

Emilio Bartezzaghi · Raffaella Cagliano  
Federico Caniato · Stefano Ronchi  
*Editors*

# A Journey through Manufacturing and Supply Chain Strategy Research

A Tribute to Professor Gianluca Spina



 Springer

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A Tribute to Professor Gianluca Spina

*Editors*

Emilio Bartezzaghi  
School of Management  
Politecnico di Milano  
Milan  
Italy

Federico Caniato  
School of Management  
Politecnico di Milano  
Milan  
Italy

Raffaella Cagliano  
School of Management  
Politecnico di Milano  
Milan  
Italy

Stefano Ronchi  
School of Management  
Politecnico di Milano  
Milan  
Italy

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## Foreword by Giovanni Azzone

I met Gianluca Spina for the first time in the end of the 1980s, just after he graduated in Electronic Engineering at Politecnico di Milano. Ever since then, we have been colleagues, at the Department of Management, Economics and Industrial Engineering and at the business school, and close friends.

This makes it very difficult for me to distinguish between the man and the scientist, as I shared most of my professional and personal life with him. Luca was so active and so full of ideas for the future that I am still unable to fully realise that he will not be able to apply them in practice or see the results of his actions.

However, as men of culture and science, we do know that our role in the world is not measured by the time we spend here, but rather by the effects of our ideas. And I am very happy that some of Prof. Spina's ideas are collected in this book, with commentary from the most important scholars in the field of research into manufacturing and supply chain strategy.

The papers show the leading role that Prof. Spina covered in the field over more than 20 years, since the early 1990s, when he, with Emilio Bartezzaghi, started his research at Politecnico di Milano. They also clarify the approach employed by Prof. Spina, to combine a sound strategic framework with a wide empirical basis, and always keeping in mind the *social role* of his studies, where the results should not only be of academic interest but should also have the aim of increasing the competitiveness of real manufacturing companies.

They also show how Gianluca was a key man in the network of international researchers promoting the development of new paradigms for European manufacturing and, above all, his capacity to create a strong group of clever scholars. These scholars—from Raffaella Cagliano to Stefano Ronchi, from Giulio Zotteri to Federico Caniato, to name a few of the better known—will be the biggest legacy that Gianluca and his passion has left to our world.

Giovanni Azzone  
Rector, Politecnico di Milano

## Foreword by Cristina Masella

I met Luca many years ago, at the start of our careers. We were on the second floor of the Electronics Department, “shoved” into offices that were a bit too small and (at least mine) very untidy, but with the advantage of being close together. What I remember about those days were the expeditions to the EurOMA conferences, schools and AiIG conferences, and the enthusiasm and energy with which we faced every new project.

We progressed through the university together and shared many important moments in our careers, but until 7 years ago, Luca for me was “only” a close colleague whom I admired for his vision and lucid analyses. This changed on the day when he asked me in for a meeting and, playing an exclusion game that I learnt to know well, convinced me—in agreement with his life-long friend Giovanni Azzone—to stand for Director of the Department of Management Engineering. I, therefore, want to talk about the Luca Spina of this last period and my co-existence with him in my “tsarina” role (which is what Luca called me as a joke).

Luca was naturally very intuitive, he was capable of seeing far ahead and, when he took a decision, he travelled much faster than most of us. He found my prudent approach extremely irritating, and often over-influenced by the contingent situation. There were countless episodes of attrition between us. Over the years, however, we learnt how to reconcile his impetuosity and my prudence, his vision and my policy of small steps. I am sure that, without his drive, today we would not be the School of Management that we have become.

Luca was a natural leader, and this often meant that he took on a dominant role when decisions were being made, in particular, when he was taking on a project. I can remember, for example, during the time when he was President of AiIG, his work to spread the culture of research of quality within our academic community, or the long process of transforming the MIP consortium into a consortium company, or again, the evolution of SoM’s organisational structure, which, I am sure, is behind many of our results.

