Lego: Embracing Change by Combining BI with a Flexible Information System
CASE STUDY

The Lego Group, which is headquartered in Billund, Denmark, is one of the largest toy manufacturers in the world. Lego's main products have been the bricks and figures that children have played with for generations. The Danish company has experienced sustained growth since its founding in 1932, and for most of its history its major manufacturing facilities were located in Denmark.

In 2003, Lego was facing tough competition from imitators and manufacturers of electronic toys. In an effort to reduce costs, the group decided to initiate a gradual restructuring process that continues today. In 2006, the company announced that a large part of its production would be outsourced to the electronics manufacturing service company Flextronics, which has plants in Mexico, Hungary, and the Czech Republic. The decision to outsource production came as a direct consequence of an analysis of Lego's total supply chain. To reduce labor costs, manually intensive processes were outsourced, keeping only the highly skilled workers in Billund. Lego's workforce was gradually reduced from 8,300 employees in 2003 to approximately 4,200 in 2010. Additionally, production had to be relocated to places closer to its natural markets. As a consequence of all these changes, Lego transformed itself from a manufacturing firm to a market-oriented company that is capable of reacting fast to changing global demand.

Lego's restructuring process, coupled with double-digit sales growth in the past few years, has led to the company's expansion abroad and made its workforce more international. These changes presented supply chain and human resources challenges to the company. The supply chain had to be reengineered to simplify production without reducing quality. Improved logistics planning allowed Lego to work more closely with retailers, suppliers, and the new outsourcing companies. At the same time, the human resources (HR) department needed to play a more strategic role inside the company. HR was now responsible for implementing effective policies aimed at retaining and recruiting the most qualified employees from a diversity of cultural backgrounds.

Adapting company operations to these changes required a flexible and robust IT infrastructure with business intelligence capabilities that could help management perform better forecasting and planning. As part of the solution, Lego chose to move to SAP business suite software. SAP AG, a German company that specializes in enterprise software solutions, is one of the leading software companies in the world. SAP's software products include a variety of applications designed to efficiently support all of a company's essential functions and operations. Lego chose to implement SAP's Supply Chain Management (SCM), Product Lifecycle Management (PLM), and Enterprise Resources Planning (ERP) modules.

The SCM module includes essential features such as supply chain monitoring and analysis as well as forecasting, planning, and inventory optimization. The PLM module enables managers to optimize development processes and systems. The ERP module includes, among other applications, the Human Capital Management (HCM) application for personnel administration and development.

SAP's business suite is based on a flexible three-tier client-server architecture that can easily be adapted to the new service-oriented architecture (SOA) available in the latest versions of the software. In the first tier, a client interface—a browser-type graphical user interface (GUI) running on either a laptop, desktop, or mobile device—submits users' requests to the application servers. The applications servers (the second tier in the system) receive and process clients' requests. In turn, these application servers send the processed requests to the database system (the third tier) which consists of one or more relational databases. SAP's business suite supports databases from different vendors, including those offered by Oracle, Microsoft, MySQL, and others. The relational databases contain tables that store data on Lego's products, daily operations, the supply chain, and thousands of employees. Managers can easily use the SAP query tool to obtain reports from the databases because it does not require any technical skill. Additionally, the distributed architecture enables authorized personnel to have direct access to the database system from the company's various locations, including those in Europe, North America, and Asia.

SAP's ERP-HCM module includes advanced features such as "Talent Manager" as well as those for handling employee administration, reporting, and travel and time management. These features allow

Lego's HR personnel to select the best candidates, schedule their training, and create a stimulus plan to retain them. It is also possible to include performance measurements and get real-time insight into HR trends. Using these advanced features, together with tools from other software vendors, Lego's managers are able to track employees' leadership potential, develop their careers, and forecast the recruiting of new employees with certain skills.

The investments that The Lego Group has made in information systems and business re-design have paid off handsomely. In 2013 the Group increased sales by 11% to €3,403 million against €3,103 million the year before. Operating profit increased 10% to €1,118. Full-time employees increased to 11,755 as the company expanded production in Asia. In the first half of 2014, revenue increased 15 percent compared with the same period last year measured, and profits increased by 12% when compared to the similar period in 2013.

