Control Tower Business in Logistic Services

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Simulated Strategies and Business Plans

By

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Cambridge Scholars Publishing

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FOREWORD

Cloud-based information systems today are mainstream and companies know how to utilise them. Despite this, cloud-based solutions for supply chain management are not yet widely used. Companies are now beginning to recognise the potential digitalisation can provide for supply chains. This is fertile ground for technology companies to seek new opportunities for their business and offer value added solutions to their existing and new customers. Cloud solutions can also reach the potential global customer base because often the solutions are similar if not identical to many customer problems and customers can benefit from the increased supply of service providers.

A Control Tower is such a cloud solution: it provides deep and extensive insight into the supply chain that has not been available before. More importantly, it offers new optimisation opportunities. Control Tower software as a service business needs the same foundation as any business: a solid strategy and a business plan to execute the strategy.

First, we need to define the actual service, who to sell it to, how to execute and the right time to implement. The business plan goes deeper into those questions and describes the concrete steps to make the best of the strategy, considering the facts that make the execution of that strategy a success and effectively mitigates the risks. For a startup, the strategy requires planning horizon of several years and to describe how the business is set up to become profitable as soon as possible.

For a Control Tower service business, it is clear – as the aim is to provide better visibility to the supply chain – that the customer segments should be logistics intensive, for example actual logistics companies, high material flow industries and retail companies. In the execution, we need to set the KPIs that must be followed; the best ones are those that display the benefit both for own business and the customer businesses. With the KPIs, the service can be also simulated to test the feasibility for both the service provider itself and the customers. With simulation we can find the required customer base which creates the predicted revenue against the predicted cost of providing the services.

An important part of setting up a new software as a service is to know the target market and the competition in that market. That can be achieved with benchmarking for which there are several tools that can be utilised. A Control Tower service can be a successful business, but it requires risk taking as it most likely will not be profitable for the first year in business just like most other startups.

The Control Tower service business also needs the right technology, the right strategy, and the right business plan. *In this book, we demonstrate how the selected strategy and business plan can be simulated in practice before starting the actual business.* These kinds of simulations are very important, not only for the startup company but also for other stakeholders.

List of Abbreviations/Symbols

1PL	Model, where all logistics are insourced
2PL	Model, where part of the logistics operations is outsourced
3PL	Model, where all logistics apart from management are outsourced
4PL	Model, where all logistics are outsourced
AI	Artificial Intelligence
AMS	Application Management Services
API	Application Programming Interface
AWS	Amazon Web Services
B2B	Business to Business
B2C	Business to Consumer
BG	Born Global
BPaaS	Business Process as a Service
BYOD	Bring Your Own Device
C2C	Consumer to Consumer
CAC	Customer Acquisition Cost
CAGR	Compound Annual Growth Rate
CARR	Committed Annual Recurring Revenue
CGM	Company Global Mindset
CI	Customer Integration
CMRR	Committed Monthly Recurring Revenue
CRM	Customer Relationship Management (System)
CRR	Committed Recurring Revenue
CT	Control Tower
DevOps	Delivery model combining development and operations
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
EI	External Integration
ERP	Enterprise Resource Planning (System)
ETD	Estimated Time of Delivery
ETA	Estimated Time of Arrival
eSCM	extended Supply Chain Management
fsQCA	fuzzy-set Qualitative Comparative Analysis
GDPR	General Data Protection Regulation
GM	Global Mindset
GPS	Global Positioning System

HCM	Human Capability Management
HQ	Headquarter
HR	Human Resources
IaaS	Infrastructure as a Service
IBM	International Business Machines (company)
IGM	Individual Global Mindset
II	Internal Integration
IOS	Inter-Organizational System
IP	Infrastructure Provider
iPaaS	integration Platform as a Service
IPR	Intellectual Property Rights
IS	Information System
IT	Information Technology
KPI	Key Performance Indicator
LPI	Logistics Performance Index
LSP	Logistics Solution Provider
MAPE-K	Monitor-Analyse-Plan-Execute over a shared Knowledge
MRP	Materials Requisition Process
MVP	Minimal Viable Product
NoSQL	Database without SQL
OPC	Open Platform Communications
OTIF	On Time and In Full
PaaS	Platform as a Service
PACE	Gartner's Layered Application Strategy
R&D	Research and Development
ROI	Return of Investment
SaaS	Software as a Service
SAFe	Scalable Agile Network
SAP	ERP systems provider
SC	Supply Chain
SCaaS	Supply Chain as a Service
SCC	Supply Chain Control
SCI	Supply Chain Integration
SCM	Supply Chain Management
SCOR	Supply Chain Operations Reference
SI	Supplier Integration
SLA	Service Level Agreement
SME	Small or Medium Sized Enterprise
SP	Service Provider
SQL	Structured Query Language (for databases)
TCT	Transaction Cost Theory