Luca was intelligent, stubborn and prickly with incredibly strong work and business ethics. We totally agreed on these points. Possibly because, underneath,

we were not very different. This led to us having a very high level of confidence: “our” moments came during the EFMD Conferences for Deans and Directors. During these two highly intensive days, we used to discuss—while respecting our mutual responsibilities—wrong decisions, errors made, counter-productive behaviour, unmet targets. And we obviously returned to Milan full of good proposals and with a bundle of projects. He running, I trotting.

This, and many other things that cannot fit into this introduction, transformed a dear colleague into a friend to whom I owe so much of my recent professional growth.

Cristina Masella  
Head of the Department of Management  
Economics and Industrial Engineering  
Politecnico di Milano



## Foreword by Andrea Sianesi

I started knowing Gianluca in 2001–2002.

In those days, Emilio Bartezzaghi was President of MIP, Gianluca ran the Master in Business Administration and I had just returned to Politecnico after a short interval at LIUC. The first project that I was involved in was to study, with Gianluca, and then launch, the International MBA.

Thinking back to what MIP was then and comparing it with today is the best way to understand what Gianluca has helped us to build over 15 years, many in a leadership position, leaving his own highly personal imprint.

Gianluca belonged to that tiny platoon of colleagues who, right from the beginning of this century, strongly believed in the power of internalisation as a tool to grow and survive competition. Until 2003, no courses were taught in English, while today, at MIP, we have 11 international Master's programmes and most of our students on Master's courses are from other countries.

Gianluca was a firm believer in meritocracy and in quality *above all else*, with no compromise. Today, the School of Management has embarked on a new journey towards our remaining accreditation, AACSB, after having successfully gained recognition from ASFOR, AMBA and EQUIS.

EQUIS, in particular, was a challenge that Gianluca pushed strongly and he spent an incredible amount of time on the process. Even daring to think about such a difficult process 10 years ago, when there was only one international programme at MIP and all our faculty were Italian, indicates how much Gianluca believed in the school's process of development, a journey that was so cleanly mapped out in his mind that he knew exactly what strategic actions had to be taken.

Internationalisation was one challenge, digitalisation was the next. The term *Smart Learning*, which outlines the direction of MIP programmes (and not just theirs) over the next years, was invented by Gianluca. *Smart Learning* is certainly his greatest achievement and our inheritance, determined by his ability to see far ahead. While, 15 years ago, internationalisation may have seemed a great novelty for us, although others had understood its immense potential, it was different for digitalisation. With Gianluca, MIP took on the role of innovator, and because of him, the school is now among the first movers globally in this area.

Finally, Gianluca firmly believed in the process of management and management methods. Being the driving force to get people to develop, whether researchers or MIP staff, challenging them by giving them increasingly more challenging positions, tasks and responsibilities, is a great quality, and he showed this in abundance over the years we spent together. I think that the time we spent together also helped me to grow.

I did not really know Gianluca the researcher, but I knew Gianluca the research group leader extremely well. Through the joint work carried out between our respective research groups, in 2009, Politecnico di Milano was able to activate a Supply Chain Management stream in the MSc and then we started looking at the key sectors for our country, such as fashion and luxury goods, in a totally new light.

I did know Gianluca my friend very well. With him, when skiing together at Gressoney, whenever we could, we have been working out any disagreement or difference of opinion, and, with him, I spent, who knows how many hours, discussing things that seemed like dreams then, and are the reality of MIP today.

Andrea Sianesi  
Dean, MIP Graduate School of Business  
Politecnico di Milano

## Foreword by Francesca Bodini Spina

I met Luca for the first time when he was still an engineering student at Politecnico di Milano. We never could have imagined, then, that Politecnico would have played such an important role in his entire life and a little bit in mine as well.

His was a long journey, initially a difficult one, when he decided to stay at Politecnico before they even had a Ph.D. programme. How could I ever forget that little office facing the Giurati sports centre which he and Roberto Verganti, both still very young, shared with two already established professors, Emilio Bartezzaghi and Adriano De Maio? His journey then gained speed, incredibly so when compared to normal academic progress, following the success and development of the course in Management Engineering. Luca spent, who knows how many nights and how many weekends writing papers, thinking about publications, totally immersed in his work. Tired? Sometimes. But his determination and passion never languished, because he was doing what he loved.

