Productivity Link

October 2014

Contents

Big data and productivity

1. Introduction

Big data is a capability that allows companies to extract value from large volumes of data. Like any capability, it requires investments in technologies, processes and governance. Companies that effectively create and implement big data strategies stand to gain a competitive advantage.

Big data today is a business priority, given its ability to profoundly affect commerce in the globally integrated economy. While it provides solutions to long-standing business challenges, big data also inspires new ways to transform processes, organisations, and entire industries.

2. What is big data?

Big data describes the exponential growth and availability of data, both structured and unstructured. It is said to be as important to business and society as the Internet has become, as more data may lead to more accurate analyses. In turn, more accurate analyses may lead to more confident decision making, and better decisions can mean greater operational efficiencies, cost reductions and reduced risk.

McKinsey Global Institute defines big data as “datasets whose size is beyond the ability of typical database software tools to capture, store, manage and analyse”. It says this definition is “intentionally subjective” and “incorporates a moving definition of how big a dataset needs to be in order to be considered big data”. McKinsey Global Institute also points out that big data is not defined in terms of being larger than a certain number of terabytes. As technology advances over time, the size of datasets that qualify as big data will also increase. Additionally, the definition can vary by sector, depending on what kinds of software tools are commonly available and what sizes of datasets are common in a particular industry. Hence, big data in many sectors today will range from “a few dozen terabytes to multiple petabytes (thousands of terabytes)”.

3. The values of big data

The right use of big data can increase productivity, innovation, and competitiveness for organisations. Big data can bring about dramatic cost reductions, substantial improvements in the time required to perform a computing task, or new product and service offerings. Similar to traditional analytics, it can also support internal business decisions. The technologies and concepts behind big data allow organisations to achieve a variety of objectives. Thus, big data creates values in several ways.

Creating transparency

Simply making big data more easily accessible to relevant stakeholders in a timely manner can create tremendous value. In manufacturing, integrating data from R&D, engineering, and manufacturing units to enable concurrent engineering can significantly cut time to market and improve quality.

Enabling experimentation to discover needs, expose variability, and improve performance

As they create and store more transactional data in digital form, organisations can collect more accurate and detailed performance data (in real or near real time) on everything from product inventories to personnel sick days. IT enables organisations to instrument processes and then set up controlled experiments. Using data to analyse variability in performance – that which either occurs naturally or is generated by controlled experiments – and to understand its root causes can enable leaders to manage performance to higher levels.

Segmenting populations to customise actions

Big data allows organisations to create highly specific segmentations and to tailor products and services precisely to meet those needs. This approach is well known in marketing and risk management but can be revolutionary elsewhere. Even consumer goods and service companies that have used segmentation for many years are beginning to deploy more sophisticated big data techniques such as the real-time micro-segmentation of customers to target promotions and advertising.

Replacing/supporting human decision making with automated algorithms

Sophisticated analytics can substantially improve decision making, minimise risks, and unearth valuable insights that would otherwise remain hidden. Such analytics have applications for organisations from tax agencies that can use automated risk engines to flag candidates for further examination to retailers that can use algorithms to optimise decision processes such as the automatic fine-tuning of inventories and pricing in response to real-time in-store and online sales. In some cases, decisions will not necessarily be automated but augmented by analysing huge, entire datasets using big data techniques and technologies rather than just smaller samples that individuals with spreadsheets can handle and understand. Decision making may never be the same; some organisations are already making better decisions by analysing entire datasets from customers, employees, or even sensors embedded in products.

Innovating new business models, products, and services

Big data enables companies to create new products and services, enhance existing ones, and invent entirely new business models. Manufacturers are using data obtained from the use of actual products to improve the development of the next generation of products and to create innovative after-sales service offerings. The emergence of real-time location data has created an entirely new set of location-based services from navigation to pricing property and casualty insurance based on where, and how, people drive their cars.

4. How can big data boost productivity?

The use of big data is becoming a crucial way for leading companies to outperform their peers. In most industries, established competitors and new entrants alike will leverage data-driven strategies to innovate, compete and capture value. Forward-thinking companies around the world are discovering that analytics can transform big data into valuable information to better track resources, increase predictive capabilities, and inform business strategy.

However, big data can also be derived from the Human Resource (HR) technology. Integrating data from the enterprise applications which contains data on the organisation's most valuable resource – people – allows the organisation to tap into business-transforming analytics that improve insight and enhance overall performance. When properly analysed, people data can and should be used to inform decision making, drive performance measures, and increase competitive advantage. Prior research has shown that data-driven decision-making can achieve productivity gains five to six percent higher than other factors can explain.

Through data analysis, companies can also significantly increase their understanding of employees, which in turn improves their odds of improving worker productivity. Analysing big data can tell the organisation more about employees' behaviour, which then allows the organisation to take steps to improve employees' performance and productivity.

