A New Era in Tobacco?
A Dynamic Capabilities Perspective on Philip Morris International´s Strategic Shift towards a Post-Cigarette Future

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Abstrato

Esta tese de mestrado examina a mudança estratégica da Philip Morris International, um ator importante na indústria do tabaco que anunciou a intenção de acabar com a venda de cigarros tradicionais. Em resposta, a empresa está a transformar o seu modelo de negócio rumo a um futuro sem fumo, liderado pelo seu principal produto, o IQOS. Este estudo, fundamentado no conceito de Capacidades Dinâmicas, identifica os fatores-chave, distribuídos nos três pilares, detetar, aproveitar e transformar, que impulsionam essa conversão. Analisa-se, assim, a resposta a desafios regulamentares e comerciais, a alocação de recursos e as reestruturações internas. A investigação adota uma abordagem qualitativa, recorrendo a entrevistas com fontes internas e à análise exaustiva de fontes secundárias, como publicações, entrevistas e comunicações corporativas. Este método combinado permite obter informações sobre os progressos da Philip Morris, nomeadamente os investimentos substanciais em investigação e desenvolvimento, e as novas estratégias de ensaio de produtos e de participação no mercado. As conclusões indicam que a abordagem pró-ativa da Philip Morris reforçou a sua posição no setor emergente dos produtos sem fumo, embora suscite preocupações éticas e estratégicas. Apesar dos esforços de inovação e reestruturação, as consequências a longo prazo para a saúde e os potenciais fossos económicos podem limitar a concorrência. As limitações do estudo, especialização sectorial, recolha restrita de dados primários e insuficiência para generalização, apontam para a necessidade de mais investigação em outros setores. Em suma, a tese fornece insights sobre a aplicação das capacidades dinâmicas na reinvenção empresarial num ambiente em evolução.

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Título: Uma Nova Era no Tabaco? Uma Perspectiva das Capacidades Dinâmicas sobre a Mudança Estratégica da Philip Morris International rumo a um Futuro Pós-Cigarro

Palavras-chave: Capacidades Dinâmicas, Transformação Estratégica, Indústria do Tabaco, Produtos sem Fumo, Philip Morris International, IQOS

Abstract

This Master thesis examines the strategic shift of Philip Morris International, a significant player in the conventional tobacco industry that has announced its intent to end the sale of traditional cigarettes. For this reason, the company is currently undergoing a transformation of its business model towards a smoke-free future, pioneered by its flagship product, IQOS. This study, centered around the Dynamic Capabilities concept, identifies key factors, categorized in the three pillars sensing, seizing, and transforming, which are contributing significantly to the conversion. Therefore, the response to regulatory and commercial issues, the resource-allocation, and internal restructurings will be discussed. The investigation will rely on qualitative approaches, including interviews with internal sources and a comprehensive review of secondary sources. This combined research method will provide insight into the factors influencing Philip Morris International's progress, including substantial investments in research and development and new strategies for product testing and market involvement. The findings indicate that Philip Morris proactive approach has enhanced the company´s position in the emerging smoke-free product sector while also considerable ethical and strategic concerns are raised. Despite the company's efforts in innovation and restructuring, long-term health consequences of the products and potential economic moats may hinder competition. The study's weaknesses including sector specialization, restricted primary data collection, and insufficient data for generalization across industries, indicate the necessity for further research to apply these findings to other sectors. In summary, the thesis offers valuable insights into the application of dynamic capabilities to drive business reinvention in a dynamically evolving environment.

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1. Introduction

The modern market environment is driven by new developments in technology, constantly evolving customer demands, which vary greatly depending on the specific market, and more intense standards and regulation that aim to protect consumers. Consequently, corporations are well-advised to innovate and refine their strategies to keep pace with dynamic market conditions to ensure competitiveness under future market conditions and minimizing the risk of becoming obsolete. The described circumstances are particularly noticeable in the tobacco industry in which a large number of measures were implemented to restrict tobacco consumption due to public health concerns.

This Master thesis analyzes the strategic transformation of one of the industry leaders, Philip Morris International. The company has positioned towards a smoke-free future and wants to leave the traditional cigarette business behind. To prepare for a post cigarette future, Philip Morris International has made immense efforts by innovating its business model through developing the segment of smoke-free products, which is currently led by the product line IQOS. The objective of this research is to investigate how Philip Morris International has operationalized capabilities to adapt its business model. In order to disclose the key factors of this process the framework of Dynamic Capabilities is employed throughout this work. Further, this thesis analyzes the implication on the competitive positioning of the corporate transformation and offers insights on how Philip Morris is approaching its reinvention while the company is developing capabilities that were not existent before.

