

February 2013

**SCOR Based Business  
Process Mapping for a Hi Tech  
Manufacturing Company**

**WHITE  
PAPER**

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## INTRODUCTION

A business process is a set of activities performed for the over-all execution of an organizational function. The concept of business process mapping consists of recording of the business processes from high-level functions to low level activities carried out by individuals and enabled by IT systems. It also consists of measurement of business process performance parameters i.e. time, cost, efficiency, or other business dimensions. These business dimensions are measured as they have a significant impact on the business process performance characteristics rolling up to the business function's performance characteristics.

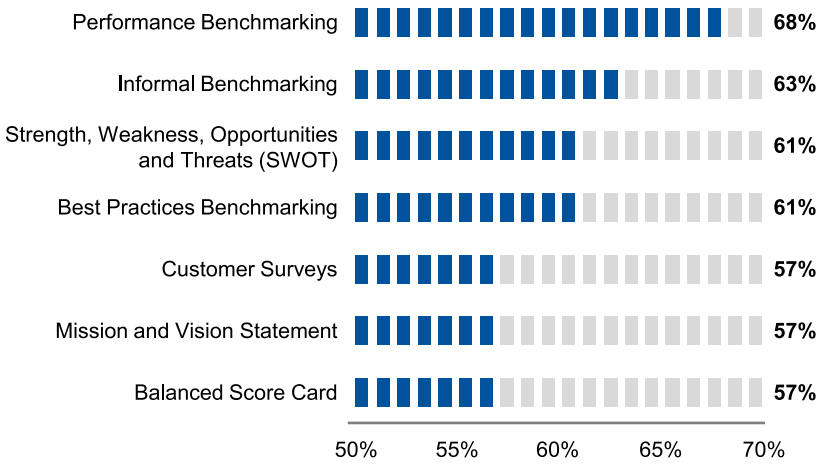
Business process mapping consists of various levels of information from business purpose, definition, stakeholders – RACI, technology enablers etc. Mapping of Business Processes can help achieve some of the objectives such as:

- Identification of bottlenecks for optimization of processes i.e. cost or cycle time reductions, efficiencies, audits, lean & quality initiatives, simulations etc
- Standardization of processes across the enterprise (Standard Operating Procedures) to eliminate rogue behavior
- Understanding of stakeholders scope of work for clear demarcation of roles and responsibilities
- Identification of automation opportunities to leverage IT investments in a better manner

Business process mapping and modeling basically consists of recording of business processes for analysis and identification of business process improvement opportunities.

## INDUSTRY ANALYSIS

Organizations must perform the complex task of keeping pace with dynamic environment – the constantly changing manufacturing volumes, fluctuating supply costs, stringent government compliance and quality requirement and asset utilization needs. Benchmarking is considered as continuous search for the best practices in industry. Manufacturing companies always need to know how they are performing in different functional areas. Process and KPI benchmarking against peers / industry leaders can help them address these concerns. Process and KPI benchmarking is needed for continuously measuring processes and practices against the competitors or those who are recognized as leaders of the industry with the focus on identifying areas of improvement.



**Source:** Global survey on business improvement and benchmarking, GBN

Performance benchmarking and best practices benchmarking are seen as amongst the top ways to improve business performance. Benchmarking is considered as continuous search for the best practices in industry which help achieve superior performance.

## SCOR MODELING

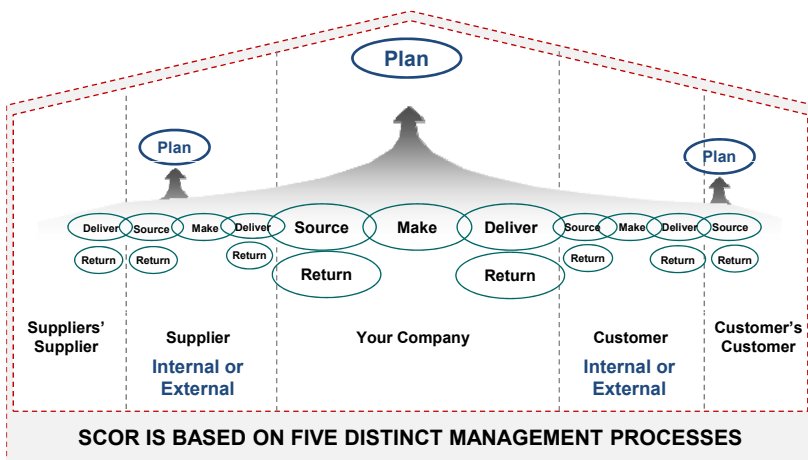
SCOR® stands for Supply Chain Operations Reference – a process reference model developed by the Supply Chain Council. It basically consists of two components – The Framework and Reference Model.

