



## 7 applications of GIS data by financial service providers

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### What decisions do providers use GIS data for?

1. Location of branches and agents
2. Marketing
3. Human resource management
4. Complaint resolution
5. Fraud detection
6. Security and cash distribution
7. Evaluating credit risk

The following is a brief from the i2i Data Quality team on their work with financial service providers (FSPs) on pioneering innovations in the application of GIS. It aims to provide a brief snapshot into the possibilities that financial access mapping can unlock. This document forms part of a forthcoming series of publications that will provide improved clarity on the application of GIS data in financial services delivery and the formation of policies.

**Geographic information systems (GIS)** is increasingly informing decision-making in financial inclusion. Financial service providers (FSPs) are not always aware of the opportunities available to them when they combine their internal datasets with financial access point data and other GIS information. This document introduces 7 ways financial service providers are applying GIS data in decision making.

### 1. Location of branches and agents

**Expansion:** FSPs use a variety of GIS layers to decide where to locate new branches or agents. GIS data allows an FSP to identify locations for investment based on existing road and electricity infrastructure, mobile coverage and the socio-economic conditions in the area. A model for identifying new locations will also include other contextual information such as the distance to other branches or agents and the concentration of similar services in the catchment area. GIS analysis for determining new locations will also take into account

customer travel elasticity<sup>1</sup> and potential physical barriers (rivers, highways, etc.) that prevent customers who appear close to a service point from accessing it.

GIS data is used to visualise economic developments that serve as leading indicators for expansion activity. For example, a South African insurer regularly monitors mining regions for indications of when new mining sites will become operational. This serves as potential marketing ground and indicates where they should open new branches. In another instance, a South African bank uses the locations of bus or minibus-taxi ranks as a leading indicator for the placement of ATMs.

<sup>1</sup> Travel elasticity calculates how many branches the customer is willing to pass before arriving at their preferred bank branch.



GIS aids these FSPs to constantly monitor such developments.

GIS analysis is not only applied to green field expansion. FSPs are using similar analyses to those described above to identify business partners who can be leveraged to offer an extended suite of products. For example, in Kenya, mobile network operators are partnering with banks to create digital financial services delivered through mobile money agents, who have a greater reach and geographical coverage than the banks.

**Performance management:** GIS information is used to adjust performance expectations for each access point based on the local geographical context. Sales targets, transaction volumes and liquidity requirements are all dependent on the income levels and industries surrounding the access point. Foot traffic can also be predicted based on various factors, including nearby shopping centres and travel routes. All this data needs to be geographically linked to the access point location in order to do the necessary analysis. Locations are chosen based on a set of criteria, but over time the area around the branch might change. Regular updates of the economic data will also allow continuous monitoring of key performance indicators and revision of targets as required.

GIS data is also used to monitor inputs required for successful operations. For example, in South Africa, FSPs require regular analysis of mobile coverage from mobile operators to ensure that each of their access points are served. This is especially important for Point of Sale (POS) devices, which require such coverage to successfully complete transactions.

In Tanzania, financial access maps are used to locate the most productive mobile money agents to understand the drivers behind their success. The analysis identified that the 11 mobile money agents with the highest transaction rates (took more deposits than any other agents) were unexpectedly located in an

industrial area. This was particularly surprising as all 11 were located within a 100 metre radius.

**Network optimisation:** GIS is also used to determine which access points need to be moved or closed in order to achieve optimal coverage. Expansion decisions and performance management is often done on an individual access point level. However, strategically it is important to take a holistic view of the network to avoid over-saturation. Network optimisation analysis is performed periodically to determine areas that were once profitable but now no longer require as many service points or perhaps different types of service points (e.g. Bank vs ATM). In network optimisation analysis the number of service points of a particular FSP, the types of service points, their location relative to each other and competitor locations, as well as travel patterns in the area are all taken into account. Demographic information is combined with the performance data of each location to identify where optimisation is likely to occur.

## 2. Marketing

**Advertising access points online:** FSPs use GIS data to publicise the location of their services. Once a service point's exact location is captured, it is uploaded to various online mapping tools such as Google Maps etc. In order for customers to make use of services they have to be able to locate the nearest and most suitable financial access point. For example, customers need to distinguish between access points that offer cash withdrawals or card services, cardless or e-services and those that receive deposits (envelope ATMs or intelligent deposit ATMs). To bridge this gap, FSPs are loading the location of their service points as well as supplementary data about the access points online.

**Above the line advertising:** GIS data is used to determine the optimal locations for billboard advertising. For example, insurance companies have used knowledge about



commuters on highways to determine the optimal site for a billboard. This includes where they are traveling from and where they are going, their income and demographic data and existing market penetration in the area. Local demographic and language data is also used to inform billboard content, by location.

**Direct marketing:** Organisations that have accurate information on the location of their clients can match the client to the event (new product launch, golf day, fundraiser, etc.), not only based on the customer profile, but also on their proximity to the event. Clients are more likely to attend events that are hosted near them. By doing GIS analysis of client locations, FSPs are also able to identify clusters of clients that may warrant additional events in secondary locations.

### 3. Human resource management

GIS analysis is used in personnel allocation planning. **Figure 1** illustrates how a bank maps its branch locations, their respective staff counts (green circles) and number of clients (white circles).

From the visual representation it is easy to see which branches are under-resourced and which are over-resourced. Decisions like choosing where to add or reduce staff are made easier and more cost effective through the use of GIS.