TMS	Transport Management System
WMS	Warehouse Management System

CHAPTER 1

INTRODUCTION

Logistics businesses are just discovering the benefits of new technology and real-time data. For example, in the case of Shaprio.com the advances in technology benefit all areas of the logistics industry: trucking transportation, international transportation (ocean and air), supply chain management and shipment tracking . Many logistics companies still use manual processes and mostly antique IT systems. For example, warehouse operators that continue to rely on printed lists for collecting goods; hauliers that receive orders through email or phone and register them manually on paper or on an online system; planning tasks on whiteboards; employees that are contacted and directed via the phone. There is considerable scope for renewing and modernising the archaic ways of working and implementing strategies to radically overhaul the current ways of data collection. The data itself holds significant value for further optimising the operations. In a study , 98% of 3PLs were of the view that improved data-driven decision-making is "essential to the future success of supply chain activities and processes."

Other businesses are also finding opportunities in on-going supply chain digitisation. According to Gartner, information technology is gaining an increasingly significant role in supply chain organisations . This means that manufacturing businesses are highly dependable on the logistics and on how the materials are brought in. How are the materials managed within the organisational premises? How are they processed during manufacturing? How does a customer take receipt of the finished product? The role of information that is required is especially important since the data collected can be utilised to optimise the whole supply chain.

One way to control supply chains is by developing logistics Control Towers and supply chain Control Towers (SCCTs) (Bhosle et al. 2011; Hofman 2014). Capgemini defines the SCCT as "a central hub with the required technology, organisation and processes to capture and utilise supply chain data to provide enhanced visibility for short- and long-term decision making that is aligned with strategic objectives" (Bhosle et al. 2011). Accenture offers a

similar definition, focusing on real-time data and integrated data management across the end-to-end supply chain (Bleda et al. 2014). In summary, a supply chain Control Tower is a centralised platform or system that provides real-time visibility, analytics and coordination capabilities across the entire supply chain network. It enables companies to monitor and control their supply chain operations, optimise processes and make data-driven decisions to improve efficiency, responsiveness and customer service. A logistics Control Tower provides real-time visibility and control over transportation, warehousing and distribution activities, enabling companies to track shipments, monitor inventory levels and manage logistics service providers.

Supply chain organisations would benefit greatly from a Control Tower in managing their material flows, meeting their service promises and improving decision-making. It would enable proactive decision-making through identifying issues and risks in the supply chain and providing real-time insights to stakeholders. The concept of the Control Tower is becoming increasingly widespread in Supply Chain Management and Control Tower technologies are currently a popular topic within the supply chain community . Our interest in this book is focused on logistics software services (SaaS) and the Control Tower is one example of such a case.

The nature of the supply chain will be changing radically in the near future. This will be driven by the need for sustainability and requirements for efficiency . There is a demand for reducing supply chain carbon footprint by way of reducing number of shipments being moved between geographical locations such as cities, countries or continents. Technology enables us to achieve that through the availability of real-time data and optimisation approaches. There are many opportunities to create a leaner, meaner and more sensible supply chains. However, this may entail changes to the role of the logistics businesses and organisations involved in the overarching supply chain operation. Again, the Control Tower is an excellent concept to assess how different changes may affect the whole supply chain. A key feature of the Control Tower is that it can assess the supply chain from several viewpoints such as:

- Customer perspective
- Product perspective
- Assignment perspective
- Shipment perspective
- Event perspective
- Carrier perspective
- Exception perspective

Cloud computing is a critical technology that enables logistics Control Tower solutions to function effectively. By utilising the cloud, logistics providers can store vast amounts of data from disparate sources, such as sensors, GPS trackers and ERP systems, in a secure and scalable environment. This data can then be analysed using machine learning and other advanced data analytics techniques to generate insights and optimise supply chain operations.

