

JOURNAL OF SUPPLY EXCELLENCE

Volume 1



THE SOURCE FOR PURCHASING

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Welcome to this first volume of the Journal of Supply Excellence. The goal of this publication is to combine academic excellence with executive relevance. Our aim is to open its pages to academics and practitioners interested in investigating and debating purchasing's contribution to value creation.

In this month of December 2011, we have brought together leading professors and practitioners from the field of purchasing and supply excellence. Through master classes, workshops, conferences and vibrant exchanges, we have taken the pulse of the purchasing profession. The current economic conditions offer both challenges and opportunities that are explored in the following pages.

In an exclusive interview, Peter Kraljic, Professor Honoris Causa at EIPM, analyses the current business outlook and shares his vision for an entrepreneurial and flexible purchasing function. As usual he forces us to revisit our fundamentals and challenges the status quo.

Prof. Richard Lamming from Manchester Business School has shared his research with the EIPM community for some years already. This time, more than ever, he asks us to look beyond the status quo and to question our deep belief. His present article presses all of us to rethink what morality means from a purchasing perspective. Unless behaviours change significantly, he denies the right to purchasing to declare itself strategic.

Dr. Hervé Legenvre, EIPM MBA Director revisits the history of the railway industry. He shows disturbing evidences that the purchasing function, as we know it today, was born as part of the radical change from open to closed innovation that took place toward the end of the 19th century. This poses questions on the ability of purchasing teams to support open innovation today.

Dr. Corey Billington and Dr Rhoda Davidson, who have taught at EIPM over the past years, answer these questions with an enthusiastic spirit. They see innovation as procurement's obligation. Their article provides solid foundations for the engagement of external networks and the management of business eco-systems. For them open innovation needs to be on the agenda of all CPOs.

Taking a practitioners perspective, Jean-Luc Ewald, who leads some of the Leadership Development activities of Technip, shows how he uses Theory U to develop effective collaborations with partners and lead transformations. His experience and cases studies are fascinating.

Prof. Arjan van Weele, is a regular Guest lecturer at EIPM. His article written in collaborations with Prof. Frank Rozemeijer looks at why corporate sourcing initiatives fail. At a time when strategic execution is key, they do a great job of reminding us some useful truths on organizational matters.

To conclude, Xavier Sarrat, EIPM China General Manager, shares news from Shanghai on business, purchasing issues and education in Asia.

For closing the EIPM 20th Anniversary, we are proud at EIPM to launch the Journal of Supply Excellence. Over the past 20 years, we have played an active role in stimulating, cross-fertilizing and coordinating European research activities in strategic purchasing & supply management. We have built and described the foundation for the European school of thought. We are now ready to accompany the profession through the transformations that will take place in the future. To strengthen the role of practitioners in developing applied research, EIPM will launch a DBA in 2012.

This Journal is yours. Thank you for your comments. Enjoy the read!

*Bernard Gracia
EIPM Dean and Director*

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INTERVIEW : PETER KRALJIC

JOURNAL OF SUPPLY EXCELLENCE



Peter Kraljic is Director Emeritus and member of the McKinsey Advisory Council; he was until July 2002 a senior Director at the McKinsey office in Düsseldorf, Germany. He headed McKinsey Operations Practice as well as its Sourcing Practice for several years. Peter Kraljic is Professor Honoris Causa at EIPM. He has published a number of scientific and business articles.

What is happening in the world economy today?

On a macro perspective, we see the consequences of the globalisation that took place over the last two decades. It has been moving at a very fast pace driven by market reforms and technological revolution.

This has given many new countries and companies access to the global playing field. However we have a global market without a global government. When the financial crisis driven by a financial snowball appeared, the real economy was impacted without a global response.

In a mega region like the European Union there is no proper economic governance. Seventeen countries have a common currency but they handle their economies in different ways. As a consequence, when the Euro came under pressure there was no clear opinion on how to handle the situation. It remains difficult for these countries to come up with a common solution.

At the meso level, some sectors are very prosperous while others are in a real crisis. For instance, the banking sector is facing strong pressures due to political expectations and bad loans. The question now is how the situation can be saved.

On the micro level, some companies are very competitive and are doing well, but the less performing ones are now in a precarious situation and at the mercy of the credit crunch.

We have these four levels that are not coordinated in a holistic way. This is why we move from one crisis or even recession to the next. Low growth will continue for a while. The economy will take at least two years to recover. In the meantime, there is some hope that European countries will resolve their problems and that economic activity will pick up in emerging countries.

How economic crises shape purchasing in terms of strategy, organisation, practice and competencies?

No company can be excellent without an excellent purchasing function. Purchasing and supply management are fundamental to the success of a company. In a crisis, this is even truer as you have to handle the crisis in two ways. Firstly, you have to provide the company with the goods it needs at the lowest possible prices. At the same time you cannot destroy your relations and the trust base created with your suppliers; you have to take a long term perspective. It is a balancing act; you need to be prepared for such events and determined to find a win-win solution. In a time of crisis, you often face lower demand but you also need to be clear about what you really need, you must show flexibility, and ensure that suppliers can be flexible too.

People from purchasing need to manage information flows especially when risks of disruptions and scarcity exist and

if they are not prepared to do so, they need to be trained. This, in fact, goes beyond purchasing, it is fundamental that all management including CEOs allocate sufficient time and attention to purchasing so that this area can fulfil its function in the best interest of the company.

Those companies which will use the crisis to streamline their practice and improve their ways of working will come out stronger from the crisis.

What is the best organisation to support this?

You need an organisation that is flexible. Everyone has to act as an entrepreneur. It is important to look at the full picture. If companies don't withdraw capacity and start to compete for volume, as has often happened in the past, they will destroy value. Each company needs to be prepared for the event to come and ensure its own flexibility.

What type of individual profile do you need to create this entrepreneurial spirit?

It is quite normal in purchasing to have commercial, technical and analytical skills; people also commonly have the ability to establish relationships with internal functions and suppliers. But if you want purchasing people to act as entrepreneurs, they need to be able to think both strategically and be pragmatic, and yet also be flexible and invoke out of the box thinking.

Furthermore, the attitude of management and the organisation climate are also important. How much trust? How many degrees of freedom are given to buyers by top management? It is about creating the culture of a profit centre and not that of a cost centre.



Should CPOs report directly to CEOs?

CPOs are more and more recognised within their companies. In many companies they are now on the executive board. A good example is Barbara Kux, the first woman to join the board of Siemens.

She acts in entrepreneurial ways and is saving Siemens, a lot of money. It also shows that diversity can bring a lot to purchasing.

What will the impact of globalisation be on companies and purchasing?

More opportunities to purchase from alternative sources will continue to emerge but cost is not the sole factor to be taken into account, you also need to look at quality, reliability of delivery and longer-term development issues.

What's most important is to adopt a strategic approach, looking at the full supply chain and identifying on a continuous basis, where value can be created and where savings can be made. This implies movement in both ways. Some production can be relocated to Europe and others transferred to distant countries. This is the sort of flexibility we have to achieve.

We also need to keep in mind that the global demand is still growing; new consumers are emerging in different parts of the world. Patterns of growth are shifting from developed to emerging countries.

Businesses from developed countries need to be innovative; they have to lead the development of new products and services for fast growing markets.

It is here that purchasing can contribute to innovation. Suppliers can be the source of new raw materials, new modules and new solutions, ready to use or to be jointly developed. Here, purchasing needs to be a function that creates value, not just a cost saver.

Another element is the contribution to sustainability and corporate social responsibility through dealing with ecological issues and addressing labour issues.

Finally, to have a sound global economy we need ethics. We only need to look at what happened in the financial sector. In purchasing, ethics is a key dimension of purchasing people's jobs ■

THE REAL CHALLENGE : A NEW MORALITY IN SUPPLY STRATEGY

By Richard Lamming

JOURNAL OF SUPPLY EXCELLENCE



Richard Lamming is Professor of Supply Chain Management, Manchester Business School, UK. He presents keynotes around the world, and conducts research and publishing with a wide network of academics and practitioners. He specialises in the field of supply chain relationships, innovation and sustainable development. For eight years Richard was Director/Dean of two Business/Management schools in UK (at the Universities of Southampton and Exeter).

Introduction

For more than three decades purchasing practitioners have bemoaned their 'back-office' status. They have frequently protested that purchasing is quintessentially strategic. Get it right and the organisation can flourish; get it wrong and major opportunities for success may be missed. Decisions made in sourcing strategy and relationship management are clearly critical for an organisation's smooth running and development. When academic research in the area took off in the 1980s (after a great deal of groundwork before that) writers firmly agreed with the practitioners: strategic purchasing had a mandate.

And yet the practical situation has changed little. It is true that large business organisations now publish their purchasing, or supply, strategies and perhaps they are genuinely strategic in supply, but the back-office status is still typically in evidence.

One reason for this is surely the origins of modern business organisational design. The early developers of what became known as 'mechanistic' organisations (Burns 1963:23) stuck to Weber's maxim: "Each office has a clearly defined sphere of competence in the legal sense" (Weber 1947:334). Much of the work following Weber pointed to the limiting nature of this design, in terms of role expectations, skill sets, and career aspirations. Purchasing, in the back-office, just bought stuff, right?

When supply chain management emerged in the 1980s it did not have all this baggage – there simply weren't any supply chain managers in the 1970s! The existing offices (hardly disciplines) claimed the new imaginative territory for themselves. These included operations managers, purchasing (or procurement, etc.), marketing, logistics, distribution (or transport), "materiel," total quality management, and outsourcing. Supply chain management was clearly going to be sexy! Of course, it isn't a chain: it's a network of dyads, perhaps even a mess – a complex adaptive system as Choi et al. (2001) call it. Supply

strategy is what is needed but the badge - supply chain management - has remained popular for thirty years.

After three decades of research we can say that we know a lot about supply chains and supply strategy. The question now is how well this prepares us – or rather business – for the impending future. This is not simply to do with the current political atmosphere of profound change (the Arab spring, the collapse of Eurozone economies, failure of the American administration to agree on budgets) or even the move of power and influence from the West to the East. Supply chain management is a major factor in an organisation's impact on the world: it cannot be practised as if its consequences do not matter. Until now, hiding behind the economist's concept of 'externalities,' this is exactly what has been done: supply chain management has been amoral. This is not just unacceptable corporate behaviour; it is literally unsustainable.

Amoral Externalities

The concept of an externality is very simple: something which one may rationally exclude from one's considerations. In business terms this has traditionally meant 'cost-free.' For example, until the mid 1990s business organisations would regularly send their waste (packaging, unwanted materials, post-process fluids, 'worthless' scrap) to be deposited in landfill: large holes in the ground into which everything was tipped. It is hard to think of anything more unsustainable! When it was realised that this could not go on, an EC Directive (1999/31/EC) was introduced "to prevent or reduce as far as possible negative effects on the environment ... from the landfilling of waste." This was followed by another directive explicitly aimed at electrical and electronic waste. Landfill taxation changed landfill from an externality to a direct cost factor and behaviour changed accordingly. Cunning, amoral supply chain strategists, however, recognised that they could ship their waste to developing countries (e.g. India) at a lower



cost than recycling at home. This practice has increased significantly and pictures of children in India sorting through massive piles of computers, and dismantling them with hammers and bare hands have become commonplace. An authority on the topic considers that this is not as bad as it first appears – part of a ‘closed loop system.’ (Pike Research 2009). This conclusion, however, leads to discussion of another externality: sea transportation.

The world’s oceans absorb about a third of the CO₂ that is emitted by the activities of the human race and other species. The CO₂ combines with the seawater to make carbonic acid (see Gosling et al, 2011). Continuous monitoring now indicates that this is decreasing the pH of the seawater, a process that would eventually kill or mutate the animal life upon which fish feed. While there is no current cost to business for this damage (e.g. no levy on logistics companies and their customers) it will still make ‘sense’ to manufacture items in one part of the world and transport them thousands of miles for sale (or recycling) elsewhere and supply chains will go on acidifying the oceans until, perhaps the damage becomes obvious – by when it will be too late. It may make commercial sense, but it is amoral (if not immoral).

Another, more horrifying example is that of the mineral alloy ‘coltan’ (Columbite-Tantalum; it contains Niobium and Tantalum). Components made from this substance are required in every mobile phone, computer and other communications devices. There is no simple substitute. Until very recently (and crucially during the immense growth in the mobile phone market) there was effectively only one source of the material, in the Democratic Republic of Congo (formerly Zaire). The result of this was severe competition in the country as companies and other interested parties fought. This began commercially but subsequently developed into civil war, largely attributed to competition for minerals, in which an estimated 5.4 million people were killed between 2008 and 2010 (this was complicated by the warfare in neighbouring Rwanda, where there was no source of coltan although the country is said to have made \$250million from its trade in this period). This situation led to a worsening of humanitarian conditions in the country: miners and soldiers had to eat but supplies were scarce. So, gorillas and elephants were slaughtered for food. (A UN Environmental Programme report estimated that the lowland gorilla population was reduced by 90% over five years: from 30,000 to 3,000). The supply chain for a basic component material in mobile phones designed in Europe, manufactured in China and bought by Westerners is connected directly to atrocities in Africa. It is plainly amoral.

Like beauty, perhaps morality lies “in the eye of the beholder.” These few examples show that such high-level, almost esoteric issues really do have to be on the agenda for moral supply chain strategists. National governments

are unlikely to do anything that restricts the ability of their home (or guest) companies to prosper in this respect and frequently support amoral supply chains; this may be unintended but many examples suggest that the concept of externalities is ever-present. Given the character of western politics and capitalism, human nature, international differentials in labour rates as countries develop, and the confection of global marketing, it is unlikely that business organisations will voluntarily take action that incurs costs associated with moral activity; policy and regulation will inevitably be necessary.

The Challenge

So what is context for the moral challenge which supply strategy must address; and why now?

The assumptions upon which current business practices were built no longer exist. As Alan Knight¹ says: “Business as Usual is not sustainable.” The twin devices of conspicuous consumption and planned obsolescence, bastions of the twentieth century’s aggressive mass production and marketing, coupled with globalisation of business and growth of the human race, have led to a situation that cannot be maintained much longer. In fact, it is already too late to carry on. A quick look at some very clear facts will serve to illustrate this.

The human population of the Earth doubled from 3.1 billion in 1961 to 6.2 billion in 2001. It passed 7 billion in October 2011 and it is generally accepted that it will increase to 9 billion by 2050. Table 1 shows the predicted dimensions of this (note that 90% of births in the next four decades will be in so-called ‘have-not’ countries.)

Table 1 : Predicted Growth in Human Population 2010 – 2050

By 2050 :

Africa :	1.01 bn - 2.00 bn
Asia :	4.10 bn - 5.2. bn
Europe	0.73 bn - 0.69 bn
USA / Canada :	0.35 bn - 0.48 bn
Latin America :	0.58 bn - 0.73 bn

Source : United Nations Development Programme 2010

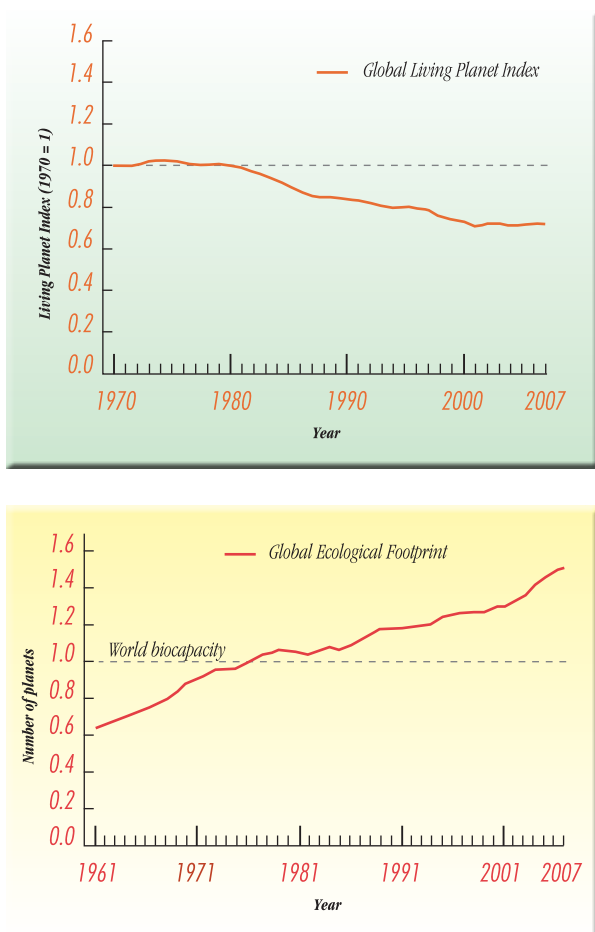
Leaving aside discussions on difficult subjects such as birth-control and population limiting policies, one could say there is nothing wrong with this trend – it is, after all, natural. If each member of the human race used the same amount of resources as they did back in, say 1961, population growth would indeed not be a problem, at least at the macro level (it is unlikely that resources will ever be shared fairly throughout the world). The problem is that they do not.



