

Spatial Data for Business Intelligence Workshop proceedings

10-11 November 2016, Dar es Salaam, Tanzania



Insight2impact (i2i) in collaboration with Financial Sector Deepening Tanzania (FSDT) hosted the Spatial Data for Business Intelligence workshop on 10-11 November 2016, in Dar es Salaam. The two-day workshop focused on demonstrating the value of spatial data for the financial sector and driving evidence-based decisions in areas such as key performance indicator (KPI) measurement, product design and implementation, and strategic investments, to increase the likelihood of institutional adoption of GIS data usage.

The proceedings of the two-day workshop were as follows:



Day 1: 10 November 2016

- Opening remarks
- Agenda review and setting expectations
- Keynote 1 – Driving market change through spatial data
- Keynote 2 – Mobile data analytics for development
- Keynote 3 – Spatial data for business intelligence
- Breakaway session 1 – Data collection
- Breakaway session 2 – Analysis and insight generation
- Breakaway session 3 – Implementing enterprise-level spatial data solutions

Day 2: 11 November 2016

- Breakaway session 1 – Low cost, flexible analysis and visualisation tools
- Breakaway session 2 – Analysis and insight generation
- Breakaway session 3 – Exploring regulatory use cases

Day 1: 10 November 2016

Opening remarks: Sosthenes Kewe, FSDT



Sosthenes Kewe, executive director at FSDT, welcomed the delegates to the workshop. His key talking points were that spatial data is a key source of data available to decision-makers in private and public institutions to influence financial inclusion policies. Sosthenes went on to stress to delegates how important it is to know how geospatial data can inform regulation in ensuring that customers generate value from using financial products and services.

Opening remarks: Grant Robertson, i2i



Grant Robertson, head of data quality at i2i, concluded the opening remarks by highlighting the role of i2i as an advocate for spatial data through its function as a market facilitator. He specifically mentioned that i2i was set up to support the process of ensuring that spatial data is integrated to contextualise the information that informs the advancement of financial inclusion. He extended an invitation to delegates to consider i2i as a resource for technical support and for interested parties to become part of the vibrant geospatial data for financial inclusion (gis4FI) ecosystem which will lead to better financial services for consumers.

Agenda review and setting objectives: Damola Owolade, i2i

After reviewing the workshop agenda, Damola invited delegates to share their expected learning outcomes from the workshop and highlight use cases relevant to their respective organisations.

Some of the feedback is outlined below:

- PEG (Ghana) provides solar home systems on credit to customers based on a pay-as-you-go mechanism which allows customers to pay over a period of time using mobile money. PEG is interested in using geospatial data to improve repayment rates, inform market segmentation and optimisation.
- FSD Africa operates as a market facilitator to help financial markets work better for low-income people. The potential role of geospatial in addressing KYC requirements in terms of customer address verification and the regulatory implication was stated as a use case of interest. This has the potential to advance financial inclusion as financial service providers (FSPs) can have location information of (potential) customers who might live in places without street addresses. This would meet FSPs' compliance requirement and provide increased access to financial products and services for low-income individuals based in rural or peri-urban areas where the level of financial inclusion is lower relative to urban areas.

- UNCDF/MM4P is a donor programme scaling up sustainable branchless and mobile financial services that reach the poor in very low-income countries through a mix of technical, financial and policy support. The regulator (e.g. Central Banks) is seen a key partner to the UNCDF in providing an enabling environment to make financial markets work efficiently and there is a need to establish a basic sustainable public data set.
- Ona provides data collection tools that are used for humanitarian purposes and are looking to find synergies between all gis4FI stakeholders including the data solutions service providers, to identify the most efficient means of using data to meet humanitarian needs including access to financial services.
- Makerere University (the geomatics department) offers a programme in GIS and suggested that university students could be in a position to collect financial access point data as part of their curriculum. Since financial access points are in communities, there is a need to think about how community members can also be used to collect or map financial access points to achieve sustainability in spatial data collection. A question was posed on whether there could be other mechanisms via agent aggregator networks in mapping financial access points.
- FSD Zambia as a market facilitator spoke of the need to map population distribution boundaries (enumeration area/district level) in order to conduct analysis using spatial data that can be applicable to the smallest geographical unit as possible. That is, analysing spatial data at the point where the population, is stemming from a concern that spatial data is not being collected at a disaggregated/enumeration area level.
- Flowminder Foundation offers an open source data service. In response to FSD Zambia, it was stated that that one of their products, Worldpop, offers population density (population demographics) data at a 100-meter spatial resolution for the whole world. Flowminder was interested in forming partnerships that would result in analysis using the Worldpop data with other data sources to create insights that could generate public and private use cases while meeting academic research objectives.

