

Barkai, Ofer; Harison, Elad

Conference Paper

Mobile Business Intelligence: Allocation of Mobile Workers for Competitive Information Gathering

Provided in Cooperation with:

IRENET - Society for Advancing Innovation and Research in Economy, Zagreb

Suggested Citation: Barkai, Ofer; Harison, Elad (2017) : Mobile Business Intelligence: Allocation of Mobile Workers for Competitive Information Gathering, In: Proceedings of the ENTRENOVA - ENTERPRISE RESEARCH INNOVATION CONFERENCE, Dubrovnik, Croatia, 7-9 September 2017, IRENET - Society for Advancing Innovation and Research in Economy, Zagreb, pp. 240-245

This Version is available at:

<https://hdl.handle.net/10419/183781>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by-nc/4.0/>

Mobile Business Intelligence: Allocation of Mobile Workers for Competitive Information Gathering

Ofer Barkai

Shamoon College of Engineering, Israel

Elad Harison

Shenkar College of Engineering and Design, Israel

Abstract

The access to real-time and updated data, in particular information about the position of firms and their competitors in the market, has become the top priority of organizations worldwide. The dynamic and rapidly changing business environment and the increasingly intensive competition suggest that companies require ongoing monitoring of the market, the behaviour and preferences of their customers and their competitors. Frequently updated information enables the firm to proactively, rather than reactively, act towards its competitors and clientele. The paper proposes and analyzes various methodologies and frameworks that employ the mobile labour of firms (such as technicians and maintenance personnel) for gathering information on the premises of clients and their surrounding neighbourhood. As mobile workers already gain access to the client and insights about the product or the service provided by their firm, they can broaden the scope of information gathered from her. The data streams continuously provided by mobile workers require IT infrastructure for transferring, structuring and processing this information to enrich managers and strategic decision makers within the firm with up-to-date, real world insights. The study presents the methodology and proposes different IT architectures that can support the implementation of mobile intelligence gathering in a variety of organizations.

Keywords: mobile workers; business intelligence; information gathering

JEL classification: L86; M15; M21

Introduction

The introduction of advanced data storage, retrieval and management technologies since the 1990s has led the way to the development of Business Intelligence (BI) tools that are based on collection and analysis of customer data and historical records (Watson and Wixom, 2007; Chen *et al.*, 2012). The complementary body of knowledge, that is the position and the activities of competitors in the market can be obtained from multiple sources, including:

- Existing, potential or leaving customers.
- Overt data sources, such as news stories and the Internet.
- Business partners and suppliers.

(Makadok and Barney, 2001; Bulley *et al.*, 2014)

Despite the vast volumes of data augmented by companies and documenting a broad variety of aspects of their customers' behaviour on a continuous basis, observations documenting changes in the market and in the properties of the competition can be identified only after "critical mass" of data is collected and

analysed through the BI systems of organizations (Harison, 2012). In this respect, those changes are not identified in real time or in proximity to their occurrence, but *ex-post*.

The access to real-time and updated information has become the top priority of organizations worldwide. The dynamic and rapidly changing business environments of firms and the increasingly intensive competition that they confront require ongoing and updated monitoring of the market, the customers of the firm and its competitors. Further, frequently updated information enables the firm to proactively, rather than reactively, act towards its competitors and clientele. For example, when a customer decides to discontinue her relationship with the firm, she is referred to the customer retention department once her decision is made and announced. At this stage, which is the final resort before the departure of the customer from the firm, companies experience great difficulties to change the decision of customers to leave them. However, if earlier indications for the intentions of customers to leave their service providers were offered, firms could have contacted those customers before their decisions were made final and could have prevented the termination of their service contracts.

The development of BI tools and methodologies has dramatically evolved during the last decade and BI systems involve analysis of commercial data, CRM, social media mining and the application of advanced processing and visualization tools that can virtually provide almost correlation between different data sources that the firm collects, obtains or accesses. However, the major challenge for organizations is the acquisition of real-time, reliable and qualitative data about its business environment, preferably as a part of its day-to-day operations and at minimal cost. Rapp *et al.* (2015) focused their research on *individual competitive intelligence* (ICI) by sales and service representatives, suggesting that a role conflict between the operations of employees and their organizational identities can emerge, due to the covert aims of ICI gathering during seemingly informative or functional discussions (i.e. offerings of services or solutions that cater to the needs of clients).

Kuester and Rauch (2016) suggest that market intelligence activities (MIA) assigned to salespersons should be conducted after a detailed planning of these operations was prepared, including assigning clear and defined aims for market intelligence collection by employees. Their research findings suggest that despite the strong motivation of salespersons to voluntarily engage in MIA, they may experience psychological difficulties (such as role ambiguity and conflict) in the long run when they assign MIA and define goals for themselves.