Cloud computing also allows logistics Control Tower solutions to be deployed quickly and cost-effectively as the go-live time can be minutes instead of months and it costs only fractions what on-premises solutions require. Instead of having to build and maintain expensive on-premises IT infrastructure, companies can simply subscribe to a pay-as-you-use cloud-based logistics platform that provides all the necessary software, hardware and storage resources. This allows logistics providers automatically to scale their operations up or down as fast as necessary, without having to spend time creating a business case and seeking authorisation for investing in additional IT resources.

In summary, cloud computing is a critical enabler of logistics Control Tower solutions, providing the scalability, flexibility and computing power needed to manage and optimise complex supply chain operations.

The National Institute of Standards and Technology (NIST) is a US government agency responsible for developing standards and guidelines for technology and information security. In 2011, NIST released a publication titled "The NIST Definition of Cloud Computing" (Simmon, E., 2018), which provides a comprehensive definition of cloud computing.

According to NIST, cloud computing is defined as a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models and four deployment models.

Essential Characteristics:

1. On-demand self-service: Users can provision computing resources, such as server time and network storage, automatically without requiring human interaction with the service provider.

2. Broad network access: Resources are available over the network and accessed through standard mechanisms, promoting use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops and PDAs).
3. Resource pooling: The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or data centre).
4. Rapid elasticity: Resources can be rapidly and elastically provisioned, in some cases automatically, to quickly scale up or down as the customer's needs change.
5. Measured service: Cloud systems automatically control and optimise resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth and active user accounts). Resource usage can be monitored, controlled and reported, providing transparency for both the provider and consumer of the utilised service.

Service Models:

1. Infrastructure as a Service (IaaS): The capability provided to the consumer is to provision processing, storage, networks and other fundamental computing resources where the consumer can deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage and deployed applications.
2. Platform as a Service (PaaS): The capability provided to the consumer is to deploy the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure but has control over the deployed applications and possibly application hosting environment configurations.
3. Software as a Service (SaaS): The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g.,

web-based email). The consumer does not manage or control the underlying cloud infrastructure but has control over configuration settings for the application-hosting environment.

Deployment Models:

1. Private cloud: The cloud infrastructure is provisioned for exclusive use by a single organisation comprising multiple consumers (e.g., business units). It may be owned, managed and operated by the organisation, a third party or some combination of them and it may exist on or off-premises.
2. Community cloud: The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organisations that have shared concerns (e.g., mission, security requirements, policy and compliance considerations). It may be owned, managed and operated by one or more of the organisations in the community, a third party.

Software businesses have been reliant on technologies associated with cloud computing for over a decade. The journey has been long and the transformation of the cloud from a nascent technology to a real alternative has taken time. This is quite normal in the adoption of innovative technology; for example, Gartner illustrates this with its *Technology Hype Cycle*:

- **Innovation Trigger:** Newly innovated technologies are in this stage and are building up expectations with accelerated speed. A highly competitive advantage could be gained if technology is appropriately implemented.
- **The peak of Inflated Expectations:** In this stage, everyone has elevated expectations of the technology and the early adopters are investing a lot in these newly innovated technologies. A highly competitive advantage can still be gained.
- **Trough of Disillusionment:** The first attempts to utilise the technology show its true potential; some attempts fail and some are successful.
- **The slope of Enlightenment:** The adopters realise where the technology should be used and where it should be avoided. They make plans for the proper utilisation of the technology.
- **Plateau of Productivity:** The technology is in a mature stage. There are models on how to utilise the technology to its fullest. The technology no longer enables competitive advantage and has become standard practice within organisations.

Cloud, as a technology, has entered the plateau of productivity. 94% of enterprises already use a cloud service . Many companies now include an IT strategy to transition their existing systems from on-premises to a full or partial Cloud deployment. It is arguable that new investments in on-premises systems will still need to be made; indeed, for critical systems, which can be a sensible choice. Nonetheless, the future will be at least a "hybrid" of both on-premises and cloud infrastructure. For example, an industrial company could run its production systems on-premises at the plant but opt to take supporting systems like finance and HR to the cloud.