Any business process framework consists of the following dimensions - business processes, metrics, best- practices, gap analyses, organizational change management and design. SCOR® framework also provides a structured approach (similar to six sigma and other industry frameworks) for identification of improvement areas based upon the desired business objectives. It follows a standardized approach consisting of:

- Project Charter, Identification of Stakeholders and Responsibilities
- Analyses & Identification of Supply Chains within the organization
- Benchmarking and Best Practice Analyses
- SCOR®Card creation
- Brain-storming and root cause analyses(using management tools/ techniques)

SCOR® model integrates the process elements, metrics, and best practices – features associated with the functioning of a supply chain in a unique format. It connects these three aspects into relationships between processes, in terms of material, information, and work flows. These pre-defined relationships are the result of the research and collaborative definition that all participants in the SCOR development have contributed.

Standard SCOR® process definition: It consists of 5 Distinct Processes– PLAN, SOURCE, MAKE, DELIVER, RETURN for MTS / MTO / ETO configurations of supply chain. (The newer version SCOR® has RETAIL related functions as well at Level2). All supply chain functions of an enterprise are classified into these 5 distinct processes.



*Source: Supply Chain Council*

There are standard SCOR® definitions for all the supply chain functions till Level3, after which the next levels are enterprise/ industry specific.

Level 1	Level 2	Level 3	Level 4	Level 5
Scope	Configuration	Activity	Workflow	Transactions
Supply-Chain Source	S1 Source Stocked Product	S1.2 Receive Product		EDI XML
Differentiates Business	Differentiates Complexity	Names Tasks	Sequences Steps	Links Transactions
Defines Scope	Differentiates Capabilities	Links, Metrics, Tasks and Practices	Job Details	Details of Automation
Framework Language	Framework Language	Framework Language	Industry or Company Specific Language	Technology Specific Language
Standard SCOR definitions			Company/ Industry definitions	

Source: Supply Chain Council

SCOR® performance attributes: SCOR® Model consists of 5 performance attributes – Reliability, Responsiveness, Agility, Cost, Assets. Each process is measured against these performance attributes. SCOR® has defined KPIs (PARENT) for each Level 1 and KPIs (CHILDREN) for each Level 3 SCOR® process activity. This can be illustrated in the following manner:

Attribute	Level 1	Level 2	Level 3	Level 4
Strategy	Overall Health	Diagnostic	Root cause	Transactional
RL Reliability	RL.1.1 Perfect Order Fulfillment	RL.2.4 Perfect Condition	RL.3.19 Orders Received Defect Free	Transactions Processed Error Free
Set scope, priority, and strategic direction	Measures ability to execute strategy	Explains why strategy is not achieved	Identifies root causes of strategy gaps	Measures (IT) transactional performance
Framework Language	Framework Language	Framework Language	Framework Language	Technology Specific Language
Standard SCOR Attribute	Standard SCOR Metrics			Technology Driven Metrics

Source: Supply Chain Council

SCOR® best practices: SCOR® model recommends best practices that impact the Level1-Level 3 process hierarchy. The best practices recommended by SCOR® are through regular analyses of participant and member organizations of the Supply Chain Council.

Quantitative analyses using KPI Benchmarking depending upon the objectives (same industry, across different industries, peers, or leaders) and qualitative analyses using best practices applicability can be done to identify areas that need improvement.