Earth's capacity to provide enough of everything we require, and to accept its disposal, is monitored in fine detail by scientists and reported every two years in the Living Planet Report by the Worldwide Fund for Nature (WWF International). It is called 'biocapacity.' It has been reducing steadily for some time through factors such as deforestation, landfill, over-fishing, the spread of concrete, and so on (Many of these individual trends are well documented, see for example Pauly, D. et al. 2005). So, supply strategy has to cope with the fact that the Earth's raw materials are reducing in absolute terms. The Earth is our monopoly supplier of raw materials; it is very much a part of our supply chain.

Coupled with this, the human race is consuming resources at an ever increasing rate. This is also monitored and reported (by WWF International). Between 1961 and 2001 it increased, at a personal level, by a factor of almost five (at the same time, remember, that the human population was doubling). Figure 1 shows the two graphs side by side: the biocapacity of the Earth to provide what the human race needs, and the 'ecological footprint' the degree to which our demands have increased:

Figure 1 - Resources :
the Earth's Capacity and the Demands of the Human Race



Source : WWF International Living Planning Report 2010

From Figure 1 it is plain that the demands of the human race passed the capacity of "One Planet" back in the late 1970s. We are now at about 1.5 planets. In business terms, this means we are using up our capital, not living off the revenue it supports. Furthermore, all the signs are that the developing economies will wish to increase their consumption rates to Western levels as their populations grow.

For example, China moved from 0.8 planet consumption level to 1.2 between 2003 and 2007. India increased from 0.4 planets to 0.5 planets in the same period: this represents 25% increase in personal consumption in five years, in a country predicted to increase in population from the current 1.17bn to 1.45bn by 2050. Note also that the resource consumption propensity for the young is likely to be greater than that of the old.

Again, these may seem very high level, almost esoteric issues to bring into this discussion but they are the real 'uncertain environment' in which supply strategy has to be formed and used. Unlike global warming, there can be no deniers regarding the facts regarding consumption and population growth. There are many more: for example the likely extinction of elements as well as species (e.g. Neodymium, essential for high quality magnets, will probably be effectively unavailable to purchasers by 2020. The reality of Malthusian behaviour in the face of resource scarcity has been seen in Rwanda in the last decade (see Diamond, 2005:310 et seq.). Perhaps supply strategy of business organisations has not been thought of in the same context of these horrors but when a large-scale moral lens is applied, the connection is obvious.

The Answer

Despite the tragedy contained in these data most commentators offer hope for the future but only in the context of very different consumption patterns. The human race has relied on innovation at many times in its history but there are also many examples of societies effectively choosing their own demise (Diamond, 2005).

A policy of morality in supply is akin to the creation of 'shared value' (Porter and Kramer 2011). It could be put into strategic reality via innovation – but only if supply strategists can pick up 'weak signals,' break down the department barriers that we saw above, and tap into the resources that are available to them. As the supply chain is well understood as a network – somewhere between a hierarchy and a market (beginning with Williamson 1975) so the innovation needed is "open innovation" (Chesborough), requiring the organisation as a whole to realise, in the words of Bill Joy, co-founder of Sun Microsystems, that "Not all the smart people in the world work for you." Chesborough calls it "a process that starts with looking outside the organisation as you think about



things to do inside” and he “using other people's wheels to get you moving.” Of course, there is no reason why such innovation should not be discontinuous or disruptive: in the supply chain, this may take the form of strategic dalliances, as described by Phillips et al (2006).

A great deal has been written about ‘dynamic capabilities’ shared by firms – including customers and suppliers in supply chains (Lamming, 1993, 1996; Teece et al 1997; Teece 2007). Combining the perspectives and innovative skills of customers and suppliers in inter-organisational relationships could provide the key to approaching morality in the supply chain. The task for strategists is to put the concepts into practice, within a policy of morality. No one business will naturally do this alone, so the combined efforts of industries, trade associations, non-governmental organisations and inter-governmental bodies will be required.

Conclusion

A few years ago, we published a model for the future of supply. It presented a cast of characters not familiar in current business. (Lamming 2007; Cousins et al. 2008: 293-299). While allegorical, it clearly rang true in practice for many supply strategists who provided responses. Recent commentators have averred that the model's description of future networking features reveals exactly how China

and Russia are beginning to work, and it also has apparent resonances, rather alarmingly, in UK healthcare. Several technology firms have claimed to be already developing other features of the model. The surprising thing is, the model has no place for supply strategy, let alone morality: it consists principally of technological intelligence and opportunistic ‘grabbing’ all the way from the lowest operative to the highest, global executive. None of the many commentators on the allegory has mentioned this. It seems the need for strategy and morality has to be pointed out, otherwise business planners will act according to the law of the jungle.

The model was just an allegory, designed to provoke discussion. It is unlikely that any resonance that it has with the real world will actually reduce the central position of supply strategy within the picture of supply networks. Its acceptance by practitioners, however, does remind us of the complex uncertainty under which supply strategy has to be formed and implemented.

Morality will be a hard sell to strategists. Unless it can be achieved, however, within a meta level policy framework, with open innovation as a real, day-to-day practice, and the evil twins of conspicuous consumption and planned obsolescence countered, purchasing supply will continue to be the handmaiden of amoral business and have no right to declare itself strategic ■

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SOURCING INNOVATION :

Open vs Closed innovation in the 19th century railroad industry

By Hervé Legenvre

JOURNAL OF SUPPLY EXCELLENCE



Hervé Legenvre is currently the EIPM MBA Director. From 2000 to 2010, he was EFQM Director. He headed the European Excellence Award, EFQM training activities and facilitated numerous benchmarking projects. He oversaw the development of the most recent version of the EFQM Excellence Model, a framework used by more than 30000 organizations to assess their performance and develop their strategy. He authored the book on innovation "An History of Inventors, the Anglo Saxon Trail".

The 19th century saw the development of networks such as railways, telegraph, telephone and electricity. They emerged out of a machine shop culture through the contribution of many inventors and entrepreneurs. Railroad companies relied initially on open innovation to access new technologies; this provided them with continuous access to a wealth of new ideas and practical developments.

However as a number of technical, legal, and competitive challenges mounted they switched to closed innovation. The rail industry was the first one to rely on engineers for cost optimization, standardisation and routine management. The modern purchasing department appeared as part of this fundamental transformation of large businesses. The present article analyses those transformations.

The context

The development of the transportation system was a necessity in a young, large and demographically dynamic area such as America. It was also economically significant; roads, canals and trains contributed to an open market and stimulated the economy. They were widely supported by governments. The Cumberland road, the first national road, was started in 1811. The Erie Canal was opened in 1825. This was the route connecting the Atlantic Ocean to the Great Lakes. It was mainly financed by the states themselves. It was both an engineering and a financial success. The Canal helped New York City to become a major trading centre. However, roads and canals were going to face fierce competition from a new mode of transportation, the rail, an emblem of America in the making. Over 100,000 miles of tracks were laid between 1877 and 1893, therefore doubling the network. On 10 May 1869, at Promontory Utah, the Union Pacific and the Central Pacific lines met, connecting the Mississippi Valley and the Pacific coast. The Southern States, Chicago were connected through rail to the rest of the country. The development of a railroad in

America was supported by the state and local authorities which granted land, offered tax concessions and bought their bonds. Railroad had significant economic impacts. First, the sheer size of the project itself was economically considerable: railroads needed workers to build and operate their lines. It also stimulated the production of steel on a large scale. Secondly, such a network of transport facilitated economic exchanges and growth. The development of the railroad also led to some institutional harmonisation, such as the adoption of a time zone system.

Early development in the railroad industry

The railroad industry started in England, where George and Robert Stephenson, using steam engines, developed locomotives and established the first railroad line between Liverpool and Manchester.

In 1831, Robert L. Stevens for the Camden & Amboy Railroad in America bought a locomotive from Stephenson. Three years after, rail lines had been established in New Jersey, Maryland, Pennsylvania, South Carolina, Massachusetts and Delaware. In 1840, with 2800 miles of tracks, the U.S. railroad took over the British ones. In 1859, it was 28,800 miles of tracks that connected American cities. The length of tracks is not the only relevant measure to depict the evolution of the railroad industry throughout the 19th century. The power of locomotives grew significantly and the freight capacity of cars more than tripled during that period. Users of railroad had a diversity of needs. Some wanted luxurious cars for passengers. Others were interested in express delivery or refrigerated units. Coaches could carry people, livestock, meat or fruits. Technical problems were diverse and encompassed: heat transfer, braking system, use of new materials, safety issues.

The railroads materialised as a large-scale system capable of carrying a diversity of people and goods. It required



complex machines, tracks and fuel but also tunnels and signals. In the 1840's, locomotives were made of about 4000 parts working together. Ten years later, it was 6000 parts (Meyer, 2006). It also needed a large number of people to coordinate the flows and a significant amount of capital.

From the perspective of innovation, the challenge was immense, as outlined by Ross Thompson: '(t)he engine and boiler had to be redesigned for use as a locomotive, and new means to transmit power to wheels had to be developed. Cars had to be designed along with mechanisms to join them together. Producing the thousands of parts of the locomotive, railroad cars, and weight-bearing wheels required sophisticated metalworking capabilities. Brakes, signals, durable track, and adequate roadbed were required. The engineering tasks of identifying track widths, laying out lines, and building bridges were formidable. To these technological requisites were added the economic and legal problems of financing roads, identifying markets, and securing rights of way' (Ross Thomson, 2004).

Inventions across the system were needed to respond to the needs and expectations of a young nation eager for transportation and communication systems. During the 19th century, the railroad industry witnessed a wide variety of inventions across the whole system, they often constituted refinement or derivatives of existing devices. New materials were continuously considered, new shapes for rails were tested.

As highlighted by Usselman (2002), in such a complex environment, decisions relating to innovation or regarding the adoption of an invention were difficult to take: '(e)fforts to channel technical changes and reshape railroad innovation, while influenced always by various economic incentives, seldom boiled down simply to making rational choices grounded strictly in hard economic data. By its very nature, innovation involves uncertainty'!

Four characteristics of the railroad system are important to understand the characteristic of innovation activities presented underneath:

First, there was no real competition between the railroads themselves. Railroads might have competed to a certain extent with other modes of transportation but not directly amongst each other; as they exploited specific connections between cities. It eased the development of collaborative work across the industry.

Second, innovations were essentially incremental ones. They often aimed at improving specific parts of the wider system.

Third, the railroad can be considered as a loose system. The components of the system could be improved to a certain extent independently. However, they also needed to work together as a system. This was the main challenge for the railroad companies.

Fourth, one important decision had an important impact on innovation, it was the decision to ensure interchangeability of cars across the different railroad lines. This decision imposed, for instance, that an agreement should be found within the industry in order to improve brake systems and other components.

Open innovation in the early railroad industry

To support the rapid expansion of railways in America, an appropriate approach to innovation emerged from the machine shop culture that already existed. It was a collective approach capable of dealing with the uncertainty and the complexity at stake. The railroads emerged from a sort of bottom up learning process where all existing industries tested their capability to support this emerging one. The industry started as a series of local experiments that came together to form the wider system. Innovation in the railroad industry depended heavily on inventions or improvements initiated in other sectors. It was a logic of open innovation (Chesbrough 2003)...

Railroad companies did not build their own locomotives. At the beginning, they relied on suppliers, especially British ones. American ones developed over the years. Such manufacturers had their roots in industries such as steam engines, textile machinery, iron foundries and other machine shops serving the capital goods market. The design of transmissions, boilers and other complex parts emerged from the machining industry and locomotives were added to their existing range of activities. For instance, Baldwin, one of the main producers of locomotives, had experience in tool making, hydraulic press and steam engines. During this period, many inventors who contributed to make an industry rise out of the ground had previously invented for other sectors.

Firms hired machinists who built the machines and, often, also used and repaired them. Stevens from the Camden & Amboy Railroad employed, for instance, a mechanic, Isaac Dripps, specialised in steamboat to work with him. Such master machinists maintained, purchased and contributed to the design of the equipment needed by railroad companies.

It was the same for civil engineers: '(o)f 81 civil engineers active through 1835, railroads employed 49 by 1840. Given that a dozen early engineers were inactive by 1830, about two-thirds of active engineers were involved in railroads in the 1830s. At least half had been trained in canals; many others had worked on surveying, water supply, and bridge-building' (Thomson, 2004).

Civil engineers often had a college background but it was different for most machinists who went through formal and informal apprenticeship, where they learned from



peer practitioners. Later, some of them could move to the position of foreman, supervisor or master mechanic, in more complex activities. They moved from one firm to another, selling their skills to the highest offer, taking with them the knowledge and experience they had gained. Their wages were amongst the highest in the industry. They acted as referrals for new jobs amongst each other. Leading machinists attracted their most talented peers hungry for learning opportunities and technical challenges. Redundancy of skills encouraged them to specialise and invent new things. Machinists visited each other within a same region or across regions to keep up to date with the technical developments. International exchanges also occurred between experts, especially with the British ones². Innovation was therefore supported by a network of machinists that expanded alongside the railroads and reach across them.

Master mechanics knew the strengths and weaknesses of the different machines at work at that time. They communicated freely such information. Job mobility among railroads and locomotive firms also helped to spread knowledge. In 1826, The Journal of the Franklin Institute, started to publish detailed assessments of locomotives. Other publications addressed railroad design and bridges. Books were also published in the 1830's to share information about tracks and bridges.

Inventions were usually attributed to their inventors. As a consequence, machinists received the largest amount of patents within the industry. Railroad companies preferred to take licences from inventors rather than buy patented products on the market.

A study of locomotive, railroad design, car, brake, and switch patents through 1865 reveals several trends. Patenting accelerated with locomotive usage. Of the 508 total patents, 1 percent were received through 1830, 2-6 percent in the 5-year period through 1850, 13 percent from 1850 through 1855, 37 percent from 1856 through 1860 and 30 percent during the Civil War years. Patenting accelerated around 1850 just after the jump in new track mileage in 1848. The occupation of patentees and the location of patents suggest that patenting was closely linked to the networks that spread railroad knowledge. Machinists working for the railroads or locomotive firms were frequent inventors... Inventors with known occupations received 53 percent of all patents. Machinists led the way, with 48 percent of patents with known inventors. Machinists making or maintaining railroad equipment received half of these patents, which understates their share because many with railroad employment were listed simply as machinists. Scientific and inventive professions, including engineers, physicians, chemists, patent agents, draftsmen, and model-makers, received another 11 percent of patents, though some listed as engineers were machinists who operated locomotives and steam engines' (Thomson, 2004).

With the rapid expansion of the industry and a continuous stream of innovations, the market for locomotives remained very fluid, until the 1860's, when the three dominant firms started to monopolise the market (Meyer, 2006). Before, entry barriers remained low.

The relationship between railroad companies and their suppliers was often based on strong informal relationships, discussions on the shop floor and intense exchanges. The style of management was personalised. Directors on the board of the railroad companies used their technical acumen and their personal relationship with suppliers to discuss needs, inventions and contracts. Trials of new equipment were erratic and consisted of discrete try-outs.