The delivery of Software as a Service (SaaS) over the cloud has become ubiquitous to the extent that customers trust and take this technology for granted. However, it is a different story for Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) as they require more management from the party using them. Customers are not accustomed to buying those as consumers; the expectation is that the organisation offering SaaS incurs the expenses towards cloud-based hosting (IaaS) and platform development (PaaS). More specifically, for IaaS, the organisation purchases the ability to set up virtual servers, which they can then manage as they were actual servers. For PaaS, the organisations purchase technical capability like a database or an application server software with certain performance promises. Based on the underlying IaaS and PaaS infrastructure, the organisation can set up their software as a SaaS; the software, in turn, uses the IaaS and PaaS deployment and offers a service to customers. It could be argued that IaaS and PaaS have no parallel available in the consumer world. For SaaS, the customer can log-on to the software and immediately start using it. It is to be noted that the software may be "out of the box" and ready to use, or it may require further configuration to best suit customers' needs. Many enterprise SaaS systems like *Salesforce.com* and *ServiceNow* require some configuration.

Understanding SaaS and what makes it unique is integral to the book's content. However, we will also take a step further: the international business discussed in this book will be based on *"Solution as a Service" (SLaaS)*. We define SLaaS as a combination of several pieces of software, for example, a workflow which chains together different inputs and outputs from individual software. We will discuss how these individual software artefacts interact, thus creating a hybrid combination that will present the overall solution with a specific purpose.

Integrating systems and solutions is a vital part of modern solution delivery. Modern solution delivery is often targeted at specific application areas. The

PACE model by Gartner proposed a model to discuss the roles of different solutions. The model divides the solutions into *Systems of Record*, *Systems of Differentiation* and *Systems of Innovation*. The main idea of the PACE model is to increase the flexibility and changeability of an IT landscape.

Amazon, Apple, Facebook and Google are the trendsetters for numerous established and start-up technology companies. Scott Galloway speaks of The Fifth Horseman as the possible fifth trendsetter every operator would wish to be. According to , the eight factors for a technology company to be included with the elite group of Amazon, Apple, Facebook and Google are:

- **Product differentiation:** How can a technology company distinguish its software products from the vast array of offerings available in the market?
- **Visionary Capital:** The company's inherent capability to develop innovative technology, create blue ocean markets and disrupt.
- **Global Reach:** The technology company's capacity to provide its product worldwide.
- **Market Likeability:** Are the product(s) and the company well-received by users? What kind of reputation do these technology companies aim to establish?
- **Vertical Integration:** The unification of various products into a cohesive supply chain, enabling the company to deliver an exceptional customer experience and achieve operational efficiency and excellence.
- **AI:** The ability to harness the power of artificial intelligence and capitalise on its numerous advantages.
- **Accelerant:** The capacity of the technology company to foster faster adoption compared to its competitors in the market.
- **Geography:** The technology company's capability to operate on a global scale while customising its products and services to meet the specific requirements of diverse geographies and markets it serves.

Our optimal Control Tower concept and execution development methodology will include conceptual thinking, numeric simulations and critical evaluation of the simulation results. In addition to the literature, we will discuss strategy setting and business planning. We will discuss how a SaaS Control Tower business should be built and in doing so, we address questions such as:

- The stage of the *Technology Hype Cycle* to which the Control Towers can be assigned?
- How to build a Control Tower strategy?
- What prerequisites Control Tower cloud service has?
- What risks should be considered? How to mitigate such risks?
- How to approach different markets?
- How to market, sell and deliver the Control Tower cloud service?
- How to build a business case?
- What outcomes would this business generate?
- How does this venture fare in comparison to its competitors?
- What is the unique selling proposal?
- Why should logistics companies invest in startup Control Tower?

Next, we will first discuss SaaS and its characteristics. It is also essential to consider the application area for the Control Tower: the supply chain and its digitalisation. With the overarching objective of expanding globally and fully leveraging the advantages of a global supply chain, we will delve into the topic of internationalisation, beginning with our local market in Finland. To meet these goals, we will concentrate on developing a strategy for such a service and formulating a comprehensive business plan. The starting point is a small business for which SLaaS gives an opportunity to compete in the market. This Control Tower cloud service is new to our chosen company and a fairly new concept to its target market. There are some similar solutions (like, for example, DHL offers) available used as a comparison to the Control Tower at the end of the book.

To conclude, we will simulate the Control Tower strategy and business plan based on metrics selected. These will be based on hypothetical scenario, customers and financials. The resulting outcome will enable us to assess the feasibility and viability of the strategy and business plan through a comprehensive evaluation of the outcomes and risk assessment.

