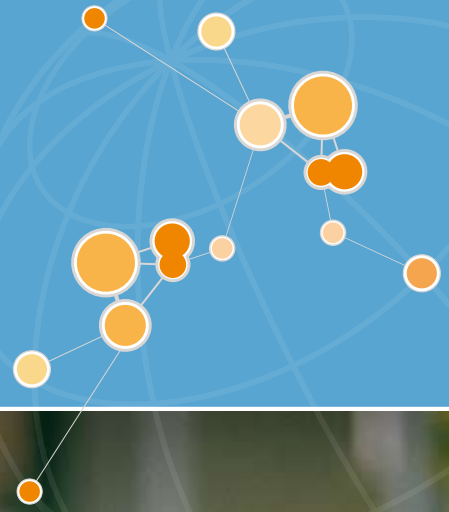


2016

FUTURE SUPPLY CHAIN



ACKNOWLEDGEMENTS

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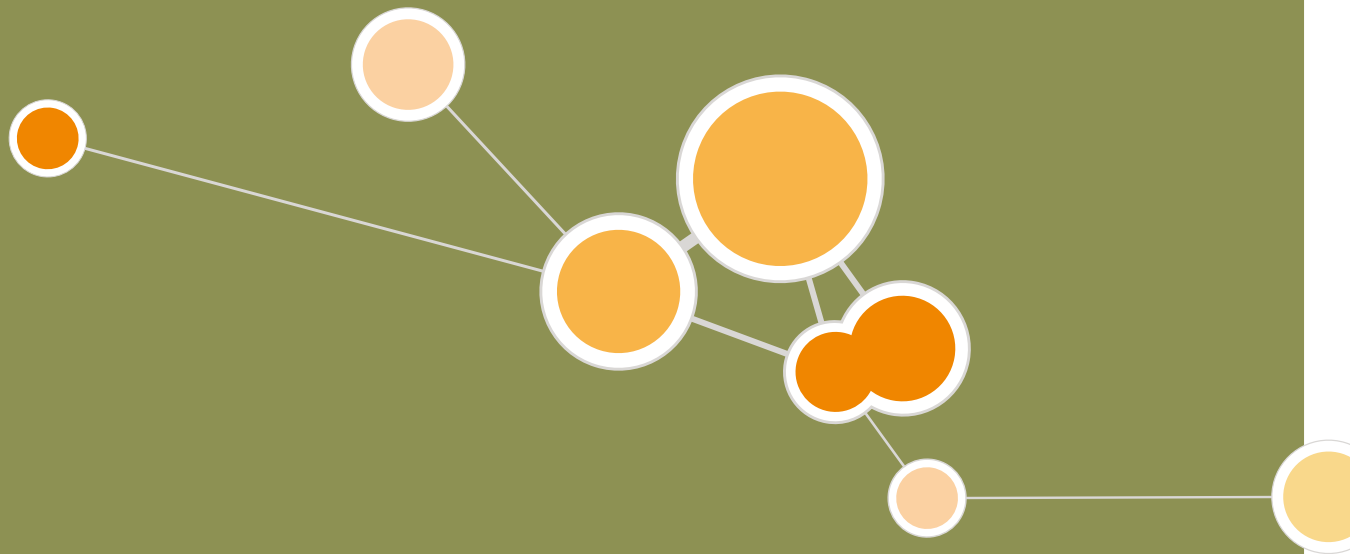
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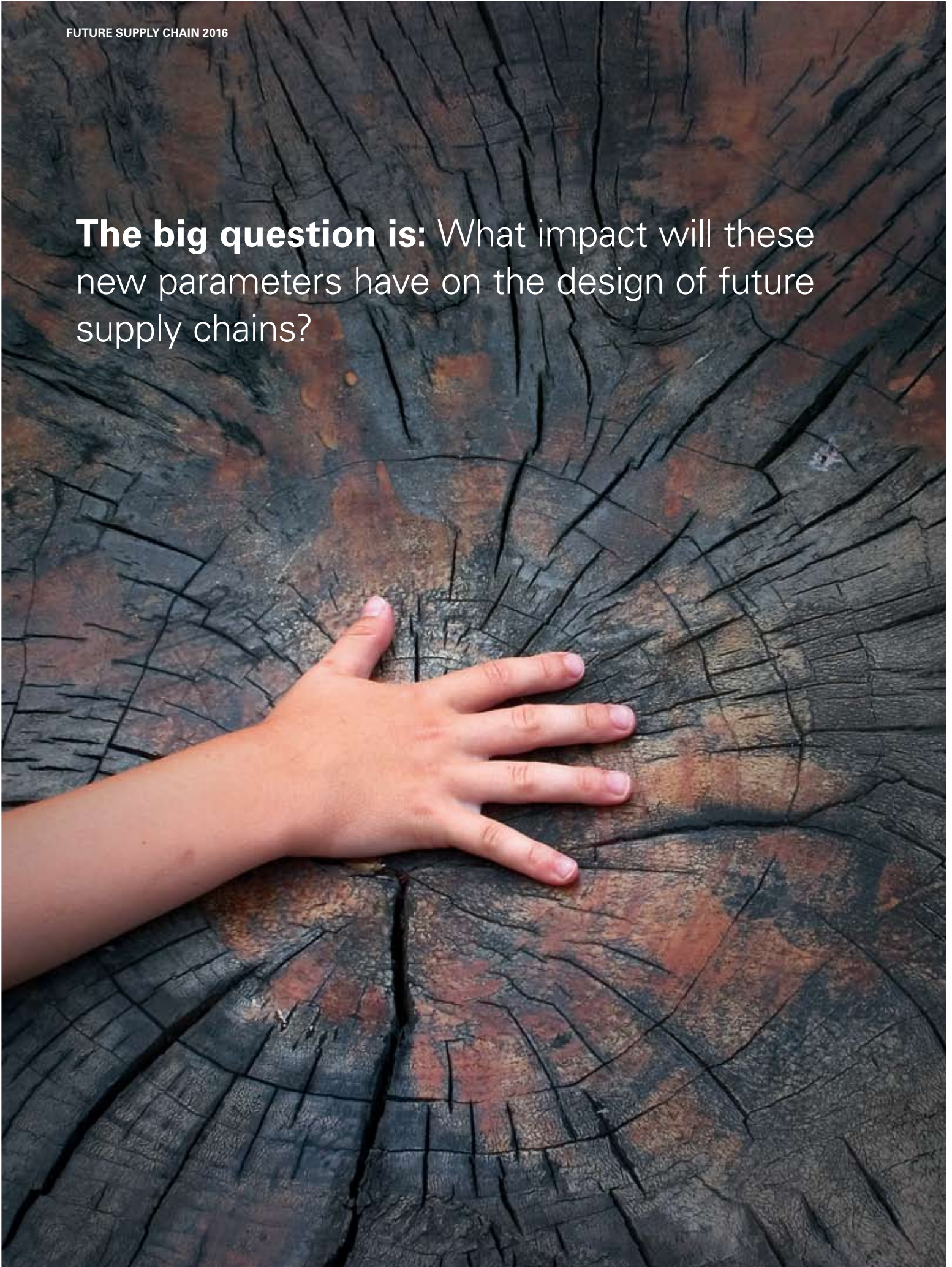
Co-Chairmen of the GCI Future Supply Chain Work Team



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The big question is: What impact will these new parameters have on the design of future supply chains?



Foreword

What does the current focus on sustainability have to do with on-shelf availability and costs in the physical supply chain for consumer goods? The answer is “everything.”

Increasing political momentum around issues such as resource scarcity, climate change, security and new regulations brings to light critical challenges that our industry will face in the coming years. The 2007 Bali Treaty and other political initiatives are driving the industry to come up with breakthrough solutions. Such solutions require new thinking, new approaches and new collaboration on infrastructures.

Until now, the most important parameters for supply chain designs have been related to cost efficiency and on-shelf availability. As a result of the growing importance of these emerging issues, new factors are becoming increasingly critical, such as traffic congestion in urban areas, energy consumption, CO₂ emissions and the permanent rise in transportation costs.

The big question is: What impact will these new parameters have on the design of future supply chains?

The ambition of this report is to provide relevant thinking, ideas and examples to help answer that question.

The breakthrough change presented in the report is based on the joint work of 24 companies in the retail and consumer packaged goods industry. All the elements of this change have been brought together into an integrated architecture for a future supply chain, aimed at a more sustainable broad-based solution for the industry.

The time to act is now, for the benefit of all.

Roland Dachs

Vice President, Supply Chain
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Directeur Flux Groupe
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*Co-Chairmen, Global Commerce Initiative
Future Supply Chain Work Team*

Executive Summary

In the conclusion of “2016: The Future Value Chain,” the Board of the Global Commerce Initiative (GCI) identified and approved three projects that GCI would pursue. These projects were determined to be core to the competency of Board members and were aligned with the Board’s strategic direction:

- New Ways of Working Together
- Information Sharing
- The 2016 Future Supply Chain

Since that time, GCI and Capgemini have worked together on the “Future Supply Chain” project focussed on the following key areas:

- The challenges ahead that will force companies to change their operation.
- The need for breakthrough change, as the past does not reflect the future the industry will face.
- The innovation that currently exists in the form of new solutions, leading practices, example supply chains and new ways to calculate the impact of the new parameters on the supply chain.
- Enhanced collaboration, which is essential among all parties in the supply chain.
- The recognition that now is the time for a step change to a future model leading to sustainability and new business opportunities.

This report, “Future Supply Chain 2016,” presents the results of the project.

Serving Consumers in a Sustainable Way

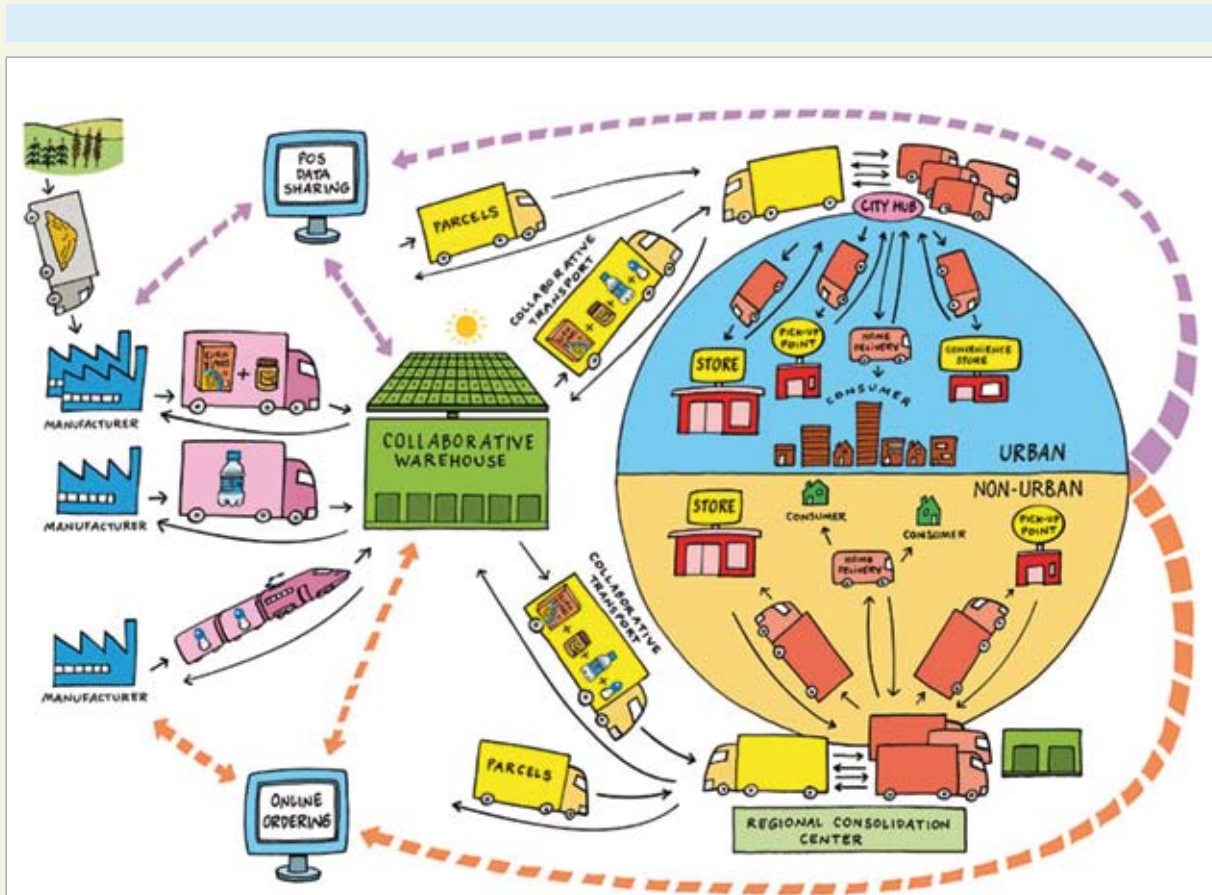
Current supply chain designs are primarily aimed at improving on-shelf availability, reducing cost and supporting sound financial figures (like ROI or return on brand equity). In the future, the industry must design for additional parameters like CO₂ emissions reduction, reduced energy consumption, better traceability and reduced traffic congestion. The impact of these new parameters on the current bottom line may not yet be substantial but will grow in the coming years and efficiency improvements will almost certainly be realised. Supply chain strategy needs to look ahead and give priority to these parameters. All stakeholders in the supply chain will need to play their part to accomplish this change. Consumer awareness and demand for new products and services will also accelerate the adoption of new practices.