We married at this time, and alongside his professional growth, our family also grew. The words that come into my mind are: happiness, dedication and his—and our—project. Together we created this wonderful life's project, allowing both of us to grow, personally and professionally, and our family too, with the arrival of Pietro and Annachiara.

And along this journey, Politecnico was always with us, joined later by MIP, the business school in which Luca believed so strongly ever since the days of Via Rombon, becoming, ultimately, its President. He was not alone in his journey. His life was filled with people, his parents, Giorgio and Anna, his sister, Fabiana, and brother, Leonardo, our children, Pietro and Annachiara, and his inseparable friend, Alessandro, and there were so many others. I can think of his teacher, Emilio Bartezzaghi, and his students, Raffaella Cagliano, Stefano Ronchi, Federico Caniato and many of his colleagues who became our friends, like Giovanni Azzone and Andrea Sianesi. And the great MIP and AiIG families.

He always told our children that in life, dedication and passion are everything, and if they are missing, you may do many things, but you will not go far.

Francesca Bodini Spina

# Preface

This book is intended to be a tribute to Gianluca Spina, and to his intense and inspiring work as a researcher, professor, dean, colleague and friend.

Gianluca was Professor of Business Management and Organisation and Supply Chain Management at the School of Management of Politecnico di Milano. He was an active scholar in the field of manufacturing and supply chain strategy, highly involved in international communities and networks such as EurOMA, POMS and IPSERA and a reference point for the Italian Management Engineering Association (Associazione Italiana di Ingegneria Gestionale—AiIG). He was also the Dean of MIP Graduate School of Business for a decade, and become very active in the international communities of management education, in particular European Foundation for Management Development (EFMD).

Very sadly, Gianluca passed away on the 21 February 2015 in a tragic skiing accident in his beloved mountains.

While trying to make sense of the loss that all of us felt, we thought that the best way to do so was to put together a testimony of the legacy that he left to us. For those who did not have the chance of meeting and knowing him as well as we did, this is the opportunity for absorbing some of his teachings and learning by his example.

We, therefore, decided to write this book, collecting together a number of papers that Gianluca had published with his close friends and colleagues in renowned, international journals. We then asked his friends and colleagues to review them, adding their commentaries to try to extract the key messages and values that continue to be valid many years after their publication.

We used the following selection criteria. First, we tried to give the sense of Gianluca's research journey over the years, and to present the main research streams that distinguished his work. We also selected papers with highest impact on the research community (measured through the number of citations received). Finally, we tried to include the most important research collaborations that Gianluca had established in Italy and abroad. Following these criteria, we selected seven papers, and we then asked a number of scholars in the field, who are among his closest friends and colleagues, to review and comment on these papers.

From our side, in the first chapter of the book, we prepared a summary of Gianluca's research journey set out in parallel with the key developments in the field of manufacturing and supply chain strategy. We have also outlined the very important contribution that Gianluca brought to management education, which, in his approach, was always closely intertwined with his research activity. In addition, we have tried to set out the key values which we think inspired Gianluca in all his work, summarising the legacy that he left to us.

The book also contains forewords by Giovanni Azzone, Rector of Politecnico di Milano, Cristina Masella, Head of the Department of Management, Economics and Industrial Engineering, and Andrea Sianesi, Dean of MIP Graduate School of Business. We asked them to write these forewords not only because of their institutional roles, but mainly because of the close friendship that linked them to Gianluca. And a foreword has been also prepared by Gianluca's beloved wife, Francesca.

We would like to remind here also our colleagues and friends of the GIGA Group (Gianluca's research group at the School of Management)—and, in particular, Roberto Verganti, Mariano Corso, Matteo Kalchschmidt, Tommaso Buganza and all the younger group—who also shared with us these inspiring years with Gianluca.

We hope that we are able to convey through this book all the values, inspiration, energy and enthusiasm that all of us experienced throughout the long journey that we had the good fortune to travel on with Gianluca.

