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FACULTEIT BEDRIJFSECONOMISCHE WETENSCHAPPEN
*master in de toegepaste economische wetenschappen*

# Masterproef

## The use of Open Innovation and innovation ecosystems by Worldtour cycling teams

Promotor :
Prof. dr. Wim VANHAVERBEKE

Copromotor :
dr. Annika LORENZ

Frederik Panis

*Scriptie ingediend tot het behalen van de graad van master in de toegepaste economische wetenschappen*

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## Preface

This research is the final proof of competence for obtaining the Master in Applied Economics, with a specialization in Innovation and Entrepreneurship. It has been four enormously educational, but also very pleasant years that I have spent at the University of Hasselt.

In this preface, I would like to take the opportunity to express my gratitude to the people who have contributed to this dissertation, which would not have been possible without their help.

I would therefore firstly like to thank my head supervisor Prof. Dr. Wim Vanhaverbeke and co-supervisor Dr. Annika Lorenz for their time, valuable input and constructive feedback on improving the quality of my thesis.

Furthermore I would also like to express my appreciation to the participants of the interviews, namely Marc Hufkens, Arne Houtekier, Servaas Bingé, Wim van Hoolst, Marko Heijl, Bjorn Legein, Morten Kristiansen, Kristof De Mey, Guido de Bruyne, Ivan Bofarull and Scott Bugden for their time and willingness to help. Their cooperation was extremely helpful during the elaboration of my master's thesis

Finally, a special thank to my family and my friends for all the support during my time studying Applied Economics at the University of Hasselt. They have always been there for me without any hesitations and encouraged me throughout the process of writing this master's thesis.

Frederik Panis
Lanaken, May 2017

## Summary

Open innovation – often abbreviated to OI – is a concept introduced by Henry Chesbrough in 2003. In this model, companies started to review and apply novel ways to increase the effectiveness and efficiency of their innovation processes. Open innovation is about using internal and external ideas to advance the development of new technologies. Many companies want to expand their innovation potential to develop beyond the current boundaries of the company together with external partners (Chesbrough, 2003).

Most previous research on open innovation has focused on the business world; in the sports industry, this model still represents rather unknown territory. However, Zynga (2014) stated that open innovation is increasingly shaping business models and delivering value across the sports world. It is useful to focus on one sport because of the limited research. The cycling world is very dependent on the newest materials and technologies, so open innovation seems to be a relevant strategy for firms in the professional cycling world. The use of external partners, and the analysis of data related to cycling, can positively influence this professionalization. The main aim of this master's study is to investigate how open innovation can deliver increased value across the cycling world through technical enhancements, medical improvements and the use of software.

The literature review helps to identify the most important internal and external stakeholders, who are actively involved in the cycling world. Internal stakeholders are those groups or parties that participate in the management of a Worldtour cycling team; they include the Union Cycliste Internationale (UCI), race organisers, cycling teams and cyclists. By contrast, the external stakeholders – such as sponsors, bike manufacturers and wind tunnel facilities – are only interested in the performance and profitability of a Worldtour cycling team. This distinction among stakeholders is an important aspect of this master's thesis, as it is necessary to understand the ecosystem of professional road cycling and its functioning.

A qualitative approach was used in this research project. Semi-structured interviews are conducted with main stakeholders of Lotto-Soudal to collect relevant data. Other participating companies include the National Lottery, Soudal, Ridley, Energylab, Lazer Sport, Union Cycliste Internationale (UCI) and Flanders' Bike Valley.

The analysis of the interview data leads to noteworthy findings related to the use of open innovation by Worldtour cycling teams. External stakeholders play a crucial role in applying open innovation in the cycling world, because Worldtour teams rely on their research and development (R&D) departments to increase the performance of individual cyclists. Over the past ten years, an increased availability of measurements has created opportunities to collaborate with medical and technical companies to accelerate the innovation process and search for new technologies. Also, the entry of wind tunnel testing into the cycling world

has offered new perspectives in the use of open innovation. Collaboration with multiple manufacturers of bike components in a wind tunnel facility reduces the air resistance of a cyclist, which also improves the cyclist's performance. However, open innovation has its limits. It only works in a situation in which companies play complementary roles to each other. All parties that cooperate with a Worldtour team have to create value by using open innovation. They are part of an ecosystem, where interaction between stakeholders has positive outcomes.

Together with the help of sponsors, the cycling world is being professionalized, which in turn leads to scientific development and new technologies. Main sponsors are spending millions of euros with the objective of creating a brand with a good image. In return, they receive increased sales, visibility, valorisation, hospitality and exposure. Moreover, these sponsoring budgets tend to increase every year because of greater media attention and professionalization. Over the next few years it is expected that wearable technology, along with integrated measuring features, will be introduced in the cycling world. This will make it possible to obtain real-time data during a race or training.

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## List of Abbreviations

| | |
|---|---|
| AIGCP | International Association of Professional Cycling Groups |
| AIOCC | Association Internationale des Organisateurs de Courses Cyclistes |
| ASO | Amaury Sports Organisation |
| CPA | Cyclistes Professionnels associés |
| EBU | European Broadcasting Union |
| GPS | Global Positioning System |
| IMG | International Management Group |
| IOC | International Olympic Committee |
| LLP | Limited Liability Partnership |
| LSO | Lotto Sports Organisation |
| MPCC | Mouvement Pour un Cyclisme Crédible |
| PIV | Particle Image Velocimetry |
| PCC | Professional Cycling Council |
| UCI | Union Cycliste Internationale |

# 1 Introduction and problem statement

## 1.1 Introduction

"Who invented the mountain bike?"

Many people assume that a large corporation must have innovated the mountain bike. However, the truth is vastly different. A group of young users, living in Northern California, were frustrated with traditional racing bikes. These bikes were too heavy and had large, uncomfortable handlebars. The young cyclists decided to combine the frames of large bikes, the brakes of motorcycles, and the gears of racing bikes. For the first couple of years, these mountain bikes were known as "clunkers" and were mainly used in Northern California. Later, certain companies that were importing parts for the clunkers decided to set up a business and start selling them to other people. After almost 15 years, the main bike firms realized there was a market for these bikes. This market had been completely created by consumers, but the original users did not have the incentive to innovate the product fully. A large company that had the knowledge and expertise as well as the right tools was needed to perfect the innovation. In this way an ecosystem is created, based on collaboration and open innovation (Leadbeater, 2005).

## 1.2 Problem statement

This master's thesis explores how open innovation can deliver increasing value across the cycling world. Open innovation or OI is a business concept introduced by Henry Chesbrough in 2003. Open innovation encourages companies to acquire outside sources in order to improve product innovations and accelerate the process to bring products to market. Companies started to review and apply other methods beyond their boundaries to increase the effectiveness and efficiency of the innovation process (Chesbrough, 2003). But at the same time, innovations generated within the R&D department of a company can be sold as technology to other firms because they do not have the knowledge or expertise to develop the idea or technology themselves.

Most previous research on open innovation has focused on the business world. Mainly large companies and multinationals delved into this topic, because they could gain most out of it. In the sports industry, however, this model still represents rather unknown territory. Zynga (2014) already stated that open innovation is increasingly shaping business models and delivering value across the sports world. Sport is no longer just a game, but is progressively science-based and is widely driven by numbers and data to improve performance. Therefore, it is useful to focus on one sport because of the limited research.

Each year, cycling teams are focusing on growing their revenues and on improving their sporting performance. Because of the larger budgets and the need to increase revenue, there is much at stake. The cycling world is very dependent on the newest materials and technologies, so open innovation seems to be a relevant strategy for firms in the professional cycling world. The use of external partners, and the analysis of data related to cycling, can positively influence this professionalization. The cycling sport does not only benefit from open innovation, but the performance of individual cyclists also improves. All previous contributions provide a competitive advantage and accelerate the professionalization of cycling.

As mentioned above, OI in the cycling world is an interesting topic for an in-depth study due to its limited research. The purpose of this master dissertation is to describe how open innovation can deliver increasing value across the cycling industry, through technical and medical improvements and the use of tactics or software. The connection between stakeholders and the use of open innovation to increase the performance of cycling teams and individual cyclists is explored. The master's thesis also analyses who benefits from the use of open innovation. Hence, the central research question is formulated as:

- How can open innovation deliver increasing value across the cycling world?

Furthermore, four sub-questions are added to support the central research question. The master thesis should come to a better conclusion pertaining to the central research question from answering these four sub-questions. A qualitative research is conducted to present a full picture of the cycling ecosystem and to answer the sub questions:

- How have materials and analysis of data changed over the past ten years, with regard to Worldtour teams?
- Why start companies sponsoring a Worldtour team and what do they receive in return?
- How can a professional cycling team increase the performance of a cyclist through open innovation?
- How do various partners benefit from the use of open innovation with Worldtour teams?

The master's thesis consists of seven chapters. In chapter one, the introduction and problem statement are described. Chapter two reviews the existing literature on open innovation and gives an introduction of open innovation in the sports industry. Chapter three and four elaborates the methodology and participants of the interviews used in the master's dissertation. Chapter five includes an overview of the internal and external stakeholders in professional cycling. Each main stakeholder is described separately in sections. Chapter six offers a detailed description of the empirical findings with regard to the sub questions. Eleven semi-structured interviews with main stakeholders of Lotto-

Soudal were conducted to collect data that would yield a better understanding of the functioning of a Worldtour team. In chapter seven, the final conclusions are summarized from the empirical study and are compared with existing theories. Also in this final chapter, the limitations of the research, recommendations for future research and managerial recommendations are pointed out.

# 2 Literature review

In the last decade, the concept of open innovation has been one of the most popular topics in management research. It offers relatively new insight in the business world (Chiaroni, Chiesa & Frattini, 2010). Although there are still many unanswered questions, the understanding of this phenomenon has significantly improved in recent years. Before discussing the concept of open innovation, the process by which an organization changes from a closed to an open model of innovation is briefly considered here.

## 2.1 Closed innovation

Classical models of innovation start from the following perspective: in closed innovation models (Figure 1), companies generate and develop their own ideas. This means the process can be strictly controlled within the boundaries of a firm (Botero, Vihavainen & Karhu, 2009).

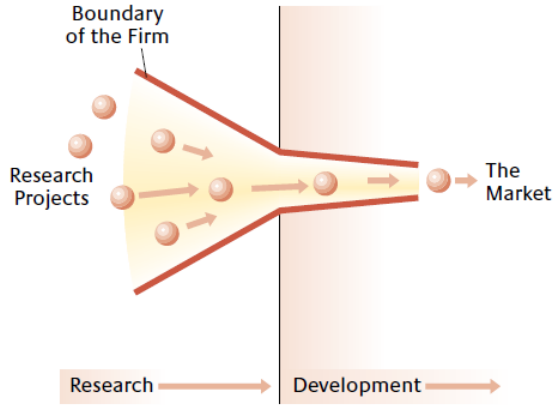


Figure 1: The closed innovation model (Chesbrough, 2003)

For years, companies considered closed innovation as the only way to bring new ideas to the market. Their mind-set was one in which their own ideas were perceived as being the best. Therefore, companies invested heavily in their internal R&D and hired the best and smartest employees. This approach meant they were likely to discover ideas independently and reach the market first. The consequence was that these firms could earn higher profits by retaining full control over the innovation process. The profits could be reinvested in the R&D department, creating a virtuous cycle of innovation (Chesbrough, 2003).

The model worked well for most of the 20$^{th}$ century. Towards the end of that century, several factors led to the erosion of closed innovation systems. First, the mobility of highly educated people has increased over the years. As a result, firms were compelled to reduce their dependence on internal R&D and to attract employees from the outside who had new or different knowledge. Second, the rise of venture capital has made it possible for firms to

develop ideas and technologies outside the boundaries of the company, if they offer good potential. This external development can be facilitated through licensing agreements or in the form of spin-offs. Finally, other firms – such as suppliers – play a more prominent and important role in the innovation process (Van de Vrande, Spruijt & De Rochemont, 2016).

Companies started to review and apply other methods to increase the effectiveness and efficiency of their innovation processes. They did so not only through collaboration with competitors and suppliers, but also through active searching for new ideas and technologies beyond the boundaries of the firm. When these ideas and technologies do not fit the strategy of the firm, their further development can be licensed out[1]. These companies should separate the good ideas from the bad ones so that they get rid of the former while developing and commercializing the latter (Chesbrough, 2003).

## 2.2 Open innovation

As discussed above, firms sought new ways to improve the effectiveness and efficiency of their innovation process. This led to the development of the open innovation model (Figure 2). Chesbrough (2003) stated that in this new model, firms generate and develop both their own innovations and ideas that filter in from the outside, to bring them to market. In other words, the boundary between the company and the environment is more penetrable, which increases mutual innovation between the two entities. Not all good ideas are generated within the boundaries of a single company, and not all ideas should be further developed within that firm. Chesbrough (2011) explained that "Open Innovation gives us the power to effectively address an issue that we simply couldn't impact on our own". When certain ideas or technologies cease to be useful for the company, the company may still profit from other people's use of their intellectual property, through joint ventures, licensing agreements, spin-offs and other agreements. Where the closed innovation model calls for firms to try and gain the smartest employees, under the open innovation model companies strive to obtain the knowledge and expertise of bright people outside the company. Moreover, external R&D can create significant value, and internal R&D merely needs to claim some portion of that value (van der Meer, 2007).

[1] Licensing out has been defined as giving a third party permission to use your intellectual property.
[2] The use of an inclination sensor allows a cyclist to track the aerodynamic posture in realt time. It tracks the head and helmet position in real time.