How should the industry build the future supply chain and what are the components? To answer that question, four key elements must be taken into account:

Solution areas: The solution areas cover existing challenges and those anticipated for the coming decade. The solution areas are focussed on physical supply chain innovation. Seven key solution areas were identified:

1. In-Store Logistics: includes in-store visibility, shelf-ready products, shopper interaction
2. Collaborative Physical Logistics: shared transport, shared warehouse, shared infrastructure
3. Reverse Logistics: product recycling, packaging recycling, returnable assets

The 2016 Future Supply Chain



Characteristics of the 2016 Future Supply Chain

- The future model will be based on multi-partner information sharing among key stakeholders: consumers (the originators of the demand signal, either from home or from a store), suppliers, manufacturers, logistics service providers and retailers.
- After production the products will be shipped to collaborative warehouses in which multiple manufacturers store their products.
- Collaborative transport from the collaborative warehouse will deliver to city hubs and to regional consolidation centres.
- Warehouse locations on the edge of cities will be reshaped to function as hubs where cross-docking will take place for final distribution.
- Non-urban areas will have regional consolidation centres in which products will be cross-docked for final distribution.
- Final distribution to stores, pick-up points and homes in urban and non-urban areas will take place via consolidated deliveries using efficient assets.

4. Demand Fluctuation Management: joint planning, execution and monitoring
5. Identification and Labelling
6. Efficient Assets: alternative forms of energy, efficient/aerodynamic vehicles, switching modes, green buildings
7. Joint Scorecard and Business Plan

Leading practices: Examples of existing leading practices are integrated into the model to show how they help to address these solutions areas. These leading practices make it clear that benefits are real and achievable.

Application to example supply chains: Simplified supply chains are used to demonstrate how the new supply chain model can work and how it can be adapted to individual companies. In each case, appropriate new solutions are posed, taking into account the main characteristics of the example supply chains.

New ways to calculate the impact on the supply chain: These calculation models, using the new parameters, are an essential element of the future supply chain in determining the impact of the leading practices and solutions.

A New Model for Enhanced Collaboration

Integrating these improvement solutions together with collaboration concepts into a cohesive model will provide the future supply chain architecture that will help bring new efficiency and cost reduction for the industry. This analysis demonstrates how the different solutions should be considered in relation to each other, and makes it clear that a big impact on the parameters can be made when the following concepts are merged and implemented:

- Information sharing – driving the collaborative supply chain
- Collaborative warehousing
- Collaborative city distribution (including home delivery and pick-up)
- Collaborative non-urban distribution (including home delivery and pick-up)

The Future Supply Chain in Emerging Markets

Many of the trends, issues and changes discussed in this report are based on the industry supply chain primarily in Western markets. In a report of this nature it is not possible to envision the future situation in all geographies. History has shown that many of the emerging nations follow the trends set by Western markets and that they often do so by moving there more rapidly than was done in established markets. New technology often leads to leapfrogging developments, skipping the evolutionary phase. A good example is the widely accepted use of satellite technology in some developing markets over the more traditional land lines. At the same time, established markets may be hampered by existing legacy systems.

Readers are encouraged to assess what the changes discussed in this report might mean for both the established as well as the developing markets across their distribution channels. Geographies, economies and social groupings will always be diverse, but many will be subject to the trends and changes identified in this report.

The future supply chain is expected to provide clear benefits for our society, for the industry, for individual companies, and ultimately for consumers and shoppers.

While individual examples of these concepts already exist, the key to their broader implementation across the industry will be improved collaboration. Improving such collaboration demands new ways of working together in the physical supply chain, a framework for which has been developed by GCI and is being addressed by a separate work team.

The total impact of this supply chain redesign (even taking into account the usage of current transport and storage technology) could potentially reduce transport costs per pallet to the order of more than 30%, cut handling costs per pallet to the order of 20%, reduce lead time by 40% and lower CO₂ emissions per pallet to the order of 25%, while also improving on-shelf availability. This does not include additional energy cost savings stemming from more efficient assets such as green buildings and fuel-efficient/aerodynamic and jumbo trucks.

These benefits and others are expected to be achievable when all the elements of the future supply chain are in place. The future supply chain is expected to provide clear benefits for our society, for the industry, for individual companies, and ultimately for consumers and shoppers.

Taking the Next Steps

The realisation of the collaborative concepts that comprise the 2016 future supply chain architecture will require a number of initial next steps, driven by industry leaders. These steps are as follows:

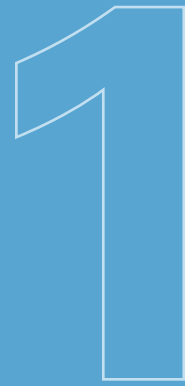
- Establish buy-in on the vision by a group of key stakeholders (such as leading retailers and manufacturers, mayors of big cities).
- Check the concept's business case with the involvement of all key stakeholders.
- Pilot the concept (or possibly leverage and enhance existing pilots).
- Evaluate the implementation and share learnings.

The following pages provide insight into the development of a future supply chain that will react to and help satisfy tomorrow's consumers in a sustainable way. (Note that further details of leading practices, example supply chains, calculation models, the integrated model and a glossary of terms can be found in the separate, freestanding Appendix that accompanies this report.)

"Future Supply Chain 2016" on the Web

More information about the "Future Supply Chain 2016" report and project, including the freestanding Appendix, can be found at www.gci-net.org and www.capgemini.com.



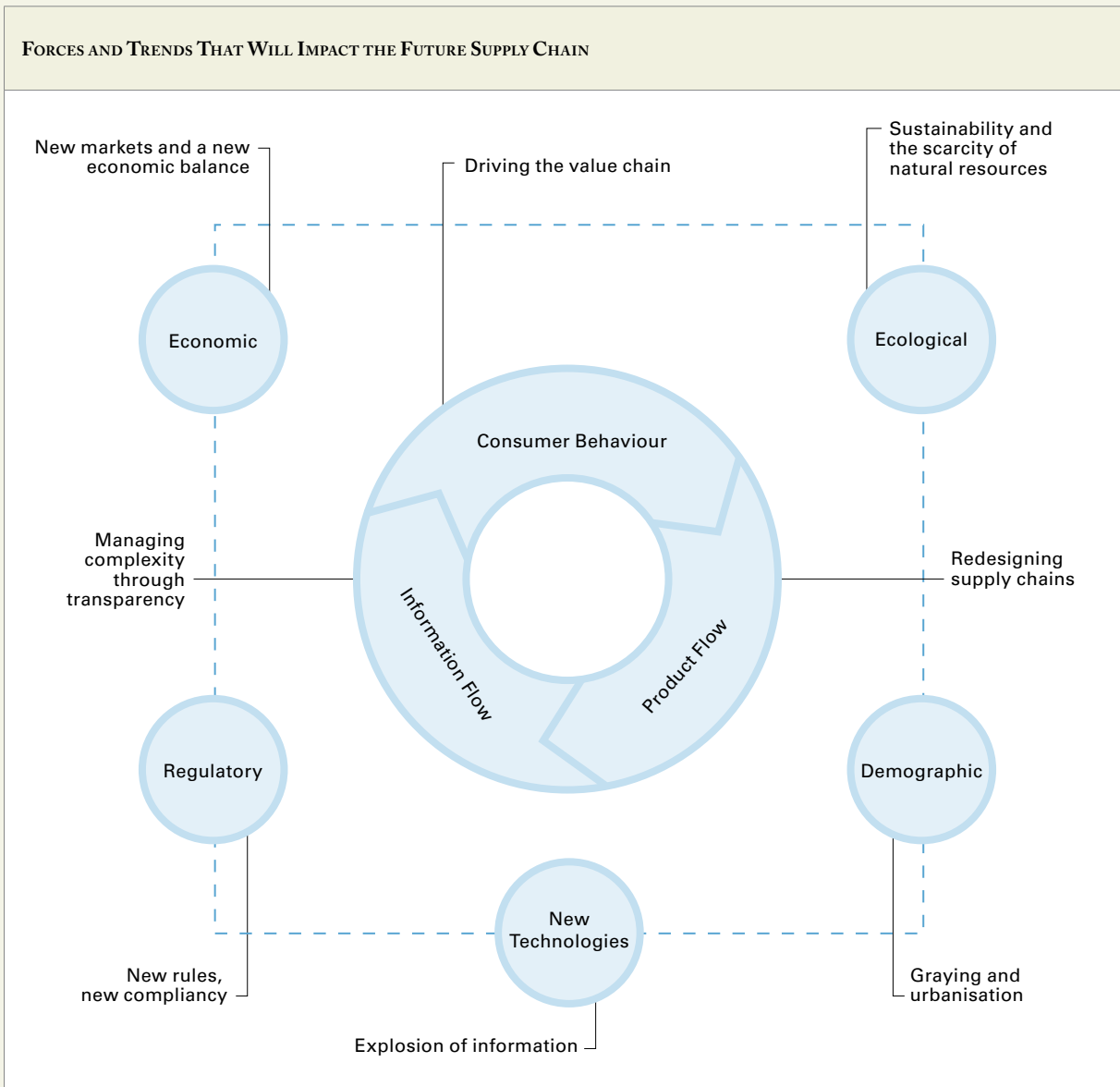


The Future Challenge

A view of the drivers of change and their impact on the future supply chain.

Are you ready for 2016? That was the question posed in the vision report titled “2016: The Future Value Chain,” published by the Global Commerce Initiative in conjunction with Capgemini and Intel. The report concluded that: “Improved collaboration between all parties in the value chain will be essential in order to achieve a more efficient and effective value chain to better serve the needs of the consumer.”

This new report focuses on the future physical supply chain and the critical role that collaboration will play moving forward. The first step toward defining appropriate scenarios for the future supply chain is understanding the relevant forces and trends that are anticipated in the coming years.



External forces impacting the future supply chain will include economic issues, ecological issues, changing demographics, new technologies and regulatory forces. These external forces are difficult to influence but will have an effect on the future supply chain. However, the industry can be part of shaping the future supply chain around key industry trends in the areas of consumer behaviour, information flow and product flow.

External Forces Driving Change

When we look ahead, we see a number of external trends that will shape the industry in the coming 10 years, which are largely outside the control of the industry. But retailers and consumer products companies must consider the impact of these external forces on their business and determine how best to respond to the changes that will be brought about as a result of their impact.

Economic trends: new markets and a new economic balance. Brazil, Russia, India, China, Africa and Korea will be major markets to consider in the coming years. Each of these markets will evolve much more quickly, compared with the parallel changes that occurred in North America and Western Europe. There will also be changes in the balance between local and global sourcing.

Ecological trends: sustainability and the scarcity of natural resources. Sustainability will be a prime consideration for future scenarios. The industry will need to convince consumers that it is operating in an ecologically responsible manner. The 2007 Bali Treaty and other political initiatives are challenging the industry to come up with breakthrough solutions by 2020. Preserving energy and raw materials and other resources like water will become a crucial aspect in future supply chains, as costs will likely remain volatile and supplies will continue to dwindle.