In railroad companies, during the 1850's and 1860's, the master mechanics and chief engineers had a significant freedom in the selection of new technologies. It was their responsibility and, often, a pleasing piece of work for them, to monitor and pick those technologies. Their personality and style impacted their work significantly. Advertising for new inventions was accumulating on their desks and the ones of their collaborators and contacts. Many people were consulted and through correspondence, inventions were extensively discussed. When experiments were considered, it was usually comparative trials between two devices conducted in fairly simplistic ways. This was closer to the tinkering habits of mechanics than to the systematic experiments.

During the 1860's and the early 1870's, Harris was the chief operating officer of the 'Chicago, Burlington and Quincy', a railroad company. He liked new technologies and networked extensively with inventors. He regularly promoted new designs and ideas coming from outside the company to his subordinate. He advised inventors on how to best promote their inventions. He also encouraged them to patent and sometimes incubated their work in the Burlington facilities.

During this formative period, new technologies and devices were not systematically used, Steel rails for instance, were used on the lines where the traffic was very intense. There was a lack of consistency across the industry but that fitted the constraints of a rapidly expanding capital intensive industry.

Open innovation acted as an information consolidation strategy to address uncertainty. There was a constant and rather free exchange of information, as observed with the flow of information between the companies and their suppliers. Master mechanics moved from one company to another, carrying with them their knowledge. The network of individuals who went across the firms, as an open innovation system, encouraged the consolidation of information and knowledge. Across and amongst markets, railroad companies and suppliers talked to each other, exchanged views on what to do and how to do it. This could appear as a costly approach. However, they



chose the best approach to improve their individual and collective chances of success by sharing knowledge freely. They facilitated the sharing of knowledge in order to continuously prevent 're-inventing the wheel' and to optimise resource allocation in innovation.

It was described by Usselman: '(s)ensing that in this experimental stage, they had more to gain by openness than secrecy, railroads generally exchanged technical information quite freely. Even key consulting experts to the railroad (...) often let their improvised solutions to the challenges of railroading in North America slip into a common pool of techniques' (Usselman, 2002).

This functioning of the industry, and more specifically of its innovation activities, shaped the industry until the 1870's. At that time, four threads can be identified for having encouraged railroad executives to start thinking differently and to bring closed innovation.

The increasing number of patents had made the work of railroad companies difficult. They were facing mounting complexity on legal cases, assigning rights to the right inventors was becoming difficult as technical issues were more and more complex.

At the same time, the rising power of some suppliers was becoming a challenge to railroad companies. For instance, Carnegie in the steel business had increased its bargaining power by building massive production capacity in a growing market. Westinghouse did not want to license his brake systems to railroad companies, as he was determined to exploit and fully benefit from his invention.

As materials became more sophisticated, purchasing them required more structured approaches. Railroad companies needed to specify and verify what they were buying. Moreover, it was time for an industry that had grown in an ad hoc way, to rationalise its functioning and adopt a different approach to innovation. The network was a collection of peculiar situations. It was ripe for a large scale cost reduction that could be conducted using the logic of standardisation.

Before describing the open innovation approach, the presentation of a transition figure, Charles Dudley, will help to understand the nature of the changes that took places.

Charles Dudley, a transition figure from open to closed innovation

Charles Dudley can be seen as an archetypical transition figure. He gained a PhD in Chemistry from Yale and was, according to Usselman (2002), the first full-time employed PhD by the industry. He was employed by the Pennsylvania Railroad company starting in 1875. He acted as President of the American Society for Testing and Materials (ASTM).

At the start of this engagement he wrote: '(s)o little was the possible use of a chemist appreciated and so little work was known that he could do on a railroad that permission to have a chemist was granted more as a concession and

as an experiment than with any faith or belief that the scheme would prove to be permanent or valuable' (ASTM, 1910).

Dudley headed an engineering laboratory, where he did a lot to standardise methods used for conducting chemical analysis. The laboratory was staffed with 34 chemists at its apogee. Dudley also played a critical role in the development of industry bodies. He was president of the American Chemical Society and of the American Society for Testing Materials. Overall, he held membership in 50 societies.

His work revolved around conducting chemical analysis of materials. His first important investigation was a long experiment on steel rails. Dudley collected 25 samples of worn steel rails and recorded their position in the track. This helped him to relate the chemical nature of the rail to the wear it had to sustain. It allowed him to develop a formula for the best steel rail. Even though his conclusion happened to be erroneous, his approach became a landmark in the transformation of the railroad industry.

He devoted a large amount of his attention to the development of technical specifications. He discovered that burning oil varied extensively in their composition. Indeed, before this transition period, many products such as soap, oil or paints were bought under their generic name.

'The problems by which Dr Dudley found himself confronted were practically fourfold. First, to ascertain what material was best for a given purpose, second, to prepare specifications under which such materials might be purchased in the widest markets under conditions of the freest competition, but with the certainty of getting what was wanted; third to devise the best methods and the most efficient organisation for carrying on routine acceptance tests on an extensive scale; and, fourth, both to conduct independent research work and to keep in touch with the latest scientific and practical developments in a vast field, with a view of profiting by whatever might be safely utilised to secure increased efficiency or reduced costs' (ASTM, 1910).

Dudley encouraged suppliers and buyers to cooperate to establish such specifications. The customer had to conduct material analysis in actual service but he also needed to involve manufacturers in the final establishment of the specifications. Dudley wrote: '(t)he specification should be the embodiment of the best that is known on the subject' (ASTM, 1910), it resonates as a precursor of the 'one best way' of Taylor.

This work on technical specifications led to the establishment of industry wide standards, which was a key activity performed as part of the American Society for Testing Materials. Dudley did not come up with specific breakthrough inventions *per se*. He has patented throughout his career 15 inventions but his main achievement was



the establishment of new methods to conduct chemical analysis, to establish technical specifications and to support the organizational innovations that were taking place in the industry.

Closed innovation in the railroad industry

In response to the challenges they were facing, railroads changed their approach regarding patents, they urged the Congress to revise patent laws. They tightened their control of patents taken by their own employees. They established cross-industry bodies to collectively handle patent issues. But it was only one side of a much more fundamental change that occurred throughout the industry.

During the later years of the 19th century, railroad companies adopted a different approach to innovation. They established centralised, corporate departments staffed with professional engineers. The personal authority of the technical experts was diminished and replaced by closed innovation systems where salaried engineers took decisions based on defined rules.

Such engineers had a knack for uniformity. They pursued a policy of standardisation, as the industry had developed haphazardly during its formative period. They conducted systematic experiments to select solution amongst existing technologies. They established methods to analyse materials and developed sound technical specifications that were integrated in suppliers' contracts.

They used managerial innovation, as much as technical ones, to optimise the performance of the traffic on the railroads and to improve the efficiency of the system. They based their decisions on financial information, not on expert opinion.

The inventors, in what can be described as a closed innovation system, were the archetype of modern engineers. They held Ph.D.'s in chemistry or were college-trained mechanics. Those academically trained engineers brought with them scientific methods of investigating the order of things, they used statistics and were keen on performing systematic analysis in order to understand what was really happening.

The performance of those engineers was not measured by the amount of new business generated but by the reduction in operational costs used to run the system. They did not promote change, designs were stabilised and mechanics were not encouraged any more to come up with new ideas. Cost became the sole judge of what should be and should not be done.

They did not pay much attention to the needs of the customers of railroad companies, they looked solely at the system, at its problems and limitations to find improvement opportunities. They standardised what they

inherited from the master mechanics but did not bring fundamentally different approaches to it. Instead of departing from existing practices they assessed what they had at hand and established standard out of it. They routinised what they had. This was a gigantic task, a response to years of ad hoc innovation.

Taussig (1900), an Harvard economist summarised this transformation in 1900: '(t)he increasing application of machinery has made it possible to reduce operations more and more to routine and system, and to lessen the need of independent judgments for every step. Technological education has supplied an array of trained, intelligent, and trustworthy assistants – engineers, chemists, mineralogists, electricians to whom can be delegated a multitude of steps and processes that formerly needed the watchful eyes of the master himself.' He also added some remarks about the impact of scientific schools and institutes of technology: '(t)heir efficacy in permeating all industry with the leaven of scientific training has been strengthened by the social conditions which have enabled them to attract from all classes of the plentiful supply of mechanical talent. Hence American industry has shown not only the inventiveness and elasticity characteristic of the Yankee from early days, but that orderly and systematic utilization of applied science in which the Germans have hitherto been - perhaps still are - most successful.'

Interestingly, Frederick Taylor, who later promoted the principles of scientific management, started his career as one of those engineers working for Midvale Steel Works. Together with Yale graduates, he worked on studies on steel rails and tyres (Usselman, 2002).

Such efforts were not limited by the widening boundaries of the railroad companies. Interchangeability of cars encouraged railroad companies to contribute to the development of trade associations in charge of reaching agreements based on systematic experiments and data collection. Engineers worked together to establish industry wide standards. Representatives from railroad companies and steel business conducted collaborative investigations. Those associations included the Master Car Builder Association, the American Society of Civil Engineers, the American Society of Mechanical Engineers and the American Society for Testing Materials.

The Master Car Builder Association was, for instance, at the origin of a series of tests on behaviour of brakes during emergency stops that occurred in 1886 and 1887. It involved 55 trains and many representatives of the industry. It led to the establishment of technical standards on brakes published in 1888. It contributed to create a much needed uniformity and inter-operability across the industry.

However, by relying on such inward looking innovation practices, railroad companies lost sight of the changing needs of the customers and of the opportunities offered by



the technologies available outside of their inner circles. It was the case of automatic train control technologies, turning the benefits of technology such as air brakes into profit was difficult (Usselman, 2002). Increase of train speed was demanded by customers, but, it was difficult to take this into account in calculations. Similar problems occurred with automatic signals and electric traction. Usselman (2002) concluded: '(o)perators of large systems, like all people engaged in management have struggled to recogni(s) e when their business or industry faced moments of transition, in which established technological trajectories and organisational paradigms produced diminishing returns, or novel breakthroughs presented new threats or opened potentially rewarding opportunities. The task of avoiding obsolescence and responding to changing circumstances can prove especially difficult in large, system based industries, which acquired substantial momentum in the form of fixed assets and perhaps more important, expectations on the part of operators and consumers.'

This industry transformation attempted to address hazards due to weak property rights. Before patents were attributed to individuals who systematically granted licences to the railroad companies. As technical complexity grew, the allocation of property rights became more and more problematic and led to opportunistic behaviours. It resulted in an increase in the number of litigations between

inventors and railroad companies. Inventors started to claim rights in a very opportunistic manner. The minutes of a case in the early 1880's is quite explicit about the opportunistic behaviours: '(i)t was never the object of (the patent) laws to grant a monopoly for every trifling device, every shadow of a shade of an idea, which would naturally and spontaneously occur to any skilled mechanic or operator of the ordinary progress of manufacturers. Such an indiscriminate creation of exclusive privileges tends rather to obstruct than stimulate invention (...). It creates a class of speculative schemers, who make it their business to watch the advancing wave of improvement and gather its foam in the form of patented monopolies which enable them to lay a heavy tax upon the industry of the country' (Usselman, 2002).

Also connected to the regime of property rights, railroads felt threatened by what they saw as a 'strategic abuse type of hazard'. They were challenged by Westinghouse who was opposed to licensing his brake system, as he wanted to exploit his invention himself. There was also the case of Carnegie who had built some entry barriers by developing enormous production capacity for steel production.

Some measurement hazards were extensively addressed by the work on technical specification and the development of industry-wide standard.

Comparative analysis of open and closed innovation in the 19th century Railroad industry

The following table (Table 1) aims at comparing and contrasting the open and closed innovation using a number of criterions from the above analysis. It highlights some striking differences.

Table 1: Comparison between open and closed innovation in the American railroad industry

<i>Criterion</i>	<i>Open innovation</i>	<i>Closed innovation</i>
<i>Period</i>	<i>Before the 1870's</i>	<i>After the 1870's</i>
<i>Nature of technical change</i>	<i>Incremental plus some local breakthrough</i>	<i>Incremental with a focus on standardisation and the use of managerial innovation to complement technical change</i>
<i>Source of invention</i>	<i>Essentially suppliers</i>	<i>Railroad companies and to some extent suppliers within defined specifications</i>
<i>Inventors</i>	<i>Mainly machinists or trained engineers acting as machinists</i>	<i>Engineers</i>
<i>Basis for decision making</i>	<i>Opinion of multiple experts</i>	<i>Financial information and technical analysis</i>
<i>Organisational issues supporting innovation</i>	<i>Networks of machinists supporting mobility and knowledge exchange</i> <i>Magazines and journals</i>	<i>Corporate functions favouring structured and discipline decision making</i> <i>Inter-firms cooperation through diverse technical organisation addressing issues related to buyer supplier contact (technical specifications) and issues related to the interchangeability of cars across the industry</i>
<i>Properties of invention</i>	<i>Machinists</i>	<i>Railroad companies</i>

Conclusion

The above historical analysis shows how a whole industry transformed itself more than 100 years ago. The story of the railroad industry is one of a radical change from open to closed innovation. At first, it offers a striking image, a sort of Garden of Eden abandoned by a maturing industry to become cost focused and inward looking. Today, within this industry open innovation is once again much talked about. However the motives that underpinned this transformation (Intellectual Property issues, transformation of the bargaining power of actors within an industry, fragmentation of technical systems), are still present in today's business context.

From an innovation sourcing perspective, this raises some questions of value in today's business context:

- When and how closed and open innovation could be adopted concurrently. How to understand the dividing line between the two and build on the best from both worlds? We need to revisit the Insourcing / Outsourcing debate from an innovation perspective and study the conditions for efficient and effective decision making and implementation in a context where uncertainty and novelty prevail
- Another important question concerns the role of purchasing in an open innovation context. At a time when companies are increasingly claiming that they want to move towards open innovation, purchasing and supply chain decision makers need to understand if they have something distinctive to bring to the business in this area. It is not just a matter of jumping on the bandwagon, it concerns more fundamental questions about the roots and of the purchasing function, how its competencies developed over time, how mature it is to handle complexity and uncertainty and its ability to reinvent itself as a future oriented function, as an integrator of strategic information, as a manager of network and business eco-systems ■

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OPEN INNOVATION PROCUREMENT'S NEXT BIG OPPORTUNITY

By Corey Billington & Rhoda Davidson

JOURNAL OF SUPPLY EXCELLENCE



Corey Billington teaches supply chain and procurement at EIPM and at ETH in Zurich. From 2005 to 2010 he was Professor of Operations Management and Procurement at IMD in Lausanne, Switzerland. As the director of Hewlett-Packard's SpaM Group, and later VP of procurement, he defined how supply chain management is practiced in the high-tech industry. He also published a number of seminal papers. Today, as a founding partner of e3 associates, Corey works with companies to redesign business processes using open innovation.

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Introduction

CEOs are under more pressure than ever to accelerate revenue growth. To drive growth, they are looking for more innovation – and more productive innovation – particularly in products and services. Defining success criteria for R&D productivity is notoriously difficult. In addition, CEOs realize that the great majority of their innovation investments fail to deliver lasting value. Recent studies show that the global 1000's top R&D spenders spend an average of 3.84 percent of sales on R&D¹. But innovation productivity is dismal. Research shows that only 4.5 percent of innovation initiatives produce successful outcomes – defined as reaching predetermined return-on-investment (ROI) targets².