Below are some examples of how people analytics can help managers create a productive work culture:

(i) Objectively evaluate the effectiveness of current policies

By synthesising multiple strains of data, people analytics helps leaders understand how policies impact efficiency. For example, data may highlight that employees are spending almost no time collaborating, despite the fact that collaboration has been proven to promote innovation and increase worker satisfaction. Conversely, data could illuminate that employees are spending more than 25 percent of their time in meetings in which their presence is not crucial, helping leaders more strategically decide who attends which meetings.

(ii) Create transparency to drive productivity

To reduce organisational distractions and encourage efficiency, companies can deliver personalised weekly reports to both employees and managers. The reports allowed both parties to see trends in their work patterns and identify issues leading to distraction from key initiatives. These insights will open the door for meaningful conversations about workload, productivity and priorities.

(iii) Recognise and foster employees' passion to reduce distractions

Employers can review multiple strains of data to assess if any particular team member spends an inordinate amount of time pursuing a particular interest in the business. By understanding employees' interests and passions, managers can more strategically allocate work assignments. When employees are engaged in work that is meaningful, they are likely to be more productive and less distracted.

(iv) Provide sales teams with an early warning system

People analytics can also be used to understand the level of engagement with prospective customers.

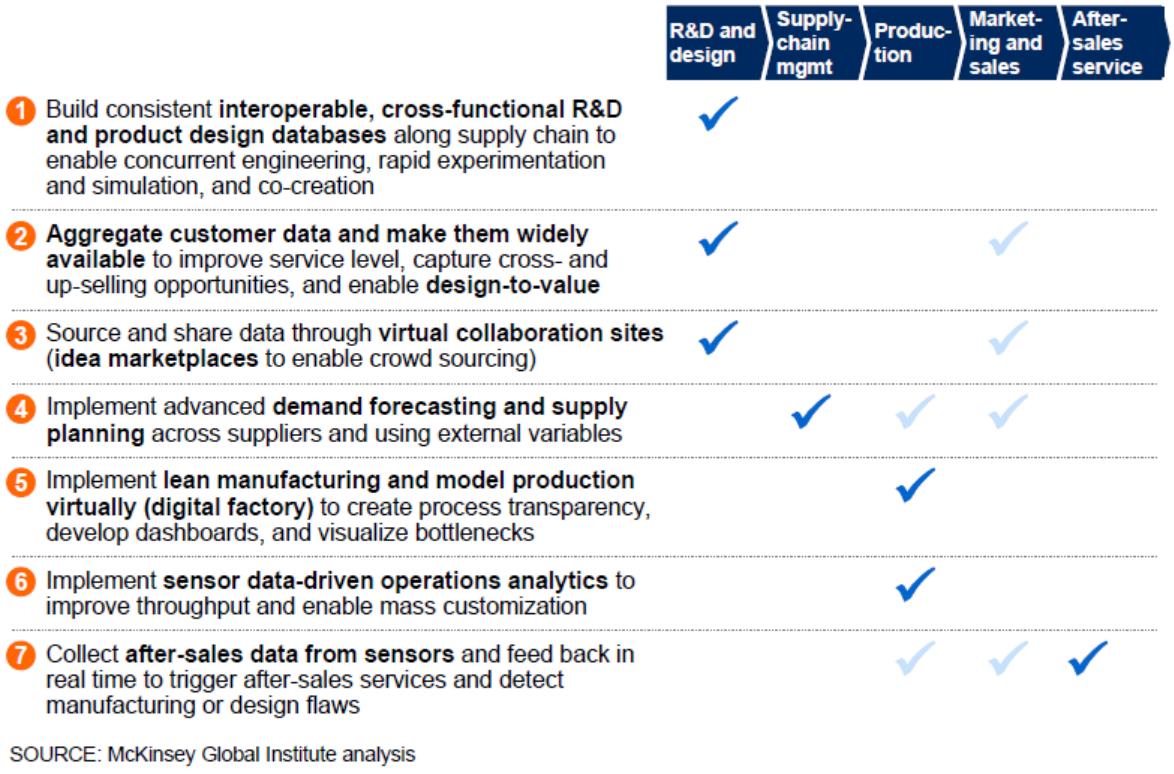
5. Manufacturing industry

Arguably, manufacturing faces the challenge of generating significant productivity improvement in industries that have already become relatively efficient, more than most other sectors. Increasingly global and fragmented manufacturing value chains create new challenges that manufacturers must overcome to sustain productivity growth. Big data can underpin another substantial wave of gains, which will come from "improved efficiency in design and production, further improvements in product quality, and better meeting customer needs through more precisely targeted products and effective promotion and distribution".

McKinsey Global Institute in its June 2011 report points out that "big data can help manufacturers reduce product development time by 20 to 50 percent and eliminate defects prior to production through simulation and testing. Using real-time data, companies can also manage demand planning across extended enterprises and global supply chains, while reducing defects and re-work within production plants." Hence, big data is capable of providing "a means to achieve dramatic improvements in the management of the complex, global, extended value chains that are becoming prevalent in manufacturing". Big data also enables customers' needs to be met in innovative and more precise ways, such as through collaborative product development based on customer data.