Demographic trends: graying and urbanisation. The future will be dramatically changed by shifting demographics, such as the graying of Western countries and the increase in urban population. For example, it is projected that 51.3% of the world's population will be urban by 2010.¹



¹ <http://news.ncsu.edu/releases/2007/may/104.html>

The coming years will see a new era for industry collaboration, which will become an important factor for future success.

New technology trends: explosion of information.

Moore's Law will continue to scale the effects of new technologies in ways never before seen. For example, RFID technologies will play a big role in the future. In addition, the adoption and use of new technologies by consumers and shoppers (in home, in stores, on-the-go) will grow rapidly.

Regulatory trends: new rules, new compliancy.

In addition to consumer pressure and companies' own growing emphasis on corporate social responsibility, governments will enact more regulations, particularly targeting areas such as sustainability. This will be done by government and regulatory bodies at different levels: local, national and international. In addition, some current labour regulations must be repealed (for example, for more flexible working times) to allow infrastructures to be used to their full capacity with less stress on the environment.

Industry Trends Driving Change

There will also be key industry trends that will affect the future value chain, particularly in the areas of consumer behaviour, information flow and product flow. In contrast to the external forces, the industry does have the power to shape how this change will take place, at least to some degree.

Consumer behaviour: driving the value chain.

Consumers and shoppers will continue to become more demanding and empowered. In fact, they

will become active partners in the supply chain and will directly drive product development and replenishment. They will increasingly interact (including ordering and buying) via different channels (online, in-store, mobile),² and will require other delivery mechanisms besides the stores, including, for example, neighbourhood distribution and home delivery.

Product flow: redesigning supply chains.

New industry challenges necessitate new supply chain solutions. Urban structures will require special attention. Current transportation and infrastructures are increasingly congested and hamper the required service levels. In addition, energy prices and government regulations (for example, relating to city distribution) will have a significant impact on transportation. The industry will need to rethink how products are distributed.

Information flow: managing complexity through transparency.

Supply chains in the future will be even more complex than they are today. Companies will need to determine how best to work together to effectively match supply with demand. Open information sharing will be an important foundation to help companies anticipate dynamic consumer demands. Collaboration should focus on areas of common interest, without affecting the competitive positioning of companies.

² "Future Consumer: How Shopper Needs and Behaviour Will Impact Tomorrow's Value Chain," Capgemini.

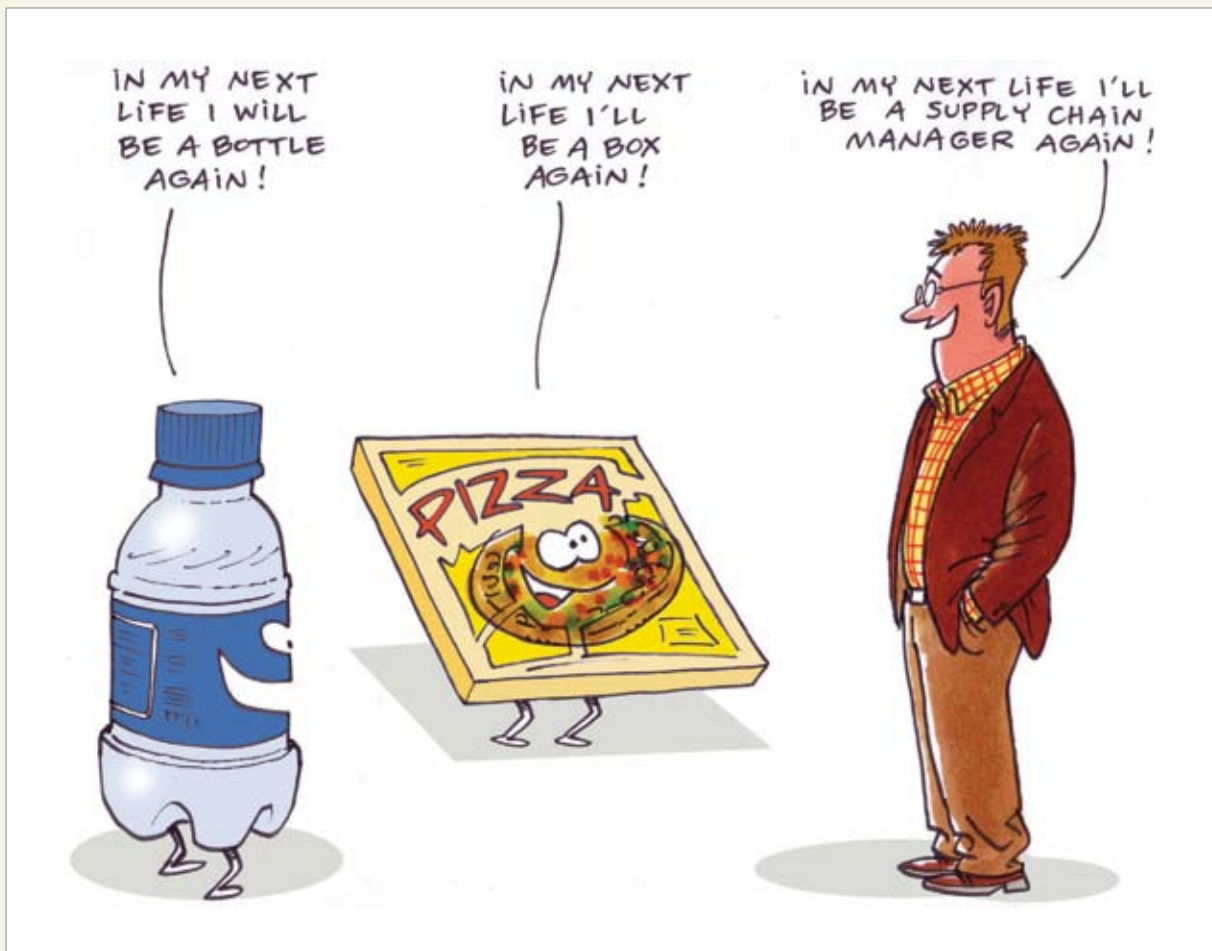
Conclusion:
Critical Changes Need to be Made

True collaboration will be imperative. The coming years will see a new era for industry collaboration, which will become an important factor for future success. In many cases, this will require companies to rethink their areas of competitive advantage. Some business areas that are now considered to be core differentiators may well become candidates for collaboration with competitors, such as replenishment in inner cities. In addition, industry collaboration will be essential to encourage governments to enact more appropriate regulations.

Supply chain managers will need new capabilities. Addressing all of these challenges will require new ways of working, new tool sets and thus new supply

chain management capabilities. New types of supply chain managers will look not only at efficiency, but will also understand the potential of innovation and collaboration. The mindset regarding the current management capabilities should be changed in order to realise the vision. Achieving this new mindset will require additional training and development of new skills and tools. Education programmes should be set up to address these behavioural issues and to develop a new approach to leadership.

This overview of trends that will impact and drive future supply chain scenarios makes clear that there are critical changes the industry will need to make. The next chapter explores the changes to the physical supply chain that will be necessary in order to move toward 2016.





2

The Past Does Not Reflect the Future

Individuals, companies and nations must move to adopt more sustainable supply chains, begin to measure against a new set of sustainability KPIs and report progress on their reduction.

Today the industry faces issues that remain difficult to solve. For example, companies are still challenged to put full truckloads on the road. Out-of-stocks continue to be a perennial problem. Results from a recent ECR Europe study on out-of-stocks show that the loss of revenue for all grocery stores in France alone is estimated at €200 million per quarter. The industry's infrastructure remains complex. Energy costs continue to rise as the price of a barrel of oil increases. Urban distribution remains an issue, because the model is outdated: New infrastructures and new rules such as congestion charges will lead to major adjustments in managing flows.

These issues have changed little in the past 10 years, yet real solutions have not been found and implemented. It's clear that the current way of working is not sufficient and that the industry must take a new approach.

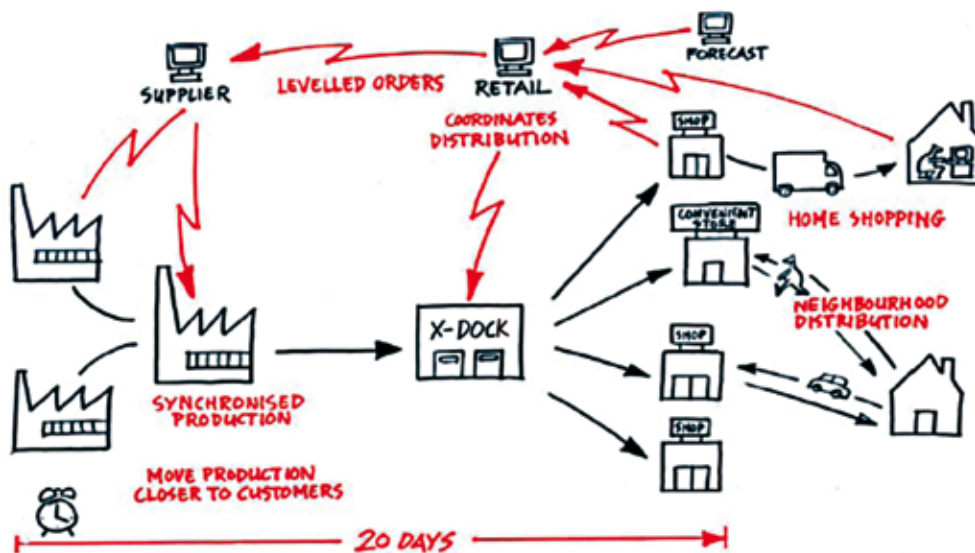
The Future Value Chain 2016

The report titled "2016: The Future Value Chain" defined a unique vision of the total value chain, including a broad-based supply chain perspective that starts with sourcing, progressing to manufacturing, then through distribution to the retailer and consumer.³

Key aspects of this vision are as follows:

- The overarching goal is to greatly reduce the lead time from source to the consumer by treating the value chain as a whole, not as a sequence of separated silos.
- This requires re-evaluation of the physical layout of the supply chain and improved mechanisms to synchronise production with actual demand.
- Real-time, flexible and standardised information sharing along the value chain is foundational for this, with consumer-driven demand data as the starting point.
- Home shopping and neighbourhood distribution will emerge in co-existence with the evolved store-oriented supply chain.

EVOLVING VALUE CHAIN OF 2016



³ For purposes of the future supply chain project, manufacturing is treated as a black box, although certainly manufacturing will also face existing and new challenges over the next decade, including issues such as ethical sourcing and fair trade.

New KPIs for the Future Supply Chain

Current KPIs

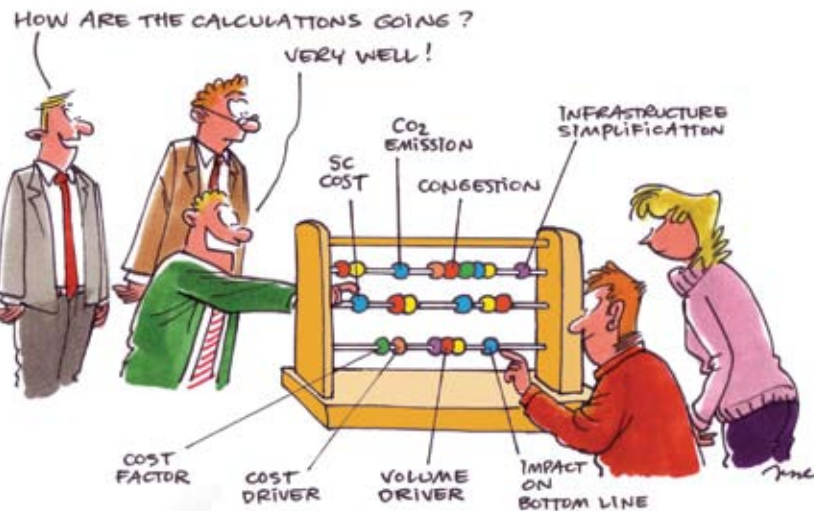
Availability to consumer (percent in-stock)
 Cost reduction
 Financial KPIs

- Return on investment (ROI)
- Gross Margin Return on "X" (GMROX)
- Return on brand equity
- Inventory

Traceability

Sustainability KPIs

Energy consumption
 CO₂ emissions (greenhouse gases)
 Traffic congestion
 Water consumption
 Security compliance
 Infrastructure simplification



New Measurements Required

Achieving this vision of the future value chain will require a different approach to measurement that must be designed for new parameters. Most supply chains today are measured by Key Performance Indicators (KPIs) such as availability to the consumer (percent in-stock) and cost reduction, as well as financial KPIs like return on investment (ROI), return on brand equity and inventory.

