OUTSOURCING

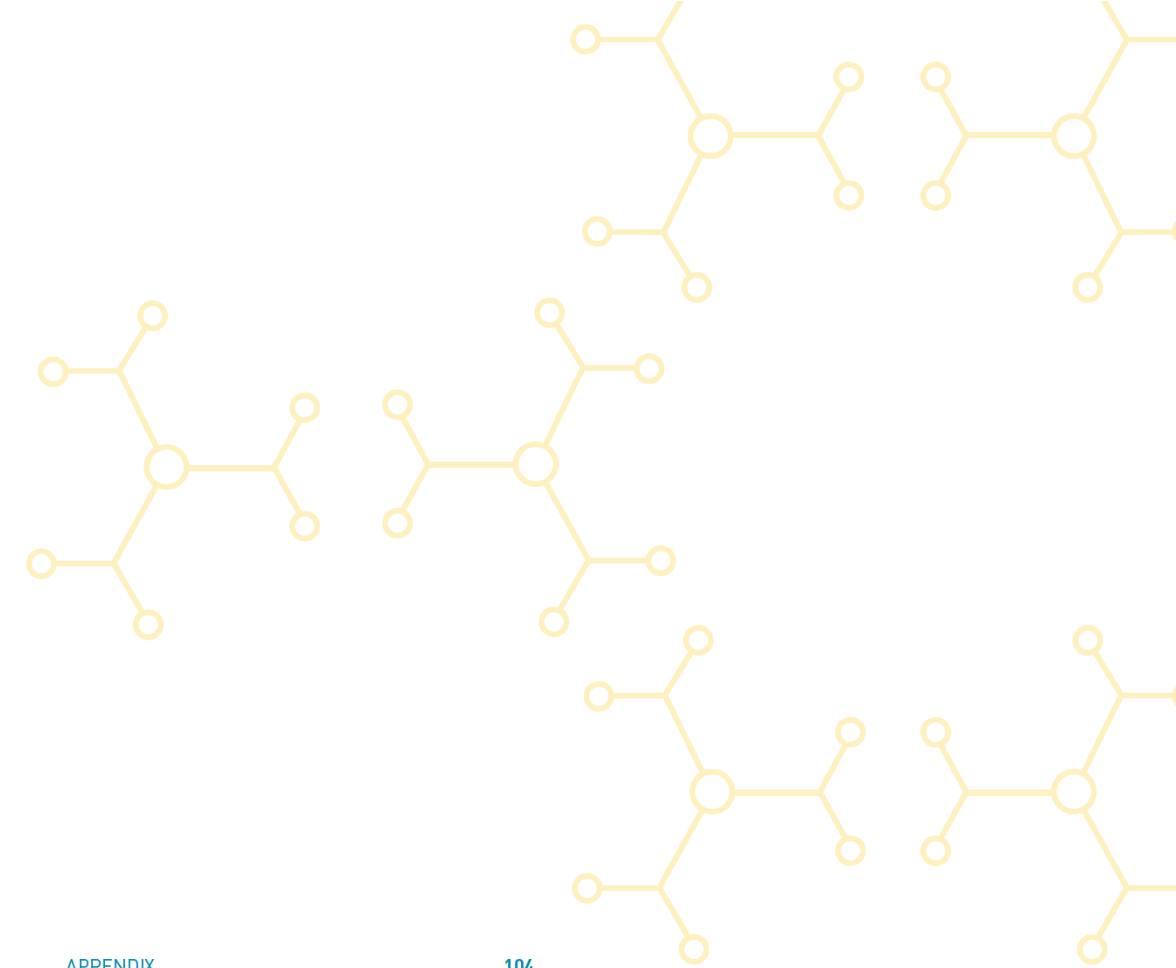# DEVELOPMENT AND LIFE-CYCLE MANAGEMENT

Colophon

OUTSOURCING
DEVELOPMENT AND LIFE−CYCLE MANAGEMENT

PREPARING, IMPLEMENTING AND MANAGING INNOVATION ALLIANCES
IN THE HIGH−TECH INDUSTRY

Index

Foreword

For more than twenty years I have worked in multinational, high-tech OEM organizations (AT&T, Philips, and Ericsson), and in my various roles I have always had responsibilities in relation to product innovation. Often that involved creating a win-win situation with suppliers: outsourcing development, and outsourcing production up to and including developing industry standards, such as Internet TV and Sustainability.