In many industries, R&D expenses have gone up while the profitable outcomes of research have gone down. The pharmaceutical industry offers a typical example: Its declining R&D productivity has obliged executives to focus their resources on blockbuster drugs (drugs that will net more than \$1 billion over their product lifecycles). The story is similar in many other sectors. As rising development costs combine with shorter product life cycles, executives have an increasingly difficult time justifying heavy R&D investments. In recent years, the concept of "open innovation" has gained more currency, with companies looking not only at how they can bring innovation in from outside their firm but at how they can sell some of their unused "information assets" – such as patents and trademarks – to increase shareholder value. Henry Chesbrough, executive director of the Center for Open Innovation at the University of California defines open innovation this way: "The use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. This paradigm assumes that companies can and should use external ideas as well as internal ideas, and internal and external paths to market,

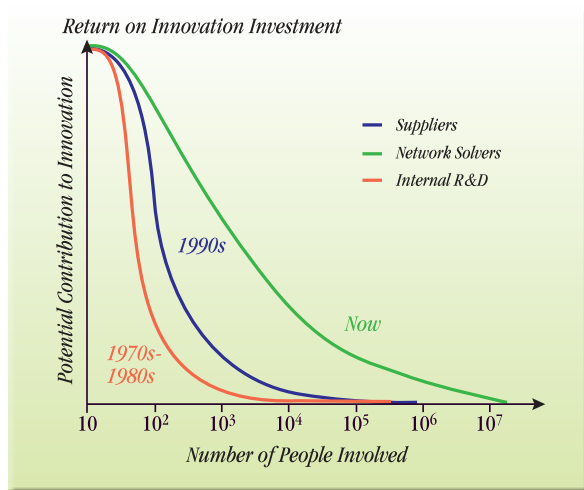
as they look to advance their technology."³ Open innovation is about finding answers and, from a process point of view, so is the job of procurement. In essence "the cloud" has become a supplier. As such, we expect open innovation activities to transform procurement's role in not only containing costs, but also in driving innovation and therefore top-line growth. Essentially, the new conditions call for a re-examination of the make-or-buy decision – make-buy changes to "make-buy-find." The approach looks well beyond fixed relationships within a carefully screened "extended enterprise" of companies and their suppliers to more one-off transactional relationships with organizations and individuals with which there is rarely a pre-existing relationship.

We urge supply management professionals to recognize that procurement processes lie at the root of open innovation activity. Further, we propose that companies should develop the processes to enable and use such problem-solving relationships. Lastly, we contend that supply management professionals will have to become more proactive at managing these sources of innovation.

Open innovation as a sourcing opportunity

Lately, the Internet has added a powerful twist to the open innovation concept that can significantly reduce the cost of innovation, pairing corporations with R&D challenges (seekers) and external scientists (solvers) who can approach problems from many different angles. The core premise is not only that somebody "out there" may already have solved your problem (or has the wherewithal to do so easily) and that they can be found quickly and efficiently and that the transfer of intellectual assets is safe and secure (Figure 1). The premise has tremendous appeal to open-minded organizations under pressure to innovate more effectively.

Figure 1 : Larger networks mean higher returns on innovation investment



The Internet's effect of tremendously reducing the cost of connecting with others has fuelled open innovation and has made it feasible and cheaper for firms to open themselves up to a wide range of external sources of innovative ideas. For instance, in 2000 Goldcorp, one of the world's top gold producers had the problem that some of its mines were performing very poorly compared to other mines in northwestern Ontario, Canada. The CEO took the bold move to broadcast the entire geological data record of the company's Red Lake Mine⁴. He offered \$575,000 in prize money, with a top award of \$105,000 to the person or company that would give Goldcorp an effective way to mine more gold. The broadcast of the challenged led to two Australian companies collaborating to come up with a three-dimensional depiction of the mine. Using this graphical data Goldcorp was able to lift the annual production of the mine from 53,000 ounces at a production cost of \$360 an ounce in 1996 to 504,000 ounces at a production cost of \$59 an ounce by 2001. An interesting facet of this example is that by using open innovation Goldcorp collaborated with two companies that were not established suppliers and with whom they had no previous network relationships or social ties. Also the company worked in a way considered as unusual or dangerous by the industry.

However, for all of their apparent benefits, there is a persistent limitation to many open-innovation structures. Few companies actively engage their procurement professionals whose job it is to help define make-or-buy parameters and support decisions accordingly. Although the process of managing the "inflows and outflows of knowledge" should sound familiar to any supply management organization (managing the interface with external suppliers is, after all, one of the function's primary roles), it is often not part of procurement's charter. If procurement is to take an active role in bringing innovation into their companies then this situation needs to change.

Seeker-solver networks as a sourcing tool

New network structures are developing both formally and informally to facilitate the search and transfer of new ideas. We use the term "seeker-solver network" to describe these structures. A seeker-solver network is defined as a formal or informal collection of people or companies that facilitates a productive working relationship between two previously unconnected parties, usually on a one-time basis. The Internet provides the facilitation mechanism to link a problem presented by a manager or organization (the seeker) with a myriad organizations or people worldwide who have the skills and time to consider the problem and share a solution if they already have one.

These emerging intermediary networks vary in terms of the degree of codification or formalization of the knowledge that can be tapped and in the degree of facilitation of the networks (Figure 2).

Figure 2 : Characteristics of intermediary networks

Degree of codification of knowledge	Low	Social networks e.g. Linked-in	Orchestrated expert networks e.g. Gerson Lehrman
	High	Search engines e.g. Google	Seeker-solver networks e.g. Innocentive
		Low	High
		Degree of facilitation from intermediary network	

In terms of codification, knowledge can be defined as either tacit or explicit⁵. Un-codified knowledge consists of tacit knowledge embedded in individual experience and is regarded as difficult to communicate or transfer to others⁶. Codified knowledge consists of explicit knowledge that is objective and relatively easily transmissible. The degree of knowledge codification has been found to be an important determinant of the speed by which major innovations are transferred within and among firms⁷.

One striking example of a seeker-solver network that deals primarily in codified knowledge is InnoCentive, launched in 2001 by Eli Lilly⁸. "Seeker" companies place challenges on the InnoCentive platform and individual "Solvers" provide solutions that can be anonymously captured, codified and transmitted to the seeker. The companies or individuals who respond to the challenges are termed "solvers" in the sense that they have a solution to the posted problem.



which they are willing to document. The seekers, who are nearly always corporations or non-profit organizations, pay an annual fee of \$100,000 to access the network and then offer a bounty to the solvers. InnoCentive also receives a percentage of this bounty paid. The fast-growing network of solvers was approaching 170,000 by mid-2010. Over time InnoCentive has expanded its service offering and domain coverage from the initial core offerings in life sciences, to include other domains such as mathematics and statistics, entrepreneurship, and engineering design.

Other intermediary sites provide ways to place seekers in contact with others who have the tacit knowledge required as input to solving their problems. These sites are primarily social networking sites, such as Linked-in or Facebook, or expert knowledge networks. Within these sites more formal intermediary networks have developed around topics and interest groups. For example, Facebook now has over 20 million user groups. These knowledge sources may be able

to offer unstructured tacit knowledge that can be leveraged and combined with other knowledge by the seeker. We term these sources "knowledge brokers". Seeker-solver networks also vary according to the levels of facilitation. Facilitated networks tend to deal primarily in codified knowledge (Table 1). For codified knowledge transfer this involves making sure that solvers are rewarded rather than exploited and in providing processes that protect the IP of the solvers. For tacit knowledge the role of facilitation is primarily to help seekers find knowledge brokers with appropriate tacit knowledge and to organize appropriate media for the transfer of this knowledge. For instance, Gerson Lehrman is an expert network with over 200,000 professionals ranging from scientists, doctors, academics, and former professionals from companies. Research managers from Gerson Lehrman assist seekers in finding experts through this network and facilitate contact with experts through phone calls, round tables, written reports, surveys, and visits.

Table 1 : Facilitated intermediary network platform examples

<i>R&D, Science and Technology</i>		
<i><u>Network</u></i>	<i><u>Network Business Focus</u></i>	<i><u>Challenge Types</u></i>
<i>Innocentive</i>	<i>R&D, Science, Pharmacology</i>	<i>Theoretical, Brainstorming and Reduction to practice challenges</i>
<i>Idea Connection</i>	<i>R&D, Supplier sourcing,</i>	<i>Innovation challenges Invention marketplace</i>
<i>NineSigma</i>	<i>Innovation management Sustainability</i>	<i>Innovation challenges Intermediary services</i>
<i>One Billion Minds and social problems</i>	<i>Technology, design, science</i>	<i>Project challenges Brainstorming, Idea Exchange</i>
<i>Yet2</i>	<i>R&D, Science</i>	<i>IP marketplace IP challenges to find applications</i>
<i>Presans</i>	<i>R&D</i>	<i>R&D challenges, IP marketplace IP brainstorming-</i>
<i>Innoget</i>	<i>Science, Engineering, Technology</i>	<i>Innovation challenges, IP market</i>
<i>Marketing, Sales and Prediction</i>		
<i>Innovaro</i>	<i>Market prediction and Foresight, IP marketplace</i>	<i>Project challenges Brainstorming</i>
<i>Ideaken</i>	<i>Marketing, sales campaign</i>	<i>Marketing challenges</i>
<i>Innovation Exchange</i>	<i>Marketing, Design, Sustainability</i>	<i>Project challenges Innovation marketplace</i>
<i>RedesignMe</i>	<i>Logos, Marketing, Design</i>	<i>Innovation challenges</i>
<i>Kaggle</i>	<i>Data mining Forecasting</i>	<i>Data contest projects</i>
<i>NewsFutures</i>	<i>Innovation mashup</i>	<i>Prediction markets</i>
<i>Intrade</i>	<i>Global prediction markets</i>	<i>Prediction markets</i>
<i>Sustainability</i>		
<i>Brainrack</i>	<i>Education, Sustainability</i>	<i>Student challenges, Brainstorming</i>
<i>MyooCreate</i>	<i>Environmental, Social problems</i>	<i>Project challenges-</i>
<i>Skipso</i>	<i>Environmental, Sustainability</i>	<i>Project challenges, Grants</i>

General Management and Employment

<i>Idea Crossing</i>	<i>Business models, Products, Services, Strategy</i>	<i>Student challenges</i>
<i>Spigit</i>	<i>Innovation management</i>	<i>Innovation challenges using organizational network</i>
<i>LeadVine</i>	<i>Sales leads, Jobs</i>	<i>Sales lead network</i>
<i>ChumBonus</i>	<i>Jobs</i>	<i>Employment challenges</i>
<i>Big Idea Group</i>	<i>Innovation management</i>	<i>Innovation challenges using customers and solvers-</i>
<i>Gerson-Lehrman</i>	<i>Specialized functional and industry expertise</i>	<i>Facilitated meetings, panel discussions</i>

These facilitated seeker-solver networks are growing rapidly in size and also in the number of domains served. Table 1 provides examples of facilitated networks in the areas of R&D, science and technology, marketing, sales and predictions, general management and employment.

In essence, seeker-solver networks are novel procurement structures enabled by the Internet. Such networks are becoming useful because they are significantly less expensive than conventional mechanisms for developing and procuring innovative solutions.

Empirical evidence from the pharmaceutical industry found that a seeker-solver network in the R&D domain can be more than 20 times less expensive than regular R&D paths⁹.

Investigators carefully studied 12 challenges and found that the gross value created was \$10.3 million – a 2,600 percent return on investments that comprised \$333,500 in prizes awarded to solvers and total internal costs of \$60,000.

While not all challenges are answered, the cost of unsuccessful challenges is significantly less than the cost of a failed internal R&D effort. However, for InnoCentive nearly 60% of challenges are resolved. Using these networks enables companies to access smaller companies, volunteers, retirees or low-paid hobbyists to resolve what once were seen as specialized technical issues. It has also been found that increasing the number of solver backgrounds in a challenge greatly increases the probability of finding a solution.

For instance, an analysis conducted on InnoCentive challenges with six backgrounds versus three increased the chances of finding a solution by more than 30%¹⁰.

Empirical evidence from business process redesign has found that using external ideas from other industries enabled teams designing new processes to complete projects twice as quickly as they would have expected

using conventional project techniques with increased new process effectiveness¹¹.

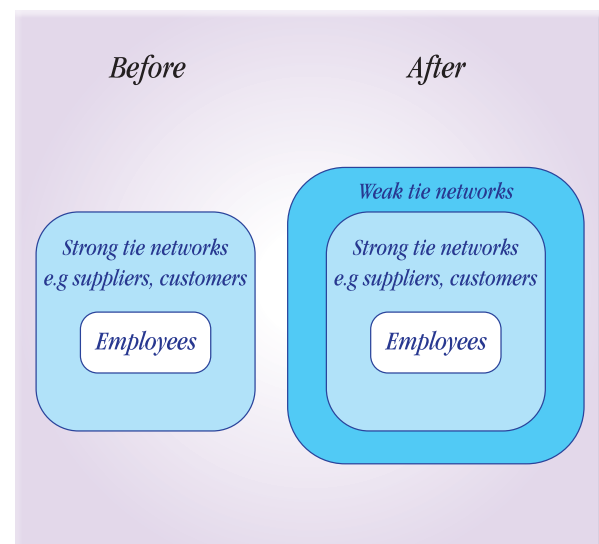
Using these networks is highly relevant when firms procure services on a non-repeating basis and under conditions of high uncertainty and is particularly salient for complex innovation with unforeseeable uncertainty e.g. distributed product design (DPD)¹².

By using these networks companies can rapidly extend the boundaries of innovation search and essentially put millions of brains to work. Companies are now able to outsource parts of central business processes to suppliers that are completely unknown at the time of the outsourcing.

This provides a stark contrast to traditional practices that only consider innovation collaboration with long-standing partners (Figure 3).

This is a growing phenomenon that is unlikely to go away.

Figure 3 : Innovation before and after intermediary networks





Challenges for procurement in using open innovation

There is no shortage of reasons why procurement organizations do not traffic in innovation ideas. For a start, the vast majority are still rewarded for and therefore focused on cost savings. Talk to most procurement heads today about other ways for their groups to contribute and they will quickly point out that their metrics first need to change from price reduction to revenue generation. At the same time, purchasing managers are only now starting to see their roles in broader value-based terms, and as such they are just beginning to explore the possibilities of contributing to top-line growth. Not surprisingly, C-suite executives still mostly view procurement as cost cutters, not catalysts for growth.

A vicious cycle is at work: The longer that procurement is seen as a support function, the fewer chances its professionals have to acquire and demonstrate new ideas, much less sell those ideas to the organization. Corporate silos compound the problem. Communications do not flow naturally between departments; unfortunately, information hoarding is often more prevalent than truly open and collaborative information sharing. And rightly or wrongly, R&D managers typically have developed their processes for acquiring innovation without support from other departments. Thus, they are unlikely to welcome unsolicited approaches from the procurement organization. Also, R&D communities have many of the same fears about outsourcing that manufacturing communities had in the 1980s.

We have also found that many R&D managers who try to utilize seeker-solver networks often make costly mistakes by poorly constructing their challenges. (In knowledge brokering parlance, a “challenge” is a question that seekers broadcast to potential solvers). Either their challenges are too tightly defined, with inherent biases that lead them to the same dead ends, or their definitions are too loose to net any new answers. Too often, R&D managers are “reinventing the wheel” of procuring services, making expensive mistakes as a result or making very slow head-way or losing process capability when managers retire or transition out of the R&D organization. For its part, the typical procurement organization has too much work to do, too many suppliers to support, and too few staff to do it all with. It is unrealistic to expect any hard-working procurement group to reach out to support their colleagues in R&D without change-making intervention by senior business leaders or without a clear and widely shared incentive to do so.

Add to these hurdles the inertia of the average Fortune 1000 organization and the persistence of compensation schemes and other incentive mechanisms that reinforce existing and often outdated business practices and it soon becomes clear that new ways of innovating – Internet-driven methods that actively involve procurement departments – are not easy to achieve.

Pre-requisites for using open innovation

Those barriers notwithstanding, we believe there is much that procurement professionals can do to help drive innovation from the outside in.

However, before we describe specific steps that should be taken, it is important to address a few of the preconditions for success that procurement can influence (but not control) and that other corporate functions can help with.

To begin with, supply chain managers and procurement chiefs in particular have to be seen – and to see themselves – as “drivers of revenue through innovation.” Of course, it will help if they start acting accordingly. But in most organizations, senior executives will need to sponsor the new approach to innovation, fostering links between procurement and R&D as well as with human resources (HR) departments.

HR plays a key role because performance metrics must be adapted to suit the changes. HR also can help employees cope with the cultural fears associated with the procurement of ideas while creating new measures that recognize procurement’s contributions to revenue growth rather than price take-down.

Another aspect that is likely to require input from other departments is control over the company’s intellectual property (IP). Procurement managers are quite used to ensuring that they have “bulletproof” processes for controlling IP transfer in their conventional contracts with suppliers.

Even though the challenges on seeker-solver networks are posted anonymously, some managers fear that industry insiders can deduce which challenges are theirs, thus signaling the competition about their actual R&D objectives and approaches.

This issue can be addressed by “thinly slicing” challenges – that is, constructing them in such a way that they do not disclose the strategy or the commercial intent behind the challenge.