Although current KPIs can be used to measure supply chain efficiency, they do not adequately address supply chain sustainability. For this purpose, additional KPIs such as energy consumption, CO₂ emissions, traffic congestion and infrastructure simplification have also been incorporated into the development of the future supply chain model. This set of KPIs will address the current and future sustainability issues as well as on-shelf availability and business cost.

Let's look more closely at these new KPIs.

Energy consumption. Companies and organisations must strive to use more renewable energy sources and use less energy overall in their operations. According to the International Energy Outlook 2007 (IEO2007) report, total marketed world energy consumption is projected to increase 57% from 2004 to 2030.

CO₂ emissions are measured in tonnes of CO₂. For transportation, the amount of CO₂ emitted is directly attributed to weight, mode and distance travelled. For warehouse and store locations, the amount of CO₂ emitted is directly attributed to the type of energy consumed to operate the facilities.

Future supply chains will have to demonstrate their reliability even in larger and complex collaborative modes.

Increasingly, governments are making commitments and legislation to drive reduction in CO₂ emissions. For example, the British Climate Change Bill published in mid-November 2007 set a legal target for Britain to cut national carbon dioxide emissions by 60% by 2050. Or the energy bill in the United States that calls for gasoline mileage requirements for cars and trucks to increase to an average of 35 miles per gallon by 2020, a 40% improvement.

Traffic congestion is a new measure that is being used by various governments and regulatory bodies as a disincentive for urban traffic congestion and pollution. Several cities of varying sizes have adopted programmes where vehicles are taxed or entirely prohibited from entering urban geographic regions.

For example, the London congestion charge is a fee for some motorists travelling within those parts of the city designated as the Congestion Charge Zone. And in Amsterdam, where 5,000 trucks per day enter the city centre, there are restrictions on truck length and weight and limited time slots for replenishment.

Water consumption will be a big issue in the future. Access to drinking water will become increasingly scarce and environmental changes will occur as a result. Governments and non-governmental organisations have implemented awareness programmes and policies to address the growing concern.

Security compliance will also be a key focus in the coming years. Recovery action plans both for information and physical processes must be integrated into everyday procedures. Security requirements in warehousing and transport must be reinforced for the safety of people and the traceability of goods in compliance with regulations. Future supply chains will have to demonstrate their reliability even in larger and complex collaborative modes. Companies should monitor their level of compliance.

Lastly, **infrastructure simplification** is a measure in cubic metres of a company's physical footprint so that going forward a base case can be established and measured against. The goal would be to optimise the overall space occupied and relocate warehouses and distribution centres in more appropriate locations.

Now that we have defined and considered the changes that should be applied to the physical supply chain, we turn to the solutions available to make this happen. The next section introduces the toolkit for making the desired changes to the supply chain.

Major Sustainability Activities and Regulations

A number of global events and recent regulations make clear the urgency of addressing sustainability issues. Consider a few examples:

Kyoto Protocol, December 1997. This treaty was signed by 36 industrial countries in 1997 in Kyoto, Japan, and called for all industrialised nations to reduce their collective emissions of greenhouse gases by 5.2% versus 1990 levels. The goal was to lower average emissions of CO₂ and five other greenhouse gases.

United Nations Climate Meeting, Bali, December 2007. Twelve thousand delegates from 190 nations gathered in Bali for two weeks of talks on climate change. A decision was finally reached to approve a “roadmap” for two years of negotiations on a broad pact to succeed the Kyoto Protocol from January 1, 2013.

Carbon Disclosure Project (CDP).⁴ The CDP is an independent not-for-profit organisation aiming to create a lasting relationship among shareholders, purchasers and corporations regarding the implications for shareholder value and commercial operations presented by climate change. Increasingly, focus is shifting from companies’ own emissions to their supply chains, where, for many sectors, the majority of greenhouse gas (GHG) emissions are generated. Corporations require better information to develop and deliver robust and effective carbon management strategies and incorporate climate change into supply chain decisions.

EU Directive on Renewable Energy, January 2008. On January 23, 2008 the European Commission put forth an integrated proposal for climate action. This includes a directive that sets an overall binding target for the European Union of 20% renewable energy by 2020 and a 10% minimum target for the market share of biofuels by 2020, to be observed by all member states.

⁴ www.cdproject.net



3

A Toolkit for an Innovative Future Supply Chain

Solution areas, leading practices, example supply chains and calculation models are the tools needed to build an innovative future supply chain model.

Taking into account the considerable forces that are driving change, together with the changes that will need to be made to the physical supply chain, how should the industry build the future supply chain and what are the elements? To answer this question, four key components must be taken into account:

- **Solutions areas:** The solution areas address existing challenges and those anticipated for the coming decade.
- **Leading practices:** Examples of existing leading practices are integrated into the model to show how they help address the solutions areas.
- **Application to example supply chains:** Simplified supply chains are used to demonstrate how the model works.
- **New ways to calculate the impact on the supply chain:** These include both macro-level and micro calculation models.

This section looks at each of these components. However, it is important to note that the components do not stand alone; they interact with each other. At the same time, they are not set in stone. Individual companies can “play” with the elements and apply them to their own specific situation. The results provide a realistic picture of a company’s own supply chain and offer insight into which solutions will be important in the future and the potential benefits.

Solution Areas and Leading Practices

All of the solution areas focus on physical supply chain innovation. Examples of real-world leading practices help illustrate the achievable benefits in each solution area. Applying these solutions and leading practices to example supply chains will help identify potential improvement opportunities.

The following solutions areas are examined in more detail:

1. In-Store Logistics: includes in-store visibility, shelf-ready products, shopper interaction
2. Collaborative Physical Logistics: shared transport, shared warehouse, shared infrastructure
3. Reverse Logistics: product recycling, packaging recycling, returnable assets
4. Demand Fluctuation Management: joint planning, execution and monitoring
5. Identification and Labelling
6. Efficient Assets: alternative forms of energy, efficient/aerodynamic vehicles, switching modes, green buildings
7. Joint Scorecard and Business Plan

1. In-Store Logistics. Solutions in this area involve improvements within the store and focus on adding value to the consumer and reducing business costs. These solutions encompass products entering the store at the back and products picked by or for the consumer in the store.

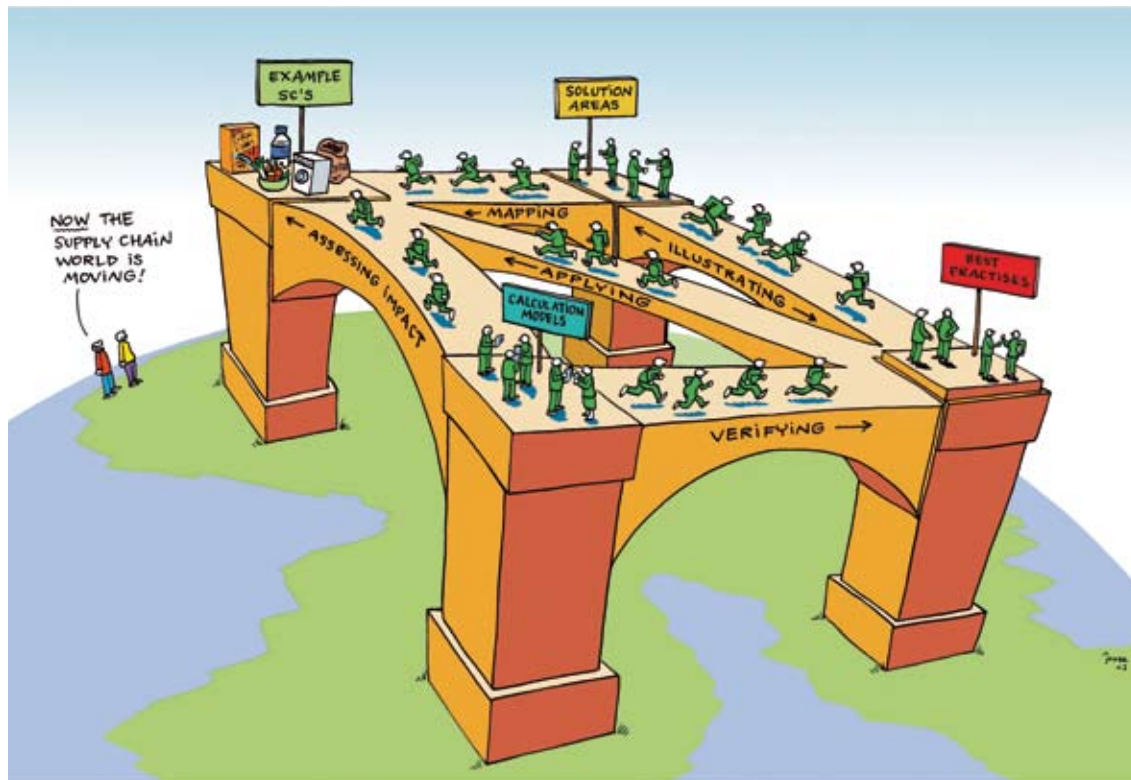
An example is in-store visibility. RFID technology can be used to enable real-time insight into inventory, with alerts via computer when supplies are running low or when theft is detected. Another example is shelf-ready products, which arrive as a merchandise unit that is easy to identify, easy to open and can easily be put on the shelf. Shelf-ready products aim to improve shelf replenishment and enhance visibility.

Shopper interaction is another in-store logistics solution and requires improved availability of consumer data for both the manufacturer and retailer. POS data should be available and used to build a data warehouse, which provides analysis and reports that fit to the KPIs of the manufacturer and retailer. Shopper interaction may involve the use of mobile devices such as electronic labelling, mobile payments and mobile device marketing, and in-store kiosks and narrowcasting to present information designed to stimulate purchases.

2. Collaborative Physical Logistics. This solution area is defined as the sharing of physical infrastructure such as warehouse storage and transportation vehicles in order to simplify the overall physical footprint, and to consolidate flows to improve service and asset utilisation. Sharing and collaboration can take place both between and across various nodes of competitive supply chains and it can apply to existing infrastructure or to newly built collaborative infrastructure. Examples include:

- **Shared transport:** A collaborative approach between manufacturers, between retailers, and between manufacturers and retailers and possibly a third-party logistics provider to share transport; it involves sharing load planning and truck capacity.
- **Shared physical infrastructures:** Manufacturers, retailers and possibly third-party logistics providers collaborate to share warehouses and distribution centres for activities such as storing goods or cross-docking.

THE TOOLKIT FOR THE FUTURE



- Shared information:** Sharing information to manage flows among manufacturers, retailers and third-party logistics providers in order to combine deliveries from more than one source towards multiple stores via a warehouse or distribution centre.

As an example of collaborative physical logistics, ECR Europe has set up a project with the objective to help companies in the supply chain reduce the environmental impact of transport in a way that is economically and socially sustainable. The project will deliver a practical roadmap and self-assessment tool, which will allow organisations to identify, plan and measure improvements in their transport operations. Ultimately such collaborative sustainable transport efforts will be measured in fewer and friendlier miles.

These solutions can benefit from efficient asset solutions, for example green buildings and more fuel-efficient transport.

3. Reverse Logistics. This is defined as logistics designed to reprocess assets, materials, packaging, products or other components that can be recycled, reused or remanufactured. Solutions include traditional backhauling, product recycling, packaging reuse and packaging recycling.

Reverse logistics solutions encompass the reuse of assets in the supply chain that are not directly product related, such as pallets and crates. For example, an automatic pallet labelling solution may incorporate “Flag Tag,” a feature that makes it possible to tag all pallets with one type of tag, such as an RFID chip.

