

BERNARDO NICOLETTI

AGILE PROCUREMENT

Volume I: Adding Value with
Lean Processes



Agile Procurement

Bernardo Nicoletti

Agile Procurement

Volume I: Adding Value with
Lean Processes

palgrave
macmillan

Bernardo Nicoletti
University of Tor Vergata
Rome, Italy

ISBN 978-3-319-61081-8 ISBN 978-3-319-61082-5 (eBook)
DOI 10.1007/978-3-319-61082-5

Library of Congress Control Number: 2017953569

© The Editor(s) (if applicable) and The Author(s) 2018

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Palgrave Macmillan imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Contents

1	Introduction to Agile Procurement Processes	1
2	Procurement Processes	7
3	Agile Procurement	15
4	Agile Procurement Support of the Value for the Customer	43
5	Customer Relationships and Agile Procurement	73
6	Processes in Agile Procurement	113
7	Resources and Agile Procurement	149
8	Costs and Agile Procurement	171

9 Conclusions for the Agile Procurement Processes	225
Glossary	227
Bibliography	249
Index	269

Abbreviations

AI	Artificial Intelligence
AILOG	Associazione Italiana di Logistica
API	Application Programming Interface(s)
AR	Acquisition Request
ASC	Agile Supply Chain
B2B	Business to Business
BC	Business Continuity
BI	Business Intelligence
BMC	Business Model Canvas
BPO	Business Process Outsourcing or Business Process Optimization
Capex	Capital Expenditure
CFFR	Collaborative Planning, Forecasting and Replenishment
CFM	Cash Flow Management
CIM	Computer-Integrated Manufacturing
CM	Configuration Management
CNC	Computer Numerical Control
COPIs	Customer, Output, Process, Input, Supplier
CPFR	Collaborative Planning, Forecasting, and Replenishment
CPG	Consumer Packaged Goods
CPM	Corporate Performance Management or Critical Path Method

CPO	Chief Procurement Officer
CRM	Customer Relationship Management
CRS	Computer Reservation System
CTC	Critical to Customer
CTQ	Critical to Quality
DDLC	Document Development Life Cycle
DMADV	Define, Measure, Analyze, Design, Verify
DMAIC	Define, Measure, Analyze, Improve, Control
DRP	Distribution Requirements Planning
DSO	Days Sales Outstanding
ECM	Enterprise Content Management
EDI	Electronic Data Interchange
EMEA	Europe, Middle East, and Africa
EMS	Small and Medium Enterprises
EOBR	Electronic on-board Recorder
EOQ	Economic Order Quantity
EPC	Engineering, Procurement, and Construction
EPE	Every Part Every
ERP	Enterprise Resource Planning
ETL	Extraction, Transformation, and Loading
ETS	European Treaty Series
EU	European Union
EVI	Early Vendor Involvement
FMCG	Fast Moving Consumer Goods
FTE	Full-Time Equivalent
GDP	Gross Domestic Product
GPO	Group Purchasing Organization
GPP	Green Public Procurement
GPS	Global Positioning System
HR	Human Resources
IaaS	Infrastructure as a Service
ICC	International Chamber of Commerce
ICT or IT	Information and Communication Technology
IoT	Internet of Things
IP	Internet Protocol
ISO	International Standard Organization
JIC	Joint Integrating Concept

JIT	Just in Time
KPI	Key Performance (or Process) Indicators
KRI	Key Risk Indicator
LAN	Local Area Network
MMR	Mass Market Retailers
MRP	Manufacturing and Material Requirement Planning
MSA	Master Service Agreement
MTO	Make to Order
MTS	Make to Stock
NIST	National Institute of Standards and Technology
O & M	Operations and Maintenance
OEM	Original Equipment Manufacturer
Opex	Operating Expenditures
OPG	Order Processing Guideline
P2P	Procure to Pay
PA	Public Administration
PaaS	Platform as a Service
PC	Personal Computer
PERT	Program Evaluation and Review Technique
PIN	Personal Identification Number
PLM	Product Lifecycle Management
PO	Purchase Order
POS	Point of Sale
QFD	Quality Function Deployment
R2P	Requisition to Pay
RACI	Responsibility-Accounting-Control-Information
RE	Real Estate
RFB	Request for Bid
RFI	Request for Information
RFID	Radio-Frequency Identification
RFP	Request for Proposal
RFQ	Request for Quotation
RFX	Any type of Request for Procurement
ROA	Return on Assets
ROI	Return on Investment
S2P	Source to Pay
SaaS	Software as a Service