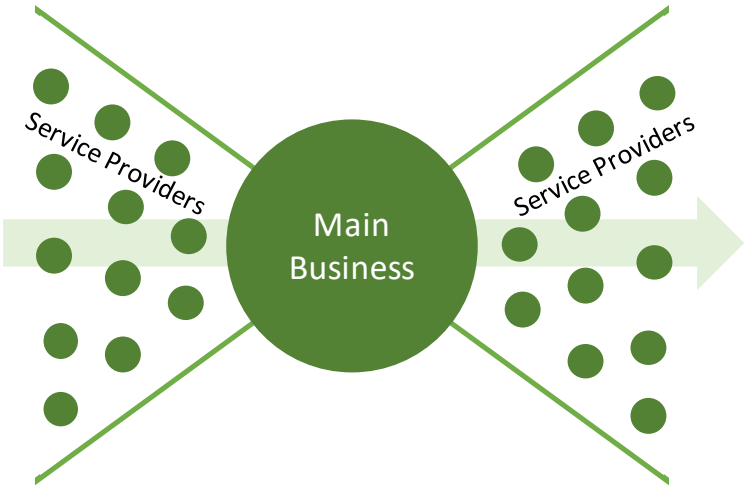
CHAPTER 2

SUPPLY CHAIN DIGITALISATION

2.1 Comprehensive Supply Chains

According to Porter, the idea of the value chain, in enhancing value of the product moving through supply chain, is based on the process view of organisations, the idea of considering a manufacturing (or service) organisation as a system that is made up of subsystems each with inputs, transformation processes and outputs. Those inputs, transformation processes and outputs involve acquisition and consumption of resources – money, labour, materials, equipment, buildings, land, administration and management. Value chain activities conducted determine costs and affect profits.

Value chain can be described as a chain in which raw materials are combined and refined step by step to produce a finished product. Value chains today do not necessarily end after production as there can be further potential services available for that product. Consider a mobile phone: it is produced in a complex value chain that ends with a retailer who sells it to a consumer. After the purchase consumer uses additional software services (which are SaaS) to make most of the phone. These services are not only from the phone manufacturer, but from an ecosystem of companies creating and selling their services and apps. Recycling of the product is also part of the value chain, for which a business must plan early in the value chain (for example when designing the product). Value chain could be described as a two ended funnel, as visualised in Picture 1.



Picture 1. Modern Value Chain.

Michael Porter introduced his model for value chains as full range of activities needed to create a product or service and he provided some content for the term competitive advantage. This was to help companies to understand and utilise their distinctive competencies to create and add value. According to Porter's model, a business comprises value functions that encompass cost creation as well as value addition to its customers. He divided the value functions into two main categories: primary functions and secondary functions. The primary functions he lists are:

- **Inbound logistics.** Tasks such as transportation, warehousing, inventory management, and supplier relationship management to ensure a smooth and efficient flow of materials into the organisation's operations. Most important part of the logistics chain for most manufacturing organisations as it has a direct effect for the next steps of the value chain such as warehousing and operations.
- **Operations.** The core of the business activities. For manufacturing organisation, it is the manufacturing process. For logistics organisation it is the transportation of the goods and for retail organisation it is the selling of the goods.
- **Outbound logistics.** Various tasks related to packaging, warehousing, transportation, order fulfilment and delivery to ensure that the products reach the intended recipients in a timely

and efficient manner. Especially important for retail businesses and part of their customers' value chain. Has a direct impact on the preceding process of manufacturing and the following process of sales and customer management.

- **Sales and marketing.** Depends highly on the operations including planning of products and the quality of the manufacturing. The effectiveness of outbound logistics significantly influences the success of sales and marketing efforts.
- **Service.** In many value chains, the service phase is becoming progressively longer. In the past, the value chain concluded once the finished goods were sold. However, nowadays, the value chain may extend beyond the initial sale to include the provision of product-related services that can span over several years.

The secondary functions by Porter are:

- **Procurement and purchasing.** Securing services, products and raw materials from suppliers to run the operations but also to produce the core products. Divided into direct procurement (for production) and indirect procurement (for product and services not directly linked to the production).
- **Technological development.** Development of technology is in many cases vital to keep the operations effective and to ensure the end products remains competitive.
- **Human resource management.** No organisation operates without people. People are needed in every part of the value chain. It can be argued though that in the future some parts of the value chain can be operated by machines with the help of machine learning and artificial intelligence.
- **Infrastructure.** The "platform" on which the whole value chain is based on, consisting of premises (warehouses, plants), machinery (conveyors, servers), equipment (tools) and corporate functions (finance, management).

