

Mobile Intelligence: An Introduction

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Abstract: Companies are under pressure to make better and faster decisions. Mobile intelligence can help them keep pace with rivals and gain competitive advantage. It is essentially the use of mobile devices to gain intelligence. Regardless of your location, you can access to information anytime with mobile phone. Mobile intelligence brings about greater availability of information, faster reaction speed, and more efficient working, improved internal communication, and the best possible customer experience. This paper provides an introduction on mobile intelligence.

Keywords: *Intelligence, Mobile Intelligence, Mobile Business Intelligence, Mobile Artificial Intelligence*

I. INTRODUCTION

The advent of the mobile device has radically changed the way people use data. This change is partly due the transformation from the wired world to a wireless world. The mobile device has provided a whole new way to look at business operation. Enterprises are increasingly working in a global and virtual environment. These days, the best way to reach your customers is through their mobile devices. Your employees also depend on mobile devices. Thus, in today's enterprises, modern productivity is mobile productivity. Smartphones, GPS-phones, tablets, and wearables from different companies such as Apple, Samsung, HTC, and BlackBerry are available today. The current generation of mobile smart phones and tablet computers has set the stage to become the universal computing platform for the world. There are several types of mobile devices and platforms available today. The screen size, processor, and memory all vary. Companies are realizing the value of purpose-specific mobile applications suitable for their mobile workforce [1]. Access to real-time information from mobile devices has many benefits. It increases workforce productivity and organization-wide efficiency by reducing time-to-information and the ability to make better-informed decisions.



Figure 1: How AI transforms mobile technology [3].

Today, there is an increasing interest in applying artificial intelligence (AI), especially machine learning, to mobile environments. AI technology makes mobile devices become intelligent objects which can learn and act automatically [2]. Businesses and mobile device manufacturers are collaborating to build hardware capabilities of battery-powered mobile devices to accommodate the AI (especially machine learning and deep learning) applications for the devices. AI is powering the future intelligence of mobile devices. For example, smartphone is one of the ideal platforms for deep learning applications.

Figure 1 shows how AI transforms mobile technology [3].

II. WHAT IS MOBILE INTELEGENCE?

Mobility is no longer a nice-to-have technology, but a must for all businesses. With executives taking their business on the road more often, mobility has become a top concern for business leaders. It is critical that they have access to the data anytime, anywhere so as to make real-time decisions. Mere using analytics on mobile devices is not enough; information must be meaningful and insightful to provide intelligence.

Mobile intelligence (also known mobile business intelligence) is the power of mobile systems to learn, analyze, understand, and resolve user queries through intelligent solutions. It is regarded as the fifth wave of computer technology. It enables different types of users to access the information most useful to them. It also enables sales teams to access product information, evaluate competitors, and record customer data. It has led to a new era of mobile computing. Mobile intelligence is critical for executives who are always on the go.

III. APPLICATIONS

The selection of the mobile device plays a big role in the implementation of mobile intelligence. The use of mobile devices to gain intelligence will change how an organization operates. Mobile intelligence has been used by a wide variety of companies to simplify their business operations. Some of the common applications of mobile intelligence are presented as follows.

A. Business Intelligence: Mobile business intelligence is an application of business intelligence (BI) on mobile devices. It is the capability of an organization to deliver relevant and timely data to anyone, anytime, anywhere. Business intelligence, as Gartner explains, "enables access to and analysis of information to improve and optimize decisions and performance." It encompasses a wide range of applications and technologies useful for gathering, storing, analyzing, and providing access to data. Having the capability is crucial success in today's fast moving world. Business intelligence applications can be used to transform reports and data into mobile dashboard. Business intelligence gives business professional plenty of information they can use to make research-based decisions. Businesses use BI to increase their corporate agility and meet the needs of today's fast-paced and

demanding marketplace [4]. Figure 2 shows the value proposition of mobile business intelligence [5].

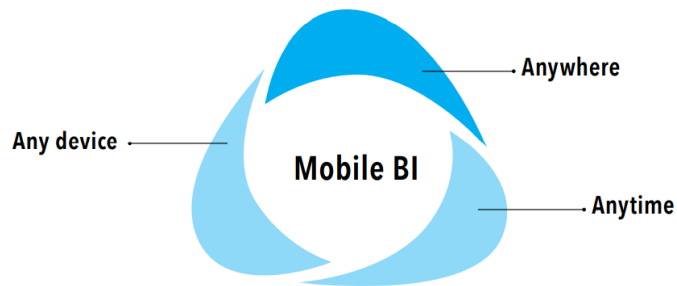


Figure 2: The value proposition of mobile business intelligence [5].

