



Business Intelligence For Mobile Users

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Abstract: Business intelligence (BI) is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions. BI applications include the activities of decision support systems, query and reporting, online analytical processing, statistical analysis, forecasting, and data mining. On the other hand Mobile BI is the capability of the organization to deliver relevant and timely data to anyone, whenever they need it, wherever they are, regardless of the device used to access that data. Mobile BI includes the concept of device independence. Users demand flexible data access and the ability to access and analyze data in a uniform manner, regardless of the device used, be it PC, laptop or smart phone.

Keywords: Business intelligence, device independence, enterprise users, forecasting, statistical analysis.

I. INTRODUCTION

There is the set of users who is physically mobile, and requires remote access to information assets. These users regularly switch between laptop, desktop and smart phone, but are not necessarily out in the field. These users include senior management and executives, key sales people and field service personnel. Mobile BI applications includes Incorporating a Mobile BI platform into an organization's analytics and reporting infrastructure will have a direct impact on improving its bottom line, by increasing competitive advantage, employee productivity and the level of customer satisfaction.

II. MOBILE BI

Mobile BI is the capability of the organization to deliver relevant and timely data to anyone, regardless of the time, place and the device used to access that data. Mobile BI means full flexibility & mobility to the user.

III. NEED FOR USING MOBILE BI

A. Improvement in the Data Delivery:

For mobile workers who are often away from their desks, a Mobile BI application provides them with direct access to organizational data assets. In addition to delivery efficiency, the ability to act on that data and overall organizational efficiencies and productivity can be streamlined. Organizations are then better placed to act on opportunities and make fast, better informed business decisions. There is the improvement in the information flow through the organization.

B. Increase in the employee productivity:

Increasing employee productivity is a key motivation for delivering BI to mobile devices. The inability to access real-time information inhibits the mobile worker from achieving maximum productivity. End-user groups must have access to

real-time data, no matter their location or mobile device, to enable them to improve individual as well as organizational performance. Delivery of the right data at the right time, can significantly improve productivity; by reducing the time wasted in searching for data employees need to do their jobs effectively. [11]

C. Real time reporting and analytics:

Mobile BI is about delivering real-time, or near real-time, access to data. Field sales and service teams need access to real-time data so they can effectively and efficiently achieve their goals and objectives. We live in the world of the instantaneous and the now inability to swiftly respond to marketplace opportunities will result in lost business and reduced competitiveness. For example if the customer places an urgent order the delivery personnel should be able to deliver the order as soon as possible. It is critical that the data delivery mechanism and the underlying data sources being accessed are capable of real-time data delivery. [9] [11]

D. Users expect to interact with the internet:

The device-savvy digital generation continues to enter the workforce, using devices to stay connected in ways previously un-thought-of. This means they are becoming device independent. Business people have the skills to use and access increasingly complex information on increasingly complex mobile devices – they expect data delivery mechanisms to support that trend and keep them well informed about the business information that matters to them. For example, social media applications such as Twitter have a web client, but also many mobile clients, each with slightly different UI. What they have in common is that all the applications deliver the same content. In the internet-centric world, content is king, and users want to stay connected to that content. Constant and uniform connectivity is a must if business users want to take action through any device, automate many of their activities on a daily basis, and participate in business processes from

any location. This allows end-users to react to change with immediacy, no matter their whereabouts. Those in the field can also respond more effectively to customer needs and issues.[9]

The ability to stay connected to the internet and business developments means that businesses have no choice but to embrace this trend or be left behind. In the past, business people worked offline when they were on-the-road. Access to the internet and real-time company information assets was not possible – that has changed forever. The fundamental issue of working offline is that data has to be stored on a device. How do you secure the data? What happens if the device is lost? How do you lock it down? In today’s business environment, it is unacceptable and cumbersome to work offline. The inability to access real-time data is a major inhibitor for mobile businessmen. The cost of establishing data reporting and analytics solutions that provide widespread workforce access to real-time data and key business drivers is becoming increasingly affordable. Additionally, delivering a Mobile BI platform via the internet removes security issues surrounding remote data access and storage, and delivers real-time data capabilities to end-users.

IV. MOBILE BI SECURITY ISSUES

Security considerations are very important. Companies must consider what type of information is going outside their firewall and how they will protect it. The most effective security strategy is to ensure Mobile BI users connect, authenticate and access organizational data from their BI server via the Web in real-time. No data should be stored on the mobile device. In-business confidentiality must also be guaranteed. Delivery of data to mobile devices must be able to be personalized to suit the needs, skills, roles and responsibilities of individuals from different departments. Finally, highly sensitive report data transferred from the server to mobile devices should be able to be encrypted.

