Marrying IoT and Big Data: Are You Ready?

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The Internet of Things (IoT) is expected to give organizations much more information about their products and services, as well as about how their customers are doing using those offerings. Innovative companies will take advantage of the rich and realtime data IoT offers. They will analyze data to derive actionable business intelligence upon which to make smarter decisions that benefit the organization and its customers.

To address the challenges of IoT, Hitachi Data Systems introduces Hitachi Social Innovation strategy and services. This strategic organization delivers a combination of people, processes, services, and solutions to help clients confidently deploy innovative analytics solutions to support new business paradigms and to accelerate time to value. Social Innovation strategy and services provides a dedicated framework to help evaluate, prioritize, deploy, and leverage the benefits of new social innovation approaches and solutions. The first offerings will focus on telecommunications and healthcare.

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1. INTRODUCTION

MOST organizations are excited about using the vast amounts of new data available and soon to become available from diverse sources such as social media, wearable devices, smart sensors, and Internet of things (IoT) devices (see Fig. 1). The intent is that by using this data and rapidly analyzing it, the organization will be able to make more insightful decisions and use the information in a more targeted way to deliver better service, improve business processes, increase operational efficiencies, and grow revenues.

However, to realize these benefits requires tight integration of vastly disparate systems. In particular, the data from individual devices must be securely captured, economically stored, and quickly analyzed, and the results easily shared. For most organizations, the time, expertise, and cost of undertaking such initiatives can make these ventures impractical. In most cases, organizations can benefit by using the services of a 3rd party that provides deep industry knowledge, the ability to integrated different technologies, and best practices and methodologies.

Other issues that Social Innovation strategy and services can address:

(1) Strategically match business needs to technology capabilities. Realize solution potential most efficiently.

(2) Design and build. There are many considerations to

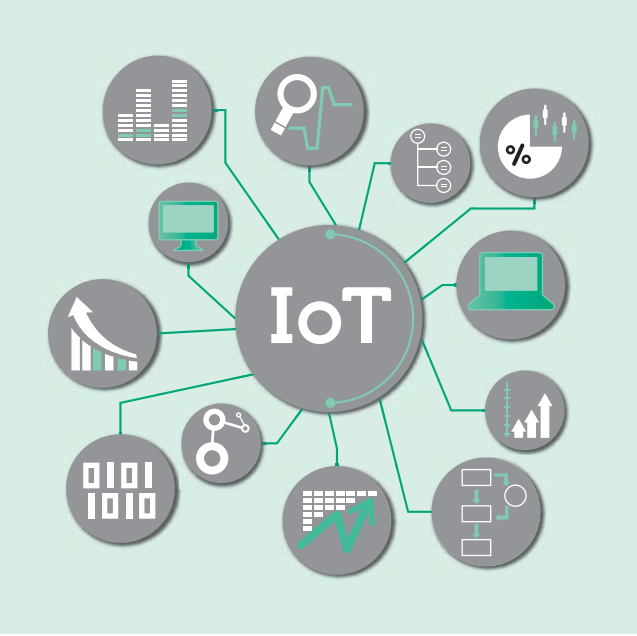

Fig.1 | Internet of Things (IoT).
The IoT interconnects computing devices from personal computers and mobile devices to smart objects and embedded sensors.

make when designing a new solution – especially when it comes to providing insight to a company. Services experts are adept at building such solutions based on business requirements.

(3) Provide project management – failure rates for these types of deployments are high given the expertise involved. Failure could be defined as "not optimized to potential."

(4) Reduce risk (risk management) of new offerings. What risks does the company have of not executing flawlessly or of taking too long to execute internally? Services experts have frameworks and delivery models that make deployments risk-free.

2. THE PROMISE OF IOT

Organizations today are at a point of inflection. They are enticed by results from early big data initiatives using new data sources. From social media streams to the added granularity and richness of data from smartphones, wearables, and IoT devices, organizations are seeing the potential to revolutionize operations and improve many common business processes.

In 2015, 4.9 billion connected "things" will be in use, up 30% from 2014[1]. Innovative organizations are already starting to take advantage of IoT to enhance their offerings and improve service. The potential benefits of using IoT are unlimited. Examples include:

(1) A manufacturer could collect information about usage of its products in the field to spot and fix potential problems before they become critical, or the information might help identify areas where new revenue generating features or services might be offered in future models.

(2) A city could use information gathered from smart devices in automobiles and roadways to optimally route emergency responders to their destination or dynamically adjust traffic signals to reduce congestion.

(3) A retailer using location-based information from a customer's smartphone and analysis of the customer's shopping history could deliver realtime promotions and ads when the customer is near a store.

3. THE CHALLENGES

To realize the potential benefits of the new technologies, organizations must overcome some sizeable obstacles.