B. Robotics: Mobility is an important feature of a robot. It is the most important function when robotics is applied to domains such as autonomous cars, home service robots, and autonomous underwater vehicles. For robots, mobile intelligence means that they can move in the same manner as human beings. The ability to have enough intelligence while moving is a key issue for the success of robots [6].

C. Military Mobile Intelligence: Soldiers need real-time access to intelligence and surveillance data. Raytheon has demonstrated its FoXTEN software product, which can be loaded on a laptop, easily deployed, and used to provide soldiers access to real-time data on the battlefield. The system is intuitive and easy to use. It is also open, allowing the Army to integrate new capabilities from any developer [7].

D. Smart Factory: In a smart factory environment, a large amount of data causes big challenges to data transfer capability and energy usage efficiency. Mobile intelligences in smart factories can be implemented for modern industrial wireless sensor networks. This significantly increases data delivery efficiency and also achieves better energy usage [8].

E. Mobile Games: Games are popular and ubiquitous, attracting a diverse range of users. They are an appealing application to showcase artificial intelligence as well as computational intelligence since these two technologies can be integrated into the games. Mobile gaming is an arena full of innovation, with developers exploring new kinds of games, with new kinds of interaction between the mobile device, players, and the connected world. Game players will expect more and more from mobile games. There are some limitations to using mobile devices for gaming (such as small screen size, limited battery life, less powerful processors etc.) but there are also many opportunities for utilizing them [9].

Other applications of mobile intelligence include e-commerce, mobile banking, automated reasoning, and location intelligence.

IV. BENEFITS

With mobile intelligence, companies are seeing their business in a whole new light. Using mobile intelligence, you can access your Web applications on the move with mobile devices. Mobile intelligence allows business owners to stay ahead of market challenges. It enables effective decision-making and management support, for the overall purpose of increasing performance of an organization. It also causes higher efficiency in business processes, improvement in employee productivity, improvement operational efficiencies, faster decision making, better customer service, and delivery of real-time data access [1]. It allows mobile workers to access business critical information to make the best decisions. It

drives innovation by staying connected 24/7 with customers, suppliers, and employees.

V. CHALLENGES

While some companies are at the leading edge of digital transformation and are gaining a competitive advantage with mobile intelligence, some remain skeptical of the business benefits and perceived lack of specific business use cases. Some organizations keep using inadequate technology and have not fully realized the potential of mobile devices. Mobile devices can be hacked, lost or stolen easily. Besides the issue of standardization, companies are also concerned that solutions should have security and privacy features. Security is regarded as the number one issue for businesses since mobility adds to security challenges. To ensure that data is not be tampered, make sure that the data is not stored in the client mobile device. This way, there is no local copy to lose if the mobile device is stolen. Implementing a mobile BI app poses challenges, especially concerning data display rendering and user interactivity. The small screen space and slow data transmission cannot provide a satisfactory customer experience [1].

VI. GLOBAL MOBILE INTELLIGENCE

Organizations around the world are in the midst of a new wave of mobile capabilities that are affecting how they serve stakeholders, employees, clients, and constituents. More of the world's population live in urban areas. The smartphones are offering a means by which municipal administrators can monitor, measure, and manage real-time information on everything from transportation networks to the electricity grid. Several cities around the world are taking advantage of the ubiquitous mobile device to gather the data city leaders need to optimize resources, economize on costs, and provide a more sustainable future for residents. Here are some examples [10]:

- In Cambridge, Ontario, mobility is used to enhance work management for city services.
- In Spain, the City of Madrid has embarked on an ambitious project to improve the delivery and efficiency of city services.
- In Istanbul, Turkey, city officials are getting a better understanding of how people move throughout the city.
- In United Kingdom, mobile banks offer advanced mobile features, including the ability to order a replacement debit or credit card.
- In China, WeChat is a super app that sends messages and it can also be used to order food, hail taxis, and book plane tickets.

CONCLUSION

The pace of business has changed, causing an inevitable shift in decision-making processes. Mobile Intelligence may be regarded as a comprehensive, Web-enabled solution that improves communications, optimizes promotional activities, and streamlines new product launches. It is quickly becoming essential for business leaders because the platform allows business officials to expand their operations. Through mobile intelligence, a company's ability to make the right decisions has greatly improved.

Artificial intelligence is key to a new generation of mobile systems. Today, organizations must embrace technology that takes advantage of mobile devices and enables smarter ways to operate. For more information on mobile intelligence, one should consult the books in [11-14] and related journals:

- Intelligence
- Studies in Intelligence
- Artificial Intelligence
- Applied Artificial Intelligence

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