## HOW IT WAS DONE FOR A HI-TECH CUSTOMER

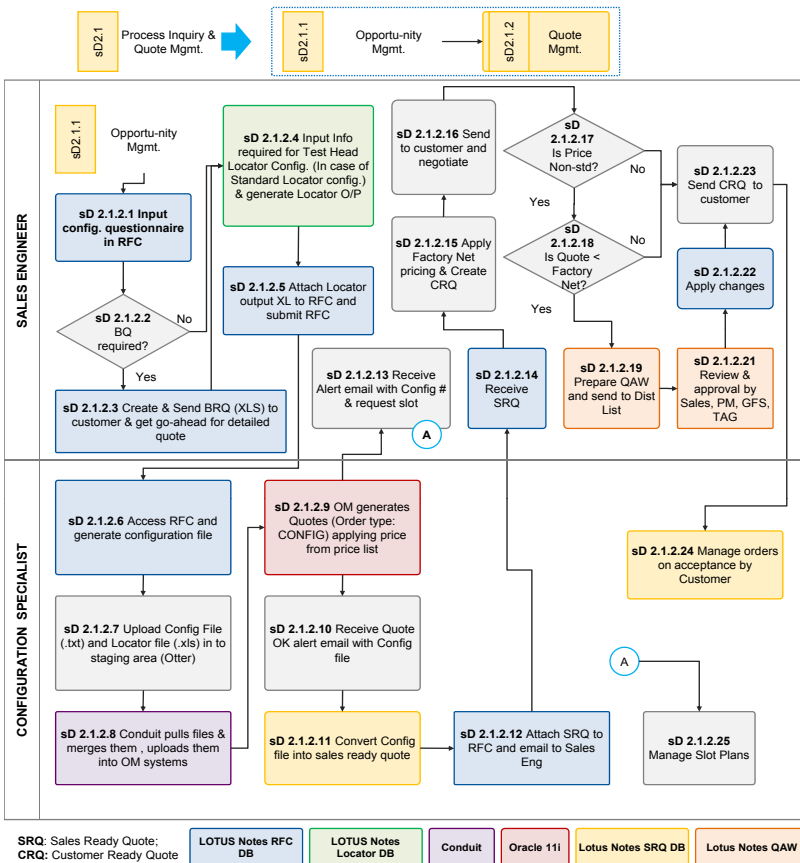
The client is a leading manufacturer & supplier of test equipment used for semiconductors, wireless products, data storage and complex electronic systems for consumer, communications, industrial and government customers.

The objectives were to:

- Map the business processes of the client’s supply chain functions
- Measure the KPIs & benchmark them against APQC industry benchmark data through HCL’s TOUCHSTONE® KPI Benchmarking Tool
- Perform best practice analyses
- Prepare recommendations for areas of improvement based upon the qualitative and quantitative analyses

The approach involved business process mapping of the client’s supply chain functions – Forecasting & Planning, Procurement, Manufacturing Execution, Order Fulfillment and Logistics.

First, the client organization’s supply chain functions were mapped against the SCOR® standard model of PLAN-SOURCE-MAKE-DELIVER-RETURN functions. Subsequently, there was a deep dive from the L3 activities to L4 and L5 activities. This was executed by conducting interviews and workshops with client’s business and IT teams to understand the L4 and L5 activities.



Illustrative SCOR Modeling - Deliver for Make-to-Order

After mapping of the supply chain business processes, the corresponding KPIs for each function were identified. This was followed by an IT system level review to identify the data points for KPI calculations. Once the data points were identified, HCL TOUCHSTONE® was used for KPI calculation and benchmarking against APQC data. The relevant data for KPI calculations was shared through pre-defined template files, which were then uploaded into the tool for computing the KPI values and benchmarking them against APQC data. The output from the HCL TOUCHSTONE® benchmarking application was then used to generate a organization specific KPI Scorecard based upon SCOR® KPIs.

Q1 – 2012	Strategic Metrics	Actual	Parity (50 <sup>th</sup> )	Advantage	Superior (90 <sup>th</sup> )	Parity gap*	Requirement gap
Business Unit 1	On Time Delivery	97%	90.2%	94%	97%	Nil	No Gap
Business Unit 2	On Time Delivery	100%	90.2%	94%	97%	Nil	No Gap
Business Unit 3	On Time Delivery	100%	90.2%	94%	97%	Nil	No Gap
Business Unit 1	Shipment Complete	91.4%	90%	95.1% ★	98%	Nil	3.7% (Advantage)
Business Unit 2	Shipment Complete	100%	90%	95.1%	98%	Nil	No Gap
Q2 – 2012	Strategic Metrics	Actual	Parity (50 <sup>th</sup> )	Advantage	Superior (90 <sup>th</sup> )	Parity gap*	Requirement gap
Business Unit 1	On Time Delivery	98%	90.2%	94%	97%	Nil	No Gap
Business Unit 2	On Time Delivery	100%	90.2%	94%	97%	Nil	No Gap
Business Unit 3	On Time Delivery	100%	90.2%	94%	97%	Nil	No Gap
Business Unit 1	Shipment Complete	86.1%	90% ★	95.1%	98%	3.9%	3.9% (Parity)
Business Unit 2	Shipment Complete	100%	90%	95.1%	98%	Nil	No Gap

#### *Illustrative KPI SCORcard for two sample KPIs*

Once the business processes were mapped, the best practices corresponding to each business function/ process area were also identified through research activities. These were then validated with the organization's business team to explore their current and future applicability in the client's business environment.