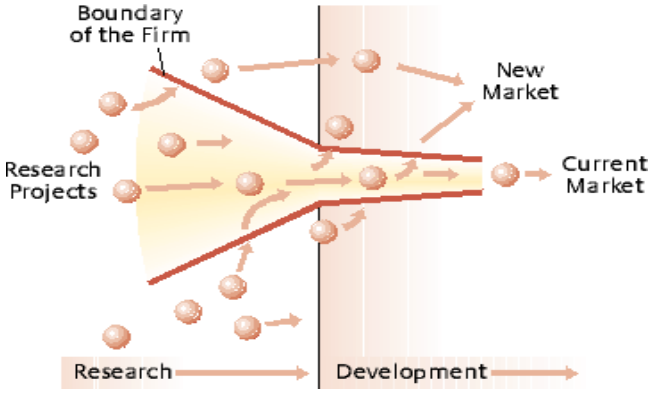

Figure 2: The open innovation model (Chesbrough, 2003)

Following this explanation of the principles of closed and open innovation models, in the next section the benefits of open innovation to the sports industry are discussed.

## 2.3 Open innovation in the sports industry

Open innovation in the sports industry is still rather unknown territory. Most studies on open innovation to date have focused on large companies in the business environment. In the sports industry, however, both traditional and open innovation have influenced all types of sports (Zynga, 2014). Budgets in all sports disciplines are increasing each year. Teams are focusing on growing their revenues and on improving their sporting performance. Because of the larger budgets and the need to increase revenue, there is much at stake. For example, Forbes (2016) published a list of the most valuable sports teams in 2016. They valued Manchester United (the English football team) at USD 3.32 billion. The New York Knicks were valued at USD 3 billion. The result of these astronomical valuations is a demand for professionalization. Sport is no longer just a game but is progressively science-based and is widely driven by numbers and data to improve performance. The use of open innovation can strongly influence the professionalization of sports.

Zynga (2014) stated that open innovation is starting to shape more business models as it delivers value across the whole industry. Hufkens (2016) compared open innovation with the networking economy: "companies need to make use of it when they want to compete against their rivals on the market. When they don't make use of the networking economy, it will take too much time to develop new products or services" (4.1.1). Various sports not only benefit from open innovation but the performance of individual athletes also improves. All these contributions provide a competitive advantage and accelerate the professionalization of sports. For example, it is obvious that aerodynamics play a critical role in sports that are highly dependent on speed and time. In these sports – which include bobsledding, skiing, sailing, athletics and cycling – split-seconds can make the difference between winning or losing. Hence, close collaboration with a wind tunnel facility can make

it possible to raise performances to a higher level, because the exchange of data and knowledge can accelerate the innovation process. This example of open innovation would create value for a team and/or sport as well for the wind tunnel facility.

According to Hufkens (2016), open innovation is not yet widely accepted:

> Only a few companies dare to use open innovation. Most still use incremental innovation, because they are afraid to lose employees and knowledge to other companies. If these companies don't change their mind-set, they will fall behind and lose their competitive advantage. (Hufkens, 2016, 4.1.1)

Within the cycling industry, stakeholders are aware of the increasing importance of open innovation. In an interview with Arne Houtekier, the communication manager of Lotto-Soudal, he explained:

> We are constantly searching for new developments in the cycling industry, but we also notice that the various stakeholders are very keen to evolve. Over a span of 20 years, things have changed a lot. Multiple collaborations have been started between sports science, technological and medical companies to collect as much data as possible to map out all the different parameters. These kind of close collaborations speed up the process of innovation. (Houtekier, 2016, 4.1.3)

Guido de Bruyne (2016) supported this statement with an example, as follows. During a brainstorm session in Flanders' Bike Valley, two start-ups showed a little device that had some potential in cycling. In function of this device, it has been turned into an inclination sensor. Lazer, a Belgian manufacturer of cycling helmets, wanted to implement this inclination sensor[2] in a cycling helmet because professional cyclists had a demand to monitor their positions of the head. The whole project would have been a serious challenge and the device would take too long to produce if Lazer did it alone. Therefore they collaborated with those two start-ups, because Lazer did not have knowledge and expertise about electronic components. Just before the development of the helmet started, they estimated it would take three to five years to go to market. Thanks to the collaboration, they managed to deliver in only nine months, which gave them a huge economical advantage. The innovation method is clearly much stronger than that of companies, which use only their own R&D departments.

[2] The use of an inclination sensor allows a cyclist to track the aerodynamic posture in realt time. It tracks the head and helmet position in real time.

# 3 Methodology

## 3.1 Main research question and sub-questions

The interview statements in the previous section showed that some interesting applications of open innovation exist. In addition, open innovation seems to be a relevant strategy for firms in the professional cycling industry. Nonetheless, there has been little research in this area to date. Most people know that cycling is highly dependent on the best materials and technologies. But who delivers the latest innovations to Worldtour cycling teams, and how can those teams get ahead and stay ahead of their competitors? This topic provides interesting questions to investigate.

This master's thesis contains one main research question and four sub-questions. The main research question is concerned with **how open innovation can deliver increasing value across the cycling industry**. The sub-questions will examine:

1. How materials and analysis of data have changed over the past ten years, with regard to Worldtour teams.
2. Why companies start sponsoring a Worldtour team and what they receive in return.
3. How a professional cycling team can increase the performance of a cyclist through open innovation.
4. How various partners benefit from the use of open innovation with Worldtour teams.

## 3.2 Research design

The main purpose of this research was to investigate how open innovation can deliver increasing value across the road cycling industry, through technical and medical improvements and the use of tactics or software. The connection between stakeholders and the use of open innovation to increase the performance of cycling teams and individual cyclists is explored. I also analysed who benefits from the use of open innovation.

This thesis starts with a literature review to explore the theoretical background. The findings from this part of the study are presented as secondary data, mainly to clarify the concepts of open innovation and closed innovation. From this, the important elements of "open innovation in the sports industry" can be determined. Sources were located online through databases like Ebscohost, Google Scholar and ScienceDirect.

The literature describes the main internal and external stakeholders who are actively involved in the cycling industry. This is a critical aspect of the research as it leads to an understanding of the ecosystem of professional road cycling.

The next section of the thesis discusses the empirical findings with regard to the main research question and sub-questions. The interview data are cited to present a full picture to answer these research questions. The empirical findings are mainly focused on Lotto-Soudal, to determine how this Worldtour team manages the use of open innovation and its increasing professionalization.

To explore the main question of this master's thesis, qualitative research was conducted. To collect sufficient information to further develop relevant ideas, it was necessary to conduct in-depth interviews with people from different sectors. Appointments with relevant companies and persons were made through e-mail and telephone contact, and almost all of the subsequent interviews were conducted face-to-face. The use of semi-structured interview schedules offered a good balance between open-ended and structured interviews. This allowed the interviewer to change the order of the questions or leave out questions that were redundant. Also, it gave the interviewer the flexibility to probe for details or interesting topics. In a semi-structured interview, the explanation and experiences of an interviewee provide greater value compared with a simple yes or no. Each interview started with an overview of the research and its purpose. The interviewee was then asked background questions to provide necessary information about the person (Zorn, 2010). After "warm-up" questions, broad questions were asked that allowed the interviewee to answer very comprehensively, to provide as much information as possible (see appendix). Each interview lasted approximately 45 minutes and every interviewee agreed to the conversation being recorded, which made it possible to transcribe and analyse the material afterwards. The names and background information of the interviewees are described in Section 4.

Within the world of innovation in the sports industry, knowledge institutions such as Flanders' Bike Valley and manufacturers of bike components (e.g. Ridley or Lazer Sport) are the main stakeholders. It was therefore important to contact various stakeholders, such as sponsors, partners, Worldtour teams and the UCI. Only in this way was it possible to get a full picture on this subject.

All of the interviewees occupied a managerial function inside the company or had an eminent influence within their department. Most of them had a connection with Lotto-Soudal, like sponsors, partners, manufacturers or people inside the cycling team.

# 4 Participants

### 4.1.1 Marc Hufkens

Marc Hufkens is co-founder and chairman of the board of directors of Flanders' Bike Valley. This company is an open innovation centre for the cycling industry, which was founded in 2013. Marc sees Flanders' Bike Valley as one of the first bottom-up clusters in Flanders, and stated that the consortium tries to set up breakthrough open innovation projects with multiple domestic and international partners.

### 4.1.2 Scott Bugden

Scott Bugden is the track coach at the World Cycling Centre in Aigle, which is part of the UCI. Scott runs all aspects of the track programme at the centre, from identifying and selecting riders to handling nutrition, training and psychology.

### 4.1.3 Arne Houtekier

Arne Houtekier is the communication manager of Lotto-Soudal. Moreover, he is responsible for the commercial department, which handles matters such as merchandising and events. Together with the operating manager, Marc Sergeant, he searches for new developments in the cycling industry.

### 4.1.4 Servaas Bingé

Servaas Bingé is the team doctor of Lotto-Soudal. He is responsible for the health and performance of every athlete of Lotto-Soudal.

### 4.1.5 Wim van Hoolst

Wim van Hoolst performs a two-fold function. First, he is the head coach of Lotto-Soudal. Second, he is leading the laboratories of Energy Lab in Gent and Paal-Beringen. He is responsible for the quality of the labs and personnel, and has to make sure that the professional cyclists of Lotto-Soudal are physically healthy. Every month he provides the sports directors with a report on each cyclist. He is also a private coach for a number of professional cyclists.

### 4.1.6 Bjorn Legein

Bjorn Legein is the sponsoring manager of the National Lottery, but he mainly focuses on sports sponsoring. About 90% of the sports sponsoring is directed at cycling and the valorisation of it.

### 4.1.7 Marko Heijl

Marko Heijl is the sponsor manager and public relations manager for Soudal. In addition, he teaches Sportmarketingcommunication at the University of Brussels (VUB) and Sportmarketing at the Karel de Grote College in Antwerp. In 2011, he published the book *In goede en kwade koersdagen – Het huwelijk tussen wielersport en marketing*.

### 4.1.8 Kristof de Mey

Kristof de Mey is a sports psychotherapist, who has worked for the University of Gent (UGent) for 10 years. For the past four years he has been responsible for the knowledge of UGent that is obtained from 30 different researchers and teams, with a focus on translating this knowledge and expertise into concrete applications.

### 4.1.9 Morten Kristiansen

Morten Kristiansen is the global head of product and marketing at Ridley Bikes. He is responsible for the product division, which deals with product development and product management. This includes everything from the initial concept or idea to the production line. He is also responsible for the development, engineering, management and strategic management of products, and for furthering the Ridley brand name.

### 4.1.10 Guido de Bruyne

Guido de Bruyne is the ventilation and aerodynamics engineer at Lazer Sport. He is responsible for the company's long-term developments, namely products that have a time-to-market of more than a year. Lazer is a manufacturer of cycling helmets.

### 4.1.11 Ivan Bofarull

Ivan Bofarull is a member of the management team of the ESADE (Escola Superior d'Administració i Direcció d'Empreses) business school, where he is working on the transformation of ESADE. Business schools depend on stocks of knowledge, but he wants to change this into flows of knowledge. He has also researched and analysed FC Barcelona as an open innovation ecosystem.

Table 1 shows an overview of the interviews during the master's dissertation. The table includes the name of the participant, company and function of the participant, date and duration of the interview.

Table 1: Overview of the interviews

| Participant | Company | Function | Date of interview | Duration of interview |
|---|---|---|---|---|
| **Marc Hufkens** | Flanders' Bike Valley | Chairman, Board of Directors | October 28, 2016 | 55 min |
| **Scott Bugden** | UCI | Track coach | | |
| **Arne Houtekier** | Lotto-Soudal | Communication manager | October 24, 2016 | 35 min |
| **Servaas Bingé** | Lotto-Soudal | Team doctor | February 22, 2017 | 35 min |
| **Wim van Hoolst** | Energy Lab + Lotto-Soudal | Head coach | March 14, 2017 | 30 min |
| **Bjorn Legein** | National Lottery | Sponsoring manager | March 2, 2017 | 40 min |
| **Marko Heijl** | Soudal | Sponsor- and PR manager | March 9, 2017 | 55 min |
| **Kristof de Mey** | CoNaMo-project (UGent) | Business developer | April 28, 2017 | 55 min |
| **Morten Kristiansen** | Ridley Bikes | Head Product & Markerting | May 5, 2017 | 35 min |
| **Guido de Bruyne** | Lazer Sport | Aerodynamics engineer | May 11, 2017 | 20 min |
| **Ivan Bofarull** | ESADE Business School | Open innovation expert | March 7, 2017 | 30 min |

# 5 Empirical context

## 5.1 Stakeholders in professional road cycling

Freeman (1984) defined a stakeholder as "any group or individual who can affect or is affected by the achievement of the organisation's objectives" (p. 46). This definition has often been questioned, but it has also been used by many researchers (Rowley, 1997). A stakeholder can be any person, organisation or society that has a vital interest in an activity or business. To understand the whole industry of professional road cycling, distinctions can be drawn between the stakeholders. On the one hand, there are internal stakeholders; on the other hand, there are external stakeholders. Internal stakeholders are mainly those groups or parties that participate in the management of a cycling team. They know most of the internal matters within a professional cycling team and have a great impact on them. External stakeholders, by contrast, are groups that are not part of management; they are outside parties within the business environment. Their core interests are the performance and profitability of a cycling team. Both kinds of stakeholders are explained in the next two subsections.

