CAPTURING VALUE FROM GLOBAL NETWORKS

Strategic approaches to configuring international production, supply and service operations
Capturing value from global networks

Global value networks – complex systems of interconnected firms that deliver value to end users, operating across the full range of business activities
Global value networks

Trends

- Disruptive change over last 20 years with firms becoming increasingly specialised (with increasing geographic dispersion)

- Strong need for lead firms to guide ongoing strategic reconfiguration and capability development at the total GVN level (within complex industrial ecosystems)
The IfM’s Centre for International Manufacturing pursues an extensive programme of research and real-world application of new approaches for the strategic configuration of global value networks, working closely with a community of industrialists, policymakers and academics.

The ‘networks’ research theme involves the close study of the characteristics of complex networks in terms of their intrinsic properties and behaviours, leading to a deeper understanding of configuration needs, especially regarding strategic design and the integration of sub-systems and partners.

The ‘capability’ research theme focuses on the advanced business processes and organisational routines that are required for the successful operation of complex value networks within multinational companies, across functions, and between the collaborative players making up the total network.

The ‘international’ research theme tackles the challenges associated with the crossing of national borders, whether in the search for new markets, vital resources and technologies, or global resilience.
Global value networks
Overview of modular strategic approach

4 strategic approaches
- Production footprint
- End-to-end supply
- Service networks
- Global value network

5 emerging themes
- Risk & resilience
- Sustainable networks
- Mergers & acquisitions
- Knowledge integration
- Last mile logistics

CHANGING STRATEGIC CONTEXT
- Business context
- Strategic imperatives
- Disruptive changes to markets, technologies and resources

NETWORK TRANSFORMATION
- Implementation competences
  - Dynamic capabilities
  - Risk and resilience

ANALYSIS – CURRENT NETWORK
- Configuration mapping
- Capability assessment
- Resource dependencies

DESIGN – FUTURE NETWORK
- Design principles
- Future configuration(s)
- Future capabilities
Capturing value from global networks
4 strategic approaches, 5 emerging themes

4 strategic approaches
- Production Footprint
- E2E supply
- Service Supply Networks
- Global Value Networks

5 emerging themes
- Risk & Resilience
- Sustainable Supply Networks
- M&A
- Knowledge
- Last mile logistics
Strategic Network Configuration
- Analysis, Design, Operation Tools

Production Footprint

Service Supply Network

End-to-End Supply Chain

Global value network within its industrial ecosystem
Designing production networks
4-step approach to production footprint strategy

1. ROADMAPPING
   Business imperatives
   Technology trends

2. MAKE-or-BUY
   Production core competences
   Strategic & low cost sourcing

3. GLOBAL NETWORK DESIGN
   Roles of plants
   Scenarios
   Network synergy

4. MANUFACTURING MOBILITY
   Defining executable projects
   Transferring production

‘Making things’ is a critical activity in the value network. Today’s production networks need to be more cost-efficient and deliver better access to attractive markets than ever before. In this context, it is imperative to develop a strategic reconfiguration process that takes a long-term perspective.
This approach was co-developed with a leading global manufacturer between 2003 and 2005, and has since been applied in a variety of multinational companies. The companies involved have undergone radical transformation or gradual evolution, or various stages between the two.

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<th>Production footprint strategy</th>
<th>Major applications</th>
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### 4 strategic approaches

**Production**

- **E2E supply**
  - **Service**
    - **GVN**

### 5 emerging themes

- **Risk**
- **Sustainability**
- **M&A**
- **Knowledge**
- **Last mile**

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<th>Scale</th>
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<td>10 year evolution strategy</td>
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<td>Film Products</td>
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<td>5 year consolidation / pre-merger plan</td>
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<td>Ideal future network</td>
<td>Fundamental shift in network approach</td>
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<td>$16bn, 40 plants</td>
<td>Impact of new process technologies</td>
<td>Optimum return on investment</td>
<td>Filled key gap in corporate process</td>
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<td>Plastic Toys</td>
<td>$2bn, 12 plants</td>
<td>Revised vision following turnaround</td>
<td>Scalable model for high growth</td>
<td>Clarity on core competences</td>
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<td>White Goods</td>
<td>$16bn, 45 plants</td>
<td>In depth process for value creation</td>
<td>In process</td>
<td>In process</td>
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Production footprint strategy

Impact

“We worked closely [with IfM ECS] to develop and direct the Global Manufacturing Strategy which will expand our global production capabilities in developing markets around the world, as well as re-aligning our existing production into manufacturing centres of excellence within an optimised network. Our goal is to significantly improve our operating efficiencies, lower our overall cost structure and implement new technologies more effectively, whilst not compromising service, quality or EHS.” The company reported a series of updates in press releases over the period 2008 to 2011, where it announced that the overall project involved capital expenditure of $220m, and delivered repeating savings of $55m per annum.