SCF	Supply Chain Finance
SCM	Supply Chain Management
SG&A	Sales, General, and Administration
S&O	Strategy and Operations
S&OP	Sales and Operations Planning
SIPOC	Vendor, Input, Process, Output, Customer
SLA	Service Level Agreement
SMED	Single Minute Exchange of Die
SMEs	Small and Medium Enterprises
SRM	Supplier Relationships Management
STP	Straight-Through Processing
SWOT	Strengths-Weaknesses-Opportunities-Threats
TCM	Total Cost Management
TCO	Total Cost of Ownership
TP	Transaction Processing
TPM	Total Productive Maintenance
TPS	Toyota Production System
TQM	Total Quality Management
UCC	Unified Collaboration and Communication
UK	United Kingdom
US or USA	United States of America
VA/NVA	Value Added/Non Value Added
VMI	Vendor-Managed Inventory
VoC	Voice of the Customer
VSM	Value Stream Mapping
WIP	Work in Process
WMS	Warehouse Management System
XML	Extended Messaging Language

List of Figures

Fig. 1.1	From the supply chain to the value network	3
Fig. 2.1	Value network, logistics and sourcing	8
Fig. 3.1	The agents of change in procurement	19
Fig. 3.2	Business model canvas	37
Fig. 4.1	The approach to agile procurement	51
Fig. 5.1	The big data analytics cycle	75
Fig. 5.2	The sourcing process and the use of open data	86
Fig. 5.3	E-collaboration (elaboration of the author on Bertele', U. and Rangone, A. (2004). The B2B in Italy: finalmente parlano di Dati, Associazione Impresa Politecnico, Milano, Italy)	97
Fig. 6.1	The basic processes of sourcing	114
Fig. 6.2	The supply matrix (Kraljic)	118
Fig. 6.3	Functionality of a process of transportation. (Musumeci A. (2012), Un caso reale di realizzazione di un Big Data nel Gruppo Ferrovie dello Stato, Big Data Forum, Nov. 21)	132
Fig. 6.4	Capabilities and decision-making level	133
Fig. 6.5	Capabilities of a logistics system in relationships with vendors	133
Fig. 7.1	From a product perspective to a customer perspective	154
Fig. 7.2	Porter's value chain	154
Fig. 7.3	A model for the classification of services	160

xii **List of Figures**

Fig. 7.4	Examples of services in the case of a transportation organization	161
Fig. 8.1	The structure of lean thinking	174
Fig. 8.2	The SIPOC	194
Fig. 8.3	Typical kanban	196
Fig. 8.4	A leagile approach based on decoupling (elaboration of the author from Christopher and Towill)	202
Fig. 8.5	The method of leagile and digitize	204
Fig. 8.6	The three flows in procurement	211
Fig. 8.7	Procurement finance model	214

List of Tables

Table 4.1	The characteristics of agile procurement	50
Table 4.2	Effect on the organization and procurement department	53
Table 4.3	Eco goals and levers to achieve them	65
Table 5.1	Some tools used to support organizations with big data analytics	79
Table 6.1	Procurement processes	116
Table 6.2	Capabilities and decision-making level	134
Table 8.1	The 5S tools	184
Table 8.2	Lean and Six Sigma characteristics	199

1

Introduction to Agile Procurement Processes

Organizations need to grow, notwithstanding market volatility, the push to reduce costs and delivery times, and the difficulty of forecasting. As the world economy becomes more competitive, organizations intensify their external activities. Better procurement may allow the organization to substantially improve its margins, due to the increased number of components of services and goods sourced externally to the organization.