5.2. Using big data across the value chain

Big data has the potential to enable seven performance improvement levers for manufacturers, affecting the entire value chain, as shown below.



Source: Manyika, J., et al. (2011, May). Big data: The next frontier for innovation, competition and productivity. *McKinsey Global Institute*. Retrieved October 1, 2014, from http://www.mckinsey.com/~/media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Technology%20and%20Innovation/Big%20Data/MGI_big_data_full_report.ashx

5.3. Productivity potential and innovation

For manufacturers, opportunities enabled by big data can drive productivity gains both through improving efficiency and the quality of products as shown below. Efficiency gains arise across the value chain, from reducing unnecessary iterations in product development cycles to optimising the assembly process. The real output value of products is increased by improving their quality and making products that better match customers' needs.

	Lever examples	Impact: Cost	Impact: Revenue	Impact: Working capital	Subsector applicability
R&D and design	▪ Concurrent engineering/PLM[1]	+20–50% PD[2] costs	-20-50% time to market		High – Low complexity
	▪ Design-to-value	+30% gross margin			High – Low complexity
	▪ Crowd sourcing	-25% PD[2] costs			B2C – B2B
Supply chain management	▪ Demand forecasting/ shaping and supply planning	+2–3% profit margin		-3–7% onetime	FMCG[3] – Capital goods
Production	▪ Sensor data-driven operations analytics	-10–25% operating costs	Up to +7% revenue		Capital intense – CPG[3]
	▪ "Digital Factory" for lean manufacturing	-10–50% assembly costs	+2% revenue		Capital intense – CPG[3]
After-sales services	▪ Product sensor data analysis for after-sales service	-10–40% maintenance costs	+10% annual production		Capital intense – CPG[3]

1 Product lifecycle management.
2 Product development.
3 Fast-moving consumer goods and consumer packaged goods.

SOURCE: Expert interviews; press and literature search; McKinsey Global Institute analysis

Source: Manyika, J., et al. (2011, May). Big data: The next frontier for innovation, competition and productivity. McKinsey Global Institute. Retrieved October 1, 2014, from http://www.mckinsey.com/~/media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Technology%20and%20Innovation/Big%20Data/MGI_big_data_full_report.ashx

Beyond pushing productivity, big data enables innovative services and even new business models in manufacturing. Sensor data have made possible innovative after-sales services.

5.4. Maximising the benefits of big data

The critical first step for manufacturers that want to use advanced analytics to improve yield is to consider how much data the company has at its disposal. Most companies collect vast troves of process data but typically use them only for tracking purposes, not as a basis for improving operations.
Much of the value that big data can create in manufacturing requires “the access and varied use of data from multiple sources across an extended enterprise”. Thus, to fulfil the potential for value creation in this sector will require manufacturing companies to invest in IT as well as to make organisational changes. The additional IT investment necessary may not be insignificant as

some of the big data levers will be costly. However, the long-term payoff should outweigh the cost.

Other investments will be required to develop interfaces and protocols to share data effectively across the extended enterprise. The standardisation of interfaces will be critical and may require industry-wide partnerships to achieve. Strongly "departmentalised companies", with multiple IT systems and overlapping and/or redundant data in different operations and divisions, are clearly at a disadvantage. To obtain the benefits of design-to-value, for instance, a company needs to have a free interchange of data among marketing and sales, R&D, and production. Thus, in many organisations, achieving success will require strong leadership and a cultural shift to establish the mind-sets and behaviours to breech today's silos. Many organisations will need to undertake organisational change programmes to enforce the necessary shift.

Many of the levers also require access to data from different players in the value chain. To optimise production planning, data from various tiers of suppliers will be necessary. Demand planning will require customer data from retailers. To access such pools of data, manufacturers will also need to be thoughtful about establishing the right value propositions and incentives. Many retailers, for instance, guard customer data as proprietary, but there have been instances of successful data sharing.

Additionally, manufacturing companies will need to build the capabilities needed to manage big data. Although the sector has been dealing with large datasets for two decades, the rising volume of data from new sources along the supply chain and from end markets requires a new level of storage and computing power and deep analytical expertise if manufacturers are to harvest relevant information and insights.

6. Retail industry

The use of information technology and digital data has been instrumental in boosting the profitability of individual players and the productivity of the entire retail sector for many years. However, the continued adoption

and development of big data levers have the potential to further increase sector-wide productivity by at least 0.5 percent a year through 2020, as reported by McKinsey Global Institute. This is also a rich domain in which to examine interactions between retailers and consumers. This is an area in which digital data are playing an increasing role as consumers search, research, compare, buy, and obtain support online, and the products sold by retailers increasingly generate their own digital data.