Over the last four years I have been involved in the outsourcing of development and life-cycle management by high-tech OEMs, this time from the perspective of the supplier (NTS in Eindhoven, the Netherlands). It became obvious to me that this form of cooperation between OEMs and suppliers often resembled a quest, both for the OEM and the supplier. At that time I had a number of conversations with Dr. Markus Matthes (Executive Vice President Design & Engineering ASML), and together we came to the conclusion that there was little practical literature available that describes this form of cooperation. This encouraged to me to bring an idea that had arisen slowly in my mind into effect: to write a book.

After that I contacted the academic world, and thus met Professor Arjan van Weele (NEVI Professor Purchasing and Supply Management, Technical University Eindhoven). In various conversations we have explored the extent to which the subject of this book was

really new in literature. The result of these conversations was that he encouraged me to continue with it. Later I also spoke with Professor John Bell (Alliance Strategy, Tilburg University), who was one of the first to review my draft book. Professor Anne-Laure Mention (Luxembourg Institute of Science & Innovation) invited me to write a chapter in the Open Innovation Teaching Handbook *Innovation Education Reloaded: Nurturing Skills of the Future* from the European Union OI-Net project.

So this is how I came to be and stayed inspired to write this book. I won't start on the 'perspiration' that followed, so as not to tire the reader. Many people have since read it over, both inside and outside NTS, and provided feedback. Here I would like to mention especially Marc Hendrikse (CEO of NTS) and John Blankendaal (Managing Director Brainport Industries). They first saw the value of sharing the content of this book with a wider audience.

I am satisfied with the result. At the same time, I hope this book will contribute to the further development of knowledge and literature on the subject. Finally, I would like for this book to encourage others to experience the great fun and added value of working in multidisciplinary teams of professionals in a high-tech environment. That fun has been the central theme of my career, and I wish that for everyone.

Management Summary

Over the last few decades, we have seen the development of open supply chains for production. These supply chains are now quite mature in terms of balanced relationships between OEMs and suppliers, as well as in terms of the associated business models and ways of working. The expectation over the next few decades is that we will begin to see a similar development towards open supply chains for Development and Life-cycle Management (D&LCM).

Outsourcing D&LCM involves three challenges. First, outsourcing development requires the Original Equipment Manufacturer (OEM) and the supplier to agree on fair risk-reward schemes for the risks associated with innovation, including technology risks, warranty on design, and intellectual property. After outsourcing development, outsourcing life-cycle management – the second challenge – is often a relatively small step, but its implications are significant, as it will impact virtually all disciplines in both organizations. So again compensation and risk-reward schemes are required, in order to create a win-win situation for both parties.

The third challenge, managing the cooperation between OEM and supplier, can easily become as complex as managing an alliance between companies, requiring great strategic alignment, a high level of operational integration, and comprehensive contracts.

This book is a practical guide for OEMs and suppliers to manage their relationship in this specific type of alliance, from its first development project right through to its full implementation. It introduces the subjects and terminology relevant for this type of cooperation in a way that all involved disciplines will (need to) understand it, including product management, development, operations, service, sales, purchasing, and legal. Then it presents a step-by-step plan to implement and manage the cooperation, with many practical tools and real-life examples. This book's in-depth, multidisciplinary approach makes it an ideal general management tool for innovation managers, especially those in the high-tech industry, who are considering outsourcing part of their development.

1.
WHAT ARE WE GOING TO TALK ABOUT?

1.1 Introduction

The challenge for Original Equipment Manufacturers (OEMs) is the need to continually develop and market innovative products in the shortest possible time. For complex products, this requires a broad set of technical skills, which often span multiple disciplines. Often only a few of these technical competencies form the key to a distinctive position in the market: the core competencies. The development and maintenance of non–core competencies in a competitive manner can be a significant and sometimes even risky undertaking. Outsourcing (part of) the development of an OEM's product then provides a possible solution.