Best Practices	Applied at Your Enterprise
Quote Capability without reserving Inventory which can be converted into an order in a single step but does not generate build signal or Reserve Inventory	Yes
Single Point of contact for all order inquiries (including order entry)	No
Electronic Commerce (Customer Visibility of stock availability, use of Hand-held terminals for direct order entry, confirmation, credit approval), On-line Stock Check and Reservation of Inventory	Partial – Reasons
Enable real-time visibility into the Back log order status shipments, Scheduled Material Receipts, Customer Credit History, & Current Inventory Positions	
Remote order entry capabilities	
Automatic Multi-level Credit Checking: Dollar Limits; Days Sales Outstanding; Margin Testing	
Available to Promise – availability and feasibility check concerning a customer request or a customer order	
Integrated order management system that treats each order line as a separate order with integration to inventory source and status; Real-time inventory management	
Advanced planning and scheduling logic with constraint, cost, and resource optimization	
Delayed Differentiation – Differentiation of the product into a specific end product is shifted closer to the customer by postponing identify changes such as assembly or packaging to the last supply chain location	

*Sample best practices list for sD2: Deliver Made to Order functions*

For any KPI value whose value was lower than the industry standard value further analysis was done from best practices perspective. An analysis was done whether SCOR recommended best practices for the specific processes were present in the organization and up to which extent. These analyses were then used to formulate a set of recommendations from both business and IT standpoint for various activities.

Once the recommendations were finalized, a risk-return matrix was developed with inputs from organization's SMEs to prioritize improvement opportunities into projects with focus upon low risk – high return opportunities.



## REFERENCES

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Supply Chain Operations Reference Manual – Supply Chain Council.

Supply Chain Operations (SCOR) Reference Model and the Integrated Business Reference Framework by Scott Stevens, CTO Supply Chain Council.

## ABOUT THE AUTHORS



**Arindam Sen, General Manager,  
HCL Technologies Ltd.**

Arindam Sen is part of the Manufacturing Solution team at HCL Technologies Ltd. Arindam's primary role in HCL is to devise solutions, IPs & frameworks to address business problems of customers in HiTech vertical.

Arindam is a seasoned professional with 18 years of global experience of which the last 14 years were in Information Technology and his initial 4 years were in Production Operations and Supply Chain Management. He has extensive experience in ERP consulting including Business Strategy & Planning, Product Selection, Solution Building, Competency Development and Program Management.

Arindam holds a Master in Management (General Management) from Asian Institute of Management (AIM), Manila. He is also a CSCP (Certified Supply Chain Professional) from APICS, USA. He completed his Master of Engineering (Production Management) from Jadavpur University, Calcutta and Bachelor of Engineering (Mechanical) from Bengal Engineering and Science University (BESU), Shibpur.



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Narayanan is a Manager within the Supply Chain Consulting practice of HCL. He is currently employed as a Solution Architect/ Process Consultant with a leading Hi- Tech Manufacturer in the US. He has earlier worked in one of the largest automotive companies in the world, Tata Motors across various roles along the supply chain. He holds a MBA in Marketing and Operations from XLRI Jamshedpur along with a degree in Production Engineering from NIT Calicut.

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## ABOUT HCL

### About HCL Technologies

HCL Technologies is a leading global IT services company, working with clients in the areas that impact and redefine the core of their businesses. Since its inception into the global landscape after its IPO in 1999, HCL focuses on 'transformational outsourcing', underlined by innovation and value creation, and offers integrated portfolio of services including software-led IT solutions, remote infrastructure management, engineering and R&D services and BPO. HCL leverages its extensive global offshore infrastructure and network of offices in 31 countries to provide holistic, multi-service delivery in key industry verticals including Financial Services, Manufacturing, Consumer Services, Public Services and Healthcare. HCL takes pride in its philosophy of 'Employees First, Customers Second' which empowers our 85,194 transformers to create a real value for the customers. HCL Technologies, along with its subsidiaries, had consolidated revenues of US\$ 4.4 billion (23,499 crores), as on 31 Dec 2012 (on LTM basis). For more information, please visit **www.hcltech.com**

### About HCL Enterprise

HCL is a \$6.2 billion leading global technology and IT enterprise comprising two companies listed in India – HCL Technologies and HCL Infosystems. Founded in 1976, HCL is one of India's original IT garage start-ups. A pioneer of modern computing, HCL is a global transformational enterprise today. Its range of offerings includes product engineering, custom & package applications, BPO, IT infrastructure services, IT hardware, systems integration, and distribution of information and communications technology (ICT) products across a wide range of focused industry verticals. The HCL team consists of over 90,000 professionals of diverse nationalities, who operate from 31 countries including over 500 points of presence in India. HCL has partnerships with several leading global 1000 firms, including leading IT and technology firms. For more information, please visit **www.hcl.com**