The increasing complexity of the business environment requires significant intervention in the management of processes and information within each organization and in inter-organization relations. The main stimulus for change comes from the need for process improvement and the evolution of information and communication technology (ICT) in terms of development characteristics and potential benefits. Digital transformation is the right solution.

An increasingly important aspect is the visibility and alignment between processes and the overall objectives of the organization. These changes have a major impact on the management of the value network of the organization and hence on its main processes.¹ Therefore, organizations put more and more emphasis on the management of these processes.

They should work together with vendors to refine their strategies and practices aimed at achieving the objectives defined in terms of scope, cost, time, and quality.

This book does not use the term supply chain or value chain. The term it uses is value network, underlining the importance of taking into account the value provided by the organization to its customers and the increasingly non-sequential nature of processes in the organization (see Fig. 1.1).

In the management of the value network of the organization, procurement processes can be defined as those of procuring, receiving, and managing goods, raw materials, services, and maintenance in exchange for financial considerations. Due to the trend of concentrating on the core business, relationships with vendors have become increasingly important. Organizations have begun to review their procurement strategies. In the past, organizations saw procurement as a service to its other functions, but it now plays an increasingly central role in successful organizations thanks to management attention to the value network. Consequently, it has come to have a greater impact on the operations and the creation of margins of the organization. The increasing outsourcing and globalization have led to greater amounts of supplies and stocks of work-in-process. The quality is increasingly critical, and delivery lead time is fundamental to the competitiveness of the organization. Managers have to adopt new models that emphasize procurement in the value network as a strategic key to success rather than simply a service organization.

In the volatile modern world, flexibility is essential to the survival and success of an organization. This flexibility is only possible in an agile enterprise.

Business agility is the “ability of a business system to rapidly respond to change by adapting its initial stable configuration.”² Business agility can be maintained by adapting goods and services to meet customer demand, adjusting to changes in the business environment and taking advantage of human resources.³

Procurement is an essential function of the enterprise (it can control up to 80% of the costs of the organization). Therefore, it is fundamental to enterprise agility.

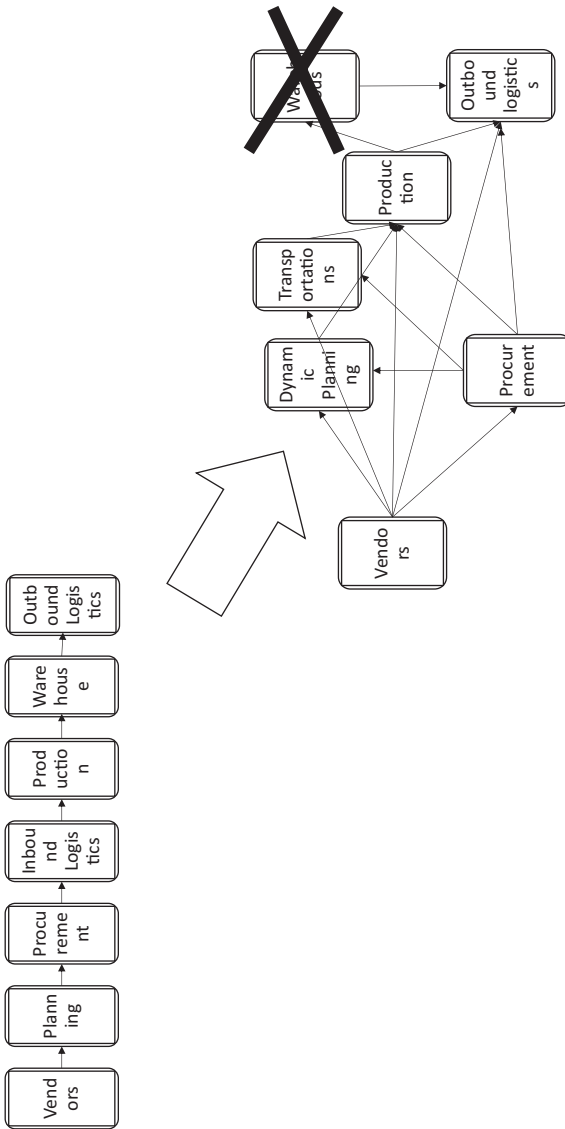


Fig. 1.1 From the supply chain to the value network

This book discusses an approach referred to as agile procurement to contribute to the improvement of value creation in procurement processes. It claims that in order for an organization to reach a state of agility, procurement must itself act according to an agile business model. The following chapters analyze in detail each basic component of the procurement business model.