AT A GLANCE: SOLUTION AREAS, KPIS, LEADING PRACTICES

Solution Areas	KPIs										Leading Practices		
	Availability to consumer	Cost reduction	Return on brand equity	Inventory	Traceability	Energy consumption	CO ₂ emissions	Traffic congestion	Infrastructure simplification	Water consumption	Security compliance	Company	Leading practice
In-Store Logistics	•		•	•							•	Schuitema	Implementing RFID on crates with ready-to-cook vegetables. Sales have increased by 10% to 12%.
Collaborative Physical Logistics		•				•	•	•	•			Carrefour, Bénédicta, Nutrimaine, Lustucru, FM Logistics ECR Europe	A multi-player approach has resulted in benefits such as a 34% increase in average delivery frequency and a 115% increase in average load per delivery. ECR Europe's sustainable transport project is designed to help companies reduce the environmental impact of transportation.
Reverse Logistics						•	•					HP, Braun/ Gillette, Sony, Electrolux	Together the companies founded the European Recycling Platform to encourage a competitive market for Waste Electrical and Electronic Equipment (WEEE), which is expected to reduce costs by more than 50%.
Demand Fluctuation Management	•	•		•		•	•					Scotts Philips	Scotts' use of consumer-driven replenishment has led to improved fill rates (98%), in-stock service (95%), inventory turns and order forecast. Philips' Collaborative Planning, Forecasting and Replenishment programmes with several customers have created a consumer-driven supply chain, resulting in an increase in forecast accuracy to above 80%, a reduction in stock levels in the supply chain by more than 30%, and an increase in on-shelf availability to about 95%, driving sales and consumer satisfaction in the process.
Identification & Labelling	•	•			•	•	•				•	GS1	The GS1 System of Standards provides a world-wide open standard, supported by published guidelines and precise allocation rules. Leading practices include GTIN, GLN, SSCC and Data Bar.
Efficient Assets		•			•	•	•	•			•	Macy's Metro	Macy's and SunPower Corporation's solar and energy efficiency initiative has reduced energy consumption by about 40%. Through the integration of EURO-5 trucks into its distribution network, MGL Metro decreased CO ₂ emissions by 25% between 2003 and 2006. It is aiming for an 84% reduction by 2009.
Joint Scorecard & Business Plan	•	•				•	•					Wal-Mart	Implementing a packaging scorecard for suppliers is Wal-Mart's next step in moving toward achieving a 5% reduction in packaging by 2013.

Source: Global Commerce Initiative, Capgemini

4. Demand Fluctuation Management. Demand fluctuations require new models to smooth the demand signal coming from customers. These new models transcend traditional approaches to retailer-supplier integration and collaboration.

Vertical solutions include promotion/introduction calendars and supply/demand capacities to align introductions and promotions. An additional solution is collaboration on execution, that is, joint supply/demand anticipation based on real-time visibility of the physical flow of goods and consumer (sales) behaviour. Also, collaboration on monitoring, which involves joint, real-time access to results of introductions and promotions, based on secure systems.

5. Identification and Labelling through the use of barcodes and RFID tags. Identification is about providing all partners in the value chain with the ability to use the same standardised mechanism to uniquely identify parties/locations, items and events, with clear rules about where, how, when and by whom these will be created, used and maintained. Labels currently are the most widely used means to communicate about relevant sustainability and security aspects of a certain product toward consumers and trading partners.

6. Efficient Assets. This solution area encompasses efforts by companies to modify existing or design new equipment or buildings, to enhance their productivity and reduce their environmental impact.

Transportation solutions include more efficient and/or aerodynamic and jumbo vehicles; utilising alternative or multiple modes of transportation; and switching to different transport modes. Solutions involving buildings include the adoption of a “green” building policy by using alternative forms of sustainable energy or improving existing building energy efficiency.

These types of solutions make more efficient use of key resources like energy, water, land and materials. For example, green buildings will typically use 25% to 30% less energy than conventional buildings, will have lower peak consumption, will typically generate renewable energy on-site, and most likely will use grid power generated from renewable energy sources.

Metro serves as a leading practice case for consolidation and the use of efficient assets by a retailer. With the award-winning⁵ concept of procurement logistics—a collaborative approach across all categories and store formats (food, non-food, apparel, DIY and consumer electronics) that is consolidating flows and warehouses—Metro already stated in 2002 positive environmental effects and “conservative” savings on the order of €150 million per year through higher fill rates and lower waiting times.

In addition, through the integration of EURO-5 trucks into its distribution network, MGL Metro decreased CO₂ emissions by 25% between 2003 and 2006. It is aiming for an 84% reduction by 2009. The use of GPS modules, traffic monitoring, planning systems and well-trained staff has delivered major efficiencies and improved asset utilisation, producing some 40,000 additional driving hours per year from the same assets.

7. Joint Scorecard and Business Plan. This solution consists of a suite of industry-relevant measurement tools falling into two broad categories: qualitative tools, which are a set of capability metrics designed to measure the extent to which the trading partners (supplier, service provider and retailer) are working collaboratively; and quantitative tools, which include business metrics aimed at measuring the impact of collaboration.

The accompanying table (“At a Glance: Solution Areas, KPIs, Leading Practices”) provides an overview of the solution areas and the related KPIs as well as examples of existing leading practices. The details of the leading practices can be found in the separate, freestanding Appendix that accompanies this report.

⁵ MGL Metro, Deutscher Logistikpreis, 2002; MGL Metro, ECO Performance Award, 2007.

Understand and Reinvent Example Supply Chains

Simplified examples of current supply chains are used to show how supply chains work today. Although there may be a wide variety of supply chains for the same type of activity, the example supply chains are described according to the same structure (see accompanying diagram).

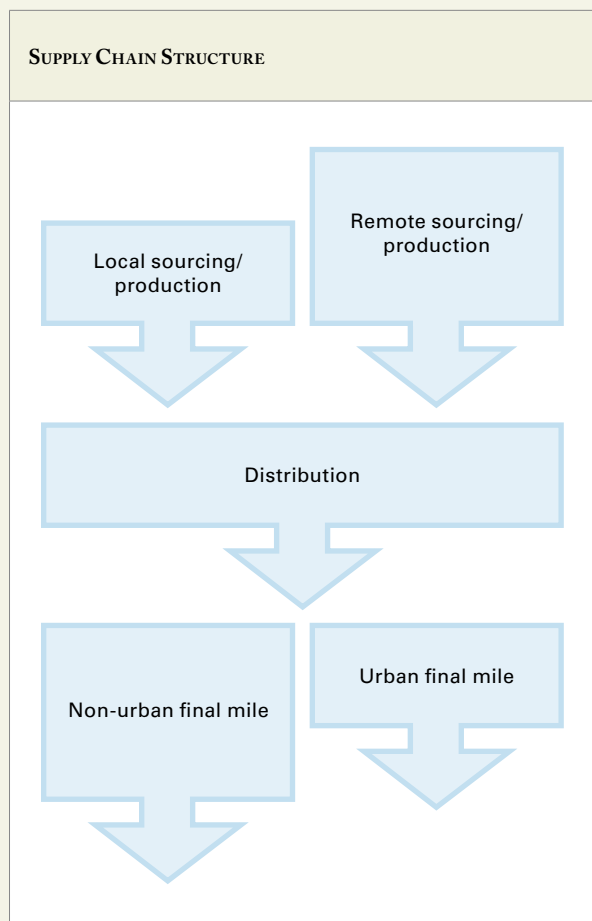
We have selected particular situations, which do not describe all cases, in order to illustrate how solutions can be applied. A distinction is made among regular replenishment, promotional flow and seasonal flow. The main characteristics of the five example supply chains chosen are identified in the accompanying table (facing page). The results of this exercise should provide inspiration to companies to adapt the examples to their own products.

Following are some illustrative thoughts on how the solutions can be applied in the context of the specific characteristics of these five example supply chains. The “as-is” flows of the five example supply chains can be found in the separate, freestanding Appendix that accompanies this report.



Cereals. The cereals supply chain is characterised by seasonal raw material production, regular consumption patterns (but

influenced by promotions) and remote as well as local sourcing (depending on the country). Overall, there is improvement potential on stock levels and the length of stay of stocks at distribution centres and on retailers’ shelves. Also, transportation and storage facilities could be improved in respect to their CO₂ emissions and energy consumption.



Some illustrative solutions for this example supply chain include shipping larger volumes or cross-docking, sharing transport to stores, efficient and aerodynamic vehicles (especially for city replenishment) and shared warehousing on combined categories using “green” facilities.



White Goods (large household appliances). The main characteristics of the white goods supply chain include long lead time from source to

shopper, yet sometimes the product lifecycles can be short; inventory levels could be improved, especially at retailers (many retailers hold inventory even though it needs to be delivered); stocking locations could be reduced; significant physical distribution and reverse logistics; collaboration and integration with other parties could be improved; home delivery could be more flexible; and opportunities exist involving standardisation of products.

Examples of suitable solutions to apply include the use of point-of-sale data for production planning, collaboration on fulfilment between manufacturer and retailer, improved forecasting and inventory management and SKU rationalisation, shared warehouses and standardisation of product components.

KEY CHARACTERISTICS OF EXAMPLE SUPPLY CHAINS

	Product Group	Final Mile	Retail	Distribution	Production	Sourcing
Example Supply Chain A	Cereals	Store, urban	Regular replenishment	Collaborative warehouse	Continuous	Remote and local
Example Supply Chain B	White Goods	Home delivered	Seasonal	Reverse logistics	Short product lifecycle	Remote
Example Supply Chain C	Beverages	Store	Promotional	Direct store delivery	Highly continuous	Local bottler
Example Supply Chain D	Vegetables	Store, non-urban	Seasonal	Cross-dock, crates	Small local farms	Local
Example Supply Chain E	Coffee	Local pick-up	Promotional	Endcap/gondola end material	Discontinuous	Remote co-operation of farmers

Source: Global Commerce Initiative, Capgemini



Beverages. The beverages supply chain is characterised by relatively high inventory costs and

opportunities to reduce transport and fuel costs. Also, there is improvement potential regarding the collaboration on both forecasting and logistics (either upstream from the raw material suppliers and manufacturers or downstream from manufacturers and retailers or among manufacturer competitors). This is also the case for data exchange, which still involves a lot of manual handling.

Suitable solutions to apply include shared warehouses; pooling opportunities run by logistics service providers; shared transport with other manufacturers; the use of mixed, efficient and aerodynamic transport modes like (jumbo) trucks, rails and barges; and reducing the number of stocking locations and new investments in assets, like green warehouses. There is also significant potential in full information transparency through data exchange (point-of-sale), both upstream and downstream.



Vegetables. The main characteristics of the vegetables supply chain are local and global sourcing, short cycle time

(the product should reach the market as quickly as possible), the critical importance of product quality and freshness, seasonality of some vegetables, and flow characterised by many miles from source to consumer.

Suitable solutions to be applied include the use of standardised totes to reduce handling, sharing infrastructures (possibilities of bulk being turned into consumer-ready units), differentiated supply chain networks (intermediate pre-processing centres, including consolidation, value-added pre-process), reducing touches after the initial farm or pre-production, efficient assets like solar-powered refrigerated trucks and solar panels on the roof, and a “green index” on scorecards.



Coffee. The coffee supply chain includes opportunities regarding the inventory stay at warehouses. Coffee is a high-value product, collaboration among

manufacturers could be improved, and there are definitely opportunities for more involvement of logistics service providers. Overall, the chain consists of a number of steps.

Suitable solutions to apply in this supply chain include collaborative physical logistics (such as shared warehouses between coffee manufacturers and between different kinds of manufacturers, and the involvement of logistics service providers in warehouses and transport). In addition, packaging can be done closer to the consumer. Better information on fluctuation management and promotions will improve forecasting. POS data needs to be available to improve replenishment (regular as well as promotions). Improvements also can be made regarding the use of efficient assets like green warehouses.

New Ways to Calculate the Impact on the Supply Chain

Finally, calculation models are an essential tool for the future supply chain to determine the impact of the leading practices and solutions. As the industry tries to improve several parameters in the supply chain, how can it compare solutions that may have conflicting impact on, for example, CO₂ emissions versus supply chain costs? This section examines the general characteristics of such calculation models. The separate, freestanding Appendix provides more detail on actual examples of such calculations.

In the calculation models used in the future supply chain research, the following parameters are considered:

- Supply chain cost reduction (mainly on handling, storage and transport)
- CO₂ emissions (greenhouse gases)
- Traffic congestion
- Infrastructure simplification

The impact of these parameters on the bottom line can always be expressed in terms of multiplying a cost driver and a volume driver. For instance, the impact of transport on the bottom line can be expressed in terms of the cost per kilometre for the particular type of transport multiplied by the number of kilometres travelled. Reductions can either be made by reducing the cost driver (cheaper transport) or by reducing the volume driver (fewer kilometres through fuller trucks or redesign of the network).