6.1. New opportunities to create value in retail

While big data linked to new technology does squeeze the industry in some ways, it also offers significant new opportunities for creating value. Sector retailers and their competitors are in a constant race to identify and implement those big data levers that will give them an edge in the market. The volume of data is “growing inexorably” as retailers record every customer transaction and operation, as well as keeping track of emerging data sources such as radio-frequency identification (RFID) chips that track products, and online customer behaviour and sentiment.

Today, leading players, particularly in the United States, are mining customer data to inform decisions they make about managing their supply chain to merchandising and pricing. Retailers across the industry are becoming more sophisticated in “slicing and dicing big data” they collect from multiple sales channels, catalogues, stores, and online interactions. The widespread use of increasingly granular customer data can enable retailers to improve the effectiveness of their marketing and merchandising. Big data levers applied to operations and supply chains will continue to reduce costs and increasingly create new competitive advantages and strategies for growing retailers’ revenue.

6.2. Big data levers in retail

The following table presents 16 big data retail levers that retailers can employ along the value chain. These levers fall into in the five main categories of marketing, merchandising, operations, supply chain, and new business models.

Function	Big data lever
Marketing	▪ Cross-selling ▪ Location based marketing ▪ In-store behavior analysis ▪ Customer micro-segmentation ▪ Sentiment analysis ▪ Enhancing the multichannel consumer experience
Merchandising	▪ Assortment optimization ▪ Pricing optimization ▪ Placement and design optimization
Operations	▪ Performance transparency ▪ Labor inputs optimization
Supply chain	▪ Inventory management ▪ Distribution and logistics optimization ▪ Informing supplier negotiations
New business models	▪ Price comparison services ▪ Web-based markets

SOURCE: McKinsey Global Institute analysis

Source: Manyika, J., et al. (2011, May). Big data: The next frontier for innovation, competition and productivity. *McKinsey Global Institute*. Retrieved October 1, 2014, from http://www.mckinsey.com/~/media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Technology%20and%20Innovation/Big%20Data/MGI_big_data_full_report.ashx

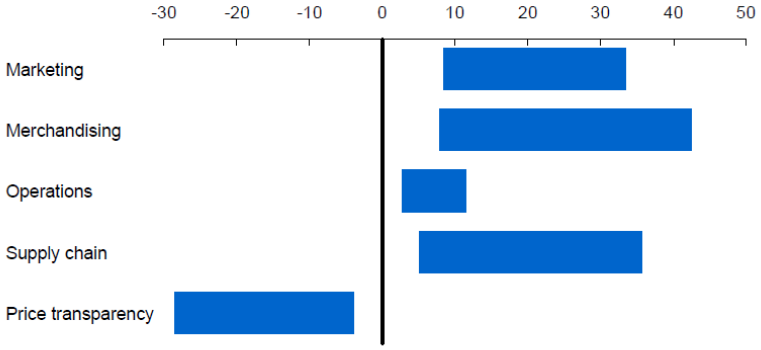
6.3. Delivering higher margins and productivity

Marketing levers can affect 10 to 30 percent of operating margin; merchandising levers can affect 10 to 40 percent; and supply chain levers can have a five to 35 percent impact. In contrast, price transparency levers will tend to cut prices and squeeze margins.

The total potential impact of individual big data levers varies significantly across retail sub-sectors. Some sub-sectors will have already pulled big data levers more than others, partly explaining this variation.

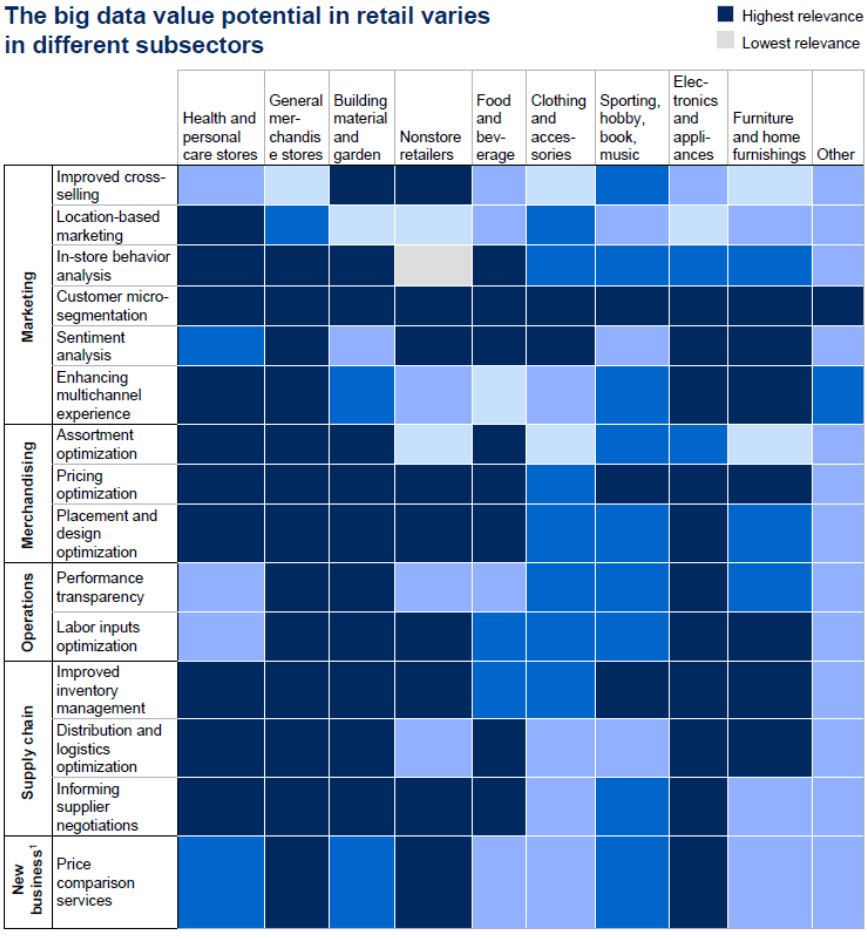
Different levers have varied impacts on the operating margins of firms