In terms of the tools to be used to gain agility, this book underlines the importance of digital transformation. This can be achieved with a Lean Six Sigma approach combined with smart digitization.

The analysis of these concepts is the subject of this book.

The principles of agility and leanness, in combination with management automation, can provide a powerful support to enable organizations to meet their daily challenges, provide the needed flexibility, and make their strategies successful in the short, medium, and long term.

The current digital transformation affects not only production (Smart Manufacturing/Factory) and logistics (Logistics 4.0), but equally all other functional areas of the organization, especially procurement. The goal is to make processes more agile and at the same time to take into account the opportunities provided by process automation. Often one of the main problems encountered is the excessive separation between the improvement of processes and digitization, or between the organization and the information and communication systems. This challenge is even more evident if one considers the organization of services, where digitization increasingly manages the processes.

This book presents in detail the application of agile procurement to optimize processes by making them leaner and, at the same time, digitizing them. The objective is to reduce waste and defects while also improving cycle times. The book uses a business model applied to the procurement function, arguing that procurement is indeed a series of processes that should act as a business.

Agile procurement is a method and a set of tools. It is also, and above all, a culture aimed at the effectiveness, efficiency, economy, and ethics of an organization. It requires a change of paradigm. Agile procurement certainly presents an important opportunity, especially considering that there is already in procurement a base orientation toward effectiveness, efficiency, economy, and ethics.

The development of agile procurement is especially important during this time of financial and economic crisis. In such moments of crisis, any initiative for improving the value of business products for customers, reducing waste, and especially becoming more flexible and productive must be undertaken immediately and as a priority.

For this, especially in these years of economic crisis, agile procurement can be of great help in improving procurement, purchasing, logistics, and, in general, the end-to-end value network. In the past, organizations aimed to produce the best products to win the competition. Today they must try to implement all necessary measures to avoid waste, add value for customers, and become more flexible. This is what the agile procurement approach aims to do. This approach requires adopting the perspective of the customer and endeavoring to increase the value of products, services, and the organization for the benefit of the customer. The value added for the organization is a derived result.

The agile procurement culture must permeate all areas of the organization in order for it to achieve flexibility and, above all, ensure the survival and growth of the organization. This book examines all these areas of improvement in the procurement processes and suggests best practices for attacking them.

The treatment of agile procurement in this book is split into two volumes. The first volume deals primarily with the contribution of process improvement to agility. The second volume deals primarily with automation. While the topic is divided into two parts, this book argues that agile procurement requires an integrated approach that involves both leaning processes and digitizing them.

These two volumes take into account the existing challenges in terms of digital transformation. The final section of the second volume looks to the future and points to a series of very interesting emerging trends.

While these two volumes present a series of models, it substantiates them with many real-life examples of their successful implementation. Good practice should be the basis of any theory.

The book presents the more important tools for an agile methodology, leaving some of the others to specialized books.⁴ Some of these agile methods and approaches include speedboats, innovation labs, venture-capital funds (to establish or support start-ups and own employees with

great business ideas), agile project management (design thinking, scrum meetings, burn out), and flexible working environment (work from home, virtual 3D conferencing).

Notes

1. Peppard, J., and Rylander, A. (2006). From value chain to value network: Insights for mobile operators. *European Management Journal*, 24(2): 128–141.
2. Leybourn, E. (2013). *Directing the Agile Organisation: A Lean Approach to Business Management*. IT Governance Publishing, Ely, UK. Wieland, A., and Wallenburg, C.M. (2012). Dealing with supply chain risks: Linking risk management practices and strategies to performance. *International Journal of Physical Distribution & Logistics Management*, 42(10).
3. Tsourveloudis, N.C., and Valavanis, K.P. (2002). On the measurement of enterprise agility. *Journal of Intelligent & Robotic Systems*, 33(3): 329–342.
4. Cummins, F.A. (2016). *Building the Agile Enterprise: With Capabilities, Collaborations and Values*. Morgan Kaufmann, Burlington, MA.