Greg Kefer states , that cloud is like any other electrical item that is instantaneously useable. It just needs power to be switched on. This is a commonly used analogy that can support almost any cloud solution, especially when compared to a traditional software . From this angle, cloud has equal importance to both supply chain operators and to logistics service providers.

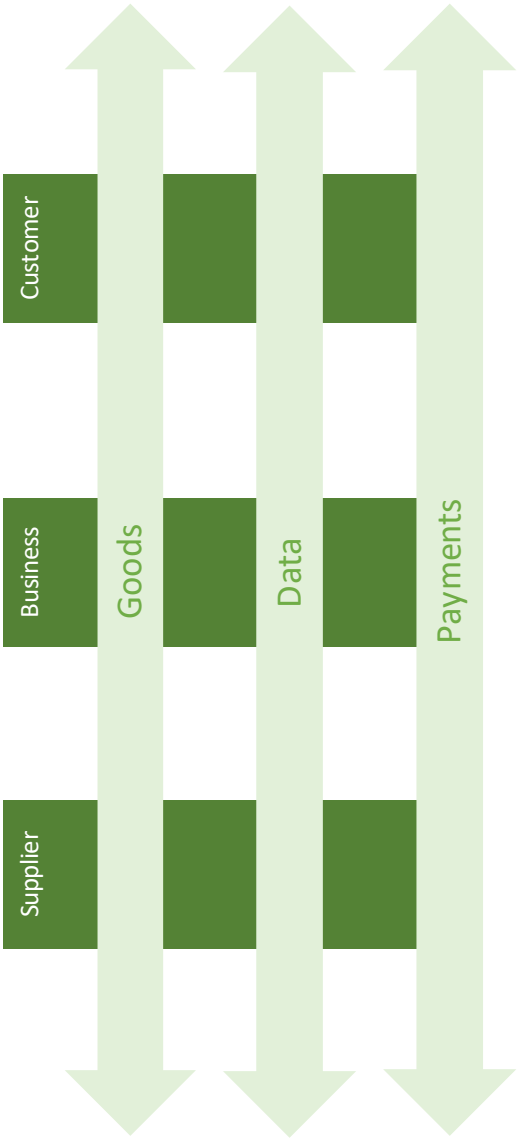
According to Kefer, maintaining real-time connectivity and communication among all partners in a supply chain is a major hurdle. It necessitates that all the collaborating entities in the chain have access to and react to the same information, creating a unified version of reality. Global supply chains frequently suffer from "black holes" where information is either lost or is incomplete. However, cloud platforms can overcome these gaps by creating a virtual, information-based replica of the physical supply chain, enabling a more complete view of operations around the world .

According to Porter , an organisation gains competitive advantage when it executes its value chain – the range of activities needed to create the product/service – better or with lower cost than its competitors. This is a valid point and in theory that is all it should take to create a competitive advantage.

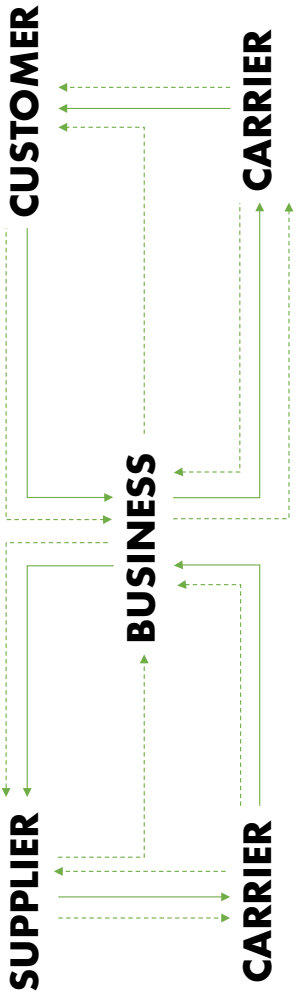
In value chains, a supply chain consists of flows of goods, data and payments. These are linked together and the importance of data is ever increasing. The ultimate situation would be such where the flow of goods automatically creates the data and the invoicing and payment process would be also automated based on that data. This is not the case with many organisations currently, but possibilities and enablers do exist. Numerous organisations have not yet reached a level of maturity where they can seize the opportunity to invest in and embrace the risks associated with innovative technologies.