Impact on operating margin
%



SOURCE: Expert interviews; publicly available data; McKinsey case studies; McKinsey Global Institute analysis

The big data value potential in retail varies in different subsectors



1 Impact of Web-based markets is very difficult to quantify and this has not been included here.

SOURCE: McKinsey Global Institute analysis

Source: Manyika, J., et al. (2011, May). Big data: The next frontier for innovation, competition and productivity. *McKinsey Global Institute*. Retrieved October 1, 2014, from http://www.mckinsey.com/~/media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Technology%20and%20Innovation/Big%20Data/MGI_big_data_full_report.ashx

While individual players can use big data levers to grow their top lines and operating margins, these gains will largely shift value within the industry rather than increasing its total size. Firms that are relatively better at deploying big data levers will experience significant gains at the expense of those that do not execute as well. The overall winners should be consumers, who will benefit from receiving goods better suited to their needs. Big data levers also have the potential to create an estimated 0.5 percent acceleration annually in productivity through 2020, according to McKinsey Global Institute.

Case Study

Google

People analytics, a new trend in people management, emerged in the larger context of using big data to inform business decisions. It provides transparency into the ways a company's biggest assets – its people – are really working.

Google has spent a number of years methodically building one of the most refined performance-management engines in the corporate world. It recognised that people-management decisions should be no different than engineering decisions. Key business decisions need to be "rooted in data". Through the elimination of subjectivity from people-management decisions using analytics, Google has promoted productivity more effectively than policing its employees' time surfing the Internet.

For example, Google's workplace and HR policies are informed by data garnered through people analytics. Google's perks are highly lauded, including their complimentary gourmet food and paid family leave, but it is important to note that these initiatives are based on data. They are proven to increase employee satisfaction, productivity and innovation.

UPS

UPS is no stranger to big data, having begun to capture and track a variety of package movements and transactions as early as the 1980s. The company now tracks data on 16.3 million packages per day for 8.8 million customers, with an average of 39.5 million tracking requests from customers per day. The company stores over 16 petabytes of data.

Much of its recently acquired big data, however, comes from telematics sensors in over 46,000 vehicles. The data on UPS package cars (trucks), for example, includes their speed, direction, braking, and drive train performance. The data is not only used to monitor daily performance, but to drive a major redesign of UPS drivers' route structures. This initiative, called ORION (On-Road Integrated Optimisation and Navigation), is arguably the world's largest operations research project. It also relies heavily on online map data, and will eventually reconfigure a driver's pickups and drop-offs in real time. The project has already led to savings in 2011 of more than 8.4 million gallons of fuel by cutting 85

million miles off of daily routes. UPS estimates that saving only one daily mile driven per driver saves the company US$30 million, so the overall dollar savings are substantial. The company is also attempting to use data and analytics to optimise the efficiency of its 2,000 aircraft flights per day.

Schneider National

Schneider National is one of North America's largest truckload, logistics and intermodal services providers. It has been pursuing various forms of analytical optimisation for a couple of decades. What has changed in Schneider's business over the past several years is the availability of low-cost sensors for its trucks, trailers and intermodal containers. The sensors monitor location, driving behaviours, fuel levels and whether a trailer/container is loaded or empty. Schneider has been transitioning to a new technology platform over the last five years, but leaders there do not draw a clear line between big data and more traditional data types. However, the quality of the optimised decisions it makes with the sensor data – dispatching of trucks and containers, for example – is improving substantially, and the company's use of prescriptive analytics is changing job roles and relationships.

