



LEGO creates model business success with SAP and IBM

Overview

■ The Challenge

LEGO is capitalizing on resurgent popularity of its building-block toys range and branded characters, by expanding internationally. Success, in the form of double-digit growth is creating scalability challenges, from employee management to product design and development. To fulfill its business ambitions, LEGO wanted to be able to roll out new operations rapidly and reliably. To do so required drastic simplification and standardization of the IT landscape.

■ The Solution

Implemented the integrated SAP Business Suite, including SAP ERP Human Capital Management and specific SAP applications, on an integrated IBM infrastructure built from IBM Power servers, IBM System Storage and IBM System x technologies and a suite of IBM Tivoli software, making extensive use of virtualization and simplifying and centralizing both service and storage management, alongside advanced IBM PowerHA high availability software.

■ The Benefits

Technology investments of around DKK300 million (€45 million) that will simplify and streamline the applications and infrastructure are estimated to produce business benefits worth some DKK1 billion (€150 million), a three-fold payback. Template-based approach allows new operations to start small and grow fast. SAP applications offer the information needed to provide advanced management control, and allows executives to respond quickly to market opportunities. IBM virtualization technologies deliver very high utilization factors, in some cases near-100-percent, and the ability to grow or even move workload easily, offering very high business flexibility and maximizing return on investments. IBM Global Financing reduces the strain on capital budgets at a time of very high growth.

■ Key Solution Components

Industry: Retail

Applications: SAP® Business Suite, including SAP NetWeaver® Business Warehouse, SAP ERP Human Capital Management
Hardware: IBM® Power® 570, IBM BladeCenter® HS22 blade servers, IBM System x3650 servers, IBM System Storage™ DS8700, DS4800, IBM Tape Library, IBM System Storage SAN Volume Controller

Software: IBM AIX®, IBM PowerHA™, IBM Tivoli® Storage Manager, IBM Tivoli Netcool/ Webtop, IBM Tivoli Netcool/ OMNIBus Probe, IBM Tivoli Composite Application Manager, IBM Tivoli Monitoring, IBM Tivoli Enterprise Console, IBM Tivoli Network Manager, IBM Tivoli Performance Analyzer, IBM TotalStorage Productivity Center
Services: IBM Global Financing, IBM Global Technology Services – Maintenance and Technical Support

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Senior Director
LEGO Service Center

World-famous construction toy manufacturer LEGO is experiencing double-digit annual sales growth. The company is extending its product portfolio by launching new toy ranges and branded theme parks, with operations in both Europe and the US.

LEGO realized that the key to success was the creation of a business model that was as modular and standardized as the LEGO blocks themselves – making it possible to expand quickly into new markets.

Supporting massive expansion brings its own challenges, one of which is to ensure that the underlying systems can scale reliably and effectively. As part of a fundamental strategic shift in thinking, LEGO is introducing SAP applications based on IBM technology to provide standardized yet fully flexible business systems capable of serving the corporate ambitions.

Esben Viskum, Senior Director, LEGO Service Center, comments, “The toy world moves onwards constantly, and LEGO needs to re-invent itself continuously. Significant corporate re-shaping introduced new energy to the company, which led to successful

brand extensions, retail outlets and manufacturing plants.

“Rapid change means being able to respond to the market quickly, using short product development processes without losing control of cost and quality, and being able to manage both people and operations effectively and efficiently.

“To make this possible, we wanted to simplify, rationalize and standardize our IT systems. Based on a coherent, strategic approach, the aim was to build a technology landscape based on the SAP software platform with a supporting infrastructure level that would reduce costs, improve service and manage our business risks.

“We selected SAP software for our core business systems, including SAP ERP Human Capital Management and SAP Product Lifecycle Management. Because these are business-critical solutions, we chose IBM technologies as the best way to deliver robust operations, and provide a repeatable template for each new LEGO venture.

“We have found that our technology investments of around DKK300 million to-date in applications and infrastructure are estimated to produce business benefits worth some DKK1 billion, a three-fold payback that supports our business strategy of rapid international growth.”

Supporting business innovation

In the face of increased competition from online and similar digital toys and games, LEGO undertook considerable corporate restructuring. LEGO launched new products, introduced LEGO Games Systems, and signed agreements with Lucasfilm® for LEGO Star Wars® characters, among many other innovations. The result has been significant success: yearly revenues of DKK 11.7 billion (€1.57 billion), up by



22 percent annually, generated in more than 130 countries by around 8,000 employees.