Emilio Bartezzaghi  
Raffaella Cagliano  
Federico Caniato  
Stefano Ronchi

# Acknowledgements

This book is supported by Associazione Gianluca Spina that was founded by a group of friends and colleagues with the aim of raising funds to finance initiatives to promote education and research in management, with particular emphasis on the topics dearest to Gianluca. In particular, the association will fund academic positions to attract international faculty and researchers to Milan to continue working on the research and education topics closest to his heart and to which he devoted such a large part of his academic life. Moreover, funds will be used to offer awards, prizes and scholarships for excellent students in the field of management. Finally, a number of cultural initiatives will be organised in order to keep Gianluca values and contribution alive. Further details are present at the following webpage: <http://www.mip.polimi.it/en/association>.

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# Chapter 1

## Gianluca Spina's Contribution to Manufacturing and Supply Chain Strategy Research and Management Education

**Emilio Bartezzaghi, Raffaella Cagliano, Federico Caniato  
and Stefano Ronchi**

**Abstract** The chapter presents a professional profile of Gianluca Spina, summarizing his contribution to both research and management education. Gianluca's research journey started in the field of manufacturing strategy, focusing on JIT first and then on innovative manufacturing paradigms. Subsequently he extended his interests to customer-supplier partnerships, focusing in particular on codesign, and supply chain management, with a focus on Internet technologies and global supply chains. Finally he concentrated on purchasing management, with a focus on purchasing strategy and the theoretical development of the discipline. His main traits as researcher are also presented. On the education side, Gianluca strongly contributed to the development of the Management Engineering degree at Politecnico di Milano during his whole career, and also at National Level as President of the Italian Association of Management Engineering. Besides, he has led MIP, the Business School of Politecnico di Milano, in its evolution from a small, local school to a large, international player, recognized and accredited by the main international institutions, capable of introducing significant innovations on the market. Finally, Gianluca's legacy is presented.

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E. Bartezzaghi · R. Cagliano (✉) · F. Caniato · S. Ronchi  
School of Management, Politecnico di Milano, Milan, Italy  
e-mail: raffaella.cagliano@polimi.it

E. Bartezzaghi  
e-mail: emilio.bartezzaghi@polimi.it

F. Caniato  
e-mail: federico.caniato@polimi.it

S. Ronchi  
e-mail: stefano.ronchi@polimi.it

## 1.1 A Journey Through Gianluca Spina's Research

Looking at the major developments in Manufacturing and Supply Chain Strategy literature over the last 25 years, we can often come across studies by Gianluca Spina, whose research has always been at the forefront of the field.

Gianluca started his research work when he joined a research project conducted by Emilio Bartezzaghi and Francesco Turco on **The Impact of Just-in-Time on production system performance** (Bartezzaghi and Turco 1989a, b), with another young scholar, Marco Perona. It was at the beginning of the 1990s, when Just-in-Time started spreading outside Japan and USA. In Europe, a common research question was asking whether it was possible to change the current status of Operations/Production Systems Management and introduce the principles and practices typical of Japanese production systems—Just-in-Time (JIT). The research project took on the challenge of exploring the level of adoption and diffusion of JIT practices in Italy through an extensive survey carried out among medium-large Italian companies (Chap. 2; Bartezzaghi et al. 1992; Perona et al. 1991).

However, the researchers' ambition reached further than this—as pointed out by Filippini and Forza (Chap. 2). On the one hand, they tried to develop a greater understanding of the JIT model, by recognising that there were many practices that could be included under the wide umbrella of JIT and that these needed to be separated into categories, since each type of practice was able to influence manufacturing performance in a different way. On the other hand, they did not limit their analysis to the level of diffusion of these practices, but tried to understand what impact the practices had on production system performance. This involved testing a framework where the impact of JIT practices on production system performance was examined through a number of operating conditions. Their findings were influenced by the times and the national context of the research, but they were able to provide insightful interpretations on the competitive advantage that could be achieved through JIT.

Gianluca and his colleagues were particularly interested in the performance of JIT, and they were among the first to recognise that one of the core principles of JIT was to focus on processes, and that lead time is one of the key performance indicators of any process where JIT can have a significant impact (Spina and Verganti 1992). On the basis of these two intuitions, they developed a model of lead time in (production system) processes, with the purpose of analysing the various components of lead time and the different levers that could be used to reduce the effect of each of these components (Bartezzaghi et al. 1993, 1994). To the best of our knowledge, this was a pioneering study in its approach and results, and—despite focusing on production system/operations processes—anticipated many of the studies on business process re-engineering and improvement of the 1990s.