2

Procurement Processes

Introduction

This chapter describes the main processes associated with procurement. It begins with a distinction between the terms sourcing, logistics, supply chain management, and procurement and presents the main activities that make up these processes.

In order to improve processes, it is essential to define the current processes, describe them, analyze them, and then improve them.

Procurement Cycle

The meanings of the terms sourcing, supply, logistics, supply chain or value network, and procurement differ from organization to organization.¹ The following section clarifies how this book uses these different terms (Fig. 2.1).

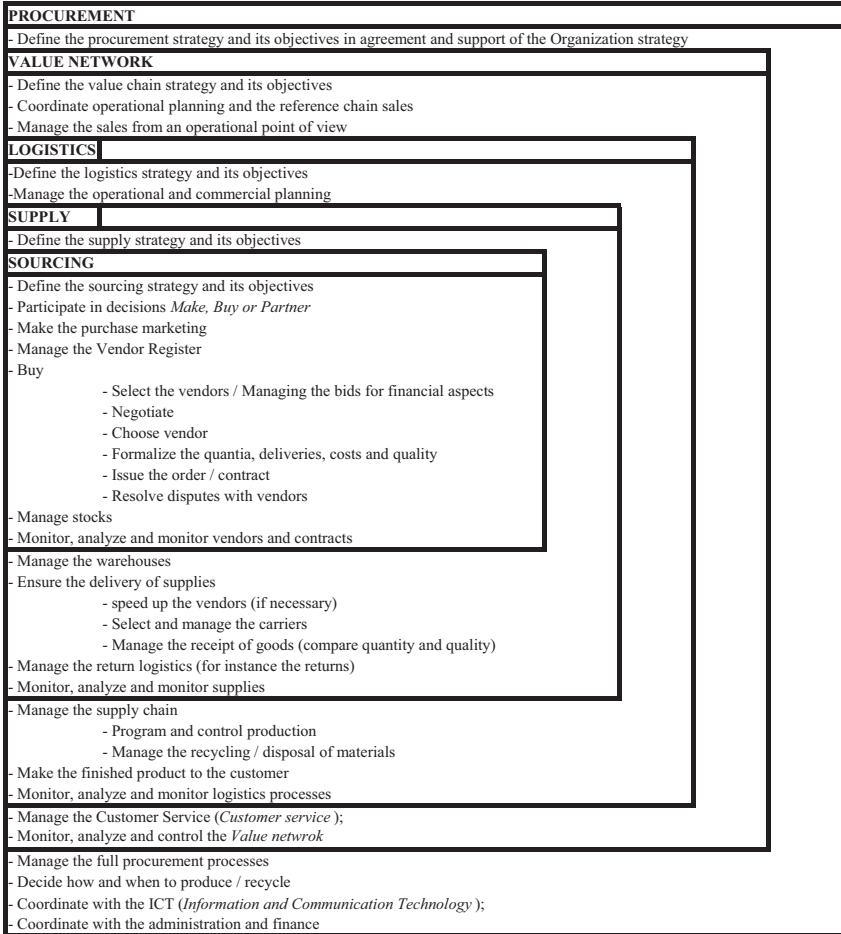


Fig. 2.1 Value network, logistics and sourcing

Sourcing

The sourcing function deals with purchasing products and services outside the organization as required by a department, a person, or an internal customer. This function acts according to a strategy and a plan aimed at achieving the organization's objectives.

The traditional activities included in this function are:

- definition of the sourcing policy based on the strategy of the organization;
- analysis of the types and volumes of purchases;
- decisions on which types of purchases to make (for example, outsourcing, e-procurement solutions, and so forth);
- analysis of the market;
- planning of the optimization of supply requirements;
- definition of the portfolio of vendors and model contracts;
- negotiation and relationships with vendors and purchase transactions;
- assessment of the cost structure;
- monitoring of activities and vendor rating.