The LEGO Service Center is responsible for operations, ongoing support and infrastructure technology projects. LEGO Corporate IT department is responsible for application development.

Esben Viskum says, "The good part is that because we are doing very well, we are able to think about what investments we can make and how they will allow us to grow even further. The aim is to become a much larger business, with the products, sales and infrastructure to become truly robust."

LEGO has a firmly established process to harvest the business strategy and requirements, through relationship managers who read unit business plans and convert them into the IT business case. The responsibility for reaping the benefits lies with the operating units, while the IT department provides the services and measures the results.

"Because the business strategy is to scale things up with new sales offices, new manufacturing plants, and new branded retail shops, this needs to be created in a 'cookbook' fashion, with suitable business infrastructure on a similar rollout model. Existing legacy applications and hardware cannot scale to meet our needs; they are also troublesome and costly to maintain, and the IT Service Center would not be comfortable providing services to the business on this foundation."

Long-lasting designs

It was at this crucial business juncture in 2003 that LEGO signed an agreement to migrate to the IBM Power platform, replacing the former HP systems, and LEGO has subsequently run its SAP Galaxy platform with uninterrupted success.

Certain elements are critical to LEGO: excellent product lifecycle management, in order to introduce outstanding new products rapidly and efficiently, and always-on logistics, to manage international manufacturing and distribution. LEGO also needs efficient human processes to support its diverse and international workforce, alongside the usual business need for financial management and analysis.

With the integrated SAP applications on the IBM Power platform, LEGO is now able to meet market opportunities more rapidly with integrated processes spanning every aspect of the business, from personnel to manufacturing systems, from product design to final sales.

Choosing the right components

"SAP software offered the best combination of standardized processes, yet with the ability to respond flexibly to the changing demands of the toy industry," comments Esben Viskum. "The SAP landscape supports all our business processes, such as finance, logistics and sales, and the long-term roadmap is to implement SAP Product Lifecycle Management, integrated with SAP Warehouse Management. As the company grows and rolls out the 'cookbook' to new geographies, we will add SAP ERP Human Capital Management to the portfolio, too.

"The step-by-step extension of the SAP landscape is a prime example of how we can extend SAP applications to fit our business needs, helping LEGO focus on core innovation and excellence."

Securing the building blocks

The commitment to SAP applications enables LEGO to consider its key business requirements, two of which – product lifecycle management and warehouse management – illustrate how integrated SAP applications make all the difference.

"IBM technology and SAP software offer a highly successful combination that has proven its value to LEGO, with a standards-based yet highly flexible operating model that helps us roll out a commercially effective business model, and continue with double-digit growth."

Esben Viskum
Senior Director
LEGO Service Center



TECHNICAL LANDSCAPE

Servers: Four IBM Power 570, 16 POWER6 cores each, 20 LPARs, 386GB main memory. Two IBM System Storage DS8700, one DS4800; BladeCenter HS22 blade servers with Intel Xeon processors, System x3650 servers. IBM Tape Library and System Storage SAN Volume Controller.

Software: IBM AIX 6.1 and PowerHA. IBM Tivoli Storage Manager, Netcool/Webtop, Netcool/OMNIBus Probe, Composite Application Manager, Monitoring, Enterprise Console, Network Manager and Performance Analyzer. IBM TotalStorage Productivity Center. SAP Business Suite based on ECC 6.0 components, NetWeaver Business Warehouse, Human Capital Management. VMware ESX 4 and Oracle 10g database.

Users: 2500 SAP users, indirectly all 8,000 LEGO employees.

“Product development is critical to LEGO,” says Esben Viskum. “Over time, LEGO had implemented about 25 different systems, all loosely described as legacy. The result was a very inflexible business process, which required extensive programming effort to change, and there was little or no integration with manufacturing operations.

“For example, if we came up with a super product for Christmas, there was no easy way to fast-track production to meet the opportunity while retaining full quality and cost control. By implementing SAP Product Lifecycle Management, the cost and manufacturing implications of product development decisions will be reflected in the financial and production solutions, giving us a complete overview of the business impact. This will help us make informed choices at an early stage, helping us to respond rapidly and effectively to market changes and opportunities.”