2. Literature Review

In the following is the concept of Dynamic Capabilities described to provide a conceptual framework by summarizing and comparing different perspectives. In the second part is the subject of investigation, Philip Morris International and its product IQOS, described in an internal developmental context and situated in the developments of the regulations in the tobacco market.

2.1. Understanding the Concept of Dynamic Capabilities

The paper *´Dynamic Capabilities and Strategic Management´* by Teece, Pisano, & Shuen (1997) marked a foundational shift in the field of strategic management studies. Through this seminal and widely recognized article, the authors gave birth to the influential theory of dynamic capabilities, because of which a more holistic and enriched approach was brought into assessing and interpreting firm performance — an aspect that surpassed the scope and capacity of previous models. While earlier models, such as the Resource-Based View (RBV), established their primary conceptualization on protecting a company´s existing resources with reference to the following definition: "sources of sustained competitive advantage are firm resources that are valuable, rare, imperfectly imitable, and non-substitutable" (Barney, 1991, p. 116), it lacks the ability to explicate how a firm can convert its resources into a competitive advantage (Wang & Ahmed, 2007). Additionally, essential elements such as changes within the market and corporate advancements are similarly disregarded (Wang & Ahmed, 2007), leaving a gap in understanding strategic resource utilization. The limitations to which the RBV is exposed enhance the notion of Dynamic Capabilities as this model integrates these components.

Teece, Pisano, & Shuen (1997) have systematically identified and integrated the factors that contribute to the distinction within the terminology. First, they characterized "dynamic" as a firm´s "capacity to renew competences so as to achieve congruence with the changing business environment" (p. 515). In this context, the researchers particularly emphasize that the potential for innovation must be complemented by a thorough awareness of the market, as the factor timing is of critical significance and exerts a profound influence on the success or failure of a company (Teece, Pisano, & Shuen, 1997). In the second terminology, "capability," the researchers identify "strategic management" as a crucial element for "appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences" to success in a dynamic corporate landscape and draw special attention to the imperfect imitability of resources, which is already mentioned in the Resource-Based-View (Teece, Pisano, & Shuen, 1997, p. 515). While Teece, Pisano, & Shuen (1997) and other scholars argue that dynamic capabilities are inherently rare and inimitable, this perspective has been challenged by others. For example, Eisenhardt and Martin (2000) contend that dynamic capabilities can often be acquired through widely adopted best practices, suggesting that they are not necessarily unique to individual firms.

Another noteworthy element proposed by Eisenhardt and Martin (2000) is the distinction between moderately dynamic and high velocity markets. The present study primarily highlights the concept of a moderately dynamic markets as it is the proper definition for the purpose of this paper. The environment of moderately dynamic market enables companies to formulate plans and adjust their actions accordingly, as changes are more foreseeable and occur at a steady pace, particularly with respect to the development of products, which becomes greater in effectiveness as test phases before the market entry are more possible (Eisenhardt & Martin, 2000). The competition structure is more comparable to an oligopoly, wherein innovations can be characterized as evolutionary rather than revolutionary. In such a market, the influence of decision-making on a company's overall strategic focus should not be undervalued, notwithstanding the above characteristics. As highlighted by Teece, Pisano, & Shuen (1997), once a company's core orientation is established, it is not effortlessly altered and significantly impacts the strategic development trajectory of an organization. While it is feasible to operate with flexibility and adjust management, the autonomy in decision-making is diminished relative to the period prior to the company's fundamental orientation (Teece, Pisano, & Shuen, 1997). A compelling metaphor is that of an oil tanker altering its course while mooring into a port. Following steering, this process can solely be modified and cannot be reversed or only with considerable effort. The author's reasoning leads to the following conclusion: “Firms, at various points in time, make long-term, quasi-irreversible commitments to certain domains of competence” (Teece, Pisano, & Shuen, 1997, p. 515).

