

## Chapter 70

# Big Data Transforming Small and Medium Enterprises

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### ABSTRACT

*The terms big data, analytics, and business intelligence are often used in the media, with much attention on Fortune 500 enterprises. Small and medium-sized businesses (SMEs) also handle large amounts of data, and it is important to their decision making and planning. This chapter explores options for handling Big Data in SMEs. It presents a framework that considers not just the volume of data, but the variety of types of data, the velocity in which data is created and transmitted, the importance of data veracity, and its value in transforming small and medium-sized enterprises. SMEs need to work with big data, and doing so will impact their business models and require them transform themselves. Their transformation will be ongoing because all indicators show that the volume of data is rising and will continue to do so simply because of the trends related to customer interaction.*

### DEFINITION AND ECONOMIC IMPACT OF SMALL AND MEDIUM ENTERPRISE

The definition of small and medium (SMEs) varies across countries. An enterprise is any entity engaged in an economic activity. SMEs play an important economic role in developed and developing countries. They provide jobs for many people and foster a spirit of entrepreneurship and innovation.

In the United States, firms that employ fewer than 500 employees are considered SMEs with farms and service-oriented firms further classified according to annual revenues (United States International Trade Commission, 2010). The vast majority of SMEs are firms with fewer than 20 employees. Although large corporations garner most media attention, there are some indications that small businesses are a major player in the United States' economy. Small businesses represent more than 99 percent of U.S. firms with employees and account for 49 percent of private sector employment (SBA, 2012). Freudenbergs et al. (2012) indicated that small businesses account for 43% of sales and 51% of the Gross Domestic

DOI: 10.4018/978-1-5225-7501-6.ch070

Product in the United States. The Small Business Administration Office of Advocacy (United States Small Business Administration, 2012) estimates that, of the 18.5 million net new jobs created in the United States between 1993 and 2011, small businesses (less than 500 employees) accounted for 11.8 million, or 64 percent.

In the European Union, designation as an SME is based on the number of employees and the annual turnover or balance sheet. An SME may have up to 250 employees, and annual turnover of €50 m or a balance sheet of €43 m (European Commission, 2003). In the enlarged European Union of 25 countries, there are 23 million SMEs, and these provide jobs for 75 million people (European Commission, 2003). Many SMEs are quite small, for example, the average European enterprise employs less than 10 people (European Commission, 2003).

In the Asia-Pacific region, SMEs are usually enterprises that employ no more than 250 employees, although there is no generally accepted definition. In China, Hong Kong, and Indonesia, the classification includes no more than 100 employees. Other countries in the Asia-Pacific region use a combination of employment and assets (Taiwan Ministry of Economics Affairs, 2006). SMEs comprise over 95 percent of the economy of the Asia – Pacific region.

On the African continent, the definition varies according to industry, but in general an SME has no more than 200 employees. In Egypt, the maximum number of employees an SME may have is 20, while in Morocco, the number is 200 (Gibson and van der Vaart, 2008). Various information sources put the percentage of SMEs from 80% to 99% of all firms (SMEAfrica.net, 2014; Fjose et al, 2010); and employ 60% of working population (SMEAfrica.net, 2014). Fjose et al (2010) estimates SMEs comprise more than 95 percent of all firms in Sub-Saharan Africa, and in South Africa, small and medium-sized enterprises make up 91% of businesses, provide employment to about 60% of the labor force and account for roughly 34% of that nation's Gross Domestic Product. Fjose, Grunfeld, and Green (2010) report that SMEs account for over one-third of the nation's employment in Malawi, Kenya, Zambia, and Ivory Coast.

A survey of global SMEs by Oxford Economics (2013) revealed that they are affected by increasing global competition. Global expansion is a priority for 34% of respondents. The same survey shows respondents expect the percentage of revenue generated outside of their home countries and the number of countries in which SMEs do business will grow sharply in the next three years. Successfully navigating these trends require a focus on business transformation. Two-thirds of the respondents are at some point in the transformation process—either planning, executing, or recently completed. Nearly two-thirds of SMEs say transformation is essential to staying ahead of the competition, and over half say technology developments are making their traditional ways of doing business obsolete.

Technology is a major element of transformation. Most surveys and reports indicate that investing in new technologies is a top strategic priority for SMEs. Business analytics are a key element of transformation, but current literature suggests SMEs struggle with data accuracy and quality.

## **THE INFORMATION TECHNOLOGY FOUNDATION FOR BIG DATA TRANSFORMING SMEs**

Given the wide variety of industries and locations in which SMEs operate, as well as the differences in numbers of employees and amounts of revenue, it is understandable that the adoption of information technology (IT) in SMEs around the world varies. Several industry studies show SMEs account for as much as half of all IT spending globally.

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