Spectators and digital audiences can also be seen as stakeholders, but will be disregarded for the purpose of this research. Because they are only indirectly involved in the sports world and do not actively participate in cycling, their role falls outside the scope of this dissertation. Only stakeholders who are actively participating and directly involved in the process are discussed here.

## 5.2 Internal Stakeholders

### 5.2.1 The International Cycling Union

The UCI is the world governing body for the sport of cycling, recognised by the International Olympic Committee (IOC). In 1900, the UCI was founded in Paris. Its headquarters are currently located at the UCI World Cycling Centre in Aigle, Switzerland.

The UCI represents, on a global level, the interests of 185 national federations, five continental confederations, approximately 1500 professional riders and more than half a million licensed competitors (UCI, 2015). The aim and vision of UCI is to develop and promote cycling through close collaboration with the national federations and continental confederations. In addition, the UCI promotes and manages eight cycling disciplines: road, mountain bike, BMX, paracycling, cyclo-cross, track indoor cycling and trials. This dissertation focuses only on professional road cycling.

Within the WorldTour of road cycling, the UCI tries to succeed in three important objectives (Morrow & Idle, 2008):

- Making road cycling more attractive to spectators and digital audiences, particularly by enhancing the participation levels at the most important events of the season.
- Making progress in the development of cycling on all continents.
- Creating value and increasing the interest of investors, by offering certain guarantees for earnings that they will receive from their investments.

Another aspect of the UCI is the promotion of its own events, including the UCI Road World Championships and UCI World Cups. The winner of the UCI Road World Championships, which covers various disciplines, is allowed to wear a colourful rainbow jersey for a year.

To contribute to the global development of cycling, the UCI has founded the UCI World Cycling Centre, which is a high-level training and education centre. Riders have the opportunity to maximise their potential through the right training methods (UCI, 2015).

Since 2013, Brian Cookson has been the elected president of the UCI. His main goal is to restore public trust in road cycling, after various cases of doping at the start of the 21st century. By creating a culture of openness, he hopes to enhance credibility and transparency in the sport.

### 5.2.2 National cycling federations

The national cycling federations play a small role in comparison with other international sports. One of the main reasons is that national cycling competitions, such as the national championships, are perceived as less important than other team sports. Another reason is that countries do not host their own separate competitions (Van Reeth & Larson, 2015). On a professional level, the various WorldTour teams compete against each other only at the UCI WorldTour Circuit. This circuit has included 27 of the most important races of four types: one-day races, stage races, the World Championship and team time trials (Cycling News, 2016). Starting in 2017, this will be increased to 37 races. Cyclists gain points based on their performances in these races. At the end of the season, the rider with the most points is named as the season's best overall cyclist (Rebeggiana & Tondani, 2008).

The only time that national teams are formed to challenge other countries is during the World Championships and the Olympic Games. All the other races are driven in sponsored cycling teams.

### 5.2.3 Race organisers

Race organisers play a major role within professional road cycling. They have a powerful position compared with event organisers of other sports (Cycling News, 2015). The various commercial race organisations are part of a collective group called the International Association of Organisers of Cycling Races (AIOCC), which is responsible for more than 100 annual race events. The main purpose of the AIOCC is to contribute to the organisation of a structured international race calendar (Sheer, 2007). This is coordinated with the UCI. The AOICC and UCI aim for the best possible race calendar, in which certain criteria are taken into account, such as alternative events and environmental conditions.

Within the AIOCC, four members exert a strong influence in controlling most of the race events. The first three are organisers of the three Grand Tours – Tour de France, Giro d'Italia and the Vuelta. These race organisers are respectively ASO, RCS Sport and Unipublic. The fourth organiser is responsible for the Tour of Flanders, called Flanders Classic. The other race organisers are too small to discuss in this dissertation. Table 2 shows the most important cycling events of each major race organiser.

Table 2: Four biggest race organisers and their most important events

| | **Main event** | **Other important cycling events** |
|---|---|---|
| **ASO (ASO, 2016)** | Tour de France | Liège–Bastogne–Liège<br>Paris–Nice<br>Paris–Roubaix<br>Paris–Tours<br>Vuelta a Espãna<br>Tour of Oman<br>Tour of Qatar<br>Tour de Picardie<br>Artic Race of Norway<br>Critérium du Dauphiné |
| **RCS Sport (RCS Sport, 2015)** | Giro d'Italia | Milan- San Remo<br>Tirreno–Adriatico<br>Strade Bianchi<br>Dubai Tour |
| **Unipublic (Unipublic, 2016)** | Vuelta a Espãna (organised together with ASO) | - |
| **Flanders Classics (Flanders Classics, 2016)** | Tour of Flanders | Omloop het Nieuwblad<br>Gent–Wevelgem<br>Brabants Pijl<br>Dwars door Vlaanderen |

Among these four organisers, ASO is the world leader in organising cycling races with 100 days of competition each year. In addition to organising the most races, they offer the best-known classics, such as Liège-Bastogne-Liège, Paris-Roubaix and of course the Tour de France. The ASO also focuses on the globalisation of cycling. With the Artic Race of Norway, the Tour of Oman and the Tour of California, the ASO invests in expanding and internationalising the world of cycling (ASO, 2016).

### 5.2.4 Cycling teams

WorldTour teams are in many ways the same as teams in other international sports such as football or volleyball. Each team employs – in addition to athletes – managers, doctors, trainers, mechanics, physiotherapists, nutrition experts, administrative staff and people responsible for communication. Most WorldTour teams consist of about 70 employed people, with 27 to 30 of them being professional cyclists. Thirty professional riders is the maximum amount allowed under the rules of the UCI. Cycling teams are "well-oiled machines" where each employer had his own function in the business, but the main goal is to maximise and maintain the performance and health of a cyclist (UCI, 2016).

However, the way how a WorldTour team is running, varies from team to team. Some examples:

- Team Bora-Hansgrohe is a completely private company incorporated for the sole purpose of funding and running a professional team. They have an owner/ General Manager who takes a salary and makes the key decisions on everything with key input from main sponsors. The sponsorships income is their only source of funding.
- Team Française des Jeux is registered and incorporated as a public association. So the team owner is technically the association, which has a President. But in this case, the association's board members manage the key decisions.
- Team Cannondale-Drapac is registered as a private limited liability partnership (LLP). Team owners do not run the team, they function as a non-executive board that govern key governance over the executive team. Jonathan Vaughters is the CEO who takes a salary as the day-to-day operations man.

Each of these three UCI WorldTour Teams has a different structure of their top management. And these are only three of the eighteen confirmed WorldTour Teams for 2017.

Besides the professional teams, there are also semi-professional teams. These two divisions can be divided into three different categories of cycling teams: the UCI WorldTeams, the UCI Professional Continental Teams and the UCI Continental teams. In accordance with the UCI regulations and with a full review of all criteria for classification (sporting, financial, administrative and ethical), the UCI Licence Commission grants a UCI WorldTour licence for a period of two years to maximal eighteen teams that meet the

requirements. An unpublished internal ranking, based on the performance of the last two years, decides if a team will be subdivided in a WorldTour team or a Professional Continental team (UCI, 2016). WorldTour Teams have the right to start in each WorldTour event. Professional Continental teams, on the contrary, need to be invited to a WorldTour event with a wildcard. Continental teams are licensed by the national cycling federations and are registered afterwards by the UCI (UCI, 2016). They only have the authorisation to start in races of the UCI Continental Circuit. These riders have to be younger than the age 28 and don't necessarily have to be professional riders (UCI, 2016).

Most of the WorldTour teams are members of the AIGCP, which has been developed into an important stakeholder in the cycling industry. The main activity of the AIGCP is that they act as an employers' association. Together with the CPA, they have edited a labour agreement, called the Joined Agreement or l'Accord Paritaire (UCI, 2013). This consists of some rules about the minimum wage, the minimum number of days of rest and some rules about the social insurance for professional cyclists. These requirements are also needed to be eligible for a WorldTour license. Out of this organisation, some WorldTour teams have, particularly French teams like AG2R and Francaiçe des Jeux, set up a new group. These teams started MPCC to strive for a clean sport without doping. All members had to sign a strict ethical code with the promise that they don't sign any riders who are coming back from a doping suspension for at least another two years (MPCC, 2016).

### 5.2.5 Cyclists

The most characteristic aspect about professional cycling is that, however it is an individual sport where only one rider crosses the finish line first, the competition is executed in a team-based context. A professional cyclist performs as a single racer, but is highly dependable on its team (Rebeggiani & Tondani, 2008). Each team has one or more captains and the rest of the squad, called helpers, helps the captain. The servants help by avoiding breakaways or by delivering drinks and food to the captains. They need to keep the captain as comfortable as possible till the end of the race. Some teams even use their servants as a 'wind shield' to spare energy of their leader. But this has also some consequences. It is a fact that only one rider can win a race or a stage, but the prize money will be divided among all team members, including the staff. This is clearly very different from other individual sports.

Each rider has his own specialty, but especially the captains excel in their specialisations. First, climbing specialists exceed on hard inclines. Most of these riders are focused on the general classification of a multiple stage bicycle race. Second, sprinters try to save their energy till the last couple of kilometres to win races. And third, time trialists need to maintain a high speed as long as possible where they race alone against the clock.

Since 1999, riders of eight different countries (Netherland, France, Belgium, Portugal, North America, Switzerland, Spain and Italy), currently working for a WorldTour or Professional Continental Team, are automatically connected with the CPA. The CPA is founded to defend the interests and rights of all the athletes. All together, they form a strong community that allows them to be heard collectively in discussions or negotiations with other protagonists in the cycling sport, such as the UCI, professional teams or race organisers (CPA, 2011). With the help of the CPA, professional cyclists are able to improve their life and work conditions so that they can ride in better circumstances or are able to get higher wages. The CPA is funded by two per cent of the prize money from all international UCI road races (CPA, 2011). This is estimated around 250.000 euros, out of a total prize pool of 12.500.000 euros.

### 5.2.6 Professional Cycling Council

The Professional Cycling Council (PPC) is a forum that brings together the most important stakeholders. The council comprises members from the CPA, AIGCP, AIOCC and members from the UCI management committee. It is responsible for the technical and administrative organisation of the UCI WorldTour, but also for setting the UCI WorldTour calendar. Decisions are made by a simple majority vote and meetings take place when at least three members request it (Van Reeth & Larson, 2015).

### 5.2.7 Overview of internal stakeholders

Figure 3 shows an overview of the different stakeholders within professional road cycling and how these stakeholders are linked with each other. The PCC, which is described in previous paragraph, is not included in the illustration because it represents a union of four stakeholders. Although, the four individual stakeholders are shown in Figure 3. In this figure, each rectangular frame represents a different player in the ecosystem. The relations between different players are indicated with arrows.

Cycling teams consist of multiple cyclists. Each of the eighteen different Worldtour teams have about 70 employed people, with 27 to 30 of them being professional cycllists. Others are part of the management, technical department or medical department. Most of these cycling teams are affiliated with the International Association of Professional Cycling Groups (AIGCP) and the Mouvement Pour un Cyclisme Crédible (MPCC). The AIGCP acts as an employer’s association to set up rules about the minimum number of days of rest and minimum wage of professional cyclists. The MPCC, however, strives for a clean sport without doping. Additionally, the cyclists are linked to the Cyclistes Professionnels associés (CPA), which has been founded to defend the interests and rights of the athletes.

Furthermore, the Union Cycliste Internationale (UCI) is linked to both the professional cyclists and cycling teams. The UCI is the world governing body for sports cycling, which manages and promotes the developments of eight different disciplines of cycling. The UCI their mission is to develop and promote cycling, in close collaboration with the national cycling federations.

Road races for cyclists and cycling teams are organised by several race organisers. All race organisers together are responsible for more than 100 races per year. These race organisers consist of five major groups: the Amaury Sports Organisation (ASO), Rizzoli-Corriere della Sera Sport (RCS Sport), Unipublic, Flanders Classics and other small race organisers. Together, the five different players represent Association Internationale des Organisateurs de Courses Cyclistes (AIOCC). The main objective of the AIOCC is to organise the best possible race calendar, which takes the demands of the cyclists, UCI and race organisers into account. All different and relevant stakeholders have to reach a consensus.

In summary, cycling teams and cyclists are centred in figure 3, because they are the core players of the internal stakeholders. Multiple players are related around both groups that are together part of an ecosystem.

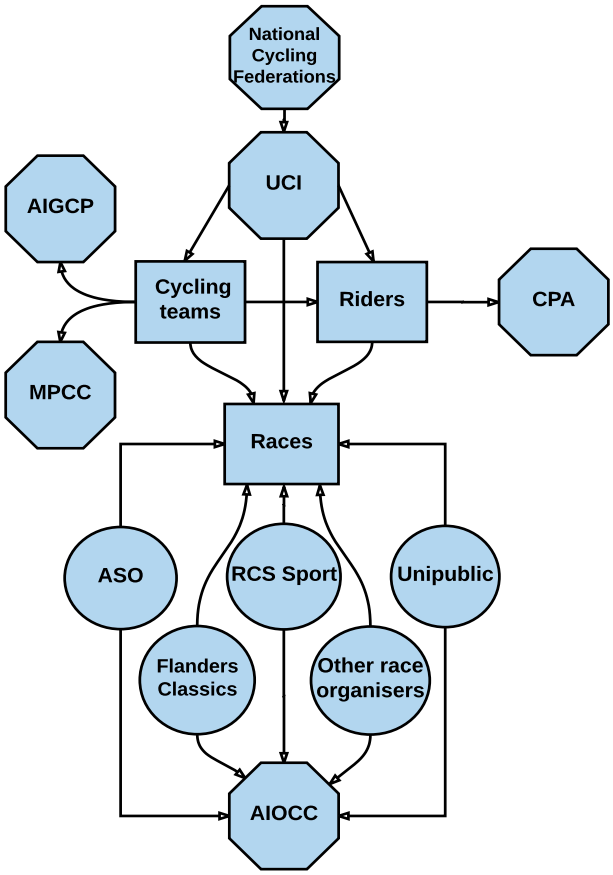


Figure 3: The internal stakeholders of professional road cycling

## 5.3 External stakeholders

This section explains the different external stakeholders in the ecosystem of cycling. Each player has a different relationship with a cycling team. Internal stakeholder are employees or groups that need to manage a cycling team. The priority of external stakeholders, however, is to improve the health and performance of a cyclist, which results in more victories for the cycling team and publicity for the external stakeholders. This is beneficial for both the cycling team and external stakeholders. The use of open innovation between a cycling team and external stakeholders helps to achieve this desired objective. Figure 7 of section 5.3.4 clarifies the connection between the different external stakeholders and the influence of open innovation.