New sensors are constantly becoming available. For example, fuel-level sensors, which Schneider is beginning to implement, allow better fuelling optimisation, i.e., identifying the optimal location at which a driver should stop for fuel based on how much is left in the tank, the truck's destination and fuel prices along the way. In the past, drivers have entered the data manually, but sensor data is both more accurate and free of bias.

Safety is a core value at Schneider. Driving sensors are triggering safety discussions between drivers and their leaders. Hard braking in a truck, for example, is captured by sensors and relayed to headquarters. This data is tracked in dashboard-based safety metrics and initiates a review between the driver and his/her leader. Schneider is piloting a process where the sensor data, along with other factors, goes into a model that predicts which drivers may be at greater risk of a safety incident. The use of predictive analytics produces a score that initiates a pre-emptive conversation with the driver and leads to less safety-related incidents.

Recommended Readings

Davenport, T. H. (2014). *Big data @ work: Dispelling the myths, uncovering the opportunities.* Boston: Harvard Business Review Press.
[658.4038 DAV]

Maisel, L. (2014). *Predictive business analytics: Forward-looking capabilities to improve business performance.* Hoboken, N.J.: John wiley & Sons.
[658.4013 Mai]

Stubbs, E. (2014). *Big data, big innovation: Enabling competitive differentiation through business analytics.* Hoboken, N.J.: John Wiley & Sons.
[658.4013 STU]

References

Auschitzky, E., Hammer, M., & Rajagopaul, A. (2014, July). How big data can improve manufacturing. *McKinsey & Company.* Retrieved October 1, 2014, from http://www.mckinsey.com/insights/operations/how_big_data_can_improve_manufacturing

Arthur, L. (2014, August 15). What is big data? *Forbes.* Retrieved October 1, 2014, from http://www.forbes.com/sites/lisaarthur/2013/08/15/what-is-big-data/

Bakshi, H., Bravo-Biosca, A., & Mateos-Garcia, J. (2014, March) Inside the datavores: How data and online analytic affect business performance. *Nesta.* Retrieved October 1, 2014, from http://www.nesta.org.uk/sites/default/files/inside_the_datavores_briefing.pdf

Big data and analytic to drive productivity. (2014, August 20). *TIBCO Spotfire.* Retrieved October 1, 2014, from http://spotfire.tibco.com/blog/?p=26741

Big data: What it is and why it matters. (n.d.). *sas.* Retrieved October 1, 2014, from http://www.sas.com/en_us/insights/big-data/what-is-big-data.html

Building with big data. (2011, May 26). *The Economist.* Retrieved October 1, 2014, from http://www.economist.com/node/18741392

Chandra, S., Miller, R., & Burrows, P. (2013, September 19). Is innovation leading to a new age of productivity in the U.S.?. *Bloomberg Businessweek Magazine.* Retrieved October 1, 2014, from http://www.businessweek.com/articles/2013-09-19/innovation-and-productivity-are-not-dead-thanks-to-big-data

Davenport, T. H., & Dyché, J. (2013, May). Big data in big companies. *Thomas H. Davenport & SAS Institute.* Retrieved October 1, 2014, from http://www.sas.com/content/dam/SAS/en_us/doc/whitepaper2/bigdata-bigcompanies-106461.pdf

Derose, C. (2013, October 7). How Google uses data to build a better worker. *The Atlantic.* Retrieved October 1, 2014, from http://www.theatlantic.com/business/archive/2013/10/how-google-uses-data-to-build-a-better-worker/280347/

Fuller, R. (2014, Augst 7). How big data will change everything about managing employees. *Entrepreneur.* Retrieved October 1, 2014, from http://www.entrepreneur.com/article/236030

Harnessing the power of big data to improve business execution. (2011). *Success Factors*. Retrieved October 1, 2014, from http://www.successfactors.com/en_us/download.html?a=/content/dam/successfactors/en_us/resources/white-papers/harnessing-big-data.pdf

Manyika, J., et al. (2011, May). Big data: The next frontier for innovation, competition and productivity. *McKinsey Global Institute.* Retrieved October 1, 2014, from http://www.mckinsey.com/~/media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Technology%20and%20Innovation/Big%20Data/MGI_big_data_full_report.ashx

McGuide, T., Manyika, J., & Chui, M. (2012, August). Why big data is the new competitive advantage. *Ivey Business Journal.* Retrieved October 1, 2014, from http://iveybusinessjournal.com/topics/strategy/why-big-data-is-the-new-competitive-advantage#.VBvhTle1U_g

McKenna, B. (2013, March). Social technology, big data can increase productivity, says McKinsey. *ComputerWeekly.com.* Retrieved October 1, 2014, from http://www.computerweekly.com/feature/Social-technology-big-data-can-increase-productivity-says-McKinsey

Parise, S., Iyer, B., & Vesset, D. (2012, July/August). Four strategies to capture and create value from big data. *Ivey Business Journal.* Retrieved October 1, 2014, from http://iveybusinessjournal.com/topics/strategy/four-strategies-to-capture-and-create-value-from-big-data#.VDTzsle1U_h