As an example, when solvers work on a P&G challenge on the InnoCentive platform, it is clear which molecule P&G wants to synthesize but the use of the molecule, the way it would be manufactured, and which product would use the molecule is left to suppliers and the internal P&G R&D lab, minimizing competitive signaling.

IP problems are routinely addressed by seeker-solver networks. The company’s legal counsel may be able to help to define challenges specifically enough while making sure that any unnecessary information is not exposed to the world. In other words, procurement managers are likely to need some assistance to learn the art of “hiding in plain sight.”



Steps for accelerating use of open innovation

Companies that want to harness the full power of seeker-solver networks must develop appropriate internal processes for bringing in codified and un-codified knowledge. Our experience shows that there are five key steps (Table 2).

Table 2 : Process for using intermediary networks for open innovation

No	Process step	Codified knowledge	Un-codified knowledge
1	Identify the business problem	Difficult problems where “someone” outside the organization may have solved a similar problem before	Set of interconnected routines or business processes exhibiting a chronic problem
2	Form the appropriate team	Specialist team working with the support of procurement	Team members drawn from all functions involved in the interconnected routines
3	Disaggregate the problem into smaller elements	Focus is on breaking down problem to leverage relative strengths of in-house versus open innovation and to ensure IP protection	Focus is on breaking into sub-routines and creating context-free problem statements to identify other contexts with relevant knowledge
4	Find solvers or knowledge brokers	Select from appropriate intermediary networks and broadcast challenge as widely as possible to find potential solvers	Use intermediary networks to locate executives or professionals with relevant experiences in different industries
5	Incorporate knowledge into local context	Gladiatorial combats to select feasible solutions	Whirlwind innovation process to construct new routines by combining ideas in a novel way
6	Pilot	Verify solution using laboratory tests, pilot plants, or alpha tests before scaling up	Pilot new routines and “learn by doing” followed by rollout
Ongoing	Document and track open innovation performance using KPIs	Knowledge / cost of ideas Interest level of potential solvers No of ideas No of ideas/ intermediary network Success rate ROI	Speed of design of business process (relative to typical speed) Cost of project (relative to typical cost) Degree of implementation and adoption of new routines Degree of satisfaction with new routines

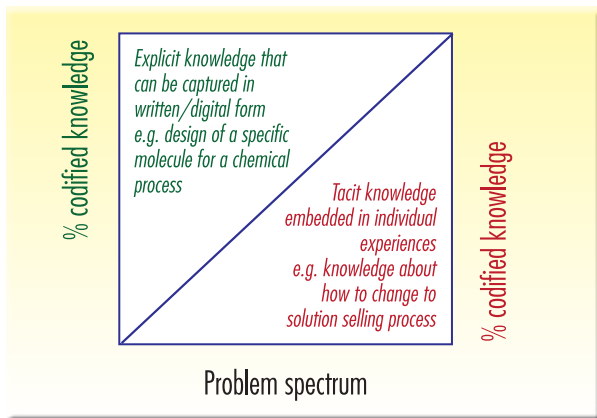
Carefully identify the business problem

In the first step the business problem is to carefully identify and characterize the type of knowledge likely to be contained in a solution. The answers to all problems can be considered as some combination of codified and un-codified knowledge (Figure 4). At one end of the spectrum there are problems where the knowledge seeker believes that a codified answer is likely. Examples might include a seeker looking for a way to synthesize a specific molecule for a chemical process, or a specific packaging type, or an answer to a mathematical problem. Identifying problems is supported by certain organizational cultures. For instance, an R&D manager at a large chemical company commented, “You must have a cooperative

mindset and then to be open to share your problem - which is quite difficult for a scientist – not a common profile. You need to have a mindset of team work, write problems with other people and for this to be seen as positive.”¹³ Creating this culture is an internal integration challenge.

In these cases the sourcing challenge is to cost-effectively find as many potential solutions as possible and to evaluate these answers according to a set of codified criteria. Used widely in procurement departments, the procurement process is about sourcing a set of candidate solutions and conducting a set of gladiatorial contests to find the “best” solution.

Figure 4: Problems display a range in degree of codification of the answers



At the other end of the spectrum there are problems where the solution is likely to be largely un-codified with a high degree of tacit knowledge and organizational interplays. This is often the case when dealing with complex business processes that are a chronic, recurring problem. These solutions are normally embedded in work systems and any solution is highly context-dependent, involving changes to the ways in which employees work, interact and behave. Easy answers for such situations are unlikely to exist as no other organization has the same environment and culture. These problems would have already have been fixed if there was a well-known improvement available within the company or the industry through the migration of industry persone¹⁴. Examples might include improving the procurement to payment process or introducing a new performance management system within an organization. For instance, in one project the Country Managing Director of a large wholesale bank was worried about the competitive situation of her bank. The organization was facing increased competition from international banks offering more innovative products. In addition, the bank was selling predominantly low-margin products to its corporate clients, achieving low returns on capital. The Country Managing Director knew that her bank needed to partner with its corporate clients and use in-depth knowledge of those clients to sell higher margin products. Achieving this required changing the power structure, compensation methods and hiring processes and would likely result in the departure of their most successful sales people. In these cases the challenge is to find knowledge brokers who can constructively stimulate the construction of solutions by company employees who understand what their firm is actually capable of doing. This is similar to a company procuring services but retaining management responsibility.

Intermediate problems contain some elements of knowledge that are likely to be codified and other elements where the amount of tacit knowledge is still significant. For example, one company in the sample from the

electrical goods industry was attempting to reduce their finished goods inventory. This problem contains codified elements, for example knowing the correct algorithms for setting safety stock levels, and also un-codified elements, for example, understanding how to set up the human processes of deciding how and when to liquidate excess stock to balance the risk of inventory write down costs with the risk of disappointing customers.

Form the appropriate team

In the second step we found that companies need to carefully assign teams with the correct scope of knowledge to work on the problem. For highly codified problems teams should contain members that have the specialist knowledge to be able to describe the problem in the correct technical terms and to be able recognize an innovative solution when they see it. For example the process of searching for a better manufacturing process to put toothpaste into a tube requires a combination of experts from manufacturing, quality, product development, logistics and marketing. Careful consideration has to be made to team formation because the team collectively needs to be able to judge whether the solution will be viable for every part of the value chain including all the other major suppliers, channel partners, and any other partners. In the previous example the logistics team member needs to be able to represent not only the company point of view but also the point of view of the channel partner:

Un-codified problems involving organizational work routines that span functional and/or organizational boundaries usually require a much more diverse team.

It is important to bring together people that can see all the different aspects of the overall business system (a combination of value chains working together to deliver the product or service) and who have knowledge of the interconnections within overall business. For example, the Finance Director of a large global company was concerned that his function was behaving reactively rather than proactively. Managers were spending too much time working on reporting basic financial information rather than spending time advising their internal clients on how to build their business and how to run their business more profitably. The global team, which was drawn from throughout the company, was charged with I) installing a process of continuous improvement within financial reporting, starting with the mid-term reporting process, II) teaching finance managers to be more customer oriented and better communicators, III) creating a more robust HR function to address the specific needs of the finance function. This global team was composed of individuals from every geography and every line of business with the financial services group i.e. private banking, wholesale banking, retail banking, insurance, online direct banking, real estate,

management reporting, legal reporting, company financial reporting, controllerships and risk function. Drawing team members widely ensures that the politics, resources and interfaces to the wider business system are adequately represented during the project.

Disaggregate the problem into smaller elements

Disaggregating the problem requires the team to break the challenge down into sub-problem pieces determined by who can solve the various parts of the problem, and how these parts will be addressed using seeker-solver networks. Similar to an outsourcing RFP, to be able to source ideas externally the problem needs to be broken into the right-sized pieces. If the problem is too big then you won't find solvers or brokers who already possess an answer. If it is too small then you are unlikely to get anything of value from external sources. You want to construct the problem so that you get a few valuable answers rather than 100s of uninteresting answers¹⁵.

With highly codified problems the starting point is to understand how to leverage the relative strengths of internal and external knowledge. Some elements of the problem, especially those that are core to the company, may be best addressed by the corporate lab or with suppliers or universities. Other elements of the problem may be well-suited to sourcing through seeker-solver networks. Companies should use the same process to take this decision as they would with any outsourcing decision i.e. considerations of risk adjusted cost-benefits. Cost considerations need to include the projected costs of resolving parts of the problem including transaction costs.

Another integration challenge is how to properly frame the challenge for solvers, using the right terms and offering the right incentives. The problem needs to be condensed down to a level at which the seeker rationally believes that

there is available expertise, understanding, and capability in the "outside" world. One InnoCentive user, a major pharmaceutical company, gives a glimpse of the typical approach to developing these capabilities. "The approach was pretty ad hoc at first, but we learned quickly that we needed to put some structure around it and help drive it", said the company's vice president on R&D. "You don't want to put all your recalcitrant challenges out there, because that doesn't offer the greatest opportunity, and not all problems fit InnoCentive."¹⁶

For un-codified problems the first step is to explore the problem and gain insights into the systemic behavior of the system. The seeker team needs to spend time evaluating the strengths and weakness of the integrated routines and identifying any repeating patterns or systems archetypes that are causing repeated failure e.g. tragedy of the common, addiction models etc. In some cases processes may be missing entirely or parts of the governance process may be weak. For instance, the General Manager of a European market in the beverage industry was facing tough competition. The market was split three ways with the three players holding equal market shares. The company had not made a profit in several years and regional management was dissatisfied with the organization's performance. In this problem the dynamics of competition when there are three equal players is well known as creating a systemic problem for overall industry profitability.

Breaking down the problem into smaller pieces is essential because the highly contextual nature of these problems means that the company is unlikely to find an answer out in the world that encapsulates the same set of integrated routines. For example, a large fast-moving consumer goods company accustomed to operating in grocery stores wanted to increase its competitiveness in specialist channels. By looking more closely at the problem of how to increase sales volumes and profitability in the new channels team members identified four discrete elements, each suggesting a different challenge requiring specific

Figure 5: High level problem for a large, fast-moving consumer goods company: Increase the sales volumes and profitability within specialist channels



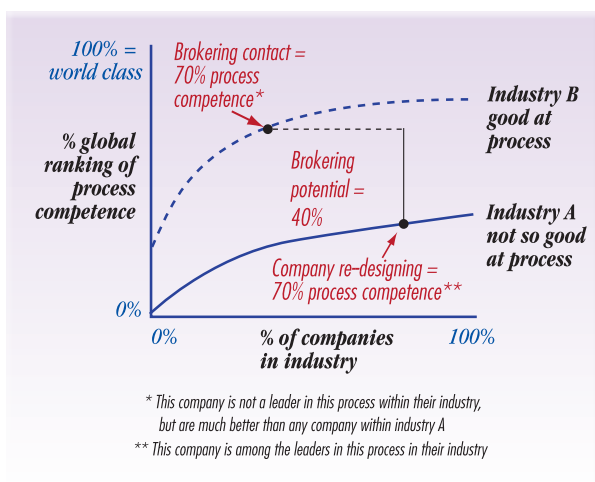
expertise (Figure 5).

We found that it is easier for teams to have insights into these points of leverage if the information about the company, industry, or product contexts is removed from the problem statement. For instance, a team from a European retail bank wanted to improve customer queuing in their branches. A vital first step was for the team members to ask themselves the question, "In which other industries is queuing and the management of service delivery resources a vital competence." This enabled them to identify industries such as amusement parks, supermarkets, highway traffic resource planning systems, and media stores with high seasonal customer level variation as potential sources of ideas.

Find solvers or knowledge brokers

For codified problems finding the appropriate seeker-solver network seems to involve some amount of trial and error. Procurement should understand which networks are more productive for which sort of problems. To maximize value it is important to work with multiple networks and to develop your internal work processes for interfacing with these networks. Another procurement challenge is to determine the size of the reward or bounty. The process for breaking up the problem into smaller pieces may be dependent on the types of networks that are being used. For un-codified problems it is less about breadth of search and more about finding knowledge brokers that have a deeper experience than the seeker of the different parts of the overall problem. This creates knowledge brokering potential (Figure 6).

Figure 6: Finding knowledge brokers relies on finding industries where companies are measurably better at similar processes



For example, a fast moving consumer goods company needed to protect their industry business systems from new entrants and government regulation. This company

had a highly immature IP management process for valuable patents that could be used to reinforce their supply chain. The lack of maturity of the IP management process created the potential for bringing in knowledge from high tech firms. As the vice-president of mergers and acquisitions told us, "We realized that we were very limited in our view of IP management and that surprisingly other industries could add a lot of knowledge to our current ways of working that we could adapt to our context."

Pilot

The final step of embedding an innovation solution into an organization is to pilot the prototype. In the case of highly codified answers this is about checking that the solution works and produces the desired effect in the system where it is used. If not, then the team needs to go back to the intermediary networks to refine the search and look for other possible answers. Sometimes it may be better to purchase several of the more attractive solutions. It is an open research question how many to buy and under what context. Another approach is to take a small subset of suppliers who came close to finding acceptable answers and to ask them to compete again using the refined brief and a different bounty¹⁷.

In the case of un-codified answers it is about taking the prototype and then "learning by doing". For a new organizational practice piloting takes place through a series of integrator-led iterative pilots where the new process becomes refined over time. Pilots of new processes need to be credible, replicable, and feasible in order to create new frames that generate affective commitment and adoption of the new ways of working¹⁸.

Conclusions

Our goal for this article was to show that procurement now has a much broader and more valuable role to play. The department best known for containing costs with a predetermined array of suppliers is now in prime position to accelerate innovation and thus drive the organization's top-line growth. Two factors make it so: the growing acceptance of the principle of open innovation and the recent emergence of Internet-enabled seeker-solver networks.

Indeed, we would argue that fostering innovation is now procurement's new obligation and that one day, the procurement group will be judged on its ability to add value in this way. Without the active process support of the procurement organization, companies are at risk of having uncompetitive innovation processes. Because of procurement's skills and competencies in outsourcing and supplier management, CPOs need to be at the forefront



of refining these competencies to provide the process guidance necessary to manage knowledge exchange through seeker-solver networks.

The procurement groups poised to take advantage of open innovation are those with a healthy respect for the groups' existing roles, where the corporate culture has adopted an experimental mindset, and where seeker-solver networks are viewed as a new value-adding capability. Companies such as Hewlett-Packard, Harley-Davidson, Dow AgroSciences, Colgate-Palmolive, and Procter & Gamble are making the right moves.

Many questions surface, of course. What response rates from solvers constitute successful "returns" from challenges posted on seeker-solver networks? What does it take to manage the interactions with unknown solvers? How

can procurement best reach out to and add value for R&D groups? How can R&D groups get better at asking "make-buy-find" questions – and how can procurement groups get better at helping them to do so?

Despite such open questions we firmly believe that the procurement organization has the best match of skills to allow open innovation to be done cost-effectively. We are confident that it will happen and we expect procurement's new recruits to have the skills to implement necessary changes. Once open innovation is understood at every level of the organization, procurement groups will be better placed to acquire and assign the resources to take on their new roles. And with the steady escalation of procurement's status come the conditions that will enable procurement to significantly influence revenue growth ■

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BUILDING A NEW COOPERATION MODEL WITH MULTIPLE PARTNERS

to the benefit of long term business performance

By Jean-Luc Ewald



JOURNAL OF SUPPLY EXCELLENCE

Jean-Luc Ewald is Head of Leadership Development activities of Technip and President of Generation Presence. He is a Graduated electrical engineer; the first part of his career was in several engineering positions and management assignments. After six years in quality management, he moved to human relations developing skills for organizational effectiveness.

This paper presents two applications of Theory U leadership development approach in the frame of "Connecting the inside organization with the Outside environment". After a presentation of two key aspects of Theory U, the social field structures of attention and the five steps transformation process, two experiences are visited, one in a three partners long term business development, and the second one in competitiveness enhancement project within Technip Region A.

Introduction

Long term business performance is usually looked from financial, sales and technical performance point of view. There is a less visible aspect: the nature and the quality of relationships between stakeholders.

There we are speaking about culture. Culture of individuals is an aggregate of education, experiences, nationality and company drivers.