While working through the different calculation models, it was found that the relative impact of these parameters on the bottom line was not equal. For parameters that already represent a large percentage of the bottom-line costs (like handling and transport), changes to these factors have substantial impact on the bottom line. For other parameters, the impact is (not yet) as big.

IMPACT ON THE BOTTOM LINE

Parameter	Cost Factor	Cost Driver	Volume Driver	Impact on Bottom Line
Supply Chain Cost Reduction	Handling	\$ manhours	# transfers, etc.	High
	Storage	\$/m ² /day	# storage points, storage time	Medium (depending on value of goods)
	Transport	\$/km	# kilometres	High
CO₂ Emissions	CO ₂ taxation	\$/kg CO ₂ (modality dependence)	# kilometres	Relatively low
Traffic Congestion	Delays	Manhours lost Delayed replenishment/ out-of-stocks	# vehicles delayed, storage of m ² /day	Medium
Infrastructure Simplification	Duplication	Duplication of costs in the supply chain	# storage points/ # of separate chains	High

Source: Global Commerce Initiative, Capgemini

Five calculations are available in the Appendix, but the main conclusions are shared here as an introduction to what the total future supply chain should look like:

Collaborative city replenishment involves concepts where the replenishment of products for several retailers into an urban area is consolidated at transfer points at the boundary of that urban area. The total impact on CO₂ emissions and congestion can be improved relatively easily, but typically at the cost of introducing extra handling. Future solutions in this area therefore need to link closely with upstream storage and transfer choices, in order to avoid introducing unnecessary handling. At the same time, congestion charges will tip the balance in favour of collaborative city replenishment.

Collaborative warehouse and distribution looks at opportunities for manufacturers to consolidate warehouse operations and transport from production to the retailer transfer point. It is clear that the combination of warehousing and distribution can help provide the desired benefits. Only looking at consolidated transport can lead to extra handling and infrastructure complication (instead of simplification). Collaborative warehousing also offers CO₂ and cost benefits through deploying greener buildings and (transport) assets. An alternative combination of collaborative city replenishment and collaborative warehouses is distribution centre collaboration for retailers. The aggregation of transport and storage for several retailers can have similar benefits as the model for collaborative warehousing.

Neighbourhood delivery considers improvements in the delivery of goods to the final consumer, either coming from online ordering or the home delivery of products ordered in a store (such as white goods). The solution can be sought in consolidating these streams at consolidation centres at the boundary of the city and then delivering everything in efficient urban delivery routes or through neighbourhood pick-up points.

A different (and often forgotten) viewpoint is the amount of CO₂ emissions caused by consumers who drive by car to the store. Research shows that, for example, over 60 % of the total CO₂ emissions for the transportation and storage of 1 kg of apples from New Zealand to a UK consumer's home is caused by consumers who use their cars for shopping trips.⁶ Home delivery can improve this significantly (perhaps reducing the "last mile" CO₂ emissions by half).

It is evident that these models should also be considered in relation to collaborative city replenishment to stores, and where possible share a similar infrastructure.

Lead-time reduction looks at various ways in which the total lead time of the product can be reduced. Infrastructure simplification is an important ingredient for this; taking away unnecessary storage points can have a big impact on inventory costs, but also on the chain responsiveness (and therefore shelf availability of the product). However, taking away one storage point usually complicates the operation of the more upstream storage point. For instance, cross-docking at a retailer distribution centre (instead of keeping stock) typically requires the manufacturer to deliver store orders instead of consolidated replenishment orders.

CO₂ emissions reduction through local sourcing considers the trade-offs for remote sourcing between lower production cost and higher transport cost and CO₂ emissions. It quickly shows that CO₂ taxation needs to be quite severe to motivate more local sourcing. However, a combination of higher energy prices and CO₂ emission taxation could tip that balance in the future.

From this discussion of the different improvements it is apparent that the future supply chain should be considered as an integrated architecture comprised of these various concepts. The next chapter does exactly that; it shows how the components can be put together into one cohesive architecture for the future supply chain.

⁶ "Lean and Green, doing more with less," David Simons and Robert Mason, ECR Journal, Vol. 3, No. 1.





A New Model for Enhanced Supply Chain Collaboration

Integrating improvement solutions and collaboration concepts into a cohesive model will provide the future supply chain architecture necessary to bring new efficiency and cost reduction to the industry.

Can the industry afford to limit itself to just implementing incremental improvements by individual companies? The answer is clearly “no.” Vigorous step changes are needed to significantly improve CO₂ emissions, traffic congestion, infrastructure simplification and supply chain costs, while at the same time reducing out-of-stocks.

The future supply chain architecture requires a structural change combining individual improvement solutions and integrated collaboration concepts. This new integrated model represents the tangible expression of the vision outlined in the earlier “2016” report.

Why should you care? Well, what if you could reduce the following by more than 20%:

- Transport costs per pallet
- Handling costs per pallet
- Lead time
- CO₂ emissions per pallet

Extensive analysis found that the KPIs for transport costs, handling costs, total truck kilometres, CO₂ emissions and lead time could all be improved substantially in this integrated model, and this does not take into account additional energy cost savings stemming from more efficient assets such as green buildings and fuel-efficient/aerodynamic trucks.

The previous section set forth the toolkit that will be required for the future supply chain. Collaboration will be the key to bringing – and holding – together all the elements into a new model or architecture.

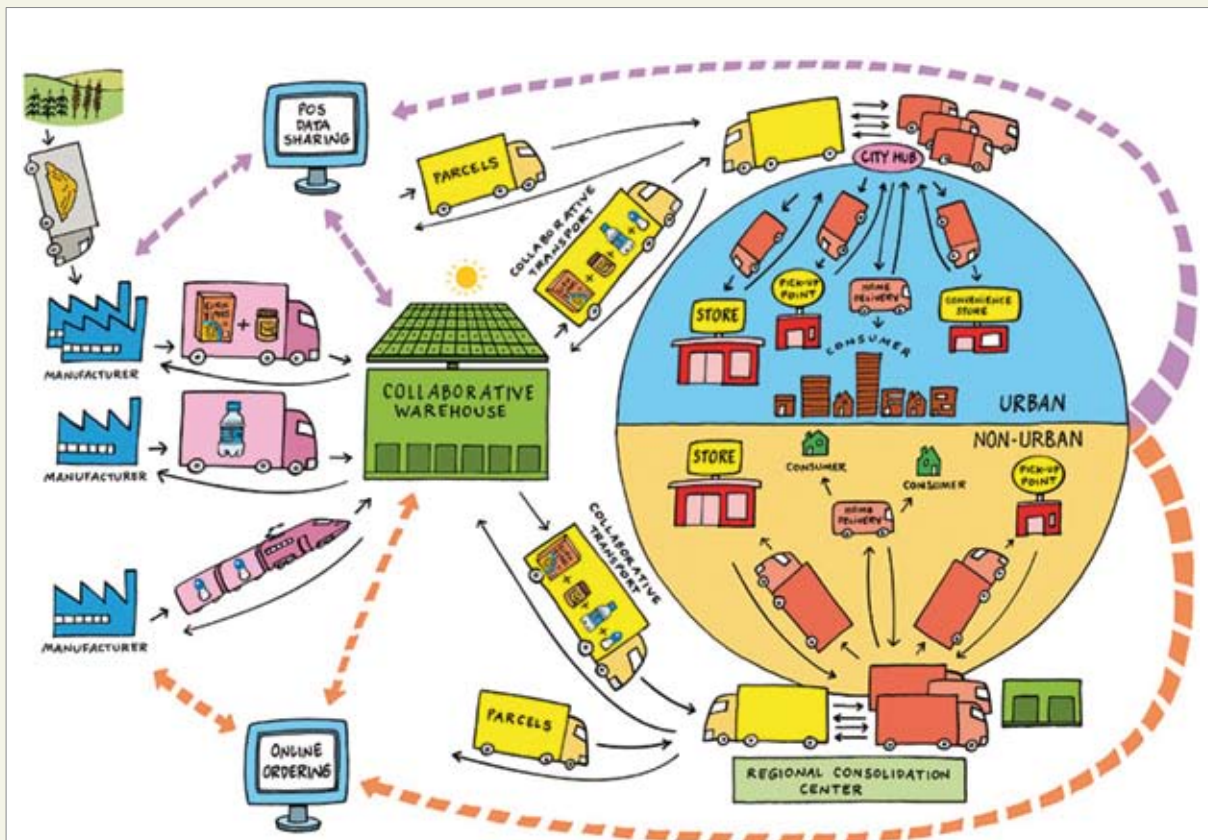
The model includes a number of different collaboration concepts that can be pulled together into a cohesive collaboration model, which serves as the new architecture. It is important to note that this is only one way in which the concepts can work together. Different regions, different markets, different companies will have to assess how these concepts should be combined to realise the maximum effect.

The following four collaboration concepts are at the heart of the overall future supply chain architecture:

1. Information sharing – driving the collaborative supply chain
2. Collaborative warehousing
3. Collaborative city distribution, including home delivery and pick-up
4. Collaborative non-urban distribution, including home delivery and pick-up

While individual examples of these concepts already exist, the key to their broader implementation across the industry will be improved collaboration. Improving such collaboration demands new ways of working together in the physical supply chain, a framework for which has been developed by GCI and is being addressed by a separate work team.

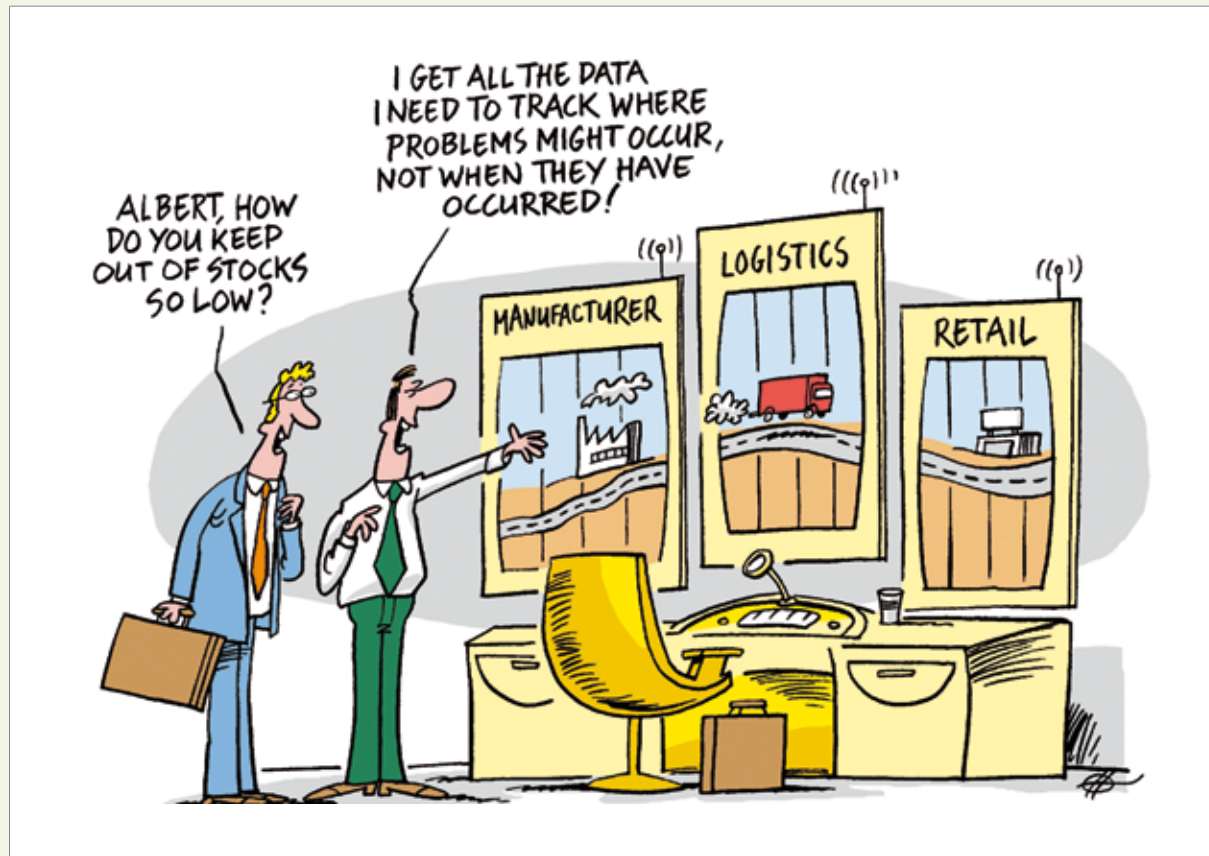
The 2016 Future Supply Chain



Characteristics of the 2016 Future Supply Chain

- The future model will be based on multi-partner information sharing among key stakeholders: consumers (the originators of the demand signal, either from home or from a store), suppliers, manufacturers, logistics service providers and retailers.
- After production the products will be shipped to collaborative warehouses in which multiple manufacturers store their products.
- Collaborative transport from the collaborative warehouse will deliver to city hubs and to regional consolidation centres.
- Warehouse locations on the edge of cities will be reshaped to function as hubs where cross-docking will take place for final distribution.
- Non-urban areas will have regional consolidation centres in which products will be cross-docked for final distribution.
- Final distribution to stores, pick-up points and homes in urban and non-urban areas will take place via consolidated deliveries using efficient assets.