### 5.3.1 Sponsors

Lagae associated "sports sponsorship" with sponsorship in general. He described it as follows:

> … Any commercial agreement by which a sponsor, for the mutual benefit of the sponsor and sponsored party, contractually provides financing or other support in order to establish an association between the sponsor's image, brands or products and a sponsorship property in return for rights to promote this association and/or for the granting of certain agreed direct or indirect benefits …, directly or indirectly arising from the playing of sport. Sport sponsorships include the right to display a brand name and/or company logo in media carriers in a sporting environment. (Lagae, 2005, p. 39)

However, the business of professional road cycling is very different from other sports. Most sports depend on ticket sales, merchandising and media rights for the bulk of their revenues. Sponsorships count for a small part of their total revenue. But in professional road cycling, the revenue model is completely the opposite. For example, all the media rights and profits from sold tickets or VIP access are intended for the race organisations (Van Reeth & Larson, 2015). WorldTour Teams are forced to pay their bills through sponsorships under current business model, which makes sponsorships very expensive. Among most WorldTour teams, more than 80% of their total revenue comes from sponsorships, leaving the remaining 20% to be derived from start fees, prize money and merchandising.

The main sponsor of a WorldTour Team (e.g. Quick-Step, Sky Sports, Garmin, BMC) is usually responsible for 70% to 80% of the total sponsorship revenues, with a maximum of two title sponsors for a team. The main sponsors provide their brand names for the registered UCI WorldTour teams (e.g. Etixx–Quick-Step or Lotto-Soudal) (Benijts, Lagae &

Vanclooster, 2011). The remaining sponsorship revenue derives from co-sponsors (e.g. 21st Century Fox and Ford are co-sponsors of Team Sky), product suppliers (e.g. bike frames, bike wheels, helmets and sun glasses), and service suppliers (e.g. communication or administration). This scenario predicates that each professional cycling team has, on average, more than 20 corporations sponsoring it (Lagae, 2005). Cycling is the only professional sport in the world that faces this kind of scenario, because cycling mainly depends on a business-to-business[3] environment (Benijts, Lagae & Vanclooster 2011). The reason sponsorships have such a strong influence is that road cycling is an outdoor sport that takes place in public space. This is a major advantage for corporate sponsors, because the sport is visible for spectators and digital audiences – but also to the public, who do not have to pay any entrance fees (Mullin, Hardy & Sutton, 2007). This means there are many spectators and potential customers for the sponsoring corporations.

### 5.3.2 Partners

#### 5.3.2.1 Partners in general

Cycling teams constantly search for new technological improvements and developments to increase the performance of an individual cyclist. Investment in their own R&D department would be unaffordable, so cycling teams collaborate with partners to accelerate the innovation process. According to Houtekier,

> Each Worldtour team has several partnerships with manufacturing and medical companies. On a technical level, most WorldTour teams work together with ten to fifteen partners or component suppliers. Each component of a bike has a different brand, valued for its specialisation. Professional teams try to work together with companies that have some influence in international cycling. For those companies, it is a way of recognition from outsiders. A good collaboration with a Worldtour team will lead to increased sales. (Houtekier, 2016, 4.1.3)

Therefore, a professional cycling team does not need its own dedicated R&D department. Close collaboration with partners can provide mutual feedback so that products can be fine-tuned, which creates value for both parties – an aspect that was investigated extensively through empirical data in this study. On a medical level, every Worldtour team has at least one medical doctor in service. The medical staff works together with other specialists and partners to collect data and information. Medical parameters are mapped out on various platforms to optimise the health and performance of each cyclist.

Marginal gains are another important aspect to consider in the search for technological innovations and platforms. Today, medical and technological innovations are highly

[3] Business-to-business or B2B is a type of transction that exists between businesses. In this situation, one business makes a commercial transaction with another.

sophisticated, which means there is little room for improvement. There needs to be a trade-off between cost and improvement for the applicable technology. It is important to analyse whether an investment towards improvement will be worthwhile.

An example of a close partnership is the collaboration between Lotto-Soudal and Ridley. The Belgian bike manufacturer Ridley wanted international attention by delivering bikes to a Worldtour team, which is good publicity. This was possible only because Ridley's materials and products are high-performance; constant investment in their own R&D department is necessary so that Ridley does not lag behind its competitors. At this point Lotto-Soudal uses four models of Ridley bikes: the Dean Fast, Helium, Fenix and Noah. Additionally, every two or three years, Ridley announces a new bike that offers new features and innovations. This diversity is inevitable for any producer, because every professional cyclist knows the latest innovations that are used in the peloton[4].

Table 3: Sponsors and partners of two Worldtour teams in 2017

| **Type of sponsor** | **Lotto-Soudal** | **Team Sky** |
|---|---|---|
| **Main sponsors** | Lotto, Soudal | Sky |
| **Product partners** | Ridley, Lazer, Look, Campagnolo, Continental, Look, SRM, Selle Italia, Elite, C-Bear, Deda, Lizard Skins, Lezyne | Pinarello, Shimano, Pro, fi'zi:k, Stages |
| **Clothing partners** | Vermarc, Gaerne, Compressport, Jako, GripGrab, Hanseeno | Castelli, Kask, Oakley |
| **Nutrition, food and training sponsors** | Mobiflex, Sanas, Energy Lab, 3Action | Science in Sport, Healthspan Elite, Today's Plan, CNP |
| **Logistic sponsors** | Skoda, Gregoor | Ford |
| **Others** | MYDIGIPASS, CAPS Fuel Card, Deloitte, Fresty Fresh, B&W International, Feedback Sports, Opticom, Grafityp, Logiscycle, Revbox, AEG | 21st Century Fox, Wahoo, Elite, Muc-off, Unior Tools, iProspect, Park Tool |

Source: websites of Lotto-Soudal and Team Sky

[4] During a cycling road race, the peloton is the biggest pack of cyclists.

#### 5.3.2.2 Flanders' Bike Valley

Flanders' Bike Valley was founded in 2013 through the collaboration of BioRacer, Lazer Sport, Voxdale, Ridley Race Productions and Flanders' Drive. Each of these complementary companies possessed extensive knowledge on aerodynamics, which played an important role in the product innovation of these companies. The goal of Flanders' Bike Valley was to work together and to see what the companies could learn from each other, in order to accelerate the innovation process and to bring new products onto the market. Hufkens described the main goal of the new wind-tunnel facility as follows:

> At first, Ridley planned to build a wind tunnel by themselves, but they found out that it would not be possible financially and the operating ratio would be too low for the cost. At the same time, Bio Racer and Lazer Sport, both manufacturers of bike clothing, were doing a lot of aerodynamic tests. But the three companies were doing those tests separately, which is not logical. It is the combination of the bike, the clothing and helmet, and the position of the cyclist on the bike that gives an overall picture of the influence of aerodynamics. So together with Bert Celis – an advisor at the Innovation Centre – we assessed whether we could start a facility with support from the Flemish government. We wanted to provide an opportunity to the three industrial players to learn from each other and reach a solution. The focus of the facility would be to learn from each other rather than each company relying purely on its own R&D department. At first, each of the three players thought they had more experience in aerodynamics than any other. However, after a few meetings in which they looked at the bigger picture, they saw that they could learn from each other. For example, the interactions of changes to a helmet or bike clothing resulted in different aerodynamics. With this experience and with a lot of start-ups in this environment, there are many possibilities for expansion over the next couple of years. (Hufkens, 2016, 4.1.1)

The result of this collaboration is a 35.5 m wind tunnel that includes a square test section measuring 2.5 m (width) by 6.5m (length), shown in Figure 4. The main advantage of these measurements is that multiple riders can be placed in the test section. The wind tunnel also contains three main measurement systems to analyse the aerodynamic drag of a cyclist (Celis & Ubbens, 2016).

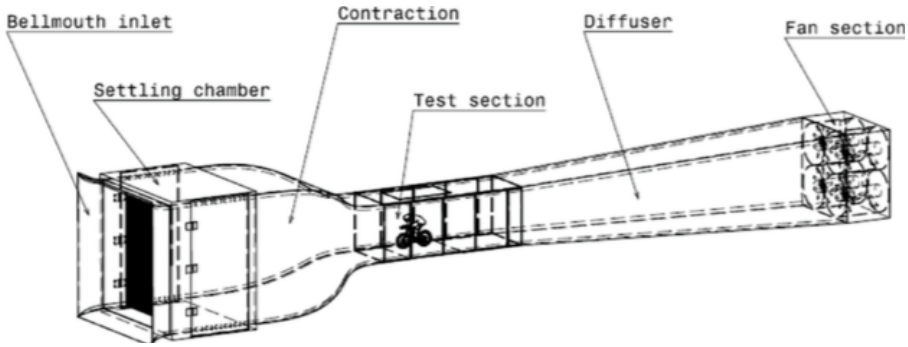


Figure 4: Schematic of the wind tunnel facility at Flanders' Bike Valley (Celis & Ubbens, 2016)

The first is a system of balances that measures the drag of the cyclist. This system determines the forces acting on the test subject, and consists of a simulation that is connected to five load cells. These load cells can determine the forces of compression and tension to find the aerodynamic drag.

The second system is a bike-fitting application, which adjusts the bike to the athlete (cyclist) in order to increase his or her physical performance and reduce potential injuries. To maximise the quality of the bike-fitting tests, the cyclist has to pedal to imitate a realistic situation. During this exercise, up to 200 pictures can be taken per second to study the behaviour of the cyclist on the bike.

The third measurement system is the particle image velocimetry (PIV) system, which Flanders' Bike Valley uses to explore the moving flow patterns. This advanced system sprays oil particles in the wind tunnel after the oil particles have been illuminated by laser. The movement of the particles, which are inserted into the airflow by a smoke generator, can be detected to calculate the velocity of the airflow based on time intervals (Celis & Ubbens, 2016). Because the laser is so powerful, it is impossible to do a live test with a cyclist. As Hufkens (2016) explained: "We had the idea to make a full-scale dummy of Tony Martin on a time trial bike with 3D-milling, which consists of synthetic material. The advantage of a full-scale dummy is that it always keeps the same position on a bike." (4.1.1). The PIV system makes it possible to study small geometrical changes in the aerodynamics of both cycling gear and cycling wear. The narrower the slipstream alongside the cyclist, the better the position on the bike (Figure 5).


Figure 5: Example of wind tunnel testing (Lava Magazine, 2015)

Hufkens clarified another aspect of maximising the speed of a cyclist:

> Two main factors play a critical role in achieving a higher speed. The first is how much power a cyclist can produce. The second factor is the influence of air resistance. The faster you cycle, the more drag you need to overcome. The aerodynamic advantages are greater than people think. When you are looking at the human energy delivered on a bike with a speed of 40 km an hour, 85% of the cyclist's energy is needed to overcome the air resistance. The other 15% goes on rolling resistance and friction. When you increase your speed from 40 km to 50 km an hour, 89% of your energy is used to overcome air resistance. Therefore, the Flanders' Bike Valley wind tunnel aids in reducing the resistance for between 5% and 15% in aerodynamic drag, thanks to an optimal aero-fit. (Hufkens, 2016, 4.1.1)
>
> Figure 6 illustrates the point made by Hufkens:

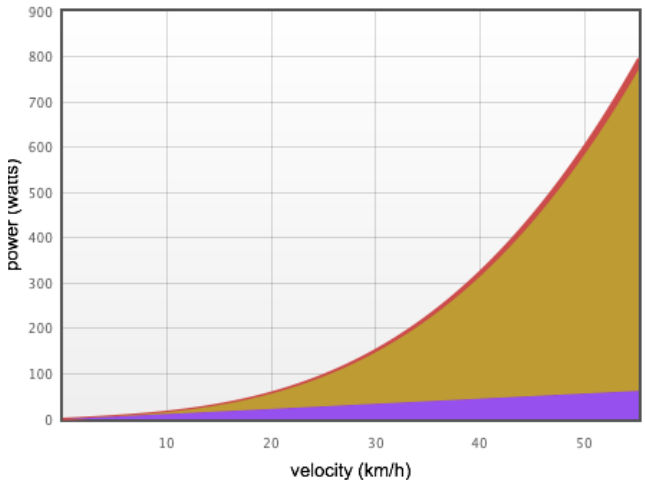


Figure 6: Total resistance of a cyclist on a bike (Flanders' Bike Valley, 2016)

Len Brownlie, a sports aerodynamicist, provided data that he collected between 2003 and 2010 during wind tunnel tests. In these tests, he measured the time savings in seconds over a 40-km time trial, riding at an average speed of 50 km/h. Each saving in air

resistance, expressed in grams in Table 4, is multiplied by 0.464 to yield the time savings over a time trial of 40 km. Chester Kyle, an authority in the field of aerodynamics, formulated this equation in 1999. Table 4 shows an overview of aerodynamic savings from using aero equipment. For example, the use of an aero skin-suit instead of a regular jersey led to a drag reduction of 289 g, which saved 134 sec over a 40-km time trial at an average speed of 50 km/h. Aerosports Research calculated these drag differences in wind tunnel tests.