VP Global Manufacturing, Sealed Air

“We are one of the world’s largest manufacturers, with sales approaching $50bn, and the main reason for starting this process [with IfM ECS] was to secure the long-term optimisation of our production network. Over time the ‘burning platform’ has changed but the process remained the same, allowing us to constantly update the vision as conditions evolve. Since 2008 this approach has been used in all business divisions and serves to guide Caterpillar’s annual, multi-billion dollar capital spend through coordinated investments across the vertically integrated company.”

Manager of Global Production Network Planning, Caterpillar

Electrolux has been conducting a collaborative programme with IfM ECS during 2012 and 2013 aimed at applying IfM’s research on optimising global manufacturing networks. The project is still ongoing and the future impact is not yet finalised. However, the outcome is expected to guide investment in the future footprint over the next 3-5 years in the order of 3.5 Bsek (400m euros) where the targeted cost savings are in the order of 1.3 to 1.6 Bsek (180m euros) annually. “This project forms a major part of our corporate business strategy and will help to guide the optimisation of our footprint of over 45 plants around the world. This will drive structural changes in terms of cost reduction and responsiveness to customers which will underpin our future competitive differentiation.”

SVP Global Manufacturing Operations, Electrolux
Managing the end-to-end supply chain
Linking configuration, capability and performance

For many global manufacturers, having a fully integrated end-to-end supply chain is a key aspiration. However, with supply chains becoming much more fragmented and dispersed, network integration has become an increasingly difficult task. The art of getting physical products to the final customer now involves coordinating a multi-tier network of upstream and downstream partners – distributed globally – across which innovation needs to be ever quicker and more relevant, all in the face of increasing risk of disruption.

Meta-Capabilities
supply network configurations combinations (above), aligned with specific supply network capabilities (below)

4 strategic approaches
- Production
- E2E supply
- Service
- GVN

5 emerging themes
- Risk
- Sustainability
- M&A
- Knowledge
- Last mile

Differentiating performance
Configuring the end-to-end supply chain
4-stage mapping approach

1. E2E supply network structure

2. Major production operations

3. Product structure

Research suggests that the product architecture itself – aspects such as level of product modularity and degree of standardisation – is often a determining factor in supply network design.

4. Network relationships

Configuring supply chains is particularly challenging when it involves a range of geographically dispersed partners whose roles and responsibilities need to be aligned.
Developing end-to-end capabilities
Capability maturity assessment & development

Creating advanced capabilities that span all activities and all players is critical in reconfiguring these increasingly complex networks.
‘Meta-capabilities’ and competitive advantage
Creating unique clusters of capabilities and configuration aspects

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Assessing existing and desired meta-capabilities

Clustering capability strengths to form distinctive meta-capabilities

It is the unique clusters of individual capabilities combined with innovative configuration elements – or ‘meta-capabilities’ – that create sustainable differentiation.
Managing the end-to-end supply chain

Impact

“Our work with IfM has resulted in innovative strategy tools – linked to original research – that have been embedded as part of our ongoing strategic processes. These are helping to guide significant investments (~£0.25bn) in our supply chain that will generate tangible business value over the life of the investments (>£0.75bn), and which will contribute to competitive differentiation.”

Director of Corporate Planning, Rolls-Royce

“Our work with IfM ECS has resulted in a range of new strategy tools with very practical application. These tools have helped in important decision-making areas in our supply chain that have enabled us to drive business performance in manufacturing and supply chain, and commercially. We estimate that this work has underpinned investment decisions affecting more than £50 million of investment and supported the development of our new product capability supporting revenue in excess of £500 million.”

SVP Head of Network Strategy, GSK

“The study has enabled Huawei to articulate its global supply chain strategy for wireless products for the first time, with a detailed capability assessment activity setting out development and implementation opportunities. The detailed analysis is now available for the company to exploit as it supports the move to 4G as well as for geographic growth opportunities around the world. There has been considerable transfer of know-how, leaving the Huawei team able to conduct future studies across different product groups.

