



Big data: the next frontier for innovation, competition and productivity

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Millions of networked sensors are being embedded in the physical world in devices such as mobile phones, smart energy meters, automobiles, and industrial machines that sense, create and communicate data in the age of the Internet of Things. “Big data” refers to the datasets whose size is beyond the ability of typical database software to capture, store, manage and analyze. There is strong evidence that big data can play a significant economic role to the benefit of private commerce, of national economies and of their citizens. In the developed economies of Europe, it is estimated that government administration could save more than €100 billion in operational efficiency improvements alone by using big data.

Data: an important factor of production

Big data has reached every sector in global economy. In 2009, all sectors in the US economy had at least an average of 200 terabytes of stored data per company of more than 1,000 employees. By near term, the most potential to create value through the use of big data will be in the most developed economies. The possibilities of big data evolve rapidly driven by innovation in the underlying technologies, platforms and analytic capabilities for handling data.

Big data creates value

5 applicable ways to leverage big data have been identified. They offer transformational potential to create value and have implications for how organizations will have to be designed and managed:

- Creating transparency: Making big data accessible to relevant stakeholders in a timely manner. In the public sector, making this data accessible across departments could reduce search and processing time. In manufacturing, it could cut time to market and improve quality;
- Enabling experimentations to discover needs, expose variability and improve performance: Organizations can collect more accurate performance data. Using this data can enable leaders to manage performance to higher levels;
- Segmenting population to customize actions: This segmentation could tailor products and services to precisely meet the needs of the population;
- Replacing/ Supporting human decision making with automated algorithms: Sophisticated analytics can minimize risks and provide valuable insights;
- Innovating new business models, products and services: Manufacturers could use data to develop the next generation of products and create innovative after-sales service offerings.

The use of big data as a key for competition and growth

The use of big data is a key way for leading companies to outperform their peers. Moreover, big data can help creating new growth opportunities and entirely new categories of companies. Many



companies have access to valuable data generated by their products and services. Networks will connect physical products enabling them to report their own serial numbers, ship dates, number of times used...

The use of big data for productivity growth and consumer surplus

The use of big data provides companies with the opportunity to improve efficiency and effectiveness, enabling organizations both to do more with less and to produce higher-quality outputs. Data can even improve products as they are used: for instance, a mobile phone that has learned its owner's habits and preferences, that holds applications and that will be more valuable than a new device that is not customized to a user's needs. Customers and citizens capture a large amount of the economic surplus that big data enables, as they are direct and indirect beneficiaries of big data relation innovation.

Issues to be addressed to capture the full potential of big data

- Data policies and data security: Big data's increasing economic importance raises a number of legal and privacy issues;
- Technology and techniques: To capture value from big data, organizations will have to deploy new technologies; There is also a need for ongoing innovation in technologies and techniques that will help integrate, analyze and consume big data;
- Organizational changes and talent: In competitive sectors, leaders will need to understand the value of big data. Many organizations have not yet the talent in place to extract insights from big data.
- Access to data: Companies will increasingly need to integrate information from multiple data sources. A stakeholder that holds a dataset might consider it to be the source of a competitive advantage and would be reluctant to share it;
- Industry structure: Sectors with a lack of competitive intensity and performance transparency are likely to be slow to fully leverage the benefits of big data. For instance, in the public sector, the lack of competitive pressure limits efficiency and productivity. Therefore, the sector faces more difficult barriers in capturing the potential value of big data. Organizations and policy makers will have to consider how industry structures could evolve in a big data world.