To start, an organization must have some idea of what is even possible. Given that the combination of IoT with big data analytics is a new approach to business, many organizations find it difficult to fully comprehend and capitalize on new initiatives.

Once an idea is conceived, any project will involve the integration of many different technologies. The required computational muscle must be provided, as well as capabilities for managing large and highly variable volumes of data, and high-speed analytics are needed to convert that data into information on which the company can take action in realtime.

The costs for undertaking an IoT project can be unpredictable and high. Organizations will need to factor in the labor and capital equipment costs to start the project, as well as the operational costs to keep the project running over time. The labor costs can be particularly high since there is a need for high-level expertise to incorporate the different data sources and then make sense of the large volumes of data involved.

An additional potential deterrent is the time from inception to results. Organizations will need to move fast given the dynamic nature of the marketplace. Traditional approaches to information technology (IT) and application development may prove to be too slow, leading to missed opportunities or concession of a market to a competitor.

Lastly, IoT projects will typically have highly variable requirements. Results may depend on a certain event (for example, a surge in product or service demand, a customer entering an establishment, an anomalous set of transactions on a network, or a patient experiencing a medical incident). This variability requires many different systems and solutions to be in place and then to quickly ramp up when an event happens.

4. AVOIDING AND REMOVING OBSTACLES

Every one of these challenges can be overcome with the help of services from a suitable 3rd party. Even with the diversity of IoT use cases, services must address some fairly common elements by providing:

(1) Industry expertise: For many companies the undertakings are their first endeavors to tap into the potential of social innovation and realtime big data analytics and as such they need help from someone who has been there, done that. In particular, they need deep industry knowledge about what is possible, best practices, methodologies, and suitable tools.

(2) Technical expertise: Most efforts require the use of new technologies and the integration and optimization of a wide variety of technologies and systems.
(3) Speed to results: Opportunities change rapidly and competitors are likely to be trying to use the same technologies to their advantage. A service offering could help reduce the time required to implement solutions.

5. SOCIAL INNOVATION STRATEGY AND SERVICES

IoT combined with the speed, variety, and importance of analyzing data fuels change by providing the ability to process big data to find patterns and insights for making better decisions. Improved decision-making, when joined with deep contextual expertise, is accelerating organizations towards more predictive realtime intelligence that is focused on bigger insights for bigger social and business outcomes: social innovation.

This inflection point, where IoT and big data feed off each other is creating many new opportunities and new challenges. To help organizations achieve the full extent of their social innovation potential, the Hitachi approach is to focus on those IoT connected objects that will have the broadest impact: Hitachi looks for impact in areas such as communications, healthcare, business analytics, public safety, energy, and transportation. Additionally, Hitachi brings together a broader, more holistic perspective when it comes to IoT and big data analytics.

Specifically, Hitachi leverages its work in 3 areas which:
(1) Build many of the sensors and the intelligent devices, like medical scanners, that generate data and are the basis of IoT that matter
(2) Provide and manage IT hardware and software to 83% of the Fortune Global 100; capture, manage, and analyze big data
(3) Deliver deep expertise in analytics innovation through its big data labs and consulting practices.

Based on this work, Social Innovation strategy and services offers expertise and services that can be delivered to any organization (see **Fig. 2**). Using these services, an organization gains deep industry knowledge, best practices and methodologies, integration of the required technologies, and fast time to results. Furthermore, in using a service, organizations have the ability to quickly try projects without incurring the large expense normally associated with such efforts.

Trying new analytics ideas with confidence or accelerating their competitive edge are two key benefits that customers will gain by partnering with Social Innovation strategy and services.

Hitachi Social Innovation solutions are built using a common advanced analytics framework that integrates