Supply Strategy Planning, Huawei

“We highly value our work with the IfM in contributing inspiring thinking to help us constantly step up in our approach to optimising end-to-end operations.”

Chief Operating Officer, The LEGO Group
Developing service supply networks
Managing shared multi-entity space

In recent years, many global manufacturers have added a service dimension to their business model and thereby introduced new challenges for network design. These product-service supply networks often involve multiple ‘primes’ that need to be highly integrated to enable effective product-service delivery.

“"The network design tools developed by the Centre for International Manufacturing provide a structured approach to develop industrial capability, and help guide the proactive reconfiguration of the network to shape future engineering and industrial capability across the design-build-service-support operation. We have used these methods and supporting tools to help design and down-select options for our Engineering operating framework.”

*Engineering Director, Systems and Strategy, BAE Systems*
Existing approaches for the design and operation of service supply networks are largely product-oriented and pay little attention to the customer-involving and relationship-based nature of services. A key area of CIM research has been extending theory on supply network configuration to fit the specific challenges of multi-partner service delivery.
Network re-configuration cycle

Some applications

BAE Systems
Beiersdorf,
Bombardier,
Caterpillar,
Electrolux,
GlaxoSmithKline,
Grundfos,
Huntsman,
Huawei,
Invensys,
Johnson Matthey,
Lego,
Rolls-Royce,
Schneider Electric,
Sealed-Air,
Shell,
Unilever,
Wavin,
Capturing Value in Global Operations

Application examples

• Gaining competitive advantage by reconfiguring the end-to-end supply chain and developing selected organisational capabilities
  • Pharma: Directing investments of >£50m, supporting £500m revenue
  • Aerospace: Capex investments of £250m supporting revenue £750m

• Designing production footprints to reduce cost and increase responsiveness
  • Construction Equipment: part of production footprint capex planning
  • Food Packaging: savings $50m/y with investments of $220m

• Developing a successful product engineering-service model that optimises through-life costs (design->build->support->in-use)
  • Defence: Proactive reconfiguration of global network incl. M&A strategy
  • Last Mile Logistics: New Business model innovation
The increasing complexity of global value networks has set new challenges for both the corporate strategist and the national (and regional) policymaker. The strategist now needs to guide the ongoing reconfiguration of these complex networks within the context of evolving industrial ecosystems, in order to maximise value for the firm’s shareholders. The policymaker’s interest lies in nurturing high value activities, often involving emerging technologies, to enhance national competitiveness.

CIM’s approach to configuring global value networks comprises three related activities: mapping, design and integration. New mapping approaches are needed to capture inherent complexity. New approaches to global network design need to reflect the typical stages in network development and the typical trends that drive reconfiguration. And new approaches to network integration are required because fragmentation within the network often results in suboptimal performance.
Mapping global value networks
Example: industrial biotechnology

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Institutions & specialists
- Research Councils
- Universities
- Gov’t Leadership forum
- RDAs
- Skills Councils
- Demonstrator facilities
- VCs
- Equipment providers
- TSB
- Diagnostic firms

Core products
- Substrates: starch, cellulose, oils, proteins, algae
- Agricultural products: intensive farming - plantations, non-intensive - small farms, under glass
- Bioprocessed inputs: fermentation, bio catalysts, bio refining, micro organisms, GMO
- Chemicals: alcohols, acids, vitamins, sugars

Core processes
- Feedstock substrate
- Grow
- Physical processing
- Bioprocessing
- Final processing
- End use

Core firms
- Feedstock developers
- Agro-industry
- Technology developers
- Plant & equipment
- Biochemical industry
- Industrial users
- Consumers

Last mile

Sustainability
Risk
Knowledge
M&A
Service
Production
Configuring global value networks
... in response to disruptive technologies and business models

Building on the industrial ecosystem mapping toolset, CIM has developed a structured approach to redesigning complex value networks. This approach has important applications for those who need to understand the impact of disruptive changes in technology on network structure and dynamics. It also helps to define how companies and countries can gain competitive advantage by proactively adapting to new industrial landscapes.
Integrating global value networks

... to improve linkage between key sub-systems

CIM’s third value network methodology explores how complex, multi-tiered value networks, often managed as semi-independent sub-systems, can be better integrated end-to-end. The approach adopts a more holistic approach to industrial system design by analysing opportunities for better integration between the sub-systems that make up the value network.
Configuring global value networks

Examples

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Summary of applications

Photovoltaic industry

Pharmaceutical industry

UK automotive
About us
Integrated approach to research, education & consultancy

Centre for International Manufacturing (CIM)
CIM is one of the IfM’s main research centres. It focuses on strategic and operations management research in close collaboration with industrial partners. The Centre has developed a strong industrial-policymaking-academic community and provides expertise and support in the area of international manufacturing and global value networks, with particular focus on capability development, strategic network design and briefing on globalisation and international manufacturing for industry and government.