Keynote 1 – Driving market change through spatial data: David Taylor, usabledata Ltd.



David’s presentation was focused on factors that would allow FSPs to increase financial inclusion by providing better products through more efficient distribution channels to encourage use by customers. With better targeting, there would be better products increasing depth and breadth of financial inclusion.

The background on this is that many countries are testing new approaches to collect and use spatial data. Regulators are looking to think through how spatial data can be used to monitor financial inclusion policies. Some FSPs are already using spatial data but behind closed doors due to intellectual property concerns. Evidence of mass adoption of spatial data to make market changes are not widespread.

The challenges that have emerged in terms of lack of usage of spatial data (especially the publicly available datasets like the FSP maps) include the following:

- The data is a snapshot that does not speak to day-to-day, hour-to-hour transactions.
- The publicly available data does not link location data to internal transactional data due to the non-standardised unique identifier.
- There is a lack of cost-effective data collection mechanisms.
- Lack of capacity in terms of appropriate tools and organisational structures that give value and insight.

However, Airtel in Uganda is using spatial data to monitor their agents. A number of the telcos operating in Ghana have also linked agent location data with their transactions and can observe real-time (hour-to-hour) trends in some key performance indicators.

In Tanzania, there is regulation that mandates FSPs to self-report their agent locations which is creating tools and standards that forms the building blocks for an ecosystem where data sharing and the value of spatial data can be optimised. Structural changes are being made to make products relevant, and provide standards and tools to make it easier for the private sector to engage with the data.

Recent years and months have brought technological advancements, which make data collection easier and more cost effective with more options than ever before. Data analysis and actionable market insight-products are changing rapidly for commercial business products.

David also stressed the need for a data aggregator/portal that is well marketed to inform would-be users of where to find relevant data. The perception is that Africa is data-poor but in actuality, there is data (for instance, Worldpop) often, however, it is difficult to find and use the data as it is not easily accessible, gatekeepers may stand between the data and users or the may not be marketed effectively so potential users don't even know it exists.

The role of the analyst is not to only produce reports but to interrogate data and continuously ask questions which could lead to financial service delivery, either through gained efficiencies or improved understanding of markets.



Keynote 2 – Mobile data analytics for development: Rositsa Zaimova, Real Impact Analytics



Rostisa’s presentation focused on the use of telco data to support better decision-making, the Real Impact Analytics Data for Good product, and showing FSP use cases.

In terms of using telco data to create value from spatial data, Call Detail Records (CDR) was identified as key. CDR provides real-time information from phone calls that are captured at a cell tower level. This is the lowest level of aggregation one can use and additional granularity (individual level data) would have implications for data privacy issues since it would require the consent of telco clients. CDR can give information on airtime spending profile, mobility patterns, identify seasonal mobility and mobility of special events. In addition, the CDR can be used in addition to external data sources such as CRM, satellite, and field surveys.

In terms of financial service provider use cases, Rostisa gave a live demonstration of how CDR overlaid with contextual data (survey data) can inform mobile money penetration and usage strategies. Specifically, Real Impact Analytics Data for Good solution was demonstrated to show how it could inform liquidity management needs of a mobile money operation and market segmentation in order for FSPs to achieve better targeted services.

Keynote 3 – Spatial data for business intelligence: Richard Yego, Airtel Uganda



Richard discussed the reasons for Airtel Uganda’s adoption of spatial data, their spatial data mapping methodology, solutions derived from spatial data analysis and the nature of the mobile money market in Uganda.

Airtel Uganda was motivated to adopt spatial data into their management information system in order to be more competitive, as a market entry strategy, improving conversion rates for existing customers that use other wallets, understanding the behaviour of GSM customers and for agent quality management.