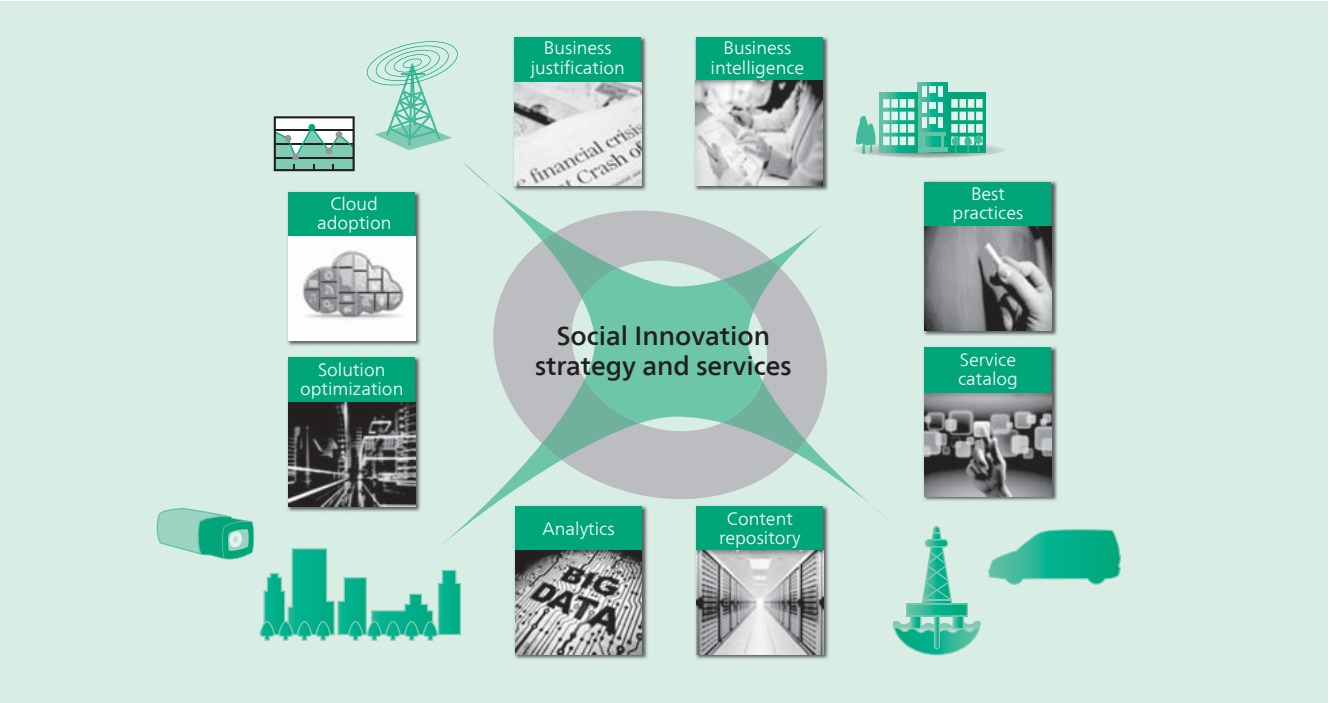

Fig.2 | Social Innovation strategy and services.
Social Innovation strategy and services combines strategic planning with broad analytics expertise and resources, tailored to deliver industry specific solutions.

technologies for correlation, intelligence, extraction, and analysis. Reusable solution components and best practices are customized for a specific industry and specific organization's needs. Each solution resides on Hitachi IT infrastructure for big data storage and computing with intelligent content management and high-speed processing. Together, these comprehensive solutions combine realtime analytics with historical analysis and machine learning to turn observations into predictions and prescriptive actions.

Social Innovation strategy and services will offer services for all industries, but has started with efforts in healthcare and telecommunications. Early use case examples illustrate the types of solutions that are possible and the potential benefits they can deliver.

For example, Hitachi Data Systems Corporation (HDS) connected healthcare offerings are working to get doctors and patients in touch regardless of the situation; patient information is made securely accessible anywhere, on any device.

Chronic diseases such as heart disease and diabetes are the leading causes of death in the world. Hitachi Clinical Repository is a secure clinical data platform with enriched metadata and workflows designed for more meaningful patient interaction and near-ubiquitous data access. These capabilities support better patient outcomes, reduced healthcare costs, and, most importantly, a reduction in deaths from chronic disease.

With communications, solutions can help large service providers sort through an information glut to improve operations. For instance, a large provider might measure 30 billion network data points per hour making it difficult to quickly sift out important information. Hitachi offers a solution for network analytics, which provides realtime streaming analysis and subsecond granularity. Along with its adaptability and openness, this solution dramatically improves network visibility and efficiency, increases services assurance and quality, and helps create new revenue streams.

To meet the demands of this emerging and rapidly growing market, Hitachi plans several steps. First, the center will grow internally by bringing in additional industry expertise. Second, the center will take advantage of the entire Hitachi ecosystem (for example, Hitachi Medical Systems). Additionally, the center will develop key partnerships to build a complete ecosystem.

6. CONCLUSIONS

IoT is expected to be perhaps the largest technology wave of the past 50 years. By infusing sensors, processors, and software and applying analytics, organizations can change how they operate and interact with customers. Services that support IoT will amount to a US$69.5 billion industry this year[(2)].

That is why the Social Innovation strategy and services is essential to organizations that seek to try new analytics ideas or gain assistance to drive higher success rates for business analytics deployments. Partnering with Hitachi allows organizations to drive tangible results, maximize quality and efficiency across all lines of businesses, and reduces the gap between the business and IT.

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Mr. Chang is a seasoned IT executive with expertise in planning, developing and implementing IT solutions to address customer pain points in big data analytics and IoT, cloud, and information management. He is both the GM of Social Innovation strategy and services, as well as the Sr. Director of the Hitachi Data Systems' US$220M+ global portfolio. Prior to HDS, Mr. Chang held a number of roles at major IT firms, where he managed and built out solutions and professional services for virtualization, cloud, data warehouse, data center automation and IT as a Service.
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