Table 4: Calculations of aerodynamic savings

| Equipment | From | To | Drag difference (grams) | Seconds saved during time trial of 40 km |
|---|---|---|---|---|
| **Skin suit** | Regular jersey | Skin suit | -289 | 134 |
| **Aerobars** | No aerobars | Aerobars included | -262 | 122 |
| **Helmet** | Regular road helmet | Aero TT helmet | -144 | 67 |
| **Shoe covers** | No shoe covers | With shoe covers | -65 | 30 |
| **Rear wheel** | Full disc | 3-spoke | -63 | 29 |
| **Front wheel** | 24-spoke | 5-spoke | -50 | 23 |
| **Frame** | Standard TT frame | Aero TT frame | -36 | 17 |

Source: Website of aerosports research

### 5.3.3 Media

The main challenge within the cycling industry is the incorporation of sponsorship investments into sales promotions, social media and advertising of the sponsor's name. First, sponsoring brands hope to reach a large audience through the use of paid advertising. Second, sponsors communicate on an interactive base with digital audiences or other stakeholders by using social media or personalised mails. Third, sales promotions should stimulate sales for the sponsoring companies in the short run. Finally, sponsors hope to increase the effectiveness of sponsorship awareness (Lagae, 2005) through the visibility of their brand on clothing and bike equipment, and through the presence of the sponsoring brand in newspapers and the digital press.

With the Olympic Games in Rio de Janeiro and the UCI Road World Championships in Qatar in 2016, road cycling has made real progress in internationalising both the spectators and digital audiences. This can help to attract new sponsors in the future because of increasing media coverage. Certainly head sponsors will benefit from the exposure, because

WorldTour teams are named after their main sponsors, as described earlier. For example, the team of Tom Boonen was referred as Team Quick-Step rather than Team Belgium (Belgium being the home country of the title sponsor). In most other sports, teams are labelled by their city name – for example, Manchester United and FC Barcelona (Benijts, Lagae & Vanclooster, 2011).

In addition to the naming of the WorldTour teams, the UCI (2015) stated in its annual report that cycling still offers good potential for increasing the brand awareness of sponsors. Innovations such as on-board cameras and new investments in UCI digital and social media are crucial to deliver global cycling growth. The UCI currently has more than 1 million followers on social media, which helps to increase the interest of international audiences and promotes the work of the UCI in cycling. It is their mission to strengthen public relations with their current partners and to ensure worldwide and available television coverage for as many events as possible. The first steps in this process were taken in 2016, with the signing of a contract with the European Broadcasting Union (EBU)[5] and International Management Group (IMG)[6] for the commercialisation of global rights to each World Cup and World Championship until 2024 (UCI, 2016).

The Tour de France is a good example to show the correlation between media coverage and sponsor investments. During the Tour of 2016, almost 2000 journalists covered 600 news media, including 87 television channels, 347 newspapers, 99 photo and press agencies, 68 radio networks and multiple Internet websites. There was live coverage in 190 countries on 60 different television channels, with 500 people in a television production team taking care of the live coverage from two helicopters (equipped with cameras) that followed the stages of the race. In addition, five cameramen on motorcycles, riding alongside the cyclists, were in constant contact with the two helicopters. Furthermore, a publicity caravan drove a couple of hours ahead of the cyclists. In 2016 this caravan included about 170 cars and trucks representing 35 different brands. They distributed almost 14 million "goodies" to fans on the side of the road during the 21 stages that year. All these goodies were spread out to an average of approximately 500,000 spectators per stage – a total of more than 10 million people during the whole Tour (Le Tour, 2016).

[5] The EBU is the world's foremost alliance of public service media organizations, with member in 56 different countries. The mission of EBU is to make public service media indispensable.

[6] The main objective of IMG is to work together with clients and partners to bring unmatched experiences in events, media and sports to the world. EBU helps to evolve brands through new market penetration.

### 5.3.4 Overview of external stakeholders

Figure 7 shows an overview of the various external stakeholders in professional road cycling and their relationships with each other. External stakeholders start collaborating with cycling teams, because they are only interested in the profitability and performance of a cycling team. Just like in figure 3, each rectangular frame represents a different player in the ecosystem. The relations between different players are indicated with arrows. Cycling teams and their cyclists are also centred in figure 7, because they are both the core groups of the external stakeholders.

Professional cycling teams are collaborating with external partners to improve the performance of an individual cyclist. The use of an own R&D department would be too expensive for a cycling team, so they are working together with ten to fifteen component suppliers to accelerate the innovation process. Each of these partners has a R&D department and is valued for its specialisation. The two-way arrows represent a close collaboration, which creates value for both groups. One on hand, cycling teams attract partners to optimize cycling performances. On the other hand, medical and technical partners start collaborating with cycling teams to increase their sales, receive publicity, collect extra data, etc. The relation between a cycling team and partners is analysed thoroughly in the empirical study of this master's thesis.

The use of open innovation makes it possible to accelerate the innovation process. Flanders' Bike Valley, for example, is a wind tunnel facility that brings a cycling team and partners together to improve the performance of a cyclist. The main objective of this facility is to combine the knowledge of the different involved players. The exchange of expertise leads to a reduction of the aerodynamic drag.

Furthermore, the link between cycling teams and sponsors is also presented with a two-way arrow. Professional cycling teams are highly dependant of sponsorships. Approximately 80% of their total revenue comes from sponsors. In return, sponsors receive more brand awareness and exposure. The link between these two parties is also investigated extensively through empirical data.

Increased media attention and coverage can help to attract new sponsors and partners, which is beneficial for cycling teams. These external stakeholders hope to reach a large audience through the use of paid advertising. Especially main sponsors will benefit from the exposure, because professional cycling teams are named after their head sponsors.

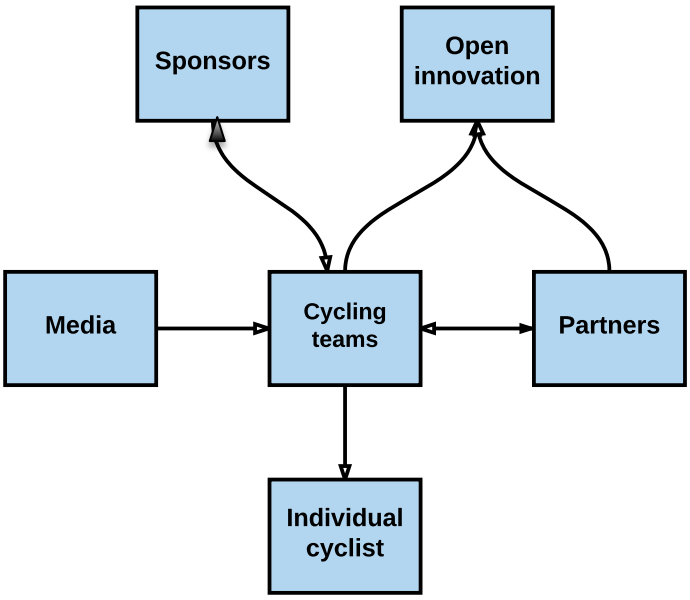


Figure 7: The external stakeholders of professional road cycling

# 6 Empirical study

The empirical study focused on four research sub-questions, each of which is discussed in this section under its own heading. These sub-questions were explored through qualitative research (interviews and case study), and the findings presented here are substantiated with quotes and paraphrasing from the interviews. After the discussion of the four research questions, overall conclusions are made based on all the findings, leading to an answer of the central research question.

This master's degree research focuses on Lotto-Soudal; all interviewees enjoyed an active relationship with this Worldtour team at the time of the study.

## 6.1 How have materials and the analysis of data changed over the past ten years, with regard to Worldtour teams?

It is clear there is a strong need to innovate. Especially with regard to materials, Worldtour teams need to follow the latest trends in order not to fall behind the competition. The bicycle industry is driven by a traditional and conservative way of thinking, and developments over the last 10 years have mainly focused on materials. In the last five to 10 years, greater attention has been given to the design parameter, the aerodynamics and performance parameter.

However, increased attention is also being paid to the analysis of data. Methods of analysis and the use of data have changed substantially in the last 10 years. Although data analysis was performed even 20 or 30 years ago, in the last decade it has increasingly driven the industry's development. The trend is towards internationalisation, and developments are globalised so that new technologies and data are available across the industry. Morten Kristiansen (2017) stated that this is a definite change in today's world, in line with both open innovation and the global sharing of data. Not only on the performance perspective, but the medical perspective as well.

Arne Houtekier (2016) explained that data are used on different levels to analyse the performance of a cyclist. Twenty years ago, professional teams only used a heart rate monitor, whereas today they use power measurements, blood results, training results and so on to create or edit a training schedule for every individual rider. Based on these measurements, it is possible to see whether a cyclist is in good shape or not. From a medical perspective, a large amount of information and data can be collected. The head medical doctor of Lotto-Soudal, for example, introduced the Adagio measurement for sweating. With these kinds of tests, he tries to collect as much data as possible to map all the medical parameters.

There is a clear overlap between the sports science aspect and the medical aspect. On the one hand, Lotto-Soudal works together with Energy Lab for the sports science aspect. The use of the power meter makes it much easier to edit training programs. A decade ago, training schedules were based solely on the heart rate; nowadays, the data provide fuller possibilities. Thanks to the power meter, Lotto-Soudal can now evaluate a cyclist after a race to see if they have reached their normal values or not. The medical department of Lotto-Soudal also collaborates with other specialists. Using data from both fields, they can obtain a full picture to improve the performance of each cyclist. Bingé illustrated how both fields are associated with each other:

> There are two important aspects in the field of top sport, namely health and performance. It is impossible to perform when a cyclist is not healthy. But when a cyclist does not perform optimal, they cannot be healthy. Performance and health go together. Therefore, it is very important for the medical staff to maximize the health aspect. The sports science and coaching staff have to get the performance of an individual cyclist as high as possible. The model Lotto-Soudal uses is that they complement each other as much as possible, so that the athlete reaches his best possible condition. (Bingé, 2017, 4.1.4)

The analysis of data and its application also offer some advantages from a coaching perspective. This makes it possible to refine certain training methods. However, an overabundance of information can make it difficult to use data efficiently. Bugden clarifies this statement:

> From a coaching point of view, we now have more data available than ever. To some extent this enables us to track rider performance, fatigue, training stress and so on much more accurately and therefore potentially to plan more effective and more personalised training. However, the abundance of data can also cause problems in that there is too much of it for a small team to effectively analyse. So you must have some sort of filter in place or risk not using anything effectively. (Bugden, 2016, 4.1.2)

Bugden (2016) indicates that middle ground has to be found, so that irrelevant data are overlooked and Worldtour teams use only relevant data to improve the performance of a cyclist. He also commented that there is a general misperception about the technology in bikes, such that it is perceived as playing a larger role than it actually does. Technology can certainly make a difference at professional level, but the rider is still the biggest factor by far. By contrast, however, Houtekier (2016) emphasizes the importance of technology in bikes:

> The evolution of the technical aspect still has great potential because small improvements can have a big influence on the performance of a rider. For example,

> a cyclist who rides a bike weighing 12 kilos will perform worse than someone on a bike with the newest technologies. In other words, a difference in weight can have a big effect on the performance of a cyclist. (Houtekier, 2016, 4.1.3)

Technology can be improved, but it is also important to take net marginal gains into account. Some improvements are cheaper and easier to obtain than others. However, because of the intense competition at the professional level, differentiating between Worldtour teams is not easy. All Worldtour teams must approach technologies and data in essentially the same way, because professional cycling teams are constantly becoming aware of new trends and emerging technologies in the cycling world. In addition, there is less room for further improvement today than in the past. But there will always be new products or services that can be integrated across multiple sports, such as the use of wind tunnels in cycling, bobsled and skiing. Teams with big budgets enjoy extra possibilities for innovation in sports science, but these advantages are minimal. However, every team searches for new kinds of platforms where they can map different parameters, and marginal gains matter in this regard: an improvement of 0.1% can make a difference during a race.

In summary, technical and medical improvements are essential in cycling, but the individual capabilities of a cyclist are crucial. A helper, for example, cannot become a captain because he does not have the same capacities as a captain. Houtekier (2016) explained that in this scenario, the improvements will only make a helper perform better.

Conservative attitudes in the world of cycling can be problematic. Worldtour teams constantly search for new developments in the cycling industry and they are well aware of the newest technology on the market. They notice that different stakeholders have strong incentives to evolve, but the interests of these stakeholders differ widely. On one hand, there is the interest of organisations such as the ASO and RCS. On the other hand, there are the interests of the teams, federations and institutions (such as UCI). These diverse stakeholders must search for consensus; even between the various Worldtour teams there are different mind-sets. Anglo–Saxon and French teams, for example, have a very conservative attitude compared with other Worldtour teams. Ten years ago, most teams encountered a French influence, but this has changed thanks to the attendance of Team Sky, Orica, BMC or Trek. Houtekier (2016) commented that "different stakeholders are aware that cycling has to grow and evolve, but divisions are rife between the stakeholders. The consequence is that innovation is rather slow and inconvenient" (4.1.3).

