset throughout its lifecycle needs to be considered in a comprehensive management model in order to maximize the benefits of its services to its customers and users.

Today's environment of limited resources and growing demand means that decision-makers need the ability to weigh multiple scenarios balancing varying levels of investment against asset lifespan. GIS technology includes the analytical tools to perform "what if" analysis and dynamic segmentation to locate multiple classes of assets. The right tools make it possible to operate, maintain, and upgrade physical assets cost-effectively.

This entails that a bank document whether its assets are being maintained at or above a condition level pre-established by the agency. It requires regular inspection for condition assessment and disclosure of infrastructure asset condition no less than every three years. In addition, anticipated and actual maintenance outlays required to maintain minimum asset condition need to be determined and disclosed.

## Retail banking services

Banking priorities are being challenged like never before and bank management is looking for innovative and smarter ways to meet the demands of retail banking service delivery. Banks should be positioned to provide solutions that improve the lives of both bank executives and their customers

The future of retail banking is, quite literally, in the customers' hands. Metaphorically, too, they are exercising the power to choose the way they want to carry out their financial affairs. This issues such as managing the technology obsolescence, new customer care initiatives, and higher levels of regulation, is a monster challenge for today's bank executive in an environment increasingly shaped by globalization

Hence banks should adopt innovative methods of automations to deliver the most efficient retail banking services to hold the customers. GIS based solutions help the bank management in achieving these objectives.

**Online tracking of Cash status in ATM's**

Distribution and replenishment of the Cash to the ATM according to demand and in-time is a major challenge in the area of ATM management as the dead-cash results into substantial interest loss.

GIS based Real Time solution for the replenishment and management of ATMs provides highly effective approach to the cash management cycle. "Auto detect" component provides real time data in order to optimize the servicing of ATMs, "just in time", based on actual customer demand. This solution should be a flexible, dynamic model, which operates in real time and is based on actual customer needs to improve the servicing of ATMs, resulting in improved efficiency and reduced costs.

GIS based solution displays the ATMs on the map along with the cash status to help in better visualization and better optimization in Cash distribution. Cash requirement for each day for a Bank/ATM can be predicted with the help of the history of cash transactions over a certain period during previous years and also with the help of Demographic data such as population density, Socio economic information etc.

**Cash Van Fleet management for Cash distribution**

Banks employ cash vans for the money disbursement across ATMS. Managing these Vehicle movement for money disbursement is a challenging task. Some banks outsource these services to third party service provider. The fleet management of the cash vans involves scheduling and planning of routes for cash vans and at the same time ensuring that the Cash vans run as per the schedule and disburses the cash at ATMs in time. This becomes exceptionally difficult in bigger cities for example metros where the number of Cash vans involved is very high and all these vans perform repetitive trips.

The failure of management in ensuring timely operations of cash vans results Into cash run offs at ATMS thus affecting customer services with the chance of banks becoming unpopular

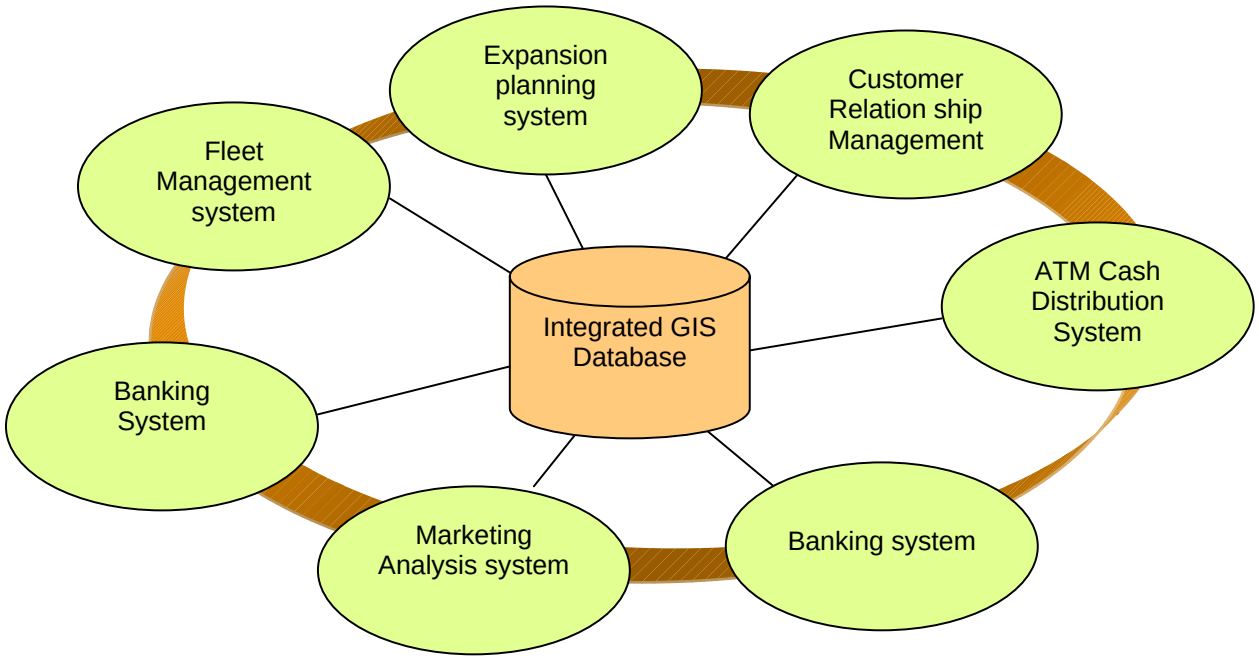
However GPS and GIS based Fleet management Systems provide the possibility of monitoring the movement of cash vans at an affordable cost.

## An Integrated approach

The proposed approach suggests the development of an “GIS based integrated Banking system” which provides all of the above functionalities by integrating the Customer databases.

The following systems can be tightly integrated to build and “GIS based integrated Banking system”

1. Market Analysis System
2. Expansion Planning system
3. Asset Management system
4. Fleet Management system
5. ATM Cash distribution system
6. Customer Relationship Management system
7. Banking system



## Conclusion

In recent years, the banking industry has been undergoing drastic changes, reflecting a number of underlying developments. Speed of information transmission has led to commoditization of banks' products and services—thus reducing the profits from product and service differentiation.
GIS based solutions can be developed in an integrated environment to help banks in decision making, Strategic planning, Effective resource management and Operations management to achieve their business objectives such as Customer Satisfaction, Business Growth and Customer base expansion etc.

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