Agent location data is geocoded and mobile money agents are assigned with unique identifiers to allow for the integration of mobile money agent location to their management information system. The adoption of spatial data has increased Airtel Uganda’s capability in mobilising agents strategically, complying with regulatory requirements (reporting agents’ locations), improving liquidity management, amongst other gains. A non-exhaustive list of insights Airtel is generating from linking agent location to transactions include:

- Number of customers in a given location.
- Agent float holdings.

- Source of float/rebalancing points.
- Fraud incidence tracking.
- Tracking of direct deposits against P2P.

Mobile money providers in Uganda are governed by Mobile Money Guidelines issued by the Central Bank of Uganda issued in 2013. The guidelines encourage non-exclusivity of agents in the mobile money market. That is, all mobile money agents are free to offer mobile money services of all providers. This has presented a level playing ground for mobile money operators to scale up agent recruitment hence bringing services closer to the wider industry of GSM customer base in Uganda.

Breakaway session 1 – Data collection: Matt Berg, Ona; and Charl van Heerden, Brandworr



This session was about assessing the opportunities and challenges involved in collecting and maintaining an up-to-date list of all financial access points. Discussions were focused on technical software options to collect spatial data as well as logistical and operational experiences from the field.



Key learnings from the session focused on existing data-collection methods, key challenges in data collection and the proposed solutions.

1. Data collection methods:
 - Crowdsourcing (for instance, OpenStreetMap).
 - Data collection during agent registration, which would entail self-reporting by financial service providers.
 - Contracting of third-party providers to collect data using enumerators.
 - Web-scraping, which entails collecting geographic data from company websites, local institutions and any other digital source of information, in order to geocode their locations to enable mapping.
2. Key challenges identified in data collection and analysis discussed included the following:
 - Resource constraints in order to pilot collection methods and uses cases.
 - The importance of considering the local context in the data collection process which could be difficult if an implementation team is not based in the country/environment being mapped.
3. Solutions to challenges in data collection:
 - There is a role for market facilitators such as the FSDs and i2i to take the lead in ensuring the sustainable data collection methods are piloted and lessons learned are disseminated.

This will ensure that the most efficient data collection models are adopted, given a resource-constrained environment.

Breakaway session 2 – Analysis and insight generation: David Taylor, usabledata; and Rositsa Zaimova, Real Impact Analytics

This session focused on the value of combining internal data, such as the transactions being done by a bank or mobile money agent or CDR data, and contextual data such as population distribution and poverty information; and how this data can be used to segment the market and drive policy-making and investment decisions.



Key learnings for market facilitators and regulators:

- Regulators have access to supply-side data but do not use the data beyond policy development and tracking financial inclusion targets. There is an opportunity to use that data to gain a deeper understanding of the context of specific markets and to facilitate the development of more complete use cases.
- There is a need to provide standards for the collection and structuring of spatial data to ensure that it is useful both to the regulator and FSPs. The most appropriate body to issue these standards will most likely be the regulator.
- Inclusion of geospatial data in monthly reports from FSPs to the regulator for new or existing financial access points that have moved location to ensure up-to-date spatial databases.
- Regulators should incentivise FSPs to self-report spatial data regularly and establish cost sharing models between the FSPs

Key learnings for FSPs:

- Product improvements: Linking internal transactional data with spatial data can be used to improve products, how they are structured, marketed and rolled-out into the market.
- Managing agent liquidity: FSPs mentioned that data for agent liquidity management exists but due to internal silos, the absence of a data champion, and a lack of capacity, this data is not used to inform decisions on agent network optimisation.
- Creditworthiness as a use case: Can spatial mapping and satellite imagery be used to assess creditworthiness? Where a person lives, how long one stays/has lived at a said location, type of house one lives in – roofing material, the permanence of the structure? Does this pose a challenge in terms of customer exclusion and consumer protection?
- Agriculture finance: Mapping agriculture value chains with information on productivity, weather, rainfall, and drought can be used to inform targeted product development – repayment plans, and in developing agricultural insurance products.
- Market segmentation and granularity of data: Geospatial data offers this opportunity but the data has to be granular for it to be useful in terms of segmentation.

- Free tools for data: Delegates mentioned that open-source and free tools for data do not necessary mean poor quality. Tools such QGIS, R for analysis, and Carto for visualisations were recommended.