From time to time, new start-ups and companies emerge to accelerate the innovation process and to try and break the conservative mould. Velon, for example, tries to offer a new experience in which the spectator is taken into the universe of Worldtour cycling with real-time data and GoPro videos. Velon's goal is to facilitate a new and better economic future for cycling through collective action and increased collaboration between Worldtour

teams and other stakeholders. In 2017, 10 Worldtour teams are members of Velon and hence also strive for more openness and a better economic future. These teams are BMC Racing Team, Cannondale–Drapac Pro Cycling Team, Lotto–Soudal, ORICA–Scott, Quick–Step Floors, Team LottoNL–Jumbo, Team Sunweb, Team Sky, Trek Segafredo and UAE Team Emirates. Houtekier clarifies the aim of Velon:

> Velon is commercializing data like cadence, heart rate and speed. This company specializes in commercializing these data for their partners, and the data are being used on various levels and this is still evolving. The sports science and medical aspect is at this point pretty sophisticated. The commercializing of data has a lot of potential. (Houtekier, 2016, 4.1.3)

In a previous quote, Houtekier (2016) declared that real-time data and the commercialization of data are still in their infancy. Therefore, collaboration between companies and start-ups can provide opportunities to bring such technologies to a higher level. This would make it possible to accelerate the innovation process. Belgium's open innovation centre, Flanders' Bike Valley, has many in-house start-up enterprises. They are trying to accelerate the innovation process by using an open innovation model and the use of their own wind tunnel. Hufkens underlines the knowledge these start-ups possess:

> We have a couple of companies in-house that are not the biggest in the world, but they are technologically at the top. This is similar to other industries. When you are looking at the car industry, Volkswagen, Audi or BMW are the biggest car brands, but Porsche and Ferrari are the most technologically advanced. This is comparable with the Belgian players in the cycling industry. Most of them are small but they have to maintain their competitive advantage by being more innovative than the bigger players. (Hufkens, 2016, 4.1.1)

The Bikeville Incubator is part of Flanders' Bike Valley. The incubator consists of 12 start-ups that have already participated in semi-open innovation projects. These start-ups have certain advantages because they work together under the same roof, which means they can gain wider exposure and better feedback than start-ups located in garages. These companies also receive better support for the development and production of new products – an area in which many start-ups fail. Start-ups are generally strong on the conceptual and product side but they lack experience in business modelling.

In summary, technology can make a difference to aerodynamic efficiency with things such as skin suit materials, wind-tunnel testing, specifically designed bikes and/or components for individual riders or teams. Authorities within the cycling world already have a good idea of what the expectations will be in the next few years.

> Wearable technology is perhaps the next big thing along with integrated measuring and recording equipment within clothes, equipment or bikes. However, technology is moving so quickly at the moment that it is hard to say where we will be in 10 years' time, in my opinion. (Bugden, 2016, 4.1.2)

In the following section, the master's thesis elaborates on the topic of wearable technology with integrated measuring features, which makes it possible to obtain real-time data during a race or training.

### 6.1.1 Case study: The Conamo project

A new project in Belgium, called the Conamo project, is a subsidized research initiative funded by the Flemish government and partners of the project (e.g. VRT, Rombit and Energy Lab). Conamo stands for CONtinuous Athlete MOnitoring, and the project represents collaboration between UGent, the University of Antwerp, Mosaic UAntwerpen, Iminds, Rombit and software companies. The goal of the project is to track live data, such as real-time monitoring of dehydration, temperature, heart rate, power and cadence. The technology makes it easier to live track this kind of information during a race or stage, for each cyclist. This research aims even higher than Velon's projects at present, because Conamo makes it possible to analyse data during a race. The project started in October 2016 and has another two years to develop a proof of concept, according to Wim van Hoolst (2017).

There are several reasons to start a project like Conamo. First, there is the "technology push approach" when technology is available but needs some refinements. These projects are a perfect opportunity to push these kinds of technology to a higher level. The Conamo project makes it possible to improve the Global Positioning System (GPS) connection in remote areas with the use of multi-hop[7] communication, which can have promising opportunities. Second, companies need to anticipate the general trends of the cycling world in which people are paying increasing attention to data-driven information. Third, companies such as Energy Lab and the VRT identify opportunities, and both want to increase the connectivity of cyclists at both the amateur and professional levels. Fourth, this project did not start at the request of Worldtour teams, but one of the tasks of the project is to visualise all the data in the following-car during a race. The communication through race radios is rather limited because it only says how much power a cyclist needs to pedal at a certain point in the race. The problem is that the following-car cannot check if the cyclist is pedalling this amount of power during the race. Fifth, there is a strong need to make training schedules adaptable. People can complete tests in Energy Lab, where

[7] Multi-hop Wireless Network adops multihop wireless technology without deployment of wired backhaul links. The benefit of multi-hop technology is a fast deployment with lower-cost backhaul and it makes it easy to provide coverage in hard-to-wire areas (Cheng et al., 2006).

they get a static training schedule; however, many factors – such as weather and altitude – need to be taken into account. Conamo wants to create a smarter system that can adjust training schedules based on previous trainings, according to Kristof de Mey (2017):

> Every project starts with a purpose they want to achieve. In the beginning, there was an idea to create some sort of communication technology. But after a certain time, they adjusted the direction of the project because people come up with new ideas or there are influences from the outside. This happens all the time. For example, the communication technology of the Conamo project was created to use it in sports. But now, Rombit used it to make this kind of technology possible for containers in ports as well. So we can speak about a technology development, which can be applied in other industries or markets. (De Mey, 2017, 4.1.8)

It is important to manage a project like this properly, therefore follow-up is crucial for Conamo. To increase the chance of success, the Conamo project has a project lead, a research lead and a steering committee. There are also work packages and work package meetings to manage the projects in the best possible way. They also have their own communication tool for sharing information, and researchers collaborate on a daily basis. De Mey (2017) explained that the project members have a written document of 150 pages that contains all the milestones, deliverables and so on, and these can be adjusted after every meeting.

Funding and subsidies are essential for Conamo to develop its idea into a proof of concept. The companies that contributed money and subsidies to the project do not have any requirements for commercial success; the project simply fits with their business strategy. For example, VRT wants spectators to experience sports in a different way. They want to create a closer connection between the spectator and the sport. There is also a social role: the VRT wants to stimulate people to work out more often. For Energy Lab, there is a good opportunity for digitization. The collaboration also results in the creation of new apps, such as the "Advanced My Energy Lab" platform or the "Start-to-cycle" app. With the help of data scientists and sport scientists at the UGent, it is possible to put together training schedules. De Mey (2017) explained these points in his interview.

In conclusion, there has been increased attention to performance and aerodynamics parameters over the past ten years. First, there was only a heart rate monitor available to analyse the performance of a cyclist. Nowadays, the availability of and analysis from the power meter, blood values, body temperature and so on add broader possibilities. Therefore, Lotto-Soudal is working together with technical and medical companies to improve the performance of cyclists. Furthermore, aerodynamic efficiency has increased in importance within the cycling world. New products and technologies can reduce air resistance with the help of wind tunnel testing.

In the future, the use of wearable technology with integrated measuring features seems inevitable. Projects already exist that are developing software to track live data, such as the Conamo project.

## 6.2 Why do companies start sponsoring a Worldtour team and what do they receive in return?

As discussed earlier, in the current business model of cycling around 85% of the income come from sponsoring. This can be considered a risk, but it is the easiest way to collect money and income as long as companies are willing to sponsor. The problem with sponsoring is when companies stop giving money. There were several attempts to change the business model into a more stable one, but to date none of these attempts have succeeded. Another problem with cycling is that the sport has less money in circulation compared with, for example, international football. The television revenues of international cycling are equal to the television revenues for Belgian football, which is about 75 million euros. Therefore, there is an urgent need to generate stronger income streams for Worldtour teams. Starting in 2017, there is a new arrangement for obtaining a Worldtour licence: companies need to guarantee that they will sponsor their Worldtour team for several years. Houtekier (2016) explained this new requirement in his interview.

In the case of Lotto-Soudal, two main sponsors contribute the bulk of the sponsorship money. These are the National Lottery of Belgium and Soudal. First, the National Lottery is the biggest organiser of lotteries and bets in Belgium. With the revenue from these activities, the Lottery subsidises and sponsors sport teams like Lotto-Soudal. Second, Soudal is the largest European manufacturer of adhesives, sealants and polyurethane foams for private and professional users. Today, the company is active in more than 110 countries and it has a turnover of 670 million euros. With 11 manufacturing sites on four continents, Soudal tries to ensure optimal logistical and technical support. For this research question, each main sponsor is discussed separately. The distinction of the sponsors is necessary in order to answer the second research question: why do companies start sponsoring a Worldtour team and what do they receive in return?

### 6.2.1 The National Lottery

The National Lottery started sponsoring a professional cycling team in 1984–1985. The main reason at that time was to give Belgian talent an opportunity in the cycling arena. Even today this is a main aim of their sponsorship. The National Lottery spends a great deal of time on sponsoring and subsidies. In Belgium, the Lottery is the most important player in the market for sports sponsorship. Bjorn Legein (2017) explains:

> In 1984, we were co-sponsor for the Tönissteiner team. Since 1985 we started our own team as a commercial venture and we were sponsoring a cycling team to give Lotto some brand awareness, which was a big success. Sponsoring is important for the image of our product, but it also has a sales-driven aspect to increase our turnover. This is still one of our most import factors after 33 years of sponsoring. The corporate social aspect is very important for us, which means striving to keep Belgium at the top of international cycling. We want to have a lot of Belgian cyclists on our team, especially at the international level. But when you give 5.5 million euros per year to a cycling team, it is important that you valorise this amount of money. (Legein, 2017, 4.1.6)

Legein (2017) also commented that the National Lottery does not have instructions from the Belgian government to sponsor an international sports team. It was a conscious decision to sponsor a cycling team that they have always supported fully. It is remarkable that Lotto and cycling are both well linked to each other. Everybody has the chance to win a race or a stage; cycling is a sport for everybody and it is easily accessible compared with football or basketball. Everything depends on a good brand fit, which the National Lottery has found with cycling, and a legacy of 33 years is not lightly dispensed with.

However, compared with 30 years ago, a shift has occurred with regard to the purpose of sponsoring. In the early years companies gave money in exchange for brand awareness and increased sales. Nowadays, according to Legein (2017), much more is at stake: "besides brand awareness, there is also valorisation[8], hospitality[9], communication, media coverage and so on." (4.1.6). He also explained:

> We no longer live in the eighties or nineties where sponsors just give money for only a logo on a jersey. We constantly need to invest and innovate to make better use of digital channels. People today no longer wait for traditional sponsoring. The focus has changed towards innovation and valorisation. (Legein, 2017, 4.1.6)

This means that Worldtour cycling teams have to change their company structure if they are depending on the influence of main sponsors.

Legein (2017) clarified the structure of Lotto-Soudal. The team is increasingly changing to a shareholder structure, in which the National Lottery is one of the most important stakeholders. The company has a strong influence on decision-making. The Worldtour cycling team is part of the Lotto Sports Organisation (LSO), which is a 100% subsidiary

[8] Valorisation is about the impact that can be created through the development of intellectual property. The commercialising of the scientific knowledge through a license or patent can make an impact to the general public.

[9] Hospitality is the entertainment that a company can offer to its most valuable clients. The invitation to cycling events and providing them with food and drinks is a popular activity within the cyling world.

company of the National Lottery. The board of directors of LSO includes people from the National Lottery and the team manager of Lotto-Soudal. This means that the decision-making power mainly lies with the National Lottery. When the Lottery sets up a cycling team and they want most of the cyclists to be Belgian, this vision or strategy has to be followed. The LSO is formed as Captains of Cycling, which is a cooperative company with limited liability. The board of directors of Captains of Cycling consists of people from the National Lottery as well as other sponsors or partners such as Soudal, Ridley and members of the professional cycling team.

Captains of Cycling aims to involve the various interested parties proactively to fulfil the mission and goals of the LSO. This company aspires to a definite presence of Belgium and Belgian cyclists in the top levels of an attractive cycling sport, and also contributes to the promotion of cycling as an international sport. Moreover, LSO ensures that the cycling sport meets professional and ethical standards. In addition, LSO ensures that a Belgium team is present at the international cycling peloton at the highest achievable level. The LSO team aims to provide numerous opportunities to Belgian cyclists while maintaining the sport's international appeal.

Legein stated that "Even the local stakeholders will be involved in management and strategy. This goal concerns everybody in the area of business, fans – but also team management, race organizers and policymakers in sports." Legein (2017, 4.1.6). It is clear that the National Lottery is investing heavily to keep Belgium at the top of international cycling, with the help of local stakeholders. Lotto-Soudal is doing everything possible to guarantee the existence of their professional cycling team. In addition to LSO and Captains of Cycling, the Lottery has another program to select and train promising athletes. This is the Lotto Cycling Talent project, in which the Lottery and Energy Lab have collaborated since 2011. In this project, the Lotto Cycling Talent project recruits the best cyclists (Juniors and U21) to give them professional support. The team behind Lotto-Soudal supports the cyclists of the Lotto Cycling Talent project, which makes it possible to develop their talents fully. The biggest advantage is that the U23-team is one of the most highly regarded teams at the international level. About ten cyclists in the current WorldTour team started in the U23 team. So there is a real chance to become a professional cyclist when a young rider starts in the Lotto Cycling Talent project.