After these initial studies, Gianluca's research followed two main paths throughout the 1990s. In one, Gianluca and Emilio Bartezzaghi, in collaboration with Harry Boer (who was at that time at Twente University in the Netherlands) and with the support of Raffaella Cagliano (then a young PhD student)—made advances in

the studies of emerging manufacturing models that had originated with research on JIT, by proposing a **new manufacturing paradigm**, called Strategically Flexible Production (SFP). In the other stream, they developed a strand of research on **manufacturing strategy content and process**. The two streams were closely intertwined, crossing each other's paths at different points in time.

Both research streams sprung from participating actively within the International Manufacturing Strategy Survey (IMSS). This was a research network that gathered academics from around the world to study Manufacturing (and later on Supply Chain) Strategies on an ongoing basis through an extensive survey (see e.g. Lindberg et al. 1998). Emilio Bartezzaghi and Gianluca joined the network at its foundation and Gianluca soon became one of the more active members, with his research group at Politecnico di Milano becoming the network coordinator in 2011.

The first stream of research was positioned in the debate that arose at the beginning of the 1990s about the new manufacturing models and practices that were spreading across Europe and the industrialised world (e.g. Jaikumar 1986; Hayes et al. 1988; Drucker 1990). Just-in-Time was not alone in becoming a common practice among many manufacturing companies, and key in achieving significant improvements to performance. Many companies were also trying out other models, such as Volvoism at Volvo's Uddevalla plant (see e.g. Berggren 1994) or Reflective Production (e.g. Ellegard et al. 1992) and the Flexible Specialisation approach used in many Italian industrial districts (e.g. Piore and Sabel 1984), among others. These emerging models were considered to be of great relevance in helping European economies to be competitive. The European Union was also analysing the spreading of what went under the name of "new forms of work organisation" among European manufacturing companies and their possible impact on the productivity and profitability of European companies and—as a consequence—on European economies (e.g. EC 1997; Garibaldo and Telljohann 2007).

The assumption made by Gianluca and his colleagues was that, behind the emerging models and the practices adopted by single companies, there were distinctive principles, common to all the emerging models and inspiring all the various advanced practices that companies were implementing (Bartezzaghi 1999). These principles were significantly different from the ones that had been used for defining manufacturing strategies and organisation in the mass production model. Gianluca and his colleagues synthesised these principles into three points: (i) strategic flexibility; (ii) process integration; (iii) process ownership (Chap. 3; Spina et al. 1996). As underlined by Chris Voss (Chap. 3), some of the ideas involved in formulating this new model were particularly novel and significant, and formed the basis for other new streams of research.

With reference to the new manufacturing model, Gianluca and his colleagues explored a number of questions relating to the emergence and diffusion of Strategically Flexible Production (SFP) in different research pieces.

These included examining the contingent factors that influence the adoption of SFP (Spina et al. 1996); the impact of implementing SFP on manufacturing performance (Spina et al. 1996); the relationships between the adoption of SFP and the use of Advance Manufacturing Technologies (Chap. 4; Cagliano and

Spina 2000a); room for strategic choices within the new paradigm (Spina 1998); the diffusion of the new model and competitiveness of regional local authorities (Bartezzaghi et al. 1997); and the use of flexible forms of work within the new model (Cagliano et al. 2014). The intention was to gather all these studies together in a book, which would have been entitled *Beyond the Machine*, but unfortunately was never completed.

The second stream of research developed by Gianluca with Raffaella Cagliano was expediently framed within the flourishing literature on manufacturing strategy. During the 1970s and 1980s—following the seminal work of Skinner (1969) and other colleagues first in USA (e.g. Hayes and Wheelwright 1979, 1984; Buffa 1984; Fine and Hax 1985) and then in Europe (e.g. Hill 1989; Voss 1992)—manufacturing strategy was recognised as a key competitive weapon for manufacturing companies, leading to the development of a general framework for studying manufacturing strategy. Manufacturing strategy was first of all defined by its content, i.e. the competitive priorities and capabilities sought by companies and the decisions and improvement programmes that were implemented for this purpose. All the same, some studies—albeit many fewer—focused on the process of formulating manufacturing strategies.