Lastly, it should be noted that the paper acknowledges the existence of further, more precise, conceptual derivations of Dynamic Capabilities, which provide more clarity and a theoretical structure on a broader level. This particularly refers to the much-cited work of Baretto (2010), who conceptualizes dynamic capabilities as a multidimensional construct, that integrates four dimensions. However, as the multidimensional construct is more suitable for qualitative studies in which the aim is to measure the comparability across firms and industries, for the purpose of this work the concept of sensing, seizing, and transforming (Teece, 2007) is used to frame the case study, as it allows a chronological exploration of the investigated case. The three key dimensions of the approach are comprehensively explained in the coming section.

2.1.1. Key Dimensions of Dynamic Capabilities: Sensing, Seizing, and Transforming

After presenting a comprehensive review of the conceptual foundation of Dynamic Capabilities and its evolution, it is essential to comprehend the three fundamental processes: sensing, seizing, and transforming, which illustrate the underlying mechanisms by which organizations adapt and innovate to stay ahead of the competition in a changing environment. These processes serve as a micro foundation of the concept and focus primarily on the capabilities that are needed to be maintained by a firm to preserve its evolutionary adaptability (Teece, 2007).
In the following is each of the three process describes:

2.1.2 The Process of Sensing

The first of the three processes is sensing. As the nature of the word already implies, the process can be described as a firm's ability to develop a frank awareness of the environment by which it is surrounded. In this context, it is important to generally emphasize the crucial significance of information, and a firm's ability of their conversion to a business model as they serve as the initial foundation for change. Resulting from that, an information can even been identified as a resource itself, which means a firm needs to strategically capitalize on it. While this fact is incontrovertible, the actual challenge revolves around a company's procurement to obtain relevant information according to its circumstances. Teece (2007) stated that it can be differentiated between two sources of information, the first source is identified as "existing information" and the second source as "new information" (p.1322). In both cases firms are urged to have a proactive attitude towards the information gathering in order to either detect or shape entrepreneurial opportunities (Teece, 2007).
In the first scenario, that an information is already existing it is crucial that, within a multinational enterprise, the information not only reaches, but is also acknowledged by the right managerial instance, given the potential for a complex structure to fail to recognize information that would trigger opposition of current actions as evidenced by historical precedents (Teece, 2007). This might be due to the different sources the existing information can come from. The origins of such information may vary, ranging from direct stakeholders to sources outside the conventional market environment (Teece, 2007). When this hurdle is successfully taken by the firm, it is a matter of understanding the information as well as to accurately interpret it to shift a firm's direction towards the utilization of the resulting potential. A famous example of a

company that was incapable of overcoming the hurdle to utilize the existing information is Nokia. Without oversimplifying the entire case, Nokia was unable to use the available information effectively to determine the right opportunity for the short-term market conditions, despite the creation of a Nokia Venture Organization, which was entirely focused on the collection of innovative information to leverage these resources effectively in a constantly evolving business environment (Doz, 2019).

In the second scenario, new information, the necessary knowledge has to be created first. Under these circumstances, the role of research and development is of particular relevance to identify new technologies (Teece, 2007). For both scenarios it should not be neglected that the competitive landscape and regulatory changes should be monitored closely. Vice versa it is stressed that the factor how other market participants perceive one's actions towards an opportunity and their related measures may affect the outcome of the initial pursuit of the opportunity (Teece, 2007).

2.1.3. The Process of Seizing

The second process is seizing. This process focuses on the capability of a firm to react on detected or shaped opportunities, which were disclosed during the sensing process, or to mitigate potential external threats. The primary focus at this defining point is to mobilize resources, to make strategic decisions, and to implement the right measures to enable a firm to respond effectively to either intrinsically initiated changes or environmental changes, with the aim to preserve an existing competitive advantage or to create a previously non-existing competitive advantage (Teece, 2007). Fundamentally, the process is iterative and dynamic, it calls for agility, leadership, and a consent to take calculated risks, all of which are necessary in the pursuit of competitive advantage within today's turbulent markets.