### 6.2.2 Soudal Group

The most important reason for Soudal becoming the main sponsor of the team was that Soudal wanted to enlarge and build its brand with a good image. Cycling seemed the perfect sport to sponsor because it is active in more than 100 countries. As a company, Soudal is active in more than 110 countries, so sponsoring a WorldTour team was a conscious choice; they saw the possibility of enlarging their brand. Another advantage of sponsoring a cycling team is that the sport is less expensive than football. For example,

the Tour the France is broadcast in 192 countries, which is the perfect opportunity to gain exposure. When a cyclist from Lotto-Soudal wins a race in France or in Italy, the Worldtour team will receive media attention in that country. It is even more important for a cyclist from Lotto-Soudal to win in their homeland because this will mean extra press attention. Winning is important for sponsors to receive press attention and visibility, as Marko Heijl (2017) explained.

Heijl (2017) further added that Soudal does not only want to create brand awareness but also brand "meaning". Valorisation of products and hospitality are important aspects of the sponsorship, far beyond merely gaining publicity. The difference between the National Lottery and Soudal is that Soudal is active in more than 110 countries whereas the National Lottery has a presence in one country only.

One problem with the sponsorship is that people know the name "Soudal" but they do not know exactly what Soudal does. Therefore, Soudal needs to inform consumers and spectators about what the company does. To succeed in this, Soudal has used Lotto-Soudal to show people how good they are in their industry. For example, they make promotional videos with the cyclists of Lotto-Soudal, to explain exactly what the company does and produces. In these promotional videos, it was important to use Soudal's own products to convey a clear message. Therefore Soudal cooperated with Lotto-Soudal to develop high quality products, especially for cycling. Heijl (2017) explains:

> Together with Lotto-Soudal, we have developed 14 different products specifically for bikes. For half a year we collaborated intensively to develop cleaning products such as lubricants, bike and chain cleaners and mud removers. We call this range of products the Soudal Cycling Range. Together with the mechanics and cyclists of Lotto-Soudal, we tested these products to optimise them. And today, the Soudal Cycling Range is for sale in stores all over Belgium. (Heijl, 2017, 4.1.7)

This is an example of cooperation between one of the best cycling teams in the world and one of the best chemical companies in the world, according to Heijl (2017). Soudal is a company with a turnover of 670 million euros per year, but unfortunately the market of the Soudal Cycling Range is not big enough to focus on. This is a market of only a few hundred-thousand euros. Soudal found it suitable to develop these kinds of products because it positions them as an innovative company. The products were tested in all kinds of weather conditions as Lotto-Soudal needed to be critical about the products. They wanted to develop products that the team would actually use and not merely promote.

Heijl (2017) stated that Soudal did not have a large budget to promote these products, because the market is simply too small. Therefore, they made promotional movies featuring the cyclists of Lotto-Soudal, which could attract wide interest. A couple of months later they introduced this range of products right before the start of the Tour the France, in

which Lotto-Soudal had won four stages. That achievement is something a company like Soudal must announce to the world as it is a beautiful form of marketing.

As a main sponsor, Soudal has an influence on Lotto-Soudal just as does the National Lottery. The partnership varies on a daily basis from public relations to contacting staff and cyclists of Lotto-Soudal. Heijl explains:

> We have a certain influence in controlling the team, but not everything. For example, we can decide which cyclists from which country we want to have. For us, Poland is a very important market. So last year, we attracted the Polish champion Tomasz Marczynski. We also attracted André Greipel from Germany, because he wins a lot of races and Germany is vital for the company. James Shaw from Great Britain is a promising cyclist who can play a key role in the future. (Heijl, 2017, 4.1.7)

### 6.2.3 Disadvantages of sponsorship

Sometimes, a good fit between the main sponsors is difficult to achieve, as each main sponsor might have its own priorities and aims in sponsorship. Soudal and the National Lottery both have an ongoing contract until 2020, and Legein (2017) mentioned that there is close contact between the two companies. Current contact is much better than it was with previous sponsor Omega-Pharma, who focused more on the international market than the National Lottery or Soudal does at present. The difference in vision between the two main sponsors was the main reason that Omega-Pharma stopped sponsoring the cycling team. The whole structure and framework is Belgian, on a few foreign riders after.

Another disadvantage is that sponsors have to bear the consequences of actions that occur in a team, as described by Legein:

> Maybe the biggest disadvantage is that you invest in a sport where you don't have everything in control. For example the dope affair – it's a bad image that could be conveyed to the sponsors and partners. Our brands stand or fall based on credibility. For some years this was a big problem. But we took a clear position and had strong belief in our cyclists, and I think we weathered the storm pretty well. But we still need to be very careful with other unforeseen problems in the future. (Legein, 2017, 4.1.6)

This quote clarifies the uncertainty of sponsoring a cycling team. The increased media attention will highlight problems or unforeseen events that Worldtour teams encounter, which can damage the reputation of the company.

A third disadvantage concerns the coverage of the market and the winning-factor. As a company, Soudal is also active in the Indian market, where few people care about cycling. In comparison with Belgium, Soudal succeeds to get press attention 365 days a year. So the sponsorship does not cover the whole market where the company is active.

The final disadvantage is budget size. For example: in the past, Belisol was a main sponsor of Lotto-Soudal, but the company had a turnover of only 120 million euros. When a company wants to be a main sponsor of a WorldTour team, they have to sponsor an amount between at least 3 and 5 million euros. A sponsorship of 3 million euro out of a turnover of 120 million euro is unrealistic. This was explained by Heijl (2017), a former manager of Belisol.

In summary, companies have two main reasons to start sponsoring a Worldtour team. First, there is the corporate social aspect, with a company sponsoring a cycling team to create a brand with a good image. Second, sponsoring a Worldtour team is a way to enlarge the brand. In return the sponsoring company receives extra visibility, exposure, hospitality, valorisation and increased sales. A good brand fit with a Worldtour team is vital to add value to the sponsorship. Nonetheless, companies sponsor sport and sport is an uncertain activity. Sponsors gain the most visibility and exposure if a race is won.

## 6.3 How can a professional cycling team increase the performance of a cyclist through open innovation?

As the literature review described the concept of open innovation in detail, this research question is answered by giving specific examples of how open innovation can increase the performance of a cyclist. The use of open innovation can improve cycling in three different areas: technical improvements, medical improvements and the use of software. The use of new platforms and software can bring the technical and medical aspects together through the analyses of data. These three aspects are discussed separately here.

### 6.3.1 Medical improvements

The problem with cycling is that science and knowledge are evolving fast, but the cycling business does not grow as fast. This is the first gap that has to be closed. Furthermore, the improvement of sports performances within a Worldtour team is mostly experience based, because a cycling team such as Lotto-Soudal does not have its own R&D department. The medical staff of Lotto-Soudal have formed a type of R&D department around the Worldtour team, which makes it possible to conduct scientific research with players in the pharmaceutical industry. It is not possible to approach everything in a scientific way but neither is it possible to decide everything on "gut feeling"; there should be a balance between these two styles. Open innovation can play an important role to

improve the performance of a cyclist but there needs to be good feedback about the innovation. New technological insights cannot necessarily be directly used and applied because mostly, these are medical applications that stem from hypotheses. This was explained by Servaas Bingé (2017).

This illustrated Lotto-Soudal with two examples. The first one is whether a connection exists between the number of hours of sleep a cyclist has and the maximum wattage he achieves after four hours of cycling. Hypotheses like this one are considered, and the team wants to resolve it. In some instances Lotto-Soudal is able to find the answer alone because they collect this kind of data, but at other times it is not possible. The second example is the different effects of supplements on cyclists. Those changes have to be measured, so that the medical staff can collect relevant data. This need leads to collaboration with independent manufacturers, during which the company does its own small-scale research – with a double purpose. On the one hand, the medical department of Lotto-Soudal wants to improve the performance of their individual cyclists. On the other hand, they want to show the scientific world that they have accomplished something on a small scale. Maybe the approach is not fully correct from a methodological perspective or the outcome lacks a significant result. Nonetheless, Bingé (2017) stated that at times connections are noted between various parameters, or even improvements are seen as a result of the research. This scenario illustrates the model they are currently using.

It is obvious that external partners are important in improving the performance of an athlete. Lotto-Soudal started recruiting external partners in 2016 and currently they have a partner portfolio consisting of five companies. Some are small enterprises but others are large multinationals. Lotto-Soudal tries to give these partners new insights on their own products in the hope of achieving a win-win collaboration, so that all cooperating parties gain value from the collaboration. Bingé illustrated this principle with another example:

> When our labs develop certain tests to measure fatigue, it is very interesting for a doctor like me, because I am able to estimate that point of fatigue in an athlete. But this is also very important for an athlete to know, because he is able to estimate his maximum physical effort and this kind of measurement makes it possible to check his level of fatigue on a diagram. Also, the lab can develop his tests and make it possible to unroll them on a large scale. We always strive for a win-win situation out of our R&D department. We've even founded a non-profit association for this R&D department and called it *Sciencefiction vzw*. Each party has to gain something from it. Furthermore, we collaborate with a pharmaceutical partner to perform academic research in exchange for sharing the results. This will create a new form of collaboration and win-win for every company, in line with the needs of every party. Thanks to this collaboration, we are able to improve the performance of our cyclists, and the pharmaceutical companies gain knowledge and expertise from the data.

> Our most important need is answering the question, "How can we prepare our athletes as well as possible at the start of a race?" (Bingé, 2017, 4.1.4).

Bingé (2017) also described the complexity of all these collaborations and partnerships, stating that such complexity requires them to be managed properly. Team Sky, for example, has its own innovation manager, but a team like Lotto-Soudal does not have the budget for this. Therefore the team doctor, Servaas Bingé, is responsible. His job as an innovation manager is to search for new opportunities, including through open innovation, so that there are enough resources available to manage the present and future partnerships properly. As a result, Lotto-Soudal may attract new people with new responsibilities and specializations. The environment is complex, but Lotto-Soudal tries to locate each activity and process within a specific framework. This makes it possible to reduce the number of parameters to five levels that can affect performance: body, mind, training, nutrition, and everything that requires technology. There is a sixth and smaller parameter, namely genetics. Every innovation project falls into one of these six categories, and in this way, everything remains focused and manageable.

Lotto-Soudal is working hard to create the ideal sports scientific cell by 2019. Once this cell is created it will be easier to attract new partners so that there is some assurance about the continued existence of their team. The main goal of the scientific cell would be to achieve structure in their projects, which would make it easier to manage the medical department. However, the main challenge is that the medical team of Lotto-Soudal currently consists of only three doctors, one psychologist, three physical therapists, one nurse and one trainer. This is rather small compared with that of other Worldtour teams, so there is an urgent need to expand their medical department. Apart from this, Lotto-Soudal will soon reach its maximum potential and professionalization. The team needs to search for new resources to make progress every year, while also investing in innovation to make use of cutting-edge technologies. The open innovation model and the opportunities it can deliver is one of the possible options to explore.

In summary, according to the Worldtour team it is important to keep health and performance in mind to optimise the results of a cyclist. These are the two most important aspects in the field of top sport. It is impossible to perform when one is not healthy, but when one does not perform it is impossible to be healthy. Those two aspects go hand in hand. Therefore, it is very important for the medical staff to maximize the health aspect. The sports science and coaching staff are required to raise the performance of an individual cyclist as high as possible. Those two parties have to complement each other to the fullest extent so that the athlete reaches his or her best possible condition.

### 6.3.2 Technical improvement

The second aspect to improve the performance of a cyclist is technical improvements. To improve certain technical products or components, Lotto-Soudal depends heavily on their partners because Lotto-Soudal does not have its own R&D department and their partners do.

Bike manufacturer Ridley, for example, has its own R&D department, where they develop new products. In the past they have always developed everything by themselves, because Ridley did not want to approach a vendor to let them develop their products. Morten Kristianson (2017) mentioned that innovation has occurred throughout the history of Ridley, but through the years the use of vendors has become more important because Ridley does not have the size or resources to do it themselves any longer. It was a strategic decision to use vendors in their current network. Networking is an important task for the CEO and founder of Ridley, because they lack a high level of expertise in-house.

> We try to innovate the same way as everybody else does. We look at the design perimeter around performance, because that is where our brand comes from. So that is the traditional weight, stiffness, aerodynamics and vibration elimination. In terms of the partners we collaborate with, right now we're doing a lot of projects within aerodynamics, so we have partners who can do things we can't do in–house. We don't have the staff to do that. We have specific partners to do that for us. These aerodynamic partners utilise the wind tunnel, which is another external partner. In the last six months, we have probably spent 20 to 25 days in the wind tunnel, which is quite a lot. But that is also because we had a couple of professional teams in the wind tunnel, so it is not only for product testing but also athlete optimisation. We also have a couple of projects at the conceptual level where we have partners that either came to us with an idea, or we had an idea that we took to them. It is not all performance based, some of it is also transit and mobility based. And that's where Ridley as a brand also is looking into how we can play a role in that market. (Kristiansen, 2017, 4.1.9)

This quote explains how specific collaborations have been established in which the parties share a great deal of expertise and knowledge. This open innovation model makes it possible to accelerate the innovation process to improve the performance of a cyclist. At the time of the interview, Ridley was cooperating with two or three start-ups of Flanders' Bike Valley and three other independent start-ups. Kristiansen (2017) also explained that the collaboration between these start-ups and Ridley is a perfect test-bed for their products and business model. The problem facing many start-ups is that they are strong on the conceptual and products side, but often seem to lack ideas or direction on the business side. Therefore, start-ups bring their ideas to larger companies such as like Ridley to convert the ideas into products. Also, start-ups fail if they have a good idea but there is

simply no market for it. In that case is it impossible to speak of innovation, only a good idea.