1. Information Sharing – Driving the Collaborative Supply Chain



Supply chain collaboration can only be effective with sufficient information transparency. This is particularly important for collaborative approaches to improve on-shelf availability (OSA).

Information about the actual status of items in the supply chain, at any moment, is essential to correctly co-ordinate all the combined logistics streams in the overall 2016 future supply chain architecture.

Sharing of standardised data (based on the use of GS1 keys and transaction message standards) is the cornerstone for this. There is essential “master data” that should be shared in standard format to correctly identify products throughout the supply chain (correct identification prevents mistakes and rework):

- Product Identification (GTIN)
- Attributes
- Classification information
- GLN

Other master data relating to locations such as node location and lead time between nodes must also be shared and aligned.

To prevent out-of-stocks, demand-signal data, like POS sales data, Internet shopping sales data and other mobile-sourced shopping data, must be shared in a standard and timely manner. This principle also applies to information about item location, quantity and status.

Events in the supply chain, such as new product launches and promotions, disrupt the regular flow of goods. The free flow of data and associated information is essential if the industry is to properly manage these events and achieve high levels of product availability when and where consumers want it.

2. Collaborative Warehousing

Collaborative warehousing, with concepts that go far beyond the warehouse collaborations that exist today, is a core component of the future supply chain architecture. The key element is that both retailers and manufacturers must be part of such collaborative warehouse concepts; they should not just encompass warehouse sharing by manufacturers alone.

For example, collaborative warehouses in carefully selected locations will collect (possibly combined) shipments from a number of manufacturers, and from there combined shipments will be made to distribute to one or more retailers covering different modes of transport ownership, formats and channels (via new urban and non-urban distribution models; see later discussion). This implies that store picking can be done from the shared warehouse.

A repositioning of warehouses is likely to be required to improve the new supply chain KPIs. This will be important in order to shorten the chain and increase flexibility in allocating inventory to demand.

Standardisation of data is critical to make this possible, so this concept relies heavily on improved data sharing. Not all products can be put into one warehouse, of course, and different collaborative warehouses will need to be designed for different categories, preferably aligning themselves on downstream distribution networks.

Collaborative warehousing should improve several KPIs:

- Capacity utilisation of the total warehouse
- Transport optimisation through shared delivery from the warehouse
- CO₂ and energy reduction through the use of the latest technologies (such as energy-efficient buildings and fuel-efficient trucks)

To succeed, this concept will require high levels of trust and commitment among manufacturers, retailers and logistics service providers, but it is a crucial enabler for realising integrated sustainability improvements.

3. Collaborative City Distribution



The future supply chain architecture anticipates new collaborative models for city distribution that need to be applied in urban infrastructures. For transport into urban areas, congestion and CO₂ emissions are the main challenges that need to be addressed. Sharing infrastructure for delivery into urban areas is therefore designed to limit the amount of (polluting) trucks going into the city.

Merging the different streams that go into the city onto one infrastructure will be a big step forward. The key element will be so-called “city hubs” with a collaborative cross-dock operation.

The final solution will be applied differently per shipment category:

- Full truckloads for store replenishment
- Less-than-full truckloads for smaller-store replenishment
- Parcels, including home delivery needs

For the first category, changes in the efficiency and emissions of the trucks could be sufficient, but the other two categories can be consolidated outside the city in city hubs and be brought into the city with alternative modes of transportation (like streetcars or electric vehicles).

In addition, to address the expected growth in home delivery and therefore parcels coming into urban areas, alternative models for home delivery and neighbourhood distribution should merge with the urban replenishment model. This implies consolidation of different delivery streams (different products based on different orders from different online ordering facilities, all for the same shopper) via city hubs.

New neighbourhood distribution models will have pick-up points or drop-off boxes to enable efficient delivery of the parcel stream in a consolidated way. Consumers will be given the choice to either have their online-ordered goods delivered at home, or to collect them at specific pick-up points or drop-off boxes. In both cases consumers will cause considerably lower CO₂ emissions, compared with using their cars to go shopping.

This collaborative concept should impact the following KPIs:

- Traffic congestion
- CO₂ emissions and energy reduction
- Infrastructure simplification

4. Collaborative Non-Urban Distribution

For non-urban areas, the challenges, and therefore the solutions, are slightly different. The longer distances to the final store or home are such that transport optimisation is the main objective. Full truckloads from collaborative warehouses can be moved in the most efficient way to the remote area, possibly using alternative modes of transport like trains.

A regional consolidation centre can have a similar function as the city hubs, consolidating the store orders from various collaborative warehouses into dedicated store replenishment routes. At the same time, these consolidation centres are needed to merge the long-distance streams with the local product streams to create efficient replenishment into the stores.

Just as with urban replenishment, parcels and home delivery models should be considered in conjunction with the store replenishment models. These flows could also be cross-docked at similar consolidation centres to improve the fill rate for the final-mile routes.

Again, as with city distribution, the key will be consolidation of delivery streams (different products based on different orders from different online ordering facilities, all for the same shopper) via these consolidation centres. There will be a convergence between home shopping and neighbourhood distribution via pick-up points. Consumers will be given the choice to either have their online-ordered goods delivered at home, or to collect them at specific pick-up points or drop-off boxes, which in both cases will reduce the CO₂ emissions that they currently cause by driving to stores.

This collaborative concept should primarily impact the following KPIs:

- CO₂ emissions and energy reduction
- Infrastructure simplification

New Ways of Working Together

The common theme for all the future supply chain scenarios is collaboration. But just identifying the benefits of collaboration is not enough to make it happen.

There are numerous stakeholders across the physical supply chain and in order to change the chain, it is important to not only have a shared perspective of what needs to be done, but also to consider the individual perspectives and unique challenges facing each stakeholder:

- **Consumers and shoppers** increasingly value sustainability aspects in their choices.⁷ But they are less willing to pay extra for it. Consumers want to be better informed about the sustainability impact of their shopping choices (including, for example, about the CO₂ emissions involved in using their car to go shopping).
- **Retailers** are motivated to serve shoppers in the most optimal way, in order to be profitable and achieve sustainable growth. Retailers welcome collaboration and standardisation, but only if this does not impact their ability to differentiate themselves towards shoppers.
- The ambition of **manufacturers and suppliers** is to manufacture, market and supply the products that consumers need and want in a cost-efficient manner. They are motivated to improve the sustainability of their supply chain, but their ability to achieve substantial improvements requires close (and standardised) collaboration with retailers and shoppers.
- **Logistics service providers** facilitate the distribution process from supplier to consumer. They are motivated to become a proactive partner in the consumer goods business for mutual sustainable growth, but this requires longer-term contracts and common processes and data standards.

⁷ "Future Consumer: How Shopper Needs and Behaviour Will Impact Tomorrow's Value Chain," Capgemini.

Company cultures, KPIs and capabilities inside many organisations could be showstoppers for moving collaborative initiatives forward in any serious fashion. The biggest challenge is “how to prepare our people for the new world of collaboration.” There are a number of people-related changes that will need to take place, including:

- **Incentives and measures.** This includes shared success measures across financial, operational and consumer-based dimensions (KPIs) that drive outcomes throughout the value chain and greater overall value for retailers, manufacturers and consumers. A critical success factor will be senior management involvement to align internal metrics to support these KPIs. Metrics that are transparent and visible across both organisations will be imperative.
- **Capabilities.** A competency model for new skills and knowledge for the “new ways” will be required to support the agreed-upon competencies. Companies should consider executing this jointly.
- **Organisational resources and design.** Clear roles and responsibilities for key people must be defined, particularly the role of a team leader or “relationship manager.”

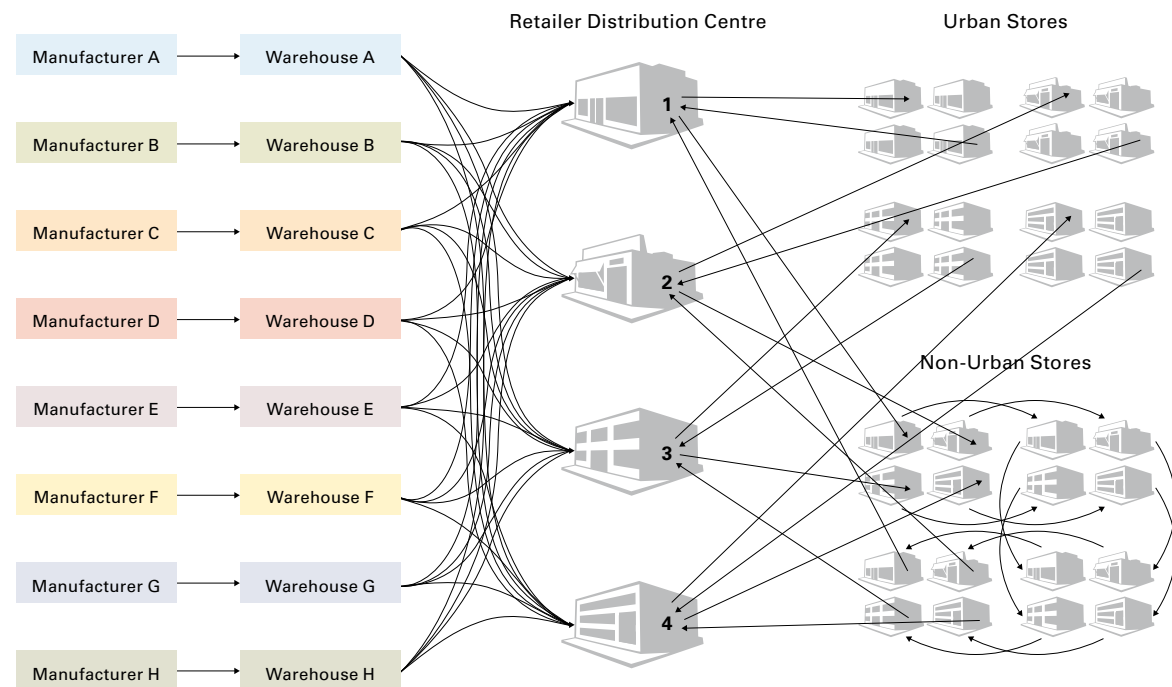
The Benefits of an Integrated Model

It seems obvious that the industry will benefit from each of these collaboration concepts, on top of the individual improvements that companies can achieve by implementing innovative solutions (as suggested in the previous chapter). But what will be the real synergetic value of bringing this all together into a true industry solution?

To illustrate how this could work, the different calculation models have been combined into one integrated model. This model compares a typical current situation with a future situation, which combines the collaborative concepts of collaborative warehousing, information sharing, lead-time reduction, shared transport to urban areas and shared transport to non-urban areas.

The model for the current situation (facing page) considers eight manufacturers delivering equal amounts of products per day to four different retailers. In the existing situation (as is), these eight manufacturers each have their own warehouse and the four retailers each have their own regional distribution centre (RDC). Delivery to the four urban stores and four non-urban stores is done by each retailer from its RDC using different urban and non-urban routes.

As-Is Situation



Characteristics of As-Is Situation

- Stakeholders are manufacturers and retailers.
- Consumers and stores are located in both urban and non-urban areas.
- Each manufacturer has its own warehouse.
- Each retailer has its own distribution centre.
- The manufacturer ships its products to each of the four distribution centres.
- A retailer ships the products from its distribution centre to each of its stores.
- No physical supply chain collaboration takes place among manufacturers, among retailers, and between manufacturers and retailers.