Said *et al.* (2015) highlight the importance and the role of market intelligence gathering within the framework of market base learning (MBL) to support the identification of customer insights on the products and the services of firms and the value that customers derive from them. Their customer insight strategy includes:

- Insight demand chain management - includes the various stakeholders that participate in requesting for and obtaining customer insights (including marketing managers, market research agencies, etc.).
- Insight value alignment – ensures that the market research is aligned with the business objectives of the firm.
- Insight value monitoring – the use of customer insights within the organization to extract know-how and benefits about customer perspectives, perceptions and preferences. This element of the customer insight strategy includes also insight sharing between organizational departments and employees and the management of insight information flows in the organization.

The paper aims at defining a coherent methodological framework for the gathering of competitive market intelligence by utilizing the access to real time knowledge on the preferences and uses of customers, or any potential customers in their geographical proximity by field employees, i.e. service workers, maintenance workers, traveling salespersons, etc., who visit existing and potential customers on their premises. The strategic planning of mobile business intelligence by employees, the technical setting and the acquisition, storage and processing of business intelligence data to produce valuable operational and managerial insights for the firm.

Methodology

The paper is based on a case study conducted in a major Israeli telecommunications company that provides infrastructure services, such as landline telephony and access to the Internet via its cable network. During the last decade, the Israeli regulator facilitated competition in the telecommunications sector, thereby fostering the entry of new infrastructure and service companies into the market and affecting the dominant position of the company in it.

The subscription and connection of clients to a service provider's network (either to the company's or to its competitors' networks) can be identified by the deployment of equipment on the client's premises, and the maintenance of it is based on field work, at the client's home or office, that is carried out by the company's technical employees. Thereupon, the company's management decided to utilize the advantage of technical workers visiting the company's clients on a large geographical scale to identify its position in local market segments (for example, old and newly-built neighbourhoods, business districts, mansions, skyscrapers, etc.). Field employees were instructed to gather information on the intentions of existing clients to proceed in their subscription or to leave the company, about the intentions of their neighbours to leave the company or one of its competitors and to report about the deployment of technical equipment by competitors on premise. In addition to the training of employees in business intelligence gathering techniques and instruction of the subjects that they should explore and report, the company initiated a BI platform that uses their mobile devices as means for data collection. Data are stored in a central database and later processed by a BI system to generate insights for different organizational departments, such as marketing, strategic planning and sales.

During the research, interviews with managers and field employees were conducted. The architecture, interfaces and specifications of the mobile BI gathering application and the central BI collection and processing system that the company employs were examined. The training program for BI gathering that of the company provides to its field workers was studied and analyzed.

Following our analyses and discussions with the company's personnel and the study of the best practices (as well as the shortcomings) of the company's mobile BI program, a framework for initiation of mobile BI strategy for the deployment of market intelligence gathering by field employees was devised. The framework, presented herein, includes a roadmap for the planning, training, operation and supporting information systems and data management that can serve other organizations that are interested to use their field employees as a valuable source of information.

A Framework for the Deployment of Mobile BI Operations, Data Collection and Processing

The framework is based on several major dimensions that should be addressed and planned by organizations that aspire to implement the mobile BI strategy.

Defining the Scope of Mobile BI Information Contents

The mobile BI strategy should include, at large, the goals of the organization in conducting this line of operation. Several major goals that can be served via mobile BI include identification and analysis of market trends on the basis of reports obtained from visits of technicians and field workers, reporting of infrastructure changes and installation of new equipment on the premises of clients and new events (such as the presence of competitor's infrastructure equipment) in their surroundings.

Additionally, a mystery customer can be sent to purchase services and goods from competitors to identify the price, terms of purchase and delivery terms, as well as problems in the purchase process that the consumer and supplier confront, and to enrich the database of the BI information system with complementary insights about the offerings and the operations of competitors. Data can further be enriched by new opportunities embraced by the competitors and presented to customers and by their forecasts of operations and fields of activity from other overt and covert sources of BI gathering.

Gathering Competitive Market Intelligence

The field workers, e.g. technicians and salespersons, are expected to collect data that reflect the occurrences on the customer's premises in terms of the competitive position of the firm and its rivals, either on limited and defined geographical scale or in the whole market. Employees, trained in mobile BI gathering, gain access to the client's home or office via necessary maintenance, a problem solving operation or a business meeting. They can identify and report upon initiation of the operations by the competition in the region (if competition have not existed before) or assess the volume of competitive activity in it (if competition is already present).

Additional and essential business intelligence can be gathered from the customers themselves through the interaction of the firm's employees with them. Field workers can inquire on the present and the future needs of customers in terms of the types of services and goods, the volumes of purchasing them and the regions of in which the firm should operate or terminate its activity. Additionally, they can identify the terms offered to customers by competitors and the present and upcoming changes in the activities of competitors. By mapping the presence of competitors, either through discussions with customers or by identifying their equipment on premise, the firm can assess their presence in particular areas and compare it to their penetration into other regions. Some sectors in which mobile BI can be applied include telecommunications and broadband connections (in which routers indicate the presence of competitors), landline phones, TV subscriptions, electricity, gas, and solar panels, among others, due to the physical installations that indicate the provision of the goods and the services by competitors.