Furthermore, in the process of seizing, it is significant to put emphasize on a firm's determination toward a recognized opportunity and a firm willingness to pursue this opportunity with a holistic intention (Teece, 2007). Up to this point, the challenge is to shift focus flexibly and entirely towards the most promising opportunity, from a potential situation in which several opportunity approaches were seeded. To cut all other approaches and to center the focus on the option that seems to be superior, can be tough as risks are taken, considering the fact that a high level of uncertainty is given. According to Teece, in this case sunk costs should be expected and in summary "early entry and commitment is necessary" (2007, p. 1326)

to make self-determined strategic decision and being in lead, with the tendency to maintain the lead over the course of development (Teece, 2007) and not being forced into decisions by pressure factors due to not taking a proactive and courageous approach to the surrounding circumstances. This includes the formulation of innovation, investment and implementation strategies that meet the company's objectives and the requirements of the environment. The process usually involves introducing or changing business models, reallocating resources and overcoming organizational inertia to implement change efficiently (Teece, 2007).
The following three paragraphs provide an in-depth explanation of core aspects of seizing:

2.1.3.1. Investment Decisions

Investment decisions are a key to capitalizing on opportunities. Firms have to wisely invest their resources in the development of new products, entry into new markets, or improvement in operational efficiency, mostly under uncertainty. The decisions often involve tradeoffs because firms have to balance risk against reward and consider the opportunity costs of alternative investments. Investment in the development of new technologies or markets may require reallocation of resources from established profitable investments (Teece, 2007).

2.1.3.2. Leadership and Organizational Coherence

Leadership and organizational coherence are major factors in taking action. Leaders are very important in the allocation of resources, attainment of internal support, and the development of a culture receptive to change. Strong leadership is instrumental in overcoming the resistance that often comes along with large-scale organizational transformation and keeping all stakeholders in line with strategic goals set by the company (Teece, 2007).

2.1.3.3. Market Dynamics

The last facet outlined is market dynamic. This includes understanding consumer demands, maneuvering through regulatory frameworks and, when necessary, entering into partnerships or alliances to strengthen the company's position. For example, companies entering new territories can enter into joint ventures or partnerships to reduce risk and gain local knowledge. The effectiveness of the seizing process also depends on the firm's ability to act on its ability to review, improve, and plan the decision-making process on an ongoing basis. In other words, organizations that are able to successfully exploit opportunities can adapt their plans in line with feedback and dynamic circumstances, securing long-term sustainability and competitive advantage (Teece, 2007).

2.1.4. The Process of Transforming

The third process is transforming. This very last process of the concept of Dynamic Capabilities concentrates on the noticeable change within a firm, represented by the reconfiguration, development, as well as the disappearance of routines and rules. Compared to the two previously coming processes, which focus on the conceptualization, framing and planning of the opportunity, transformation is about the actual implementation of the sensed and seized opportunity. This results in a value adding property of the process, however, before the firm generates growth and profitability out of the opportunity, some hurdles have to be overcome such as the application of the ability to recombine and reconfigure assets and organizational structures. In principle, routines are of essential importance for the success of a firm. They create synergies by providing ways of working with a clear structure and procedure, which in turn contributes to operational efficiency. However, at a certain point when change is necessary, routines and rules can limit the agility and flexibility of the organization if they remain rigid and do not adapt to the circumstances. For this reason, inefficient routine approaches should be adapted and or replaced by improved approaches. A distinction can be made here in the way in which the change takes place, firstly in successive phases, or secondly in a radical change. In the second scenario, it should be noted that it may be advantageous to establish an entirely new structure. However, it can be extremely difficult to dismantle structures and routines that once led to greater efficiency. But it also seems plausible that it can lead to a form of management, that can be described as centralized and overregulated and, thus, stand in its own way. Therefore, it is suggested that a decentralized structure should be preferred, in which local entities are allowed to respond better and faster to local stakeholders, particularities and circumstances. It is a form of regional enablement by getting rid of the obligation to communicate and coordinate with upper management not located at the local entity. In addition to the factor of decentralization, the factor of co-specialization is also highlighted in the process of transformation. It describes the ability to identify assets and resources as a manager within the firm that can be overlapped or configured in such a way that it creates greater value combined than independently. Once an asset or resource is identified a manager may encourage cross functional teams, knowledge exchange, or technological pairing, what may eventually lead to a company's enhanced future robustness (Teece, 2007).

2.2. Philip Morris International – from Humble Beginnings to Global Dominance

The foundation stone for one of the world's largest tobacco companies was established by its founder Philip Morris, who was born in a family that worked in the tobacco industry as tobacconists and importers. Philip Morris opened his tobacco retail store in 1847 in London, United Kingdom, where he sold and manufactured tobacco products. In the following decades until the