Creating the template

LEGO uses centralized high-bay warehouses to store some of the 19 billion components that are manufactured every year, in Denmark, Eastern Europe and Mexico. As the company grows, it is essential that the warehousing solution is reliable and can be easily reproduced in new locations.

“The warehouses were controlled by proprietary systems, and we could not rely on the support from the vendor. This situation left LEGO very exposed: If a warehouse system failed and we were unable to fulfill orders, there was considerable financial risk,” says Esben Viskum.

“To reduce business risk, we want to create a template based on SAP Warehouse Management that we can

easily replicate when we set up new operations. The advantage of this approach is that we gain access to the full support and development resources at SAP with a standard operating model for each new venture internationally.”

Assembling the physical components

For the cookbook approach to work, it is essential to select reliable and flexible infrastructure. Each new operation will start small and grow fast, which means choosing scalable platforms that can grow in response to increasing workload.

“Virtualization and sharing of resources were the key principles here,” says Esben Viskum. “We looked for ways to allocate processing power according to the workload, on systems with a track record of reliability and stability.

“The IBM Power platform fit perfectly with our strategy. We deployed four IBM Power 570 servers, two each in twin data centers, running multiple virtual servers containing the SAP applications. The advantage is that within a relatively small physical footprint, we can run the standard production, development and test environments, a fully replicated landscape for integration testing, as well as retaining the ability to run continuous operations even if one data center is taken off-line for maintenance or even knocked out through disaster.”

Using PowerHA, in the case of disaster, all SAP applications failover automatically from one datacenter to the other. The twin systems run in active/active mode, sharing the workload, which allows LEGO to use all its available capacity. If one data center is offline, planned service reductions automatically reallocate capacity used for the development, test, simulation and integration environments to the production systems.

Systems are supported by IBM Global Technology Services, with maintenance contracts that offer on-site assistance related to hardware defects and software issues, and provide direct access to IBM laboratories. Furthermore, IBM Enhanced Technical Support allocates specialists within each hardware and software platform, teamed with an account advocate across all IBM platforms and products with a deep knowledge to the LEGO installation.

“These capabilities are vital for LEGO, as there is more demand than we can produce, so any inability to continue with business systems produces an immediate financial impact. In short, there is no opportunity for downtime, which was a key factor in our choice of the IBM Power 570 platform.”

LEGO distributes the total compute capacity between systems according to workload requirements in order to meet its business commitments. For example, LEGO uses SAP Advanced Planning and Optimization (APO) to maximize supply chain efficiencies. At weekends, when the main systems are largely idle, LEGO allocates spare compute capacity to APO, which ensures that it concludes quickly and successfully – and with enough time for a re-run if necessary. The IT team tailors the resources devoted to the APO run so that it runs at close to 100 percent utilization of the virtual processor, while remaining capacity can be directed to other SAP applications that continue to run at weekends.

Virtualization enabled by the IBM PowerVM technologies supports the LEGO strategy, by allowing the team to shift processing resources according to business needs on an almost hourly basis.

“The Power 570 platform allows us to take an ‘all virtualized’ approach. Our decision tree is that if it can run virtually, it does.”

Keeping copies of finished work

LEGO has centralized its information storage, with 1.5TB of production data, using IBM System Storage DS8700 systems, with one in each data center for resilience. Desktop application storage is also directed to the DS8700s, to ensure that LEGO has complete control of all business data.

IBM System Storage DS8700 is the most advanced model in the IBM DS8000 lineup, and introduces new dual IBM POWER6®-based controllers that usher in new levels of high performance. The DS8700 is designed to support the most demanding business applications with superior data throughput, and with unparalleled resiliency and availability features. With advanced scalability, flexible tiered storage, and support for advanced IBM deduplication technology, the DS8700 helps to simplify storage environments and reduce business costs.

“To manage information storage and backups, we selected IBM Tivoli Storage Manager, which we perceive as the best in the market, with the greatest range of functionality and technology. We use the ‘incremental and forever backup’ feature, and have implemented this worldwide, even for our smaller offices that would otherwise struggle commercially to implement this kind of enterprise-class storage management,” explains Esben Viskum.

LEGO has selected a comprehensive suite of Tivoli solutions to manage almost every aspect of its information infrastructure, from monitoring network and system health through graphical views of application performance with

IBM Tivoli Netcool/Webtop. The Tivoli solutions standardize management and control for LEGO, helping to reduce infrastructure management costs in this geographically diverse landscape.