It is critical that authentication (such as password management) is managed centrally, preferably through a Lightweight Directory Access Protocol (LDAP) directory, so that a lost device does not result in unauthorized access to the BI server. A single simple change to the centralized authentication system ensures access to reports from a lost or stolen device is disabled.[5][2]

V. IMPLEMENTING MOBILE BI

- a. Train as many people as possible from across the organization with the skills, knowledge and permission to access BI data – widespread user-adoption is the key factor to successful BI projects.
- b. Using an open ‘anywhere, anytime’ attitude towards business data to empower employees to make decisions and take full-advantage of the benefits associated with pervasive BI. As companies continue to focus on delivering information to the mobile workforce, they will need to ensure information is delivered promptly to affect action in the field.
- c. Understanding the reporting needs of each of the three main beneficiaries of Mobile BI – the executive, sales and

service teams –is critical. Have clearly defined business goals and objectives that are openly articulated throughout their organization so that Mobile BI can be delivered in a way that most effectively supports those demands. Employees on-the-move need to know that they can access the data they need when and where they need it. [4][5][10]

VI. TECHNOLOGY TO BE CHOSEN FOR MOBILE BI

The fundamental requirement is that this platform is internet-centric. Beyond that, there are some other essential technological components that are required to deliver the business benefits sought from Mobile BI. The most critical selection criterion is that a single authoring environment exists. With a single authoring environment, information can be delivered to mobile users without having to create a separate set of BI views, reports and dashboards, which would double maintenance and support needs.

This concept needs to be extended to ensure that users have access to all authorized content that they would otherwise be able to access via their desktop. There should be no difference in the content able to be accessed from different devices. Users must have the same access to reporting and analytics on-the-go as they do from their office. There should be no need to re-create content for the mobile platform, or repackage it for mobile distribution. A 100 percent Web-based BI solution will allow data to be delivered seamlessly to mobile platforms. This way, users can gain the benefits of Mobile BI immediately and experience the power of true device independence.

The mobile software client should optimize the delivery of content based on the size of the screen. Emphasis should be placed on “bite size” reports such as KPI spark lines and bullet charts. Mobile reporting should be designed to highlight those strategic KPIs that are of the greatest concern, as well as drive action, through exception reporting. This is not a contradiction to the point above, but an acknowledgement that what works well in a full size browser, is often not ideal on a mobile device. For example, delivering an analytical dashboard with eight to ten reports on it would be a terrible user experience on a phone.[2][4][5] [11]

VII. BENEFITS OF MOBILE BI

A. *Competitive advantage:*

Organizations are looking to be more responsive and flexible by having access to data that keeps the mobile worker ahead of the competition. Access to real-time data increases the opportunities to up-sell and cross-sell as well as respond dynamically to changing market conditions..

B. *Increased productivity of the workforce:*

With real-time access to data the potential to improve operational efficiencies are dramatically increased. The ability to speed-up the decision-making process, by extending critical information out to decision-makers in the field, is a major benefit of Mobile BI.

C. Raising the level of profitability through customer satisfaction:

Delivering Mobile BI to the field will improve customer service and increase customer satisfaction by empowering workers to make faster and more accurate decisions. Access to timely information, particularly for field and sales staff, will help deliver better and quicker results to customers, improving their experience and saving them time, which will lead to lasting improvements in customer satisfaction levels. Through exception reporting, mobile workers can be quickly alerted to important or harmful events before they affect customer relationships, and can proactively capitalize on emerging opportunities without delay. [11]

VIII. APPLICATIONS OF MOBILE BI

Similar to consumer applications, which have shown an ever increasing growth over the past few years, a constant demand for anytime, anywhere access to BI is leading to a number of custom mobile application development. Businesses have also started adopting mobile solutions for their workforce and are soon becoming key components of core business processes. In an Aberdeen survey conducted in May 2010, 23% of companies participating indicated that they now have a mobile BI app or dashboard in place, while another 31% indicated that they plan to implement some form of mobile BI in the next year.

Some mobile BI applications:

- a. Mobile Browser Rendered App: Almost any mobile device enables Web-based, thin client, HTML-only BI applications. However, these apps are static and provide little data interactivity. Data is viewed just as it would be over a browser from a personal computer. Little additional effort is required to display data but mobile browsers can typically only support a small subset of the interactivity of a web browser.
- b. Customized App: A step up from this approach is to render each (or all) reports and dashboards in device-specific format. In other words provide information specific to the screen size, optimize usage of screen real estate, and enable device-specific navigation controls. Examples of these include thumb wheel or thumb button for BlackBerry, up/down/left/right arrows for Palm. This approach requires more effort than the previous but no additional software.
- c. Mobile Client App: The most advanced, the client app provides full interactivity with the BI content viewed on the device. In addition, this approach provides periodic caching of data which can be viewed and analyzed even offline. Companies across all verticals, from retail to even non-profit organizations are realizing the value of purpose-specific mobile applications suited for their mobile workforce.[8][11]

IX. ROLE OF BI FOR SECURING MOBILE APPLICATIONS

To ensure high security standards, BI software platforms must extend the authentication options and policy controls to the mobile platform. Business intelligence software platforms need to ensure a secure encrypted keychain for storage of credentials. Administrative control of password policies should allow creation of security profiles for each user and seamless integration with centralized security directories to reduce administration and maintenance of users.[9]

X. ACKNOWLEDGMENT

Successful Mobile BI execution will lead to sustained competitive advantage, increased productivity, enhanced profitability through improved customer satisfaction ratings.

Senior management, key sales people and field service personnel as the three main user-groups to benefit from the implementation of an organization-wide Mobile BI program.

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