Socio-Demographic Business Intelligence

Although national Central Bureaus of Statistics (CBS) in most OECD nations collect socio-demographic data on particular geographical areas, other countries do not

necessarily carry out this practice in full or even on a partial scale. Further, data are collected in a national census once in a decade (and thereby do not provide an updated socio-demographic outlook) and despite their collection in resolution of street-by-street, CBS provide them on an aggregate level and in lower resolution to maintain the privacy of citizens.

By employing field workers in socio-demographic data collection on customers and their neighbourhoods, firms can evaluate the number of potential customers that share similar attributes as sub-groups in the clientele, predict changes in the population (such as the increasing number of students, customers leaving to other locations and the construction of new buildings in areas of operation). Other indicators that can be collected via mobile BI methods go beyond the national statistics. They include data on customers changing service providers, changes in the population's consumption behaviour, social changes in terms of the presence of immigrants and families with children in the population of existing and potential customers and evaluation of the satisfaction levels of different types of customers.

Mobile Business Intelligence Systems

The system architecture and configuration are based on mobile reporting applications that are installed in the devices of field workers and enable them to report on their findings to a central business intelligence gathering system. The central system collects data from multiple sources, in addition to the field reports, and transforms them into structured format or into a searchable (unstructured) format. Based on these databases, managers can define BI reports, which are generated on a constant basis or per need, to gain useful insights about changes in their business and competitive domains and among the population of customers.

Conclusions

The paper proposes a methodological and practical framework for the application of mobile BI gathering by field workers in multitude sectors and firms. The framework is based on data gathering on the customer's premises or in its geographical proximity, and on the use of mobile applications connected to a central BI gathering system to obtain real-time, real-world data. These data are later processed into reports and trend analyses that can be employed as a part of managerial decision making processes, marketing and strategic planning.

The proposed framework can serve, in particular, utility firms, such as energy, telecommunications, Internet and TV providers, where the installation of physical infrastructure is a pre-condition for service provision, and thereby signals the operation of competitors on a geographical scale. Nonetheless, other sectors can also benefit from the application of some of the methods described in this paper by training their employees to identify and to extract customer insights through customer-representative interactions.

References

1. Bulley, C.A., Baku, K.F., Allan, M.M. (2014), "Competitive intelligence information: A key business success factor", *Journal of Management and Sustainability*, Vol. 4 No. 2, pp. 82-91.
2. Chen, H., Chiang, R.H.L., Storey, V.C. (2012), "Business intelligence and analytics: From big data to big impact", *MIS Quarterly*, Vol. 36 No. 4, pp. 1165-1188.
3. Harison, E. (2012), "Critical Success Factors of Business Intelligence System Implementations: Evidence from the Energy Sector", *International Journal of Enterprise Information Systems*, Vol. 8 No. 2, pp. 1-13.

4. Kuester, S., Rauch, A. (2016), "A job demands-resources perspective on salespersons' market intelligence activities in new product development", *Journal of Personal Selling & Sales Management*, Vol. 36 No. 1, pp. 19-39.
5. Makadok, R., Barney J.B. (2001), "Strategic Factor Market Intelligence: An Application of Information Economics to Strategy Formulation and Competitor Intelligence", *Management Science*, Vol. 47 No. 12, pp. 1621-1638.
6. Rapp, A., Agnihotri, R., Baker, T. L., Andzulis, J. (2015), "Competitive intelligence collection and use by sales and service representatives: How managers' recognition and autonomy moderate individual performance", *Journal of the Academy of Marketing Science*, Vol. 43, pp. 357-374.
7. Said, E., Macdonald, E.K., Wilson, H.N., Marcos, J. (2015), "How organisations generate and use customer insight", *Journal of Marketing Management*, Vol. 31 No. 9-10, pp. 1158-1179.
8. Watson, H.J., Wixom, B.H. (2007), "The Current State of Business Intelligence", *IEEE Computer*, Vol. 40 No. 9, pp. 96-99.

About the authors

Ofer Barkai, Ph.D., is a Senior Lecturer in the Department of Industrial Engineering and Management at the Shamoon College of Engineering (SCE), Ashdod, Israel. He has 27 years of industrial experience. He specializes in information technologies and service organization and compensation strategies at the organizational and managerial levels. Author can be contacted at ofer@sce.ac.il.

Elad Harison, Ph.D., is a Senior Lecturer and the former Head of the Department of Industrial Engineering and Management at the Shenkar College of Engineering and Design, Israel. He specializes in the Economics of innovation and technical change in the context of information technologies. Dr. Harison received his Ph.D. from the University of Maastricht, was a Marie Curie research fellow at the Copenhagen Business School and a faculty member at the University of Groningen, before his current affiliation in Israel. He was involved in several research projects on innovation policies for the European Commission and for several European governments. Author can be contacted at eladha@shenkar.ac.il.