Since the publication of these seminal works, many other authors had been trying to understand how companies around the world were using this new (or newly rediscovered) competitive weapon, by looking at the different strategic choices, contingent factors, best practice, performance achieved and so on. Many of these studies were survey-based (e.g. Flynn et al. 1997; Whybark 1997; Ferdows et al. 1996).

Gianluca's stream of research on manufacturing strategies followed along this path, mainly using IMSS data and centred upon three distinctive types of question:

- The process of formulating manufacturing strategies (Cagliano and Spina 2000b): Gianluca and Raffaella Cagliano looked at the different drivers that explained the choice of manufacturing improvement programmes, including competitive priorities, contingent factors and previous experience (payoffs) gained from the implementation of the programmes. Through their study, based on longitudinal, empirical evidence, they were able to show that not all strategic choices are coherently made by companies. Some types of programme in particular, especially the most up-to-date—or “trendy”—choices, tend to be made more often, creating misalignment with the company's competitive priorities. With this result, the study also entered into the debate on management fads and fashions, a discussion that has been very important throughout the history of management in general, and manufacturing best practice in particular (e.g. Abrahamson 1991; Laugen et al. 2005)
- The interlink between strategic choices and the new manufacturing paradigm (Spina 1998): this is where the two streams of research cross each other; Gianluca entered into a very important debate at that time, which was to understand whether, if companies adopted the emerging manufacturing model, this would restrict them in terms of defining their own strategies and so be able to

differentiate themselves from their competitors (e.g. Voss 1995; Clark 1996; Hayes and Pisano 1996). The empirical results of Gianluca's research showed that there was strategic manoeuvring room for companies even when they followed the principles of the new paradigm. This was further confirmation and reinforcement of a number of conceptual studies of that time.

- Manufacturing strategies of small and medium-sized companies (Cagliano and Spina 2001, 2002). Following a study carried out in collaboration with Chris Voss at the London Business School, Gianluca and Raffaella Cagliano were able to explore manufacturing practices among Italian SMEs and their impact on performance. The research question was relevant, on the one hand, because of the extremely high number of manufacturing SMEs in Europe in general and Italy in particular. On the other hand, it was of timely interest because of emerging literature showing that SMEs tend to use their own distinctive models rather than less mature versions of those of large companies (e.g. d'Amboise and Muldowney 1988; Jennings and Beavers 1997). At the same time, the debate on the importance of SME management practices was ongoing, with a number of authors maintaining that the success of SMEs depends more on the ability, skills and intuition of the owner-manager, rather than on the practices adopted (e.g. Storey 1994; Peterson 1989). By analysing the adoption of best practice among SMEs and its impact on performance, Cagliano and Spina were able to show that SMEs were competing in a specific way compared to large companies. They were also interested in understanding the differences between independent SMEs and sub-contractors, where the latter are often subject to the influence of their customers when designing and managing their production system/operations processes.

The shift from this stream of research to the study of Supply Chain and Purchasing Strategy was an easy and natural step, in a context where, in many studies on Operations Management, there was the recognition that a company's competitive advantage does not only rely on internal practices, but is also influenced to a high degree by the practices put in place for managing the entire supply chain, starting from their strategic relationships with suppliers.

Gianluca embarked upon this new stream of research at the end of the 1990s, initially focusing on **customer-supplier partnerships**, which were a key element of the Japanese model for managing the automotive production system (e.g. Lamming 1993). Gianluca worked closely in this area with two of his Politecnico di Milano colleagues, Roberto Verganti and Giulio Zotteri.