In its basic form, supply chain is a relationship between a supplier, main organisation and a customer (see Picture 2). One view of a supply chain is a full chain from the first possible part of the value chain to the last possible end customer. Another but narrower view of a supply chain is limited to considering it from the perspective of a single supplier-organisation relationship or a single organisation-customer relationship which includes only information related to that relationship.

The flow of goods consists of the movement and use of the physical goods as raw materials or parts from supplier and warehousing them, using them in the production to create finished goods and warehousing them and then shipping and delivering the goods to the customer . This chain repeats itself many times within the value chain. Supply chain could be described as in Picture 3 when including the logistics companies or functions (carriers) moving the goods.



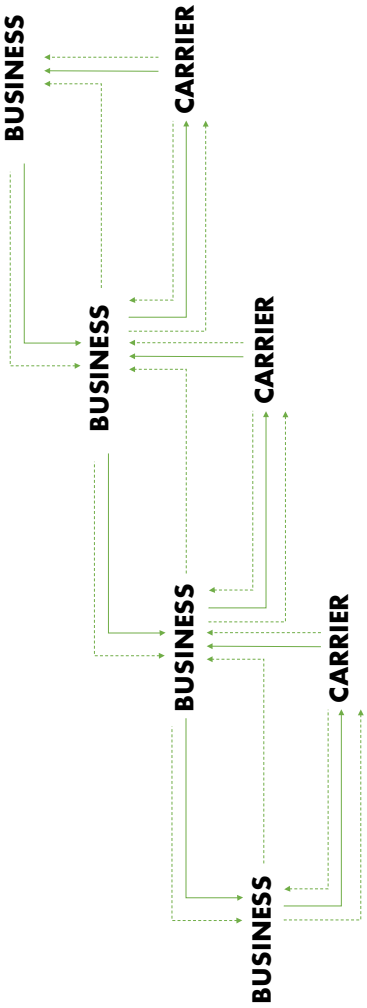
Picture 2. Simple definition of Supply Chain.



Picture 3. Supply chain with carriers, movers of the goods.

Supply chain is a complex chain which cannot be expressed with simple visualisation as it can consist of many actors and these actors can have multiple roles in the chain. This chain can also be managed in many ways. For instance, a single carrier may have the capability to transport goods across multiple points within the supply chain or even hold contractual

responsibility for moving them from the beginning to the end of the chain. On the other hand, another carrier could assume full responsibility for the entire chain, actively taking part in its end-to-end management. What is created is akin to the chain in Picture 4.



Picture 4. Extended Supply Chain (The solid line denotes a process flow and the dotted line denotes a data flow).

It is evident that data gathered from the supply chain is important as it gives information on how the supply chain works and it acts as feedback that should be regulating the supply chain accordingly. The data should be as real-time as possible for the control actions to be precise and to produce the best possible end result. Management decisions should be based on real-time data and not on reports based on several hours old historical data . There is no longer any reason to use data that is not real-time as data can move many times faster than the goods they represent.

Cash is naturally the reason for operating such complex supply chains and as the goods and data flows, so should the invoice be processed for the payment within credit terms to keep the cash flows healthy and the basis for operations intact. As soon as the goods are sent, an invoice should be triggered and the customer should settle it as per the credit terms. The data is the tool to control the cash flow. Real-time data means more receipts collected as scheduled.

Summary

In this chapter, we discussed the concept of value chain and how it enhances the value of products moving through the supply chain. We explained Michael Porter's model for value chains that consists of primary functions and secondary functions that create the costs and add value to customers. We also mentioned the role of cloud computing in the supply chain, particularly in creating a virtual replica of what is happening on the ground, around the globe and filling the information gaps in the global supply chain. We noted that supply chains consist of flows of goods, data and payments and that the importance of data in supply chains is increasing all the time. Finally, we need to highlight the need for organisations to invest in modern technology to improve their supply chain operations.

2.2 Why digitalise Supply Chain

Digitalisation has been a buzzword for several years and still remains a global trend and growth factor of the modern economy . Businesses continue to grapple with the concept of digitalising their supply chains as there is no universally applicable blueprint for this transformation. Digitalisation manifests differently for each business, with varying objectives, approaches and results. Employing the same digitalisation solution for two different businesses can yield disparate outcomes. This disparity does not imply one outcome is superior to the other but rather highlights the likelihood of