Simonds, L. (2013, September 19). How data analysis boosts productivity. *Time.* Retrieved October 1, 2014, from http://business.time.com/2013/09/09/how-data-analysis-boosts-productivity/

The social economy: Unlocking value and productivity through social technologies. (2012, July). *McKinsey Global Institute.* Retrieved October 1, 2014, from http://www.ijrdet.com/files/Volume3Issue2/IJRDET_0814_23.pdf

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3) Implement improvements

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SINGAPORE PRODUCTIVITY ASSOCIATION

The Singapore Productivity Association (SPA) was set up in 1973 as an affiliated body of the then National Productivity Board, now SPRING Singapore. Its objective is to promote the active involvement of organisations and individuals in the Productivity.

<table>
<tr><th colspan="2">CPP Course Syllabus</th></tr>
<tr><th>CPP</th><th>CPP (Retail)</th></tr>
<tr><td colspan="2">Module 1: Understanding Productivity
(Duration: 1 day)
• Introduction to Productivity and Quality Concepts
• Factors Affecting Enterprise Productivity
• Productivity Movement in Singapore
• Productivity Promotion in Businesses
• Productivity Challenges</td></tr>
<tr><td>Module 2: Productivity Tools, Techniques &
Management Systems
(Duration: 3 days)
• Business Excellence
• Productivity Measurement & Analysis
• Process management:
▪ Cost of Quality
▪ Lean Six Sigma
▪ Process Mapping & Analysis
• Integrated Management Systems</td><td>Module 2: Productivity Tools, Techniques &
Management Systems
(Duration: 3 days)
• Delivering Service Excellence
• Productivity Measurement & Analysis
• Process management:
▪ Cost of Quality
▪ Lean Six Sigma
▪ Process Mapping & Analysis</td></tr>
<tr><td>Module 3: Innovation & Service Excellence
(Duration: 3 days)
• Knowledge Economy & Innovation
• Service Excellence
• Team Excellence</td><td>Module 3: Innovation & Service Excellence
(Duration: 3 days)
• Introduction to Service Excellence & Sales Productivity
• Store Management & the Roles of a Store Manager
• Minimising Operational Constraints & Focusing on Sales
• Setting Goals & Analysing Statistics
• Coaching & Motivating Sales Staff
• Service Behaviours that Encourage Business</td></tr>
<tr><td colspan="2">Module 4: Critical Success Factors
(Duration: 1 day)
• Management Commitment
• Managing & Sustaining Change
• Overcoming Resistance to Change
• Training and Education
• Planning for Implementation and Control of Productivity Improvement Programme
• Briefing on project assignment & Role of Productivity Practitioner</td></tr>
</table>

As part of the CPP curriculum, participants are required to start a productivity improvement project upon completion of the in-class component. Project guidance will be provided by a professional consultant assigned for this purpose and is for a total of 2 man-days.

Funding & Payment

The course is supported by the Singapore Workforce Development Agency (WDA). Funding is available at 70% and 50% of the course fees respectively for SMEs and MNCs/LLEs/Statutory Boards. Please find the prices payable in the net fee table below:

For All Entities:	Nett Fee:	Nett Fee (with GST):
All Entities ($3950)	$1,185	$1,267.95

Here are the schedules for CPP:

Oct-14		
Date	**Module**	**Time**
Monday, 13 October 2014	Module 1	9-5 pm
Wednesday, 15 October 2014	Module 1 & 2	9-5 pm
Monday, 20 October 2014	Module 2	9-5 pm
Friday, 24 October 2014		9-5 pm
Wednesday, 29 October 2014	Module 3	9-5 pm
Friday, 31 October 2014		9-5 pm
Tuesday, 4 November 2014		9-5 pm
Wednesday, 5 November 2014	Module 4	9-5 pm

Nov-14		
Date	**Module**	**Time**
Monday, 10 November 2014	Module 1	9-5 pm
Wednesday, 12 November 2014	Module 1 & 2	9-5 pm
Monday, 17 November 2014	Module 2	9-5 pm
Wednesday, 20 November 2014		9-5 pm
Tuesday, 25 November 2014	Module 3	9-5 pm
Thursday,27 November 2014		9-5 pm
Tuesday, 2 December 2014		9-5 pm
Wednesday, 3 December 2014	Module 4	9-5 pm

Core Faculty Members

MR. LAM CHUN SEE
B. ENG IN INDUSTRIAL & SYSTEMS ENGINEERING (UNIVERSITY OF SINGAPORE)

Chun see manages his own consultancy practice, Hoshin Consulting and is also an associate consultant/trainer to the PSB Corporation and Singapore Productivity Association. Prior to running his own practice, he has had years of experience as an industrial engineer with Philips, and trainer and consultant with the then National Productivity Board, APG Consulting and Teian Consulting, He was conferred the Triple-A Award in 1989 for helping to transfer Japanese know-how, particularly in the area of 5S, into local programmes and packages. Throughout his years of consultancy experience, Chun See has assisted many businesses in analyzing their productivity and quality objectives and performance; primarily through the application of the PDCA technique and basic QC tools.