The first contributions focused on analysing specific industrial cases in Italy, other than in the automotive sector, where the concept of partnership involved a mix of successes and failures. Spina et al. (2000) examined how transport is managed within the cement industry, while Spina and Zotteri (2000) analysed a case in the textile machinery sector. In this study, the focus was to understand which decision criteria are the most appropriate when deciding between a partnership, in-house production or traditional, arm's length outsourcing. Once a partnership was seen as the most suitable form of relationship, Gianluca also examined the

conditions that would lead to the desired benefits, looking especially at the enabling factors and the protection mechanisms for the parties involved. A further development of this stream was to analyse the strategic context that led to customer-supplier partnerships being established, achieved by adopting a contingent perspective and a different methodological approach. Spina and Zotteri (2001) used the IMSS data to broaden the scope of analysis and demonstrate that partnership was not driven mainly by contingent factors linked to country, industry or size, but rather by strategic variables, such as level of vertical integration, commitment to innovation and improvement-related priorities.

Within this stream of research, Gianluca and his colleagues were particularly concerned with co-design, i.e. customer-supplier partnerships established within the New Product Development (NPD) process to improve the company's overall performance in terms of innovation, time to market and cost. In their research, they adopted multiple methods, including in-depth case studies within a specific industry and a large panel of survey data. Spina et al. (2002a, Chap. 5) investigated four co-design projects set up by a large household appliance manufacturer, which helped to classify co-design relationships, based on the know-how being exchanged and the features of the decision-making process. Spina et al. (2002b) used the IMSS data once again (the Italian sub-sample data) to analyse the drivers that led to adopting a co-design approach, considering structural characteristics, strategic priorities and internal consistency with purchasing and NPD practices. This stream of research allowed them to open the black-box of co-design, moving research in this area one step further and revealing, on the one hand, the different forms of co-design and, on the other, the contextual variables that can guide their adoption process.

The CO-IMPROVE project was a further evolution of this stream. This was an EU-funded initiative involving several research groups and manufacturing companies from Italy, Denmark, Netherlands and Ireland. The project consisted in extending the traditional concept of continuous improvement to collaborative supply networks, through an action research approach, with the help and collaboration of another colleague, Mariano Corso (Cagliano et al. 2005a).

At the turn of the millennium, a radical technology innovation was rapidly changing the world. The Internet was extending its impact to every aspect of business. Supply Chains were not spared, since there was the need for better, faster and cheaper means of communicating and sharing information between customers and suppliers which laid the foundations for the widespread adoption of Internet-based technologies. Gianluca, Raffaella Cagliano and Federico Caniato (at that time, a new PhD student), opened a new research stream on this topic, once more basing themselves on the IMSS project. IMSS data for 3rd edition was gathered in 2001 and included questions about **Internet-based technologies adopted in the supply chain** (i.e. with suppliers, internally and with customers). This led to a first published paper (Cagliano et al. 2003). The main contribution of this work consisted first in showing that, despite all the hype, at that time only a small number of large companies surveyed in the IMSS European sample were adopting the new technologies. But even more importantly, the combined analysis of



the adoption of the technology with supply chain integration practices was used to understand the role of technology in supporting a broader, strategic partnership approach, as well as the structural contingent factors that explained such results. This paper was included in the special 25th anniversary issue of the International Journal of Operations and Production Management-IJOPM, which contained a selection of the most influential papers published in IJOPM. The authors were also requested to add a brief update of the research, which reflected on the rapidly growing expansion of Internet-based tools in supply chains (Cagliano et al. 2005). In 2009, together with two other colleagues, Matteo Kalchschmidt and Ruggero Golini from the University of Bergamo, they published a new paper (Caniato et al. 2009), which replicated the original work using new IMSS data (4th edition), providing a longitudinal perspective on how the adoption of Internet-based tools in supply chain relationships has evolved. This stream, therefore, spanned across almost a decade, covering the period in which digital communication technology evolved from being the new frontier of supply chain integration to the standard tool, although not yet common practice for many companies.