Organisations that have mapped the home locations of staff also take this into account when reallocating staff. The travel distance, access to public transport and route options are all taken into account

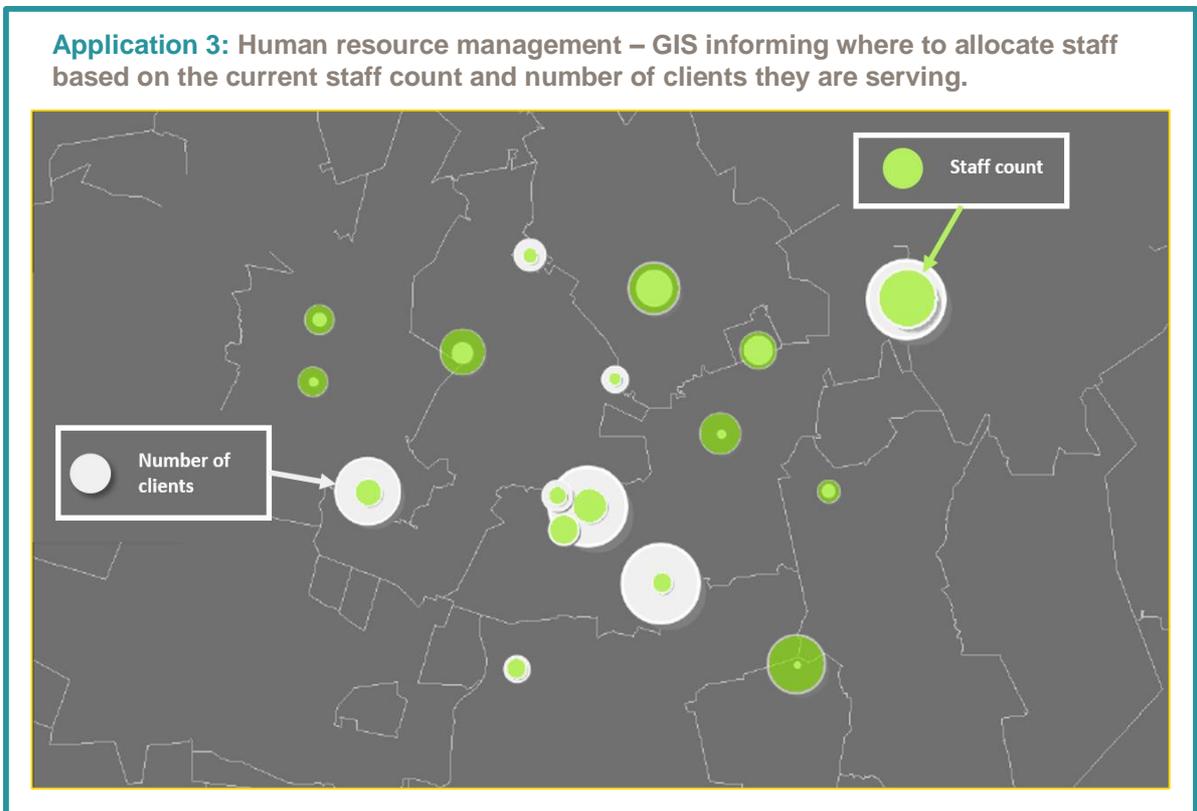


Figure 1: South African Bank branch location, staff allocation and customer numbers



Furthermore, having mapped locations of all employees, some FSPs in South Africa have arranged staff transport schemes to and from areas with high concentration of staff. This reduces the burden on employees and creates a more productive work environment.

## 4. Complaint resolution

GIS analysis is applied to complaint resolution in two ways. First, by geo-locating complaints, problem branches or areas are easily identified. Depending on the granularity of the complaints data, it is even possible to determine which problems are most prevalent in which areas. As a result of this analysis, interventions are targeted at specific branches or areas.

Second, in some cases the resolution of the problem requires the customer location to be known. The customer is either directed to the nearest facility that can assist with their problem or a representative is sent directly to the client.

## 5. Fraud detection

Banks are using GIS to determine potential fraudulent transactions. Fraudulent transactions are typically card based transactions that happen in short succession and in very disparate locations. Retail banking departments constantly flag transactions that are suspicious in nature with respect to locations. Such monitoring protects the consumers and the commercial banks against cloned cards, cloning syndicate schemes and card theft.

## 6. Security and cash distribution

Through effective use of GIS information, FSPs are improving their cash management, planning and security. Deposit-taking institutions plan the most efficient routes for cash deliveries to multiple drop-off and collection points, taking into account safety,

road works and traffic congestion between branches. Banks also use GPS trackers for security measures, e.g. a cashbox opened more than 30m away from the bank branch or ATM can automatically explode and taint the money, rendering it useless.

## 7. Evaluating credit risk

Credit providers use GIS data to evaluate risk associated with loans. For example, GIS information about rainfall patterns and typology of the area is used as inputs into the credit application for agricultural loans. Information about surrounding commercial property values are also used to evaluate property loans. Having information about the area surrounding the farm or commercial enterprise allows the credit provider to better evaluate risk and the probability of loan repayment.

### About insight2impact

insight2impact | i2i is a facility advancing the use of data for financial inclusion. It was established by **FinMark Trust** ([www.finmarktrust.org.za](http://www.finmarktrust.org.za)) and **Cenfri** ([www.cenfri.org](http://www.cenfri.org)) in 2015 in response to a growing need amongst policymakers and providers for a platform to inform and support data initiatives in financial inclusion.

For more information see our website [www.i2ifacility.org](http://www.i2ifacility.org) or contact i2i community of practice and partnerships manager Mari-Lise du Preez at [mari-lise@cenfri.org](mailto:mari-lise@cenfri.org)