Reflecting its growing emphasis on developing a global company, and its substantial investment in global information systems both in the supply chain and the distribution chain, The Lego Group in 2014 is showing strong, long-term growth in all regions. In Europe, America, and Asia, sales growth has been in the double digits for over five years despite the fact that the Global Great Recession (2008 to 2013) led to flat sales of toys worldwide. In the Asian region, growth in Lego sales varied from market to market. China's growth in consumer sales of more than 50% was the most significant in the region. This supports The Lego Group's ambitions to further globalize the company and make Asia a significant contributor to future growth.

During April 2014 The Lego Group opened its first factory in China, located in Jiaxing, and a new office in Shanghai, which is one of five main offices globally for The Lego Group. The executives of Lego believe there is huge potential in Asia, and they are moving to be located close to their Asian customers. Lego executives believe that there is tremendous potential in Asia, and have decided to learn more about the Asian market and build capabilities in the region. The new factory and office represent a significant expansion of the Lego physical presence in the region. According to executives, in combination with their existing office in Singapore, the Shanghai office and the new factory enable strategically important functions to be located close to their customers as well as children and parents in China and Asia.

The decision to place a Lego factory in China is a direct consequence of The Lego Group's ambition to have production placed close to core markets. This same philosophy has led to expansions of the Lego factory in the Czech Republic, and an entirely new factory was opened in Nyiregyhaza, Hungary, in March 2014. These factories, along with the parent factory in Denmark, serve the European markets. To serve the Americas faster and with customized products, the company expanded its Lego factory in Monterrey, Mexico.

Executives believe the global approach to information systems and production facilities enables the company to deliver Lego products to retailers and ultimately to children all over the world very fast, offering a world class service to consumers. In 2014, in addition to its growth across a variety of markets, *The LEGO Movie* was also released to overwhelmingly positive reviews, bolstering the company's brand and allowing it to develop a new array of products based on the movie's themes.

The Lego Group is primed to continue its growth throughout 2015 and beyond using its organizational flexibility and the concepts it has honed for years. The company is responding to its customers and releasing new versions of some of its most popular sets of toys, including its Bionicle series of block sets. The company also launched a new office with 120 employees and an additional 80 more to come in 2015, complete with an innovative work environment without assigned desk spaces and emphasizing creativity over rigid routines. Like their expansion into Asia, the new office represents an effort to establish a global presence with offices and employees around the world to reach as many potential families and children as possible. So far, Lego has built an impressive worldwide presence, block by block.

Sources: Roar Trangbaek, "New London Office Supports Lego Group Strategy to Reach Children Globally, Newsroom, www.lego.com, November 2014; Roar Trangbaek, "Global Lego Sales Up 15 Percent in First Half of 2014," Newsroom, www.lego.com, 2014; Jens Hansegard, "Oh, Snap! Lego's Sales Surpass Mattel," *Wall Street Journal*, September 4, 2014; "How Lego Became World's Hottest Toy Company," *Economist*, March 9, 2013; "Business 2010: Embracing the Challenge of Change," *Economist Intelligence Unit*, February 2005, http://graphics. eiu.com/files/ad_pdfs/Business%202010_Global_ FINAL. pdf, accessed November 16, 2010; "Lego Creates Model Business Success with SAP and IBM," *IBM Global Financing*, May 19, 2010, www-01.ibm.com/software/

success/cssdb.nsf/CS/STRD- 85KGS6?OpenDocument, October 20, 2010; "Human Resources as an Exponent of Good Governance" (in Danish), www.sat.com, October 20, 2010; "Lego, the Toy of the Century Had to Reinvent the Supply-Chain to Save the Company," *Supply Chain Digest*, September 25, 2007, www.scdigest.com/assets/on_target/07-09-25- 7.php?cid=1237, accessed November 16, 2010; G. W. Anderson, T. Rhodes, J. Davis, and J. Dobbins, *SAMS Teach Yourself SAP in 24 hours* (Indianapolis, IN: SAMS, 2008).

CASE STUDY QUESTIONS

6-13 Explain the role of the database in SAP's three-tier system.

6-14 Explain why distributed architectures are flexible.

6-15 Identify some of the business intelligence features included in SAP's business software suite.

6-16 What are the main advantages and disadvantages of having multiple databases in a distributed architecture? Explain.

Case contributed by Daniel Ortiz Arroyo, Aalborg University.

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6-17 Identify the five problems of a traditional file environment and explain how a database management system solves them.

6-18 Discuss how the following facilitate the management of big data: Hadoop, in-memory computing, analytic platforms.