IfM Education & Consultancy Services Ltd (IfM ECS)
IfM ECS works with companies of all sizes to create and capture value and with national and regional governments to support and grow their industrial sectors. It does this by transferring the new ideas and approaches developed by researchers at the IfM through a programme of education and consultancy services. CIM research is disseminated via IfM ECS through collaborative projects with companies and governments. These projects involve teams of senior researchers and experienced practitioners working closely with senior client teams, leading to significant business benefits.
New Research Projects in 2014

• Re-Configuring Supply Networks through production-process redesign
  • Advanced Manufacturing Pharmaceutical Supply Chains
  • CMAC - Continuous Manufacturing and Crystallisation –phase II
  • Network Design Process Laboratory

• Sustainable and Resilient Supply Networks
  • Engineering driven Sustainable Supply Network design
  • Sustainable Chemical Feedstocks
  • Risk and Resilience of Supply Networks

• New models of Internationalization
  • Interdisciplinary research – Exploring Interfaces in OM
  • Offshoring/Re-shoring trends - evidence
  • Emerging Country MNCs
Emerging themes

- **Risk and Resilience** - investment risk, supply network focus
- **Sustainable Supply Networks** – integrating sustainability into network design
- **Mergers & Acquisitions** – extending analysis to non-equity investments
- **Knowledge Integration** – knowledge transfer
- **Last Mile Logistics** – integrating developments in e-commerce
Companies and, indeed, governments are increasingly concerned about the risk and resilience of the global supply networks on which they depend. Traditionally, the key criteria for successful network design were speed, efficiency and use of resources. In an increasingly uncertain environment, however, corporate decision-makers and policymakers are anxious to ensure that networks will be able to recover from risk and unexpected disturbances.
Developing sustainable supply networks has become an increasingly important objective for many major companies, driven by a number of imperatives including customer expectations and the need to comply with increasingly robust regulatory frameworks...

...This has led to a greater focus on energy, resource efficiencies and waste reduction. While many organisations successfully use quantitative approaches to sustainability measurement - such as carbon footprinting – within the firm, these methods are often difficult to apply across a complex and extended supply network.
CIM research argues strongly for more proactive engagement of operational leaders and strategic network planners in pre-bid processes, and in post-deal integration. The concepts and frameworks emerging from the research provide useful analytical tools, and work is ongoing to convert these into practical business tools for use by corporate strategists.

Understanding the overall M&A process

Drivers of value creation in M&As – operational perspectives
Knowledge integration
Leveraging the combined knowledge across sites and functions

Integrating knowledge presents a significant challenge for global network strategists. There are many factors to consider. Success relies on collaboration between different sites and different functions...

...Only by understanding the various types of knowledge and how they – and the configuration of the network – affect how knowledge is shared, can a proactive and integrated approach to knowledge management be developed.

Model for knowledge integration
Recent years have witnessed the development of new routes-to-market involving specialist ‘last-mile’ consolidation and distribution service providers. CIM has developed a last-mile methodology which addresses the interests of the various stakeholders – institutional players, companies and customers.
Industrial Outputs

**Business Tools**

**Network Design Projects**

**Executive Education**

**Publications**

- **Practical support guides**
- **Annual Symposium**
- **Events**
Capturing Value from Global Networks
Two-day Symposium, 11-12 September 2014

The 18th Annual Cambridge International Manufacturing Symposium.

Topics address current themes impacting the design and operation of international manufacturing such as:
• risk and resilience of extended supply networks,
• re-shoring of production,
• technology implications on operations network design,
• design of sustainable supply networks,
• e-commerce and service based supply,
• industry evolution models
• emerging country multi-nationals.

www.ifm.eng.cam.ac.uk/events/cimsymposium14/
Questions