Whatever the numerous charters hook up on the walls of our meeting rooms, what regulates our behaviors is made from less visible drivers, whose some predominant ones are the fear to loose control of own interest preservation.

Safety need lead people to use procedures from the past as an umbrella to avoid the risk to innovate, and to stay in contractual type of relationships. How to overcome these resistances to get contributors a step ahead of what they consider as their formal duty?

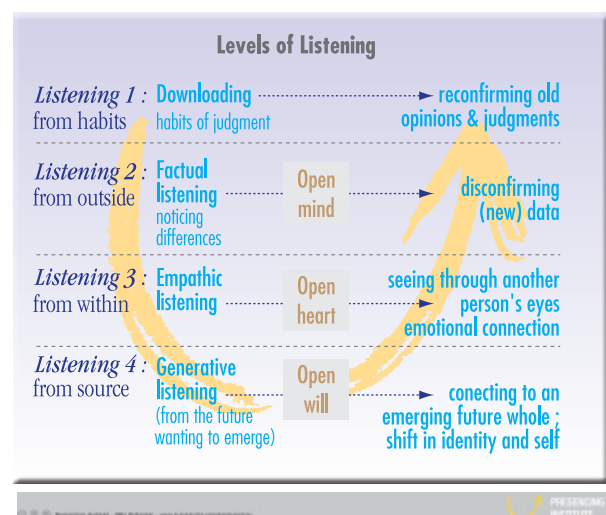
This is only possible when people are placed in a container within they authorize themselves to innovate new kind of connections together. Leadership development is something about building this container.

Before relating two illustrations in the context of Technip, I would like to introduce you two different aspects of leadership development, described by Dr C. Otto Scharmer in his book Theory U. The next two paragraphs are an abstract of the executive summary of Theory U¹.

What is really necessary to operate as partners?

In Theory U², Dr C. Otto Scharmer proposes to consider four structures of attention in the social field – see Figure 1:

Figure 1: Field structures of attention



Field 1 : operating from the old "I-in-me" world

This field manifests by a type of listening called downloading. Downloading is listening by reconfirming habitual judgments. When you are in a situation where everything that happens confirms what you already know, you are listening by downloading. This field is correlated with centralized hierarchical type of governance.

Field 2 : operating from the current "I-in-it" world

This field corresponds to a factual, object-focused type of listening : listening by paying attention to facts and to novel or disconfirming data. You switch off your inner voice of judgment and listen to the voices right in front of you. You focus on what differs from what you already know. You let

the data talk to you. You ask questions, and you pay careful attention to the responses you get. This field is correlated with a divided type of governance and competition.

Field 3 : Operating from the current "I-in-you" world

This field manifests by empathic listening. When we are engaged in real dialogue and paying careful attention, we can become aware of a profound shift in the place from which our listening originates. We move from staring at the objective world of things, figures, and facts (the "it-world") to listening to the story of a living and evolving self (the "you-world"). It is correlated with relational networking and dialogue allowing mutual adjustment.

Field 4 : Operating from the highest future possibility that is wanting to emerge

This field can be recognized by a generative kind of listening. This type of listening moves beyond the current field and connects us to an even deeper realm of emergence. We can call this level of listening "generative listening," or listening from the emerging field of future possibility. This level of listening requires us to access not only our open heart, but also our open will—our capacity to connect to the highest future possibility that can emerge. We no longer look for something outside. We no longer empathize with someone in front of us. We are in an altered state. "Communion" or "grace" is maybe the word that comes closest to the texture of this experience. This field is the one of deep innovation and change also called Collective Presence.

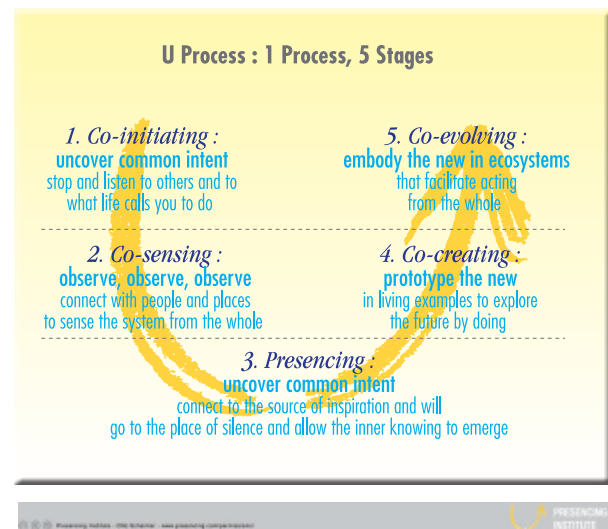
When we look at what fields we most practice in our usual activity, the answer is first 1 and 2, sometimes 3 in a face to face relationship, and improbably 4.

The challenge of building new cooperation models is to create the conditions for people contributing to a same goal to move from their usual 1&2 type of attention to the 3&4. Thus, at human system level, even when people are coming from very separated horizons, a sustainable change in connections may emerge, which is the birth of a new culture from which partners may operate.

Building a cooperation model as per Theory U five movements

Building a new cooperation model, or a new culture within an organization or between several organizations, may follow a five stages process that Dr C. Otto Scharmer describes in Theory U (2). What are these five steps? – See Figure 2.

Figure 2 : U process



1 • Co-initiating

At the beginning of each project, one or a few key individuals gather together with the intention of making a difference in a situation that really matters to them and to their organizations. As they coalesce into a core group, they maintain a common intention around their purpose, the people they want to involve, and the process they want to use. The context that allows such a core group to form is a process of deep listening—listening to what life calls you and others to do.

2 • Co-sensing

The limiting factor of transformational change is not a lack of vision or ideas, but an inability to sense—that is, to see deeply, sharply, and collectively. When the members of a group see together with depth and clarity, they become aware of their own collective potential—almost as if a new, collective organ of sight was opening up.

What is missing most in our current organizations and societies is a set of practices that enable this kind of deep seeing—"sensing"—to happen collectively and across boundaries. When sensing happens, the group as a whole can see the emerging opportunities and the key systemic forces at issue.

3 • Presencing

At the bottom of the U, individuals or groups on the U journey come to a threshold that requires a "letting go" of everything that is not essential. In many ways, this threshold is like to go through "the eye of a needle".

At the same time that we drop the non-essential aspects of the self ("letting go"), we also open ourselves to new aspects of our highest possible future self ("letting come"). The essence of presencing is the experience of the coming



in of the new and the transformation of the old. Once a group crosses this threshold, nothing remains the same. Individual members and the group as a whole begin to operate with a heightened level of energy and sense of future possibility. Often they then begin to function as an intentional vehicle for the future that they feel wants to emerge.

4 • Co-creating

In all our training and schooling one important skill was missing: the art and practice of prototyping. That's what you learn when you become a designer. What designers learn is the opposite of what the rest of us are socialized and habituated to do. So the prototype is not the stage that comes after the analysis. The prototype is part of the sensing and discovery process in which we explore the future by doing rather than by thinking and reflecting. The innovation processes of many organizations are stalled right there, in the old analytical method of "analysis paralysis."

The co-creation movement of the U journey results in a set of small living examples that explore the future by doing. It also results in a vibrant and rapidly widening network of change-makers who leverage their learning across prototypes and who help each other deal with whatever innovation challenges they face.

5 • Co-evolving

Once we have developed a few prototypes and microcosms of the new, the next step is to review what has been learned - what's working and what isn't - and then decide which prototypes might have the highest impact on the system or situation at hand. Coming up with a sound assessment at this stage often requires the involvement of stakeholders from other institutions and sectors.

The co-evolving movement results in an innovation ecosystem that connects high leverage prototype initiatives with the institutions and players that can help take it to the next level of piloting and scaling.

Let us now visit two illustrations of that process.

Building a cooperation model for a long term business performance

Our client's perspective was to initiate a 15 years business with two major partners in the market of FLNG plants. A classic approach in such case would be to sign first a FEED contract with an engineering contractor and then to issue bids for EPC phase. As the goal of our client was to realize several FLNG plants in a very competitive way, his assumption was that can be achieved only through a innovative cooperation model. This cooperation model is the frame to allow project execution people to overcome

the contractual boundaries, which tend to preserve companies own interests, in order to look more at the global interest.

As soon as the project was kicked off, our client called us to prepare a seminar to build a cooperation model with a group of project responsible and with experts in the management of such big projects from the three entities.

Co-initiation phase was realized with the three project managers and three facilitators, two from client internal organization and myself. We defined together the intent and expected outcomes of the seminar, people to be invited to attend and prepared the co-sensing phase.

Co-sensing phase was performed by the three facilitators through dialog interviews. We prepared a simple questionnaire to lead the interviews: the intent was to collect the best of the interviewee experience in realizing such projects, and their expectations from the seminar. It was sensing the differences of point of views inherited from the different companies' culture and building an alliance toward success.

The Presencing two days seminar used the material of the interviews in order to allow people to sense their whole system, to open awareness of what the new cooperation would allow and to visualize it. Then the group entered a co-generative phase where a goal and behaviors charter could be set up. This charter was not just a piece of paper that we stick on the meeting room wall and that we do not see any more. In our case it was more than that: it was the crystallization of profound collaboration intents shared by key representatives from the three entities and the ground for a particular type of relationships for all project engineers.

The project began by a one year front end engineering phase and was conducted by a common leadership team. Several workshops were organized to align people on drivers: safety, robustness, cost, and schedule. It is probably a dream to believe that a simple workshop may change the mindset of senior people who have to preserve their company own interests.

But creating a space for alignment allows people to sense what are the other party's constraints, the hidden logics in work processes and decision making. Knowledge of the mindset of the partners makes easier anticipation and adaptation of relationships to enhance cooperation.

Behavior charters cascading was initiated in all disciplines. It was first presented to all project engineers, and the importance of it. The charter recommended behaviors was used by discipline's partners to assess the current reality of their collaboration and one team spirit, and concrete ways to improve common work processes were identified.

Facilitators were involved in "crisis workshops". Once, the project leader from my company called me for help



because a dedicated group of people having to design together a package and to prepare agreements with subcontractors were stuck. The consequence of the bad relationships could have been critical for the reliability of the global design. I just organized a workshop applying the four types of listening as presented earlier. I was surprised by the fact that people identified in three hours where their misunderstanding was coming from. One key was people to accept to open mind and heart in order to enter the point of view of the other. Another key was to realign themselves on the project goal and on the "one team spirit" intent, making emerge an open will leading to easier conflict resolution.

At a point purchasing process cycle became critical for project cost and schedule. Client's engineers were lacking confidence in the design and in the purchasing practices of our engineers. The consequence was the issue of a lot a technical queries and comments, using a lot of energy and slowing the purchasing cycle. A workshop was organized with key people from the different parties. The articulation of the workshop was focused first on making visible the drivers behind the behaviors of the different players. Then was a time to share differences in purchasing processes: what does really matters at the different stages. Then some points were selected to initiate improvements. The immediate feelings from the workshop were mitigated because some people made a lot of downloading and debate.

Nevertheless, I was surprised to discover some time later that procurement relationships climate was improving and that ordering was progressing satisfactory. Why? Apart of processes and different matters of discussion during the workshop, the most important thing was that engineers and purchasers got the feeling that the leadership team was aware of their difficulties and offering attention to them. Expressing differences and sensing the system as a whole was authorized and even encouraged, in order to surface common areas of improvements.

Now we are at the beginning of the execution phase of the first unit. Our client invited us two years after the initial seminar to assess where we are in terms of cultural differences acceptance and ways to go forward. More than thirty people attended a workshop to surface hidden agendas and identify key enhancements expected in the collaboration system. One conclusion of the workshop was that the behavior charters set up at the beginning, two years earlier was still the reference even if strong improvements were still in front of us.

I discussed with the project purchasing manager from my company to assess the real impact of these initiatives on the purchasing process. She highlighted that the major outcome of this long term business cooperation approach was to create a climate where dialog focused on conflict resolution was possible. Alignment on drivers is a

challenging thing : the key is to understand differences on drivers from the partners, to take care of it and to adapt behaviors to overcome it.

Be committing middle management toward a cultural change

One year ago, my boss shared with me his concern about competitiveness : "Asian competitors being more and more aggressive, we need to get our middle management aware of that reality and create the conditions to transform our mindset about competitiveness.

I proposed to him to apply the Theory U approach and we started working together on the formulation of his own vision of where he wanted us to move forward: 10% price reduction of our bids, achieved by deep design innovation and more involvement of our low cost partners and suppliers.

Existing mindsets in my company and field structure of attention are closer from 1&2, as previously described in paragraph 3, than 3&4. Thus the mission was to create a learning context where people from different sectors: business units, estimation, operations, etc. could learn to listen to each other in a different way and overcome the "silo effect" generated by years of matrix organization.

Co-initiating : my boss chose 15 executives and experts, that we called "sponsors" to co-initiate the process. They represented the whole system by their role. I performed with each of them a dialog interview to collect what was meaning "competitiveness" for each of them, what are our strengths and what are our collective learning edges? I prepared a synthesis on big A0 papers and during a half day session they appropriated the picture of our current reality and identified five strategic orientations to progress:

1. be selective in our prospects and get effectiveness in our bid process
2. orient all our engineering, procurement and construction process toward construction milestones
3. communicate inside about competitiveness and outside with our clients to value our know how.
4. coach the project execution team
5. challenge our current design, procurement and construction work processes

Co-sensing : from this frame, sponsors chose people having the potential to be the "ambassadors of the change in competitiveness" within our organization and to prototype new cooperation patterns. We gathered these 30 additional people with sponsors to initiate together a sensing journey in the organization. Sponsors presented the outcome of the first seminar, the five strategic axis, and I let people experience the dialogue interviews and train



them to access listening level 3. Five sub-groups organized themselves to perform this sensing journey during two months.

Co-innovating : We convened all people to first share the synthesis of the different interviews, in order to have access to the big picture of what our cooperation system is and where are the cracks through which an emerging future could become a reality. Then an innovation movement was conducted with the contribution of guests from the senior managements. It was a presencing moment: first because my boss was fully involved with the 45 people and challenging them, second because the level of commitment increased strongly. The outcome was an impressive list of concrete ideas to test as prototypes in the reality of our proposals and projects.

Co-creating : same groups as for sensing journey organized themselves to formalize prototypes and get it tested in concrete contexts. I provided support to them to facilitate some workshops on specific focus and also when cooperation level within the prototyping group needed to be enhanced.

The story is still going on and that is too early to rise final conclusions. What I observed is that prototyping groups started to "attack the hard" which means to implement new processes, things that the current organization missed to see and do. Here are some examples :

- a regular communication was reset between business units and operations

- a business strategy committee, supported by a commercial intelligence intranet platform is under implementation
- project scheduling is now grounded on C-P-E sequence instead of classical E-P-C way of thinking
- creative processes to find more economic technical solutions have been tested and are going to be standardized
- purchasing activities are now delegated to our indian partner and we are going to simplify our material requisition and bidding process.