MR. LEE KOK SEONG
M.SC. IN CHEMICAL ENGINEERING (IMPERIAL COLLEGE, LONDON UNIVERSITY), B.SC. IN CHEMICAL ENGINEERING (NATIONAL TAIWAN UNIVERSITY)

Kok Seong has accumulated vast experience in the areas of productivity training and management consultancy throughout his 30 years of experience with the Standards, Productivity and Innovation Board (SPRING). He has provided consultancy assistance and training for numerous organisations both within and outside of Singapore in the areas of Productivity Management, Operation and Production Management, total Quality Management, Total Productive Maintenance, Shopfloor Management, Occupational Safety Management, Industrial Engineering Applications and Supervisory Management. He has also been greatly involved in the pinnacle Singapore Quality Award (SQA) initiative since its inception in 1993. his track records include the assessments and site visits of award recipients like Micron Semiconductor (formerly Texas Instruments), Motorola, Baxter Healthcare, Philips Tuner Factory and Teck Wah Industrial Corporation Ltd. Mr. Lee is currently a certified SQA Senior Assessor, as well as a resource person for Basic and Advanced Training Courses for Productivity Practitioners, a position he has taken on since 2007.

MR. LOW CHOO TUCK
M.SC. IN INDUSTRIAL ADMINSITRATION (UNIVERSITY OF ASTON, UK); B.SC. IN PHYSICS (NUS); DIP IN QUALITY CONTROL INSTRUCTORS (INTERNATIONAL QUALITY CENTRE, NETHERLANDS); CERTIFICATE IN PRODUCTIVITY DEVELOPMENT (JAPAN PRODUCTIVITY CENTRE); CERTIFICATE IN ADVANCED MANAGEMENT DEVELOPMENT (INSEASD)

Choo Tuck currently provides training and advisory services in productivity and quality management to businesses and government in the Asean region and Middle East. He was previously the Executive Director of the Restaurant Association of Singapore as well as the Singapore Productivity Association, and was also the Director for Strategic Planning in SPRING Singapore. During his many years of service with SPRING Singapore, he gained wide experience in productivity training, management consultancy and productivity promotion, and has helped more than a 100 businesses in improving productivity, quality control and business excellence, including organisations such as Cycle & Carriage, Motorola, PUB and DBS. On top of that, he has also served as an Asian Productivity Organisation (APO) expert on Productivity for several APO member countries, and was part of a team of experts engaged by the Singapore cooperation Enterprise to provide productivity expertise to the Government of Bahrain in 2007 and 2008.

MR. QUEK AIK TENG
B.ENG (HON.) IN MECHANICAL ENGINEERING (UNIVERSITY OF SHEFFIELD); DIP. IN BUSINESS EFFICIENCY (INDUSTRIAL ENGINEERING_ (PSB-ACADEMY); CERTIFIED MANAGEMENT CONSULTANT (CMC); PRACTISING MANAGEMENT CONSULTANT (PMC); MEMBER, INSTITUTE OF MANAGEMENT CONSULTANTS (IMC) SINGAPORE

Aik Teng currently manages his own consultancy, AT Consulting Services. One of his most recent projects includes being the LEAD Project Manager for the Singapore Logistics Association. Prior to running his own consultancy, he has been with SPRING Singapore for 20 years, and was the Head of the Organisation Excellence Department from 2004-05. He was also

SQA Lead Assessor and Team Leader up till 2008 and has been involved in the SQA initiative since its inception in 1993. tasked to start up the consultancy unit within the then Productivity & Standards Board (PSB) to provide training and consultancy services to organisations, his consulting team assisted close to 30 organisations during that period. He was also involved in a project coordinated by the Singapore Cooperation Enterprise (SCE) to assist the Bahrain Labour Fund in their Labour Reform strategy, which included helping the Bahrain government to initiate a Productivity Movement as well as develop the productivity of the local enterprises. In addition, he was appointed as Project Manager to assist the Government of Botswana to implement a national Productivity Movement, from 1994 to 2003. Botswana is currently held as a model of Productivity in the Pan-Africa region.

MR. WONG KAI HONG
MBA IN STRATEGIC MARKETING (HULL), BSC (NUS)

Kai Hong is a business consultant, management trainer and company director. He has spent almost 2 decades in the consumer products industry, having worked with retailers like Isetan, Metro, Royal Sporting House, The Athlete's Foot and Sunglass Hut; brands like Reebok and Doc Martens; and technology group Wearnes Technology. He has been involved with various functions including operations, business development, project management, human resource, training, marketing, logistics, budgeting and general management. He has developed businesses in Singapore and many Asian cities such as Seoul and Beijing.

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