In the case of a bike manufacturer, they rely on their own development and their own technologies. At the same time they are closely tied with vendors because most bicycle components are made by the same four or five factories worldwide. This means that they basically all share knowledge without necessarily realising it. Some factories are stronger technology-wise than others, which means there is a good chance that Ridley will indirectly receive some of that technology or some of that learning.

### 6.3.3 The use of software

Lotto-Soudal uses a software program called TrainingsPeaks. Wim van Hoolst (2017) mentioned that every cyclist needs to upload his or her training and race using this application. This training software analyses power measures, heart rate, distance, altitude metres and so on. Both the team doctor and head coach use the same login code to access the same data. A power meter can provide a great amount of information about a cyclist, because it can analyse if he or she has reached his or her normal values during a race or training. The problem of this training software is that no real-time monitoring is possible; the analysis of data can only be done after a training session or race. The Conamo project, which was described under the first research question, may prove to be of great value in the future. The Conamo project enables the team to set up dynamic rather than static training schedules. This will also be a game-changer during races, because the use of real-time monitoring will change a team's strategy. Thanks to this project, the team's managers can visualise all the data of a cyclist from the following-car so that they can make projections during a race.

Lotto-Soudal is also making use of the Edge Team Platform, which the physical therapists, doctors, trainers and sports directors have access to. This platform consists of medical and performance data such as blood results, training results, feelings of the cyclist and osteopath treatments, as well as the stages, moments of rest and peak times.

In summary, the use of open innovation can improve the professionalization of cycling in the medical department, technical area and the application of software. The medical team of Lotto-Soudal collaborates with external partners to gain insight into new technologies, even if the research is not fully correct in its methodology. The optimisation of the health aspect is the main objective of the medical staff. In addition, Worldtour teams make use of technical partners to improve the performance of a cyclist. Cycling teams depend heavily on their R&D departments to accelerate the innovation process for existing and new products. Finally, partners who specialize in software can help to analyse the data to maximize the performance of a cyclist. This includes both technical and medical data, which makes it possible to compile individualised training schedules.

## 6.4 How do various partners benefit from the use of open innovation with Worldtour teams?

Lotto-Soudal has partnerships with Energy Lab and Ridley, which are brands that want to profile themselves. For Energy Lab, there is a good opportunity towards digitization of their data. Ridley wants to gain international attention by delivering bikes to a Worldtour team, which is only possible when they have high-performance materials and products. It is good publicity for a bike manufacturer when they are linked to a Worldtour team. However, Ridley has to invest in its own R&D department to stay competitive on an international level. Currently, Lotto-Soudal uses four models of Ridley bikes: Dean Fast, Helium, Fenix and Noah. Every two or three years a bike is upgraded, with new innovations. This is important because every professional cyclist knows the new innovations that are used in the peloton.

Houtekier (2016) mentioned that Lotto-Soudal is working with 12 different partners and component suppliers. Every component of a bike is a specific brand, which is valued for its specialization. Lotto-Soudal only works with companies that have brand awareness in international cycling. For those companies, the collaboration provides a reference point and acknowledgement towards the outside world, and partnership with a Worldtour team will lead to an increase in sales. Worldtour teams help to market the company's products and showcase their technology and products, which have to fulfil the highest standards in the industry.

Another important aspect of partnership with a Worldtour team is providing mutual feedback and improving cooperation for future projects. The use of mutual feedback is clearly visible between Ridley and Lotto-Soudal. Every month, the engineers of Ridley meet with the mechanics. According to Kristiansen (2017), the number of meetings is quite high because Lotto-Soudal is a Belgian team and the wind tunnel facility is nearby. The engineers of Ridley also attend the training camps of Lotto-Soudal once or twice a year, to receive feedback from the cyclists and mechanics. Mostly, the feedback Ridley receives is qualitative but it varies in type. Sometimes they hear anecdotes that they cannot really use, but other times they gain valuable information from athletes who are really capable of explaining the way they experience things. Kristiansen illustrated this with an example:

> In April, we had a cyclist in the wind tunnel of Flanders' Bike Valley, where we delivered a new product that cyclists were very happy with. During this wind tunnel session, he said to me that he prefers the previous product over the current one. In this case, it was a bike with a change in stiffness. The cyclist said, "This new product is much stiffer." But in fact, when we looked at the laboratory testing, they had a margin of five per cent. So there was no real difference between the two bikes.

> Sometimes that is the difficult thing about the athletes – you get these soundbites that you have to figure out… why they are saying that. Because in this case, I could see that the parameter he was referring to was not there. It is always difficult, unless the athlete has a very scientific mind or he is also a little bit of a designer in his way of thinking, so that he can explain what he is feeling. (Kristiansen, 2017, 4.1.9)

Furthermore, partnership with a Worldtour team provides the company with a huge opportunity. Companies and start-ups approach Ridley because these companies know Ridley's products are at the highest level. The common objective is to develop greater expertise and knowledge through open innovation. It does not matter how many "likes" Ridley has on Facebook; it is about the company's position as a brand within the cycling world.

As a result, partners benefit from the use of open innovation with Worldtour teams in three different aspects. The first is an increase in sales because of the extra visibility and exposure to enlarge their brand. The second is the use of mutual feedback between Lotto-Soudal and their partners. Good collaboration with mutual feedback leads to better products, so that Lotto-Soudal can make use of these improved products. The last aspect is the development of expertise and knowledge. Companies and start-ups would like to cooperate with partners of Worldtour teams, because they have one of the best products in the world. This is a win-win situation for every company that cooperates.

# 7 Conclusion

## 7.1 Discussion

The main purpose of this research was to investigate how open innovation can deliver increased value across the cycling world through technical enhancements, medical improvements and the use of software. Eleven semi-structured interviews with the main stakeholders of Lotto-Soudal were conducted to collect data that would yield a better understanding of the functioning of a Worldtour team. The use of a qualitative research led to four important findings, obtained from a comparison between the theoretical context and the empirical study. First, the research findings show that the medical department of a Worldtour team can improve the performance of a cyclist through open innovation. Second, a Worldtour team depends heavily on the R&D departments of the team's technical partners. Third, specialized software programs help to analyse medical and technical data to maximize the performance of a cyclist. Fourth, Worldtour teams depend strongly on sponsorships. These points are discussed below.

1) The medical department of a Worldtour team improves the performance of a cyclist by using open innovation. When this finding is compared with results reported in the literature, Chesbrough (2003) stated that in the open innovation model, firms generate and develop both their own innovations and ideas from the outside to market. This statement can be confirmed based on the first finding of this study. The data from the in-depth interviews show that Lotto-Soudal has created a sort of R&D department around themselves, which makes it possible to conduct scientific research with players from the pharmacy industry. Both parties share data and knowledge that help to accelerate new medical applications and improve the performance of a cyclist. This also means that both parties create value from the collaboration. However, the approach to most new applications lacks methodological precision, which is an important aspect the medical department needs to resolve in the near future.

2) Worldtour teams rely on the R&D departments of specialized external partners, because the teams do not have their own R&Ds. Essentially, the use of an own R&D department is financially not possible, and teams lack in-house expertise in bike components. Comparing the findings of the empirical research with those presented in the literature, one might conclude that Worldtour teams do not use open innovation in the technical department. Only external partners use it and Worldtour teams completely depend on them. The advantage of collaborating with a Worldtour team is that technical partners can attract more interest from start-ups and other companies. External partners use open innovation with these firms to accelerate the innovation process for new products. A wind tunnel facility can be a matchmaker between those companies, because the collaboration between them can accelerate product development through wind tunnel testing. The problem with the use of open innovation is that it works only in situations where the

partner companies focus on complementary elements. Each of these complementary companies has the same customer, and with the use of the wind tunnel, they can optimise aerodynamic resistance. In the current ecosystem, this is an open innovation model where everybody wins. When a Worldtour team stays loyal to a certain partner, it means that the partner is excelling in the development of products. The use of open innovation certainly plays an important role in this excellence.

3) Software programs and apps can analyse medical and technical data to improve the performance of a cyclist. The literature review showed that budgets in all sports are increasing year after year, and this increase calls for greater professionalization. Cycling is no longer experienced-based but is progressively science-based, and is largely driven by numbers to improve the cyclists' performance. Platforms like TrainingsPeaks can act as an important link between data from the medical and technical departments, to increase the performance of a cyclist. Worldtour teams present certain demands when using new software platforms or apps. Together with developers, Lotto-Soudal can generate new software and both parties can create value. For example, Worldtour teams use apps to analyse data from both departments to create individual training schedules. Unfortunately, these individual training schedules are static and cannot be adjusted after each training session or changes in data.

4) Sponsors are a crucial factor in the ecosystem of the cycling world. In the empirical context, more than 80% of the total revenue of a Worldtour team comes from sponsorships (Benijts, Lagae & Vanclooster, 2011). Because of the unstable economic model of cycling, teams cannot survive without the money of sponsors. Also, without the help of sponsors, Worldtour teams might end up spending more time overcoming barriers than accelerating product development. Part of the sponsorship money is used for research and for partners that use open innovation to improve the performance of a cyclist. Basically, sponsors are indirectly connected with the use of open innovation, because they are vital in applying open innovation in the cycling world. In return sponsors receive visibility, valorisation, hospitality and increased sales. As long as sponsors are willing to sponsor Worldtour teams, the existence of cycling teams is assured. However, it is a very unstable business model with many disadvantages.

## 7.2 The evolution of open innovation in the cycling world

Three decades ago, cycling teams were already trying to improve materials, but these improvements were mainly incremental innovations. Moreover, cycling teams performed data analysis in the eighties, yet every cycling team was keeping these data for themselves. When this finding is compared with results in the literature, Van de Vrande, Spruijt and De Rochemont (2016) explained that this closed innovation model worked well for most of the 20th century. Towards the end of that century, companies started to search for new technologies and ideas beyond the boundaries of the firm. The use of open

innovation can significantly influence the professionalization of cyling. In the last five to ten years, greater attention has been given to the analysis of data and the performance parameter in the cycling world. The trend is towards internationalisation and sharing data across the industry. Most external partners of cycling teams started close collaborations with other companies or start-ups, because these external partners do not have the resources or the size any longer to innovate themselves. The exchange of expertise and knowledge between the companies results to an accelerated innovation process. On one hand, this is beneficial for the involved companies. On the other hand, the use of open innovation between the companies leads to successful cycling teams. Clearly, cycling is no longer based on a "gut feeling". It is progressively science-based and widely driven by numbers and data.

## 7.3 Limitations and recommendations for future research

This master's dissertation is, to my knowledge, one of the first exploratory studies on the use of open innovation by Worldtour cycling teams. The limitations of this study lead to suggestions for future research, and it would be interesting to conduct a larger-scale study on this topic. This study included only 11 interviews with stakeholders; including more interviews with a wider range of stakeholders would be more representative and would enable deeper insight and firmer conclusions to be drawn. In addition, this research focused on a single Worldtour team. The results might not be generalizable to other teams or contexts.

The literature on open innovation in the sports industry is limited. Zynga (2014) appears to be the only researcher who has studied the role of open innovation in sports. Therefore, it was necessary to conduct descriptive research. A descriptive study cannot test or verify the research problem statistically because it uses interviews, which are qualitative in methodology. The absence of statistically oriented surveys can sometimes result in a certain level of bias, such as respondent bias. This type of bias occurs if the respondent is unable to answer a question accurately or is unwilling to provide honest answers.

Furthermore, there are still many unanswered questions about the use of open innovation in sports. Most previous research on open innovation has focused on the business world and the sports industry represents rather unknown territory. Because this master's dissertation only covers an ecosystem in Belgium, it would be interesting for further studies to look beyond the borders of Belgium by conducting a comparative analysis of diverse Worldtour teams. This would yield new insight into the manner in which cycling teams use open innovation and how their stakeholders are connected with each other.

## 7.4 Managerial recommendation

In the near future, investing in wearable technology and integrated measuring systems will create beneficial opportunities to improve the performance of individual cyclists. The use of open innovation with specialized external partners will accelerate the development of communication technology that makes it possible to monitor real-time data during a race or training. At present the analysis of data is possible only after a race or training session, so this kind of software will have considerable potential.

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# Appendix

## Interview topics

Partners

- Information about the interviewee and function within the company
- How the availability and analysis of data have changed over the past 10 years
- Whether partners own an R&D department and invest in new technologies
- Whether they make use of external partners to improve the performance of a cyclist
- The importance of open innovation and who benefits from it
- Reasons to collaborate with a Worldtour team
- Disadvantages of collaborating with a Worldtour team
- Expectations for the future

Sponsors

- Information about the interviewee and function within the company
- Reasons to sponsor a Worldtour team
- Influences of a sponsor on a Worldtour team
- The relationship between the sponsor and Worldtour team
- Expectations of the sponsorship
- Disadvantages of sponsoring a Worldtour team

Lotto-Soudal (Worldtour team)

- Information about the interviewee and function within the company
- How the availability and analysis of data have changed over the past 10 years
- How important external partners are to improve the performance of a cyclist
- Whether open innovation is important in cycling, and who benefits from it
- How a Worldtour team manages the use of open innovation
- Whether the Worldtour team invests in new technologies
- Whether there is room for improvement in the medical and technical fields

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**The use of Open Innovation and innovation ecosystems by Worldtour cycling teams**

Richting: **master in de toegepaste economische wetenschappen-innovatie en ondernemerschap**
Jaar: **2017**

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