To conclude on this approach, I would like to highlight three success factors for such cultural transformation :

1. an inspired leader initiates the transformation and is present in all phases
2. connections are established vertically : management positions work together with lower levels positions, and horizontally : people from different division, department accept to listen to each other and to challenge the way they cooperate.
3. learning by doing : people tend to lose themselves in very long discussion before to enter in action. A deep cultural transformation may occur when people are trusted to action first, accept that earlier they make mistake, earlier they will progress and realize ■

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FACING THE CHALLENGES OF CORPORATE SOURCING

Why Corporate Sourcing Initiatives Fail to Deliver

By Arjan van Weele & Frank Rozemeijer

JOURNAL OF PURCHASING STRATEGY AND VALUE CREATION



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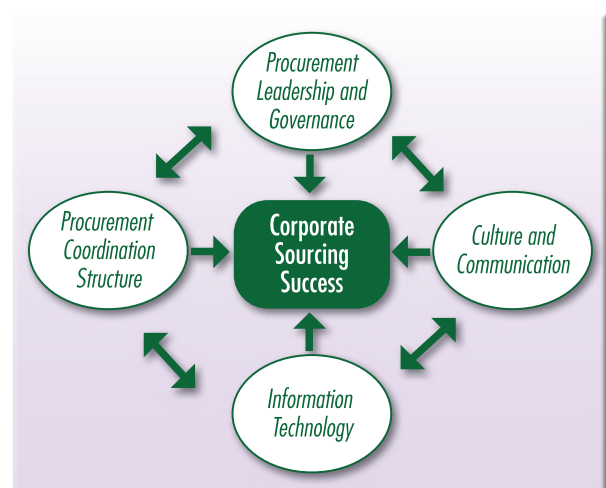
Sourcing as the new competitive arena

Today, faced with an increasingly competitive environment, a greater pressure from capital markets for shareholder value and the unwieldy possibilities of information and communication technology, many corporations have adopted a global approach towards their business activities. These activities do not only include marketing and branding, research & development, manufacturing, but also, and increasingly so, procurement and sourcing². Given their tremendous procurement spend, representing in many cases over 70% of their sales turnover; more and more firms recognize the potential benefits of coordinating their materials and services providers on a global scale, and, therefore, have started implementing corporate sourcing strategies and structures³. Large companies initiated during the last decade corporate cost reduction programs, aimed at saving multi-millions of dollars through creating new competition by continually searching for new suppliers⁴. Research indicates that there has been an actual increase in purchase volume consolidation by large companies since 1990⁵. An ever-increasing number of firms appears to foster the sharing of procurement information and 'best-practices' across their business units⁶. As part of this process, most firms have put a Corporate Procurement Officer (CPO) in place to manage their corporate sourcing activities across business units. Next, they installed corporate lead buyers and cross-functional commodity sourcing teams to manage their often highly fragmented supply needs of their multiple businesses. However, in doing so corporations only seem to scratch the surface: many corporate sourcing initiatives do not deliver the results that were expected from them. Many managers feel that opportunities for synergies in corporate procurement are not fully utilized and important savings opportunities, therefore, are being missed⁷. Overlooking the numerous initiatives that corporations have embarked on to manage their often

huge procurement spend across their business units, the question emerges: 'how to make sure that the corporation gets maximum value from its massive procurement spend?'. Given the many disappointments in this business arena, the answer to these questions is far from simple.

Indeed, large corporations can capture significant competitive advantage through concerted corporate sourcing initiatives. Provided that the proper procurement coordination structure is in place. And, provided that the right information technology and systems are in place. Next, a sharp eye is needed for the cultural and communication related aspects that are influencing corporate sourcing decisionmaking and implementation. And, finally, the right leadership and clear procurement governance rules are needed. These four aspects appear to be important drivers behind successful corporate sourcing initiatives and are key to benefit from real savings from such initiatives (see Exhibit 1). Let's see what is behind each of these important drivers of corporate sourcing success.

Exhibit 1: Four drivers of corporate sourcing success





Choosing the right procurement coordination structure

Some years ago a leading European airline, decided to embark on a major cost reduction project. A project structure was set up aimed to save the company about 6% on its total procurement spend within two years. The project was driven by a task force, reporting directly to the Executive Board. Its task was to initiate, coordinate and drive major cost down projects in close collaboration with the procurement managers, residing in the company's business units and operations. The top down driven approach turned soon into a failure. When the corporate procurement team, supported by some external consultants, set out to gather basic spend data, procurement managers appeared reluctant to share this information. Their cooperation was crucial, since at that time the airline did not have a common, corporate wide procurement information system. Procurement managers did not want to hand over their spend data and supplier agreements since they considered this confidential information that should not be shared with outsiders. Being loaded with work already, local procurement managers were unwilling to participate in the corporate initiatives. When the project was analyzed, it appeared that many middle managers resisted the top down approach also. Moreover they criticized the well funded corporate initiative where they felt that they were kept short of the most basic resources. Next, they disapproved of the bonuses that would be provided to corporate sourcing staff in case of success, whilst leaving the local procurement managers empty handed. Based on this analysis, the CFO decided to review the cost reduction campaign thoroughly. First, cost savings targets were imposed on individual business unit managers, making them part of the game. Next, more generous resources were provided to local procurement managers to free them up for the project work expected from them. Third, the reward structure and incentives were reviewed in such a way that local procurement managers (and other functional managers that were to be involved in the exercise) would also benefit from their team's successes. The review appeared to be very effective. Considerable procurement savings, amounting to about 150 million euro, were realized within 2 years.

This example shows what may happen if sourcing initiatives are misaligned with the company's overall governance structure. The airline's highly decentralized organizational structure, keeping every business unit manager responsible for his bottom line results, did not coincide with a top down driven initiative. Success could only be gained when business managers were actively engaged in this exercise. Targets, roles, the allocation of resources, and the reward structure therefore had to be reviewed.

Our research has shown that large companies may opt for five different coordination models when organizing for corporate sourcing strategies. These should be carefully chosen.

Centralized sourcing model

In a centralized sourcing structure all major supplier contracts are managed by a corporate center. Business units are consulted but apart from some minor contracts, they are not responsible for key sourcing activities. Centralized sourcing specialists provide the firm with a concentrated, collective sourcing and buying power.

This model captures a large part of the potential corporate sourcing synergies, but business units are not always involved, leading to little responsiveness to local needs. Historically, the primary advantage of centralized procurement has been to realize favorable conditions that result from aggregated volumes. This coordination model, however, interferes with a business model that puts the bottom line responsibility at the business unit level, where business unit managers are continuously pressed for short term financial results. In such a situation, these managers usually want to have a say in the contracts that are made with suppliers and, not surprisingly, press local suppliers to do better than the corporate contracted suppliers. As a result compliance on corporate contracts will suffer, and cost savings and bonus targets are not made. For this reason centralized sourcing is scarce in business and mostly found at companies that run centrally coordinated brands and formulas (such as franchise organizations and large retail firms). They may also be found at companies where purchasing professionalism in business units is low.

Decentralized sourcing model

Decentralized sourcing relates to a business structure where all purchases and supplier contacts are managed by individual business units. In this approach, each business unit is autonomous in its contracting activities. Cross business unit co-ordination, if any, is voluntary, ad-hoc and informal. In a decentralized structure it may appear that different business units within the corporation deal with the same suppliers for similar products and services, however at different prices and conditions. Given the fact that all contract negotiations are conducted without any form of coordination, the negotiation position of each individual business unit is weak. As an illustration may serve a large food company in Europe that operated ten individual operating companies in three countries, doing business with 54 different car lease companies! This company operated, due to its take over activities, four different ERP-systems. Since a common coding system for purchased products and services did not exist, it had great difficulty

in making its procurement spend transparent. Moreover, procurement processes and procedures were vastly different, leading to different ways of working and supplier relations. Today, given its high procurement turnover ratio (over 72% relative to sales turnover) this food company has turned its fully decentralized sourcing model into a hybrid one in order to benefit from its procurement power. Having reduced its number of car leasing companies to one, this company was able to post double digit savings percentages on its car leasing rates. A decentralized sourcing model may be found in conglomerates with vastly different business activities. In this situation commonality of procurement needs and suppliers is low, a reason why global procurement coordination does not pay off.

Hybrid sourcing model

Hybrid sourcing models may have three different forms, which are the federal sourcing model, the coordinated sourcing model and the center led sourcing network. Through these hybrid sourcing models corporations avoid the rigidity of the centralized model and the fragmentation that is due to the decentralized model.

Federal sourcing model

The Federal Sourcing model consists of a small central core, is relatively flat, and provides in a common sourcing infrastructure for all autonomous business units. This infrastructure may consist of common sourcing processes, tools and templates, common IT systems and reporting and joint competence development and recruiting. Given the fact that commonality in terms of procurement needs and suppliers is rather limited, there are very few corporate sourcing projects. Apart from some voluntary coordination, most business units source for their own needs. The way in which this is done, however, is similar among the business units. Business units are encouraged to use facilities, systems, tools and services that are provided by the corporate sourcing staff. Usually, there is only a functional reporting relationship between the corporate procurement manager and the local procurement managers. The Federal Sourcing Structure is based upon a few principles. The first principle is that procurement authority resides within the business unit, not with the central staff. Second, all investments made in procurement infrastructure should be beneficial to the business units, whilst each of these is not capable of making these investments themselves. Third, the overall governance model of the firm should stimulate and allow for common sourcing policies and systems. Having concluded their cost savings project, the European airline decided to adopt this coordination model for their corporate sourcing activities. A main reason for this was, the low degree of common products and services that were bought throughout the company.

Co-ordinated sourcing model

This model consists of decentralized sourcing units, that reside within the individual business units, that are supported by a small sourcing staff at corporate headquarters. This sourcing staff oversees sourcing strategies and issues of concern for the entire firm, and it seeks sourcing opportunities for the firm as a whole, where individual business unit staff may not be able to develop this macro-view.

A typical example can be found at Heineken, one of the world's leading beer companies, operating over 100 breweries and selling beer in over 170 countries. Raw materials such as barley and malt and hops are contracted for by the corporate procurement organization.

However, strategic commodities such as glass bottles, system packaging, crown corks and cans are contracted by carefully selected cross functional and cross business commodity sourcing teams. A corporate procurement board, consisting of senior executives representing the most important business units, oversees, approves and monitors all corporate procurement activities. Although bottom line responsibility resides within Heineken at the local business units, corporate interest (when in conflict with the interest of the local business unit) comes first. If an individual business unit does not want to comply with the corporate agreement for these strategic commodities it can only do so after having gained approval from the Corporate Procurement Board. In this model the business units maintain their responsibility for the majority of their procurement spend.

The advantage of this coordination model is that the firm attains the corporate scope as well as the authority in dealing with suppliers, but it does not carry the full overhead cost that often go for fully centralized groups. This coordination model usually is to be found in corporations that operate major global brands and that have a high degree of standardization in their manufacturing operations and product structures.

Centre-led sourcing network

This coordination model consists of a network in which corporate sourcing initiatives take place with the active support of fully empowered sourcing specialists from the individual business units. Standardization of sourcing processes, reporting, IT-systems and competence development are driven by the corporate centre.

The difference with the coordinated sourcing model is that in this latter model no sourcing activities are conducted by staff specialists. The reason for this is that the level of expertise required for professional sourcing resides primarily in the business units. Sourcing staff, however, may initiate corporate sourcing projects based



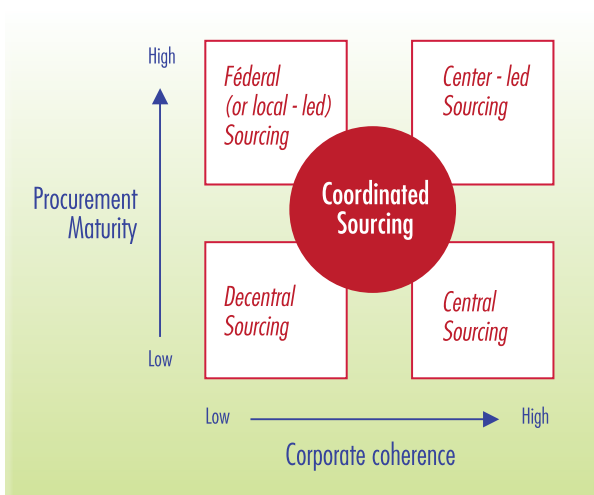
upon specific spend analyses and supply market studies. The primary interest of corporate staff is to initiate and facilitate networking between the individual business units to stimulate exchange of knowledge and experience. Sourcing specialists in the business units report to their own business managers but also to the CPO. However, all corporate sourcing initiatives, essentially, are managed and governed by senior and business management.

These hybrid sourcing models are, thus, somewhat more complex than the straightforward centralization or decentralization models.

In our view, CEO's do not add value by choosing a certain approach to create corporate advantage in procurement as such. They add value by creating a fit between the approach used to create corporate advantage in sourcing, and, as our research has revealed, the level of corporate coherence and procurement maturity (see Exhibit 2). For details with regard to the research that was conducted we refer to Box 1. Corporate coherence is related to the extent to which the different parts of the corporation operate and are managed as one entity. Major differences across business units in management style, vision, strategy, culture and structure usually reflect a low corporate coherence. In a situation, in which a firm lacks a clear corporate strategy, does not have an integrated corporate structure and has a weak corporate culture, the integration of global sourcing activities will be a significant challenge.

Procurement maturity relates to the level of professionalism in the procurement and sourcing area as expressed in the role and position of procurement professionals, involvement of these professionals in major business decisions, involvement of business leaders in corporate sourcing decision making, cross-functional teamwork, the availability of company wide procurement information systems, and competence of procurement staff. Our research has shown that a high level of procurement maturity correlates positively with a hybrid sourcing model.

Exhibit 2: Coordination models for corporate sourcing



Investing in the right procurement information technology

When Skanska, one of the world's leading construction firms with operating units throughout Europe, United States and Latin America, decided to coordinate its global sourcing activities, it faced an almost impossible task. The Executive Board was aware that in the fact based culture of the corporation any plans that would be conveyed to coordinate the firm's massive international spend, would fail without a thorough spend analysis. Skanska's business units used different ERP-systems, not allowing for the detailed spend analyses that many large companies have available today. Even worse was that the corporation, being the example in many disciplines in construction industry, did not have a common coding system for segmenting purchased products, services and subcontractors. Its newly appointed CPO first set out to develop full spend transparency. Starting with the business units in Skandinavia, he sought the help from IBX, a specialized firm selling advanced e-procurement suites and electronic ordering systems. This investment paid off quickly: thanks to detailed spend information, common spend areas among business units in Skandinavia could be identified. An international category sourcing structure, employing initially 30 category teams, was set up to make sure that Skanska would benefit from its massive procurement power and get a preferred treatment from its major suppliers and subcontractors.

Skanska is not alone. Many large corporations today face similar challenges when they set out to develop global sourcing strategies. Basic spend data, supplier information and contracts are hard to find. Certainly, companies that have grown through mergers and acquisitions face a myriad of administrative systems that obscure their procurement's massive profit potential. When basic procurement data is presented, it shows that the corporation deals with millions of transactions that are conducted with thousands of suppliers for hundreds of thousands of items and services. Thanks to a detailed spend analysis common products and services and common suppliers can be identified rapidly. Next, differences in prices paid and other commercial conditions can be thoroughly analyzed. This first step towards corporate sourcing can, based upon our experience, result in procurement savings ranging from 5-35%! This is to say, if and when this exercise is embedded in the right sourcing coordination model.

Managing information, implementing effective international procurement information systems and building complex corporate procurement data warehouses are key in any corporate sourcing initiative. Apart from creating spend transparency, CPOs need their CEO to request large investment budgets for two other important IT-tools: electronic catalogue- and ordering systems and e-auction facilities and marketplaces. However, as is explained

below, these tools will not be effective without building a coherent and professional procurement community in the corporation.

Electronic catalogues and ordering systems. Having been involved in many corporate sourcing initiatives we, again and again, are amazed about the sheer numbers and complexity that are related to procurement operations. Large corporations process millions of transactions, leading to even larger numbers of contracts and transaction processing documents, and millions of invoices. To cite a recent example from a large European bank: until recently this bank processed over 25.000 invoices annually coming from a handful of temporary labour providers, keeping 8 internal, full time staff busy. At a cost of € 50,00 per invoice the administrative costs involved were € 1.250.000,00. It is important to recognize that this 'hidden factory' behind procurement operations does not provide any real value to the company, and these costs should be considered as 'waste', which therefore should be avoided. To improve the situation, the bank implemented an electronic order to pay system, allowing HR-people to order temps electronically from its contracted providers. Weekly/hourly temps notes would be processed similarly, allowing the company to check its expenditure in a more effective way. Next, invoices could be processed electronically, most of the time without human intervention. Other European banks, meanwhile, have decided to process their accounts payable through outsourced service centers located in low cost countries, to even further reduce these administrative costs.

Modern, electronic procurement platforms (as provided by for example Ariba, IBX and many others) provide in more convenience for internal users, a better control of procurement spend and easier and timelier payment of invoices to suppliers. Through channelling all invoices, data can be stored in the procurement data warehouse, allowing procurement managers more effective contract and performance management in supplier relationships. Therefore, investing in electronic catalogue and ordering systems is the backbone of any corporate sourcing initiative. But there is more to do in this area.