Such outsourcing does create a huge dependence. The way in which a product is developed is almost by definition unique, whereby changing supplier becomes riskier and more expensive than with other types of outsourcing. Moreover, such outsourcing can have an impact on virtually all disciplines and departments within the OEM's organization. All this makes the implementation of such an outsourcing complex. Specialist knowledge on the subject is still developing and there is little practical literature available. This book, therefore, aims to provide a tool to shape this new trend towards open innovation.

1.2 Target markets for this book

The subject matter of this book is applicable to a wide range of potential OEMs and suppliers. These are located in the following markets, for example:

- **Machinery and equipment industry: e.g. semiconductor, printing, healthcare, food, and analytical.**
  In these markets, an OEM generally owns the technical core competencies for the development of a competitive product. The supplier is then asked to provide the non–core competencies. This may include the development of frames and sheet metal, but could also mean an advanced opto–mechatronic system for the manipulation and precise positioning of the product made or analysed in the machine or device.
  An example of a major OEM is ASML, which develops and manufactures lithography machines for the chip industry. ASML has built a dominant position for itself in its market by focusing on developing the lithography process, and on the system integration of its lithography machines. ASML outsources many of its non-core system modules. Another major OEM is Elekta, which is developing its MR-linac, a combination of MR imaging and radiation therapy, providing real-time visualization of tumours with the ability to adapt the dose. Elekta decided to focus on system architecture, system integration and application software, while outsourcing the development and life-cycle management of key system modules. These are all global players in their markets, which have already made far–reaching choices in outsourcing the development of parts of their product.

  The NEVAT report *Raising the Bars* from 2008 (1) described the trend towards

outsourcing from the perspective of the suppliers to this type of OEM.

- **Consumer products: e.g. cars, telephones, and televisions.**
  In these markets, the OEM owns a primary brand, access to distribution channels, and an organization that serves its customers. The OEM's technical competencies can vary greatly, especially so depending on the market in which they operate. On one side of the spectrum, they are a systems integrator (e.g. for cars) and possess a number of distinctive core technologies (e.g. motors that deliver a distinctive performance or are particularly efficient). At the other end of the spectrum, they do not have any distinctive technical competency. In this case, they make full use of the work of 'white label' developers and manufacturers, and are distinguished only by an industrial design and a user interface, for example. Instances of the latter category are the markets for white goods, personal computers, and telephones.

  The contents of this book will be applicable to both markets, especially in the early stages of innovation. In consumer markets, for a product component the role of the supplier is often in the end comparable to that of an OEM: the supplier is responsible for the entire life–cycle management of a component. Examples include integrated circuits, new generations of displays, and car parts.

In the machinery and equipment industry, the supplier will often remain in the role of provider: it provides services in the fields of development and life–cycle management, but the customer remains the OEM, which is responsible for the entire life–cycle management of a product in its market. That often makes the collaboration between OEMs and suppliers complex. Therefore this book will focus on examples from the machinery and equipment industry.

1.3 Trends in outsourcing

The trend for outsourcing is fuelled by the need for innovation, specialization, and time–to–market. This trend, most common in recent decades, is nearing its final stage:

From
- Outsourcing support services and secondary processes: catering, building management, IT, and administration;
- And outsourcing a growing proportion of the primary processes: production of compo-nents, modules, and complete machines.

To
- Outsourcing the development of components, modules, and machines/systems;
- With, by extension, the life–cycle management of the developed products.

Figure 1 visualizes the trend in outsourcing the primary processes.

FIGURE 1 – Trends in outsourcing

OUTSOURCING BECOMING MORE HIGH–TECH AND BROADER IN SCOPE

Driven by specialization and time–to–market

Outsourcing development, manufacturing, and life–cycle management – 'Original Module Manufacturer' or 'Black Box'

Outsourcing development 'Build–to–requirements'

Outsourcing manufacturing 'Build–to–print' or 'Build–to–design'

All R&D and manufacturing inside OEM organization

TIME