Breakaway session 3 – Implementing enterprise-level spatial data solutions: Damola Owolade, i2i



This session explored the requirements and opportunities involved in investing at an enterprise “organisational level” spatial data solution to manage data and generate business intelligence insights. The approach was to have a discussion based on the experiences of delegates who work or have worked in the financial sector.

Key challenges identified:

- FSP products are generally not client-based and are thus not influenced by data. Products are launched as a response to competition in most cases.
- FSPs have organisational silos – data and operations – that pose a challenge to overcome.
- In some cases, product development takes place at the FSP headquarters without consideration for country specific data.
- Institutionalising geospatial data initiatives is a challenge involving capital investment, human resource, skills and change management, including the need to ensure the correct technological infrastructure is in place to manage and update data collected.

Recommended solutions identified:

- Having a data champion in the organisation is key.
- Basic training on how to use free tools such as QGIS to analyse and present spatial data. This could be used to generate organisational buy-in needed to invest in more automated solutions.
- It is important to work to establish linkages between the use cases to make the data more powerful across silos in an FSP.
- FSPs should assess their capacity in data management and to regularly update spatial data in order to chart a sustainability plan.
- FSPs should focus on the problem to be addressed instead of the need to invest in the tools since there could be other ways/data sources to address problems.

Day 2: 11 November 2016

**Breakaway session 1 – Low cost, flexible analysis and visualisation tools:
David Taylor (usabledata) and Lara Storm (FINclusion Lab)**



This session was initially going to be an introduction to low-cost, basic, user-friendly GIS software, analytic and visualisation tools for participants to explore options for implementing data-driven decision-making without breaking the bank.

However, following feedback from the delegates, the session turned into a general discussion, as outlined below.

The key insights from this session are as follows:

- There is a challenge in moving spatial data analysis from a “nice to have” to a “must have”. Even when organisations are keen to use spatial data and constrained by resources, they tend to prioritise processing of KPI reports as opposed to developing new insights from spatial data.
- There is a need to invest in change management within FSPs for them to become more data driven.
- There is a need to focus on improving existing data and processes, such as using spatial data to add context to KPI reports, layering with other data and then developing predictive models.

**Breakaway session 2 – Analysis and insights generation: Megan Yates, Ixioanalytics;
and Xavier Vollenweider and Veronique Lefebvre, Flowminder Foundation**



This session focused on best practices in building a data culture, removing technological constraints, and implementing a data framework that informs agent placement, access point network optimisation and customer engagement.

The Flowminder team presented their research involving the overlay of nationally representative data on population density and characteristics against data on the locations of mobile money agents. By evaluating the success of agents (in terms of volumes of transactions) in relation to population and locational characteristics, operationally-relevant insights that will support mobile network operators and agent aggregators to develop the MFS market in rural areas can be developed.

Megan discussed how Ixioanalytics is in the process of providing technical support to Fidelity Bank in Ghana by restructuring their decision-making process to be more data-centric. She referred to the

challenges of having siloed organisational structures which have negative implications for the integration of systems.

Breakaway session 3 – Exploring regulatory use cases: Brian Loeb, Bankable Frontier Associates; and Ahmed Dermish, MM4P, UNCDF



This session provided an opportunity for all delegates to solve a case study that looked to match the incentives of the regulator with the private sector with implications for data sharing and policymaking. Brian and Ahmed led the session and the case study that the delegates had to resolve is summarised below.

A government is looking to launch a G2P (Cash Transfer Scheme) and want to identify two areas to pilot the scheme.

The solution requires the use of data including a geospatial solution which should take the following into consideration:

- Low-cost delivery of cash to intended beneficiaries.
- Increased transparency.
- Ensuring good customer experience for the intended beneficiaries.
- Reduced use of cash in the society.
- Reduced leakage in the system.

The key feedback from the different groups on how the government should go about rolling out the G2P project included the following:

- There are a plethora of data sources which are being under-utilised.
- It is important for the regulator to be cognisant of the compliance cost and the competitive sensitivity for the private sector in sharing data.



In closing, the workshop was interactive and generated interest from the diverse set of stakeholders that were present. It is expected that the market facilitators will be looking to have country level GIS workshops while documenting and disseminating lessons learned from the burgeoning relationships that are been formed between the data service providers and the financial service providers. It is also expected that the common incentives between the regulator, financial service providers and the data solutions service providers are exploited in order to foster a vibrant gis4FI ecosystem at a country level.