Electronic procurement portals. In 2006 AirFrance-KLM, another leading airline in Europe, introduced a Procurement Portal for its international procurement community. This portal does not only serve as a terms of reference for all kinds of basic procurement management information. It also contains functionality for supporting more professional procurement processes. All kinds of tools and templates are available to conduct efficient tendering among pre qualified suppliers, select the right contracting models for supplier negotiations and agreements, monitor and evaluate supplier performance. Finally, this portal allows managers to retrieve information related to procurement improvement initiatives, procurement plans and management reports. E-auctions are of particular interest to companies who

are starting up global procurement initiatives. As examples here may serve General Electric and Volkswagen, who were the pioneers in their industry and have executed since 2000 thousands of electronic auctions, resulting in billions of dollars saved. However, many companies are still reluctant to apply these new procurement tools, since they require seamless teamwork among the staff involved, standardization of processes and a meticulous preparation and execution. Our view is that few CEOs have a free choice with regard to whether to invest in this technology or not. When competitors have done so already, they just have to follow.

These investments will, however, not pay off if firms are not able to build coherent professional procurement communities inside their organizations. Doing so effectively, requires a thorough understanding of the role and impact of corporate culture and communication patterns on corporate sourcing initiatives.

Corporate culture and communication

The continuously changing business environment puts corporate procurement structures - and with them the relationships between senior executives - under pressure. The tension that results from this often impedes the effective implementation of procurement synergies. To achieve results from joint sourcing initiatives, the CEO needs to have a good eye for the tensions that can occur between business unit managers and corporate staff, business and functional areas, employees and suppliers, and the political and power struggles that almost always result from these. Most of these tensions are often barely visible, but are felt strongly by the actors involved.

In general, aggregating volumes for common products and services at the corporate level and negotiating better deals through performance based corporate agreements might be attractive due to the substantial savings that may result from these activities. However, when contracts and contracted suppliers are communicated to the business units, strict governance rules need to be agreed upon. The compulsory character of these contracts needs to be clear and follow up on the actual compliance to these contracts needs to be monitored. Otherwise, the business units, forced by relentless pressure to perform better financially, will use any opportunity to reduce their purchase prices. They will find those opportunities at suppliers that have missed the corporate agreements. By playing 'low ball' these suppliers offer more favourable conditions, at the condition of keeping things strictly confidential and exclusive. Usually, these conditions only last for a short time, but that is not communicated, of course, at the time of negotiation. As a result business units in reality will deal with their own, preferred suppliers, rather than with the



corporate suppliers (who had to offer a worldwide deal most favourable for the entire corporation). The result is that savings opportunities and bonuses are missed at the end of the year, since the contracted volumes with the corporate suppliers did not materialize.

In some cases the problems encountered in this sensitive and political minefield may be detrimental for the CEO's position. Ahold, the Dutch retail company, may serve as an example here. Its American subsidiary, Foodservices, reported in line with budget targets significant cost savings in its commercial deals with major suppliers that did not materialize. However, the much lower cost savings and end of year bonuses were not reported to the CFO, who therefore could not provide a profit warning to the financial community. When this, combined with other irregularities, became public, shareholders demanded Ahold's CEO and CFO to resign. It was estimated that this affair alone costed the company over 800 million dollars. These problems could have been prevented if clear governance rules on how to deal with corporate supplier agreements would have been in place and when contract compliance would have been part of any business unit manager's scorecard.

CEOs and even most CPOs are, as we have experienced frequently, not aware of this kind of obtrusive behavior when carrying out corporate sourcing initiatives. Given their mandate, CPOs in reality have limited power to actually enforce contract compliance from dispersed parts of the organisation. This is why some CPOs after a few years often end up frustrated, feeling that they are "beating a dead horse". This may be the reason for their limited and even decreasing tenure in their job.

It is important that CEOs realise what a difficult position CPOs are in. The solution revolves around the recognition that realising targets related to corporate sourcing initiatives is primarily a business leader responsibility and that corporate interest comes first. Therefore, CPOs have a leading and supporting, rather than a managerial role to play. Projects aimed at realising procurement savings should be presented to business leaders beforehand in the form of a persuasive business case. Having agreed to go for the business case, the CEO and CFO need to manage the entire process. The CEO and CPO should also ensure that corporate sourcing teams have sufficiently qualified staff and that they operate according to previously established and agreed upon targets, sourcing procedures and templates. Doing so requires regular and effective communication among all stakeholders involved. This is one reason why some CPOs have put some part of their investment budget aside to start their own procurement and supply chain management academies, allowing employees and managers to meet in different training programmes, roundtable settings and conferences. Every time that we have been present during this kind of meetings we are impressed about the knowledge that

is present within corporations and how much people and staff can learn from each other. In order to facilitate exchange of knowledge and experience large companies have annual or bi-annual conferences for their multi disciplinary procurement communities that provide a platform for conveying new plans and ideas, reporting on progress, exchange between senior management and category sourcing staff and for energizing the assembled audience. In our view Procurement Intranet and Extranet solutions cannot do without this type of interpersonal exchange. It is decisive for the return that is made on any investments made in procurement information technology and for keeping corporate sourcing initiatives aligned with the overall business interests and objectives.

Procurement leadership and governance

Corporate sourcing initiatives should be driven by clear targets. Targets should relate to expense reduction, procurement cost savings, supply chain cost reductions, reduction of transaction cost and supply base reduction. Targets should also be related to reducing global supply chain risks and creating business value through superior supplier relationships.

Although this may sound logical, most companies fail to provide in proper guidance for their corporate sourcing initiatives. As an example may serve a European manufacturer of offshore equipment, that wanted to coordinate its procurement activities across its six business units. Since this initiative was not meant to add to corporate overhead, the Executive Board decided to set up a Procurement Coordination Committee (PCC), consisting of the local purchasing managers. The PCC initially was chaired by the purchasing manager from the largest business unit. The PCC was asked to come up with ambitious savings.

In general such an approach will not do the trick. Why not? Faced with such a request, procurement professionals are confronted with a dilemma: they realize that target savings should be substantial in order to pay for all the effort. However, if they put ambitious procurements savings upfront they run the risk of being confronted with questions like: 'If these savings would be feasible, why haven't you realized these earlier?'. This shows that target setting for these professionals is not without risk. In order to prevent these confrontations with senior management, procurement managers usually play it on the safe side. Modest savings targets, if any, are put forward in order not to rock the boat too much. Obviously, the corporation is going to satisfy itself with savings that could have been a multiple when more ambitious targets would have laid down the law to the sourcing teams. Therefore, targets should be driven top down based on a thorough spend



analysis by independent internal or external experts. Ideally, these targets also have a clear linkage with the corporate strategy.

Having clear savings targets, allows business leaders to free up resources for it. Here the old saying goes: 'If you pay peanuts, you get monkeys'. Corporate sourcing initiatives should easily pay for themselves since the costs associated with these initiatives should be considered an investment rather than a burden. This is the reason why more professional corporations require their staff to present business cases on corporate sourcing initiatives indicating targets, resources needed, staff involved and time schedule. When pay out ratio's are lower than 10:1, project initiatives are canceled. Apart from sourcing, there are very few business initiatives that meet this kind of investment ratios!

We, therefore, have little sympathy for those corporations, that we have witnessed over time, who stated that sourcing projects to be started should be 'budget neutral' and not get additional funding. This would mean that staff should conduct their team activities next to their daily duties. We do not comply with this narrow minded view. Rather, budgets necessary for freeing up sourcing staff, research and travel should be allocated generously. Otherwise all kinds of discussions may start to occur, delaying project activities, demotivating staff involved and result in lower cost savings than anticipated.

Business leaders should be reported monthly, not quarterly, on the results obtained from corporate sourcing initiatives. Here, the CFO needs to come in. First, he/she needs to define procurement savings. Here, we recommend differentiating between calculated savings and actual savings. The former are savings related to calculating contracted volumes with price differentials. The latter are savings that have accrued from actual, monthly order volumes from contracted suppliers. Second, the CFO needs to provide in the monthly reporting in order to avoid the window dressing that is so common among procurement executives. Third, the CFO needs to report on contract compliance per business unit. Here, major differences between business units may surface. Why do some business units demonstrate high corporate contract compliance, whilst others keep on working with their own suppliers? What monetary benefits are missed by the corporation due to such behavior? Is that allowed? Reasons should be explored and discussed. Next, a decision should be made about the contract compliance rate that every business unit should adhere to.

Corporate sourcing initiatives should be driven and actually managed by a senior executive from the board and not by a Corporate Procurement Officer. Why not? Most CPOs face a difficult dilemma. In many cases, CPOs have assumed a large responsibility for saving the company

millions of Euros. However, they lack authority and mandate over the people that they need to work with to realize the savings. In other words: they cannot force, apart from procurement managers in some cases, any manager in the corporation to comply with corporate contracts. They simply do not have the authoritative power to do so. This problem can only be solved by the personal and demonstrated commitment from senior management. Procurement Coordination Councils should be headed by senior executives representing major business units. When this is done, results may be dramatic. Heineken may serve as an example here. During the last decade Heineken set up a coordination model that originally was presided by a Procurement Executive Board. This Board was chaired by its CEO at that time. The Board consisted of the CEOs of Heineken France, Heineken The Netherlands, and Heineken Export, the CFO, the director of Heineken Technical Services, Heineken R&D and the CPO. At a lower level in Heineken's hierarchy the CPO chaired the International Procurement Meeting, consisting of the local procurement managers from all (European) business units. This type of leadership was not without success. In its first year of existence the company posted over 50 millions euro savings on corporate agreements.

As explained before, business leaders have the authoritative power to control resources, but what is the position of the CPO? Based on our research, we conclude that the power base of CPOs today is different, depending on the sourcing coordination model that is in place. The higher the reporting line and the better the access to business leaders, the more influence the CPO may have. Business skills and management seniority are key for this position, given the changes that are invoked by corporate sourcing initiatives and the sensitivities that surround these. This is why large companies increasingly recruit their CPOs from business rather than procurement ranks.

Making corporate sourcing initiatives perform

Starting up corporate sourcing initiatives implies in many cases significant changes in the way tasks, responsibilities and authorities are divided within the corporation. Implementing such initiatives, therefore, requires a careful change management approach that acknowledges the politics and hidden interests among the major stakeholders. In his or her role as an intelligent change leader, the CPO should be aware that "multiple realities" exist among key players. Issues that involve change are perceived and interpreted differently by each employee and executive. Before starting such a process, but also during it, the CPO should regularly validate and check the expectations of the most important stakeholders against his or her own expectations. This is part of effective leadership that



is needed for managing corporate sourcing initiatives. Meeting procurement cost savings targets and complying to corporate sourcing agreements should be part of any senior manager's bonus scheme. Otherwise, only lip service will be paid by individual business unit managers to corporate sourcing initiatives.

Most corporate sourcing challenges, that have been addressed, are in fact symptoms of underlying governance problems that in many cases do not surface at the level of corporate management. In unleashing the often unprecedented potential of corporate sourcing initiatives, the CEO needs to manage the careful balance between

corporate synergies and decentralized business unit autonomy and interests. Being able to do so requires a careful selection of the right sourcing coordination model, selective investments in information and communication technology, a sharp eye on the cultural and communication aspects as well as strong guidance from effective leadership and clear governance rules. Only if these four levers have been taken care of, CEOs and CPOs might live up against the challenges of corporate sourcing and capture a significant competitive advantage for their company ■

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- ² Procurement and sourcing will be used as primary terminology in this article. Procurement relates to all activities which are required to get products and services from a supplier to its final point of destination at the lowest total cost of ownership. Sourcing is related to finding the best possible source of supply worldwide for a specific procurement need.
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INTERVIEW : XAVIER SARAT

GENERAL MANAGER OF EIPM CHINA



JOURNAL OF SUPPLY EXCELLENCE



What were the major changes within Purchasing in the past 20 years? How has Purchasing evolved in Asia?

Once, many business professionals regarded purchasing as a secondary discipline to finance.

Generally the legal entity owner or leaders simply made the assumption that spending money was the easiest process within their organization.

They preferred to think their challenges lay in Sales & Marketing or with Production. Consequently, Supply Chain Management was narrowly being considered simply as logistics.

Not anymore. This decade, changes are taking place in the areas of Supply Chain Management, Supply Management, Supply Network Management, buyer/supplier alliances, and virtual corporations leading to new concepts such as supplier ecosystems.

Dynamic, collaborative and trusting alliance relationships and networks are the keys to survival and indeed success in the 21st century. These relationships are best established and nurtured by Supply Chain Management professionals. Information technology, engineering, marketing, operations, quality, and finance all play critical roles, enabling advancement in our quest for value-added relationships.

Xavier Sarrat has been working for 10 years in the field of purchasing and supply chain. He started his career with PSA Peugeot Citroen. In his last position, Xavier was in charge of wood-pulp sourcing and supply chain management in the Arjowiggins Group. Xavier is now General Manager of EIPM China.

What will be the major influences on Purchasing in the coming 20 years? What do you expect to see happening in China and Asia?

Now World Class Purchasing & Supply Chain Management is the “front-line” to restrain expenditure and improve the bottom line through reduced costs. Therefore Supply Chain Management has as much or even more impact on the organization's return on assets than any other business function.

First, companies were still looking for cost reduction and endeavoured to alleviate the rise of labour costs or Raw Material costs, especially in the developed areas of China. So far the solutions explored by companies were to move the supply to west inner China or other countries such as Vietnam. Another evolution illustrated by Foxconn, (the world's largest maker of computer components which assembles products for Apple) shows the switch to more automation and a less labour-intensive process through their announcement to deploy 1 Million robots within the next 3 years (10,000 currently).

The second evolution shows the shift from tactical Purchasing roles to Strategic Sourcing & Supply Chain Management roles in order to facilitate marketing's efforts to increase sales. Strategic Sourcing & Supply Chain Management may have a major impact on the organization's top line and creation of value.

The next influence concerns the aversion to risk in a world dependent to increasingly complex supply chains. As one knows, a chain is as strong as its weakest link. Awareness of supplier's financial risk, supply disruption risk, price increase



risk as well as brand issues are rising. Buyers spend more and more time on these subjects on which effects cannot be seen immediately. Thus, efficient communication on this process should be implemented throughout the organization to support the Buyers continuous effort.

The last move which is now gaining further importance in China concerns Corporate Social Responsibilities and the fight against the "hidden rules".

In recent years, the government "purchase prices" have been exposed as well as reports concerning the occurrence of non-competitive behaviour, over-prices or over specifications, reflecting the relationship between parties rather than fair competition.

Recent issues inside MOR (Ministry of Railway) following the train accident in Zhejiang province seem to have put an end to these excesses and we are now seeing a wave of change in the behaviour amongst all actors, not limited to public services.

Which new "competencies" will be required from personnel in Purchasing at the operational and Management levels?

Traditionally in China, respect of professional Purchasing and Supply Chain Management is missing in the market. Today's global corporations recognize the importance of talented and highly educated purchasing professionals in maintaining their competitive edge and sharpening profit margins. The specific competencies required in Asia are mainly on the soft side. The staff is expected to evolve in a cross cultural environment, mainly virtual and with extended responsibilities. According to all executives, further efforts should be undertaken to increase the intercultural awareness, networking activities and ability to challenge internal customers. On the management

side, companies should develop long term vision as well as the business mind-set of their managers enforcing team empowerment at the strategic level.

Do we foresee a major change in investments of companies for purchasing education?

There is a clear switch for companies to invest in purchasing education as the variety and complexity of commodities purchased in Asia increases. Nonetheless, this evolution is limited to global organizations.

We can see a clear difference with Chinese corporations which are still viewing Purchasing as a clerical function and expecting their staff to develop competencies by themselves rather than through company policy. We believe that this gap will remain at least for the coming 2 to 3 years.

As competition for talents is still increasing and salaries for local staff reach the limit of bearable, global organizations also see in training and education a competitive solution to retain their talents and limit the internal turnover ■





EIPM was created in December 1990 by leading companies - Alcatel, Aérospatiale, Amag, Bull, Cerestar (Ferruzzi), Herberts (Hoescht), Nokia, Pechiney, Philips, Renault - and sponsored by the European Commission, the Rhône Alpes Region and the Haute Savoie department to create an European Executive Education and Training Center in Purchasing Education.

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