The storage picture is completed with the deployment of IBM SAN Volume Controller (SVC), which extends virtualization to information storage. SVC allows LEGO to place all its storage capacity, even from other vendors, into a single pool, and allocate space according to requirements. Because SVC virtualizes storage, LEGO can complete data migrations between sites even as the applications continue to run, significantly enhancing business productivity while offering very great infrastructure flexibility.

Connecting with other components

IBM Tivoli Composite Application Manager (ITCAM) for Applications provides one solution for monitoring, viewing, analyzing, and managing integrated SAP applications across the enterprise – consolidating critical application data in one easy-to-use interface. This solution provides smooth integration from the SAP environment to external applications, and allows LEGO to achieve comprehensive visibility and control of the entire application landscape.

By improving utilization of network assets, with consequent improved IT service availability, IBM Tivoli Network Manager helps to cut costs, while IBM Tivoli Performance Analyzer provides simple, intuitive forecasting of resource trends, helping LEGO to plan its expansion as cost-effectively as possible.

“This continues our template theme: we use the same processes and standards wherever we are. All data from every office and all the SAP

transactions are backed up to the twin data centers, controlled by Tivoli Storage Manager, which directs archive data to additional DS4800 systems.”

Desktop applications run on Intel Xeon 5500 processor-based IBM HS22 blades and IBM System x3650 servers. Following the virtualization principles, LEGO has deployed VMware ESX server on the x3650 systems, and around 70 percent of Intel-based workload at LEGO is virtualized. VMware ESX allows multiple server applications to run on each physical system, reducing complexity and maximizing the productivity of the servers.

The result is a dramatic simplification of the IT infrastructure, with fewer processors running at higher utilization and thus able to complete the same processing workload. For software licenses charged per-processor, simplification through virtualization reduces costs, and there are fewer servers to buy, maintain and operate, with Tivoli providing a comprehensive way to manage the entire application, storage and network environment.

Planning future models

Alongside the warehouse and production systems, LEGO has extensive plans for introducing SAP ERP Human Capital Management and strengthening its enterprise reporting capabilities with SAP NetWeaver Business Warehouse (SAP NetWeaver BW). The huge scalability of the IBM technology and the ease of management provided by the Tivoli solutions make such expansion a realistic and commercially cost-effective proposition.

To help build the business, LEGO needs high-quality staff, usually

sourced through recruitment partners. LEGO intends to bring recruitment in-house, as part of a continuous employee management solution that will offer time and attendance, self-booking of holidays, training management and more.

“At present, people within the human resources unit are all too often tied up answering calls and emails asking basic questions. Users would feel much more empowered if they could use a self-service system,” says Esben Viskum. “SAP ERP Human Capital Management will help us expand the business without linear increases in the human resources workload, an essential requirement to maintain profitability, giving us a standardized approach to employee management, worldwide.”

LEGO will use SAP NetWeaver BW for sales reporting across the extended enterprise, as a ‘source of opportunities’ for procurement spending, and as an internal benchmarking service to drive performance.

“Transactions will be exported from SAP applications to SAP NetWeaver BW, where you can discover how much LEGO spends group-wide on particular raw materials or with certain suppliers. The information will potentially allow us to reduce the costs of raw materials. For example, it could allow us to examine the benefits of consolidating multiple suppliers to a smaller number with higher volumes at lower prices, or perhaps speaking with a supplier and saying ‘Look, three different units are all buying from you, and LEGO would like a centralized, discounted purchase price.’ Likewise, using SAP NetWeaver BW we can compare supplier prices in each LEGO operation and give each procurement division a benchmark target to beat.”

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Completing the LEGO model

The critical server infrastructure was purchased with the assistance of IBM Global Financing. The capital outlay was deferred by using the equipment itself to provide collateral, and the purchase was made easy with simple budget planning for regular payments.

“IBM Global Financing was able to assist during this period of very high growth, as our investment budget is required for many different projects,” says Esben Viskum. “LEGO is in a capital intensive platform-building phase, and we are perhaps 50 percent complete. IBM Global Financing was able to make the investments possible without diverting precious resources away from the core business building activities.

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that has proven its value to LEGO, with a standards-based yet highly flexible operating model that helps us roll out a commercially effective business model, and continue with double-digit growth,” concludes Esben Viskum.



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