The operational business of sourcing starts with the acquisition request and moves to the issue and comparison of tenders, negotiation, vendor selection, and allocation of the orders. Purchases must take into account the stocks available and the need to reduce the capital of the entire cycle, including vendors.

Supply

The supplies are for procurement of the raw materials, goods, and services necessary for the organization's operations. The supply, especially for economic and productive activities, is of considerable importance for the economics and the organizational life of the organization. The term supply indicates the evolution of the sourcing function and the enrichment of its role. It also includes responsibility for the availability of goods and services in terms of:

- provisioning times according to production plans;
- quality assurance;
- costs of transport, handling, and storing.

It is not always possible to pursue this range of objectives within an organization, even if it is desirable. There is a need for training, for having

an appropriate level of organization and awareness of the key roles necessary over the entire value network.

For the organization, it is important to adopt an effective, efficient, economical, and ethical procurement function. This is particularly true in mass production, where a lack of spare parts or excess inventory can have an impact on the costs of sales and service, due to the need to satisfy, and possibly delight, the customers.

Logistics

There are several possible definitions of logistics, with varying degrees of breadth of vision. The Italian Association of Logistics (AILOG) provides the following definition:

The set of organization, management, and strategic governance for organizing the flows of materials and related information from its origins at the vendor sites to the delivery of finished products to the customers and after-sales service.

The logistics function is an extension of the activities and responsibilities of the supply chain function, adding:

- sales and operations planning (S&O);
- production scheduling;
- management of the flow of materials and components from vendors;
- delivery of the finished product to the customers or retailers.

Supply Chain Management

Supply chain management (SCM) has some additional functionalities with respect to supply (Hines et al. 2004).² It involves the systematic and strategic coordination of the functions and operational tactics within the organization first, and then along the various elements of the supply chain and distribution. Its goal is to improve the performance of the long-term

individual components of the whole chain.³ It is a set of several entities (organizations or individuals) directly involved in the flows (upstream and/or downstream) of products, services, money, and/or information from the raw material to the last operation with the customer.⁴

There may also be return flows, usually included in the so-called reverse logistics. These return flows can involve the entire supply chain, from the point of view of:

- commercial relations with the customer;
- sourcing relationships with vendors and/or production;
- accounting for the administration.

Procurement

This book uses the word procurement to refer to sourcing initiation, design, development, acquisition, and logistics of goods and services for the organization. Procurement further generalizes the supply chain management, including also strategic aspects and activities outside the organization.

The resources consumed in the process of procurement are used for goods and services that:

- contribute directly to the value added produced by the organization;
- are indirect to the core business, but are essential.

The process of procurement involves a large number of functions of the organization. It is characterized by several micro activities (see Fig. 2.1). If these are not properly organized, they can be a vehicle for serious ineffectiveness, diseconomies, and inefficiencies throughout the supply chain. The costs involved in well-structured procurement can be quite high, but the rewards are relevant. For instance, the procurement function is increasingly involved in strategic activities. For procurement, strategic activities refer to the definition of policies for sourcing, logistics, and structure and relationships with the vendor base.

Conclusions

In recent times, new challenges have increased the pressure on performance. It has become important to seize all opportunities also for the optimization of procurement processes and the elimination of waste. Today's challenges include:

- Focus on service level, especially quality and speed of execution: the transition from focusing on the purchase price to the total cost of ownership makes clear that it is not enough to get the best possible purchase price. Actually, it might be dangerous in terms of quality of the supply. The procurement function must have as its objectives:
 - increasing the value added for the customer starting at the earliest stages of the process;
 - reducing lead times and increasing quality in the execution of processes (correct supply at the right time, at the correct location, and certainly also at the best price).
- Research productivity and efficiency: the pressure to reduce operating costs pushes organizations to eliminate or at least reduce waste. In other cases, an increase in the scope of activities (higher volumes and/or the need to increase interactions with the other processes of the organization and potential outsourcers) brings additional work to procurement. In some cases this is even coupled with a reduction of staff and a need for different skills.
- Increasing integration with vendors in the value network: the impact of vendors on the ability to create value and innovation is now recognized as very important.
- Homogenization of behavior and increase in controls: the growing organizational complexity requires the standardization of behaviors to keep processes manageable and to ensure adherence to regulations and best practices.