In the first half of the 2000s, the stream of research on customer-supplier partnerships did not just involve the impact of new technologies, but rather took on a broader perspective, to consider supplier integration practices in general alongside supplier selection criteria, analysing their impact on the operational performance of the buying company. These works were also based on the IMSS project, therefore stemming from the traditional operations strategy approach, with a contingent perspective. Cagliano et al. (2004) proposed a taxonomy of supply strategies, based on supplier selection criteria and integration mechanisms, and analysed their impact on performance. The best performing strategies were in line with the Lean and Agile paradigms, which had already found popularity in the scientific literature of the time (Lamming 1993; Christopher 2000). The lesser performing models were in line with the traditional approach to supply relationships. Subsequently, Cagliano et al. (2006) investigated the relationship between supply chain integration and two most popular manufacturing improvement programmes, lean production and ERP systems. They analysed how closely internal manufacturing strategies and external supply chain ones were related. Results showed that, while lean production had a strong influence on integrating both information flows and physical flows along the supply chain, adopting ERP did not influence supply chain integration.

In the mid-2000s Gianluca and his colleague Andrea Sianesi, who was leading a research group on supply chain planning, decided to join forces and start a new project, focusing on **supply chain management in the Italian fashion and luxury goods industry**. While the sector was well known world-wide, at that time it was facing the challenges of globalisation and needed to evolve rapidly in terms of its supply chain strategies and models. The “positioning paper” of this stream, the first in a long series, was published in 2008 (Chap. 7; Brun et al. 2008) and presented an empirical investigation of 12 Italian fashion luxury retailers. The research studied their operations and supply chain strategies, analysing their impact on the critical success factors of the industry (see Chap. 7 in



this book). The project was subsequently carried forward by a large research team that included Maria Caridi, Alessandro Brun, Cecilia Castelli, Luca Crippa and Antonella Moretto, and led to several publications. This stream of research first focused on the supply side, investigating the role of suppliers in both the NPD and the production processes for fashion companies. This resulted in the paper by Caniato et al. (2015), where the authors analysed the different strategic approaches to internationalisation and outsourcing, as well as collaborations within and across organisations, according to brand positioning, company size and the technical complexity of the products. Subsequently, the research focused on the downstream supply chain of fashion firms, i.e. on distribution and retail operations on a global scale, with the researchers investigating the strategic role of these supply chains in achieving competitive advantage for the company. In their paper, Caniato et al. (2014) focused on the role of international retail operations within the NPD process of Italian fashion companies, investigating how retail contributed to align new products with the characteristics of the main international target markets.

In the 2000s, another key topic in SCM research was **global SCM**, and Gianluca's research covered this topic. The IMSS project was clearly an ideal source of data, as reflected in the paper by Cagliano et al. (2009), in which global supply chain configurations were investigated by adopting a longitudinal perspective and comparing the latest two IMSS databases. Alongside this, Gianluca supervised a PhD student from Argentina, Julio Loppacher, who investigated global sourcing strategies of multinational companies operating in Italy and Argentina, which resulted in the publication of three papers (Loppacher et al. 2010, 2011a, b).

In 2007, Gianluca, together with Stefano Ronchi, Federico Caniato and a new PhD student, Davide Luzzini, decided to launch a new major project, the **International Purchasing Strategy (IPS) survey**. The idea was to replicate the successful model of IMSS in the field of Purchasing and Supply Management (PSM), which had become increasingly relevant in both research and practice. However, no major international survey-based research project had yet been carried out and, more in general, there was the need to encourage theoretically sound and methodologically robust research. To achieve this goal, the team approached some of the best-known PSM researchers in Europe and North America, among whom Finn Wynstra and Erik Van Raaij at Rotterdam School of Management, Michael Essig at Bundeswehr University in Munich, Alistair Brandon-Jones at the University of Bath, Asta Salmi and Katri Kauppi at Aalto University in Helsinki and George Zsidisin at Bowling Green State University in USA, with a proposal to join forces and initiate a new ambitious project.

The initiative gathered together a group of highly-motivated people and resulted in administering a first round of the survey in 2010 and a second round in 2014. IPS introduced some innovative features, such as its focus on single purchasing categories, since the concept of purchasing strategy is more appropriate to a single category than to the whole company. The project led to several publications on different topics, in particular Gianluca contributed to the paper by Luzzini et al. (2012). In their work, the authors used the IPS data to propose a classification of strategic purchasing categories based upon the Transaction Cost Economics