All KPIs for transport costs, handling costs, total truck kilometres, emissions and lead time could be improved substantially in this integrated model.

In the new model (facing page), the eight manufacturers are arranged into two groups of four, each running a collaborative warehouse. From these collaborative warehouses, store-picked orders are shipped in fuller truckloads to either a city hub or a regional consolidation centre, where the different streams are efficiently merged into store replenishment routes.

In the case of urban replenishment, alternative transport is used into the city, reducing not only the total number of city kilometres, but also reducing the CO₂ emissions per city kilometre. In the case of non-urban replenishment, stores of different retailers are consolidated into more efficient store replenishment, such as one route per village or municipality.

From this description, it should be clear that to realise this to-be model, all the collaborative concepts discussed previously are needed.

The result of the combination of these concepts provides an indication that these models can indeed reinforce each other and create a synergetic effect (an overview of the detailed parameters that are used in these calculation models can be found in the separate, freestanding Appendix.)

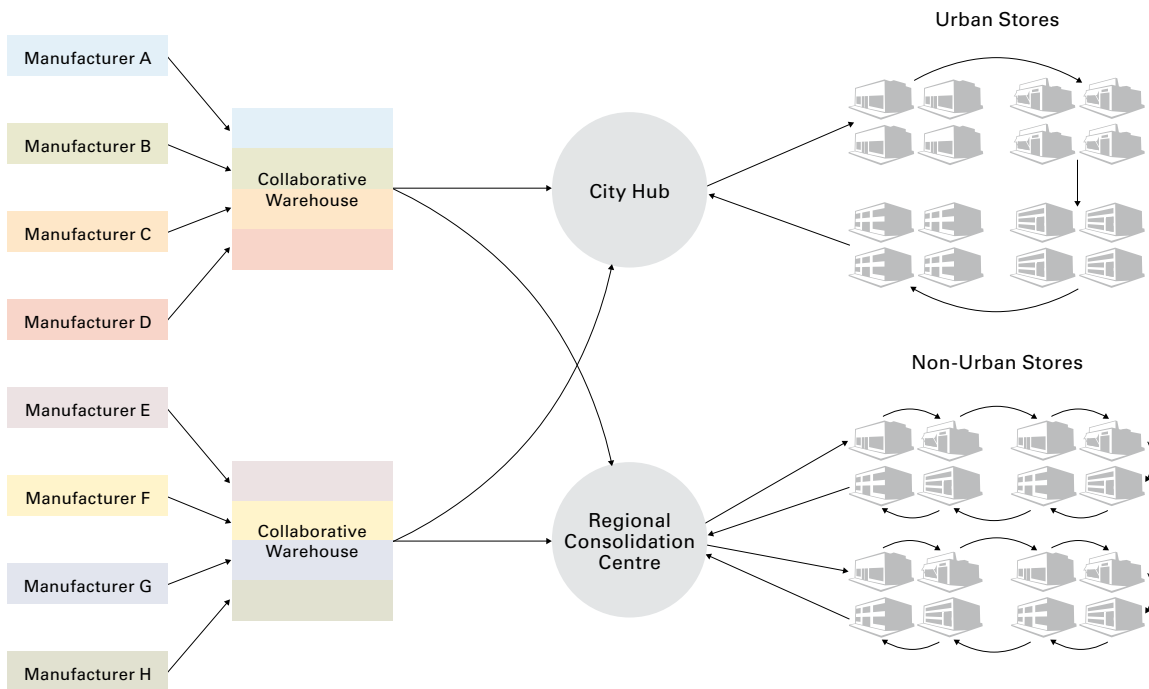
An example run from the model indicates that all KPIs for transport costs, handling costs, total truck kilometres, emissions and lead time could be improved substantially in this integrated model:

- Almost 40% reduction in transport costs per pallet
- 20% reduction in handling costs per pallet
- 25% cut in total truck kilometres travelled
- 25% reduction in CO₂ emissions per pallet
- 40% cut in lead time

At the same time, it is important to note that this will not negatively impact customer-availability parameters.

In addition, it should be noted that one of the important underlying assumptions in this model is that store orders can be assembled in the collaborative warehouse and consolidated at the city hub or consolidation centre. This means that the retailer distribution centre can be bypassed. The transition model to this future state may not be easy. As long as some portion of the store orders are still assembled in the RDC, it cannot be taken out of the picture. However, the part of the assortment that is picked at the collaborative warehouse can be cross-docked at or “flown through” the RDC, and this should still have a positive impact on the lead time of the chain.

The model clearly shows that integrating the collaboration concepts can generate significant improvements, with clear benefits for our society, for the industry, for individual companies, and ultimately for consumers and shoppers.

To-Be Situation INTEGRATED MODEL**Characteristics of To-Be Integrated Model**

- Stakeholders are manufacturers and retailers.
- The manufacturers have a collaborative warehouse, possibly run by a logistics service provider. In this example four manufacturers share a warehouse.
- The retailers do not have their individual distribution centres anymore; products will be cross-docked by either a city hub for urban areas, or by a regional consolidation centre for non-urban stores.
- Transport from the city hub/regional consolidation centre will be shared and goes to the stores of the different retailers. Full truckloads will be realised more easily.



5

Next Steps Toward the Future Supply Chain

Feasibility studies and collaborative supply chain scenario pilots are among the critical next steps that must be taken to ensure that the future supply chain reacts to and satisfies tomorrow's consumers.

The road toward the 2016 future supply chain architecture will be paved with a combination of individual improvements by companies and collaborative initiatives by groups of retailers, manufacturers, suppliers and other companies in the value chain (such as logistics service providers).

While individual company improvements will be implemented based on assessments of the added value of certain solutions in their specific situations, that will not be enough for collaborative initiatives. These collaborative initiatives need industry leadership in order to move forward.

The realisation of the collaborative concepts that comprise the 2016 future supply chain architecture will require a number of initial next steps, driven by industry leaders. Action must be started in one or more of the following areas:

- Information sharing – driving the collaborative supply chain
- Collaborative warehousing
- Collaborative city distribution (including home delivery and pick-up)
- Collaborative non-urban distribution (including home delivery and pick-up)
- New ways of working together in the physical supply chain (including management of required investments, capabilities, organisational resources and design, incentives and measures, social regulations like working hours, etc.)

The actions should be structured as follows:

- Establish buy-in on the vision by a select group of key stakeholders (such as leading retailers and manufacturers, mayors of big cities).
- Check the concept's business case with the involvement of all key stakeholders.
- Pilot the concept (or possibly leverage and enhance existing pilots).
- Evaluate the implementation and share learnings.

Call to Action

Implementing the proposed new model will not be an easy task given the legacy of existing infrastructures and established processes. Companies will run pilot projects (see sidebar, "Future Collaborative Supply Chain Scenario Pilots"). A GCI Project Team will be established composed of companies involved to co-ordinate and surface issues relevant to the whole project and the community.

The main objectives of the project team will include:

- Providing support for an implementation team composed of companies actively using solutions proposed in this report.
- Capturing, identifying and resolving potential implementation issues.
- Enabling and driving the measurement of progress of the implementation introducing one or more new items in the Global Scorecard.
- Organising regular (yearly) follow-up meetings of involved parties to maintain and develop the future supply chain model.
- Providing for a permanent platform for the exchange of implementation experience (web presence, etc.)

The GCI Future Supply Chain 2016 team will continue to encourage the establishment of new projects to drive a sustainable supply chain for the retail and consumer goods industry.

Future Collaborative Supply Chain Scenario Pilots

Embarking on specific future collaborative supply chain pilots will be one of the critical next steps that the industry and individual companies must focus on to help realise the future supply chain scenarios. Examples of such pilots include the following:

Sharing of information. Sharing of information about product movements along the supply chain is an essential part of the following collaborative processes.

Collaborative warehousing. The first priority for effective collaborative warehousing is to set up pilots and check their business case: The results should be reviewed, and a go/no-go decision made about a pilot approach. A collaborative warehousing pilot would be an enormous undertaking so commitment at the top level and alignment across the board would be imperative.

Collaborative warehousing will happen because of good collaboration among manufacturers, among retailers and between them both. New ways of working will include collaborative order handling and standardised deliveries.

Collaborative transport. The first step towards implementation of collaborative transport is to set up pilots. Following that those existing pilots should be leveraged on a wider basis.

City replenishment/non-urban replenishment/home delivery. The first step towards effective implementation of “last mile” replenishment (to city stores, local stores and home delivery via shared facilities) is to further detail the vision and to conduct feasibility studies. Based on this, companies should align with local city authorities.





Appendix: Building the Future Supply Chain

Developing the future supply chain required time, insight and input from a wide range of industry players, including retailers, consumer products manufacturers, industry standards organisations and technology companies.

The working group gathered initially in Capgemini's Accelerated Solutions Environment (ASE) in Utrecht, the Netherlands, for an intensive two-day workshop. Participating companies consisted of Carrefour, Crown Europe, Freudenberg Household Products, GlaxoSmithKline, Kellogg Europe, L'Oreal, Nestlé, Philips, Reckitt Benckiser, Royal Ahold, Sara Lee International and Unilever. Also participating were representatives from AIM/ECR Europe, GCI, GS1US and Capgemini.

The objectives of this session included:

- Confirming and extending the KPIs that the group had earlier set.
- Formulating a set of solutions that met the KPIs.
- Designing a draft version of the future supply chain architecture.
- Crafting an agreed timeline and approach for the final architecture and accompanying report.

Using this input, the project team ran a second, two-day workshop in Capgemini's ASE in Chicago in the U.S. Companies participating in this session consisted of British American Tobacco, Black & Decker, Carrefour, Colgate-Palmolive, Crown Europe, Freudenberg Household Products, Group Danone, Johnson & Johnson, Kraft Foods, Loblaw Companies Ltd., L'Oreal, Nestlé, Philips, Procter & Gamble, Reckitt Benckiser, Royal Ahold, SCA, Symrise and Unilever. Also participating were GCI, GS1US and Capgemini.

To develop potential collaboration concepts, the workshop group identified and built out the toolkit for the future supply chain consisting of solution areas, leading practices, existing supply chain examples and calculation models.

The results of both workshops, as well as numerous additional meetings, provided the input for this report.

About the Global Commerce Initiative (GCI)

The Global Commerce Initiative (GCI) was established in October 1999 as a voluntary platform. Its mission is to lead global value chain collaboration through the identification of business needs and the implementation of best practices and standards to serve consumers better, faster and at less cost.

It is a network created by the member companies and sponsors to simplify global commerce and link the value chains to improve consumer value.

GCI operates through an Executive Board composed of senior representatives of more than 45 companies drawn equally from manufacturing and retailing that do business across continents or via global supply chains. It works closely with eight partner organisations – the regional ECR Initiatives and VICS, four trade associations (AIM, CIES, GMA and FMI) and the standards organisations GS1 and GS1US – representing more than 1 million companies in the world.

For more information about the Global Commerce Initiative and questions raised by this report, please contact:

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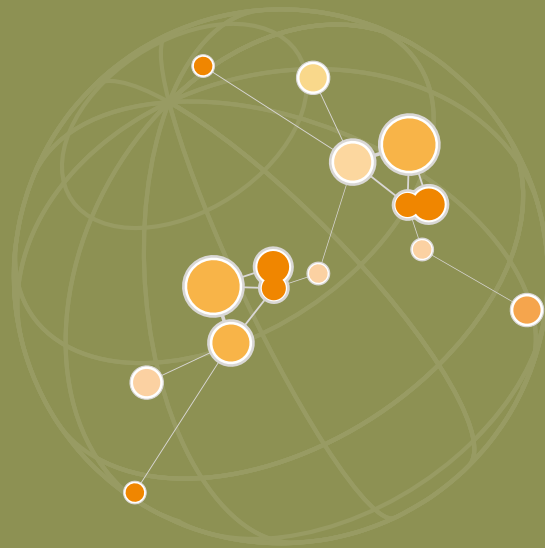
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DESIGNING THE 2016 PHYSICAL SUPPLY CHAIN

“We can’t solve problems by using the same kind of thinking we used when we created them.”

— Commonly attributed to Albert Einstein

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