Increasingly, the managers and buyers responsible for procurement processes should ensure they make a greater contribution to the value creation of the organization for customers, shareholders, and staff.

This chapter has defined the core activities of procurement according to a new, integrated perspective. This can bring significant improvements in the definition and negotiation phase of procurement processes. In terms of operational processes, they have not progressed with the same effectiveness, efficiency, economics, and ethics. The tools used for improvement often have been aimed at more automation of existing processes, without a clear vision of the business model to adopt.

In order to meet the growing need to provide customer value and productivity, it is necessary to pay attention to process optimization, applying the procurement methods developed in manufacturing for process optimization and automated management. This can be done through agile procurement. This path allows for extending the responsibilities of the procurement function, resulting in a focus on how and what to buy in addition to the traditional reduction of the purchase price.

This development must consider all the processes described in this chapter in the same way. The upstream part (planning, definition of the sourcing strategy, activation of supply sources, and negotiation) must be developed in an innovative and effective way. More attention should be devoted to the operational part of the processes for improving them and introducing information systems to support transactions and administration (ERP, electronic catalogs, EDI, and so forth).

The current challenge is to create synergy and fluidity in the processes of procurement, while respecting the roles and responsibilities of the different actors, internal and external to the organization, in order to add more value for the customer. This is the goal of the agile procurement approach developed in the following chapters.

Notes

1. This book uses the word “organization” to refer to a company or an institution, either private or a public body.
2. This book generally does not use the term supply chain, but rather value network, because the sequence increasingly is not along a chain or assembly line but works as a network. The main objective of the so-called supply chain is not to “supply” but to bring “value” to customers and the organization.

3. Mentzer, J.T. et al. (2001). Defining Supply Chain Management, *Journal of Business Logistics*, 22 (2), pp. 1–25, Autumn.
4. See endnote 3.

3

Agile Procurement

Introduction

During the current economic crisis, organizations have been working to become more streamlined and agile in order to adapt quickly to changing socio-economic conditions. The procurement function should be a full and integral part of this strategy because it can provide significant support to the entire organization. The strategy requires flexibility. The responsibilities of the buyer increasingly move towards monitoring, controlling, and steering tasks. This approach imposes new requirements on procurement in relation to changing tasks and processes.

Lean is a “mean,” not an objective, for organizations. In a situation characterized by great turbulence and uncertainty, such as the current one, the objective of the organizations is to become more agile. Agility allows the organization to exploit market opportunities, respond to competitive treats, and face the myriad challenges that accidents may introduce to a global value network.

Procurement must be agile. Agility requires being lean and digitized. The tasks of procurement are strongly impacted by the new technological

possibilities and solutions, such as predictive analytics software, new metrics, big data analytics, and the real-time availability of better information. New opportunities arise. The operational processes can run almost autonomously.

Before tackling automation, it is essential to improve processes. The introduction of methods for process improvement enables a reduction of time along the chain of decision-making among different subjects. In addition, these methods provide tools for process improvement and knowledge management. The brute management automation of existing processes does not solve the problems of organizations. If the process is incorrect, its automation only tends to produce problems more quickly. An integrated approach to reviewing processes and their automation is essential.

Lean Six Sigma is one of the most effective modern methods to satisfy customers in terms of product and service quality and simultaneously reduce cycle times.¹ These goals are achieved with methods and tools that allow for the elimination of waste, a reduction in the process time, and the simplification of operations.² Lean Six Sigma combines two methods:

- Six Sigma helps reduce the number of defects and the variability of the results of processes;
- lean thinking helps reduce cycle times and adds value for customers.

This book uses a method referred to as agile procurement that contributes in this direction, with a focus on procurement. The goal is to make processes more agile and hence leaner and at the same time take into account the opportunities provided by their automation. Often the main problem is the excessive separation between the improvement of the automated and manual tasks, including optimization and automation, or between the organization and information and communication systems. This problem is even more evident if one considers the organization of services, such as procurement, where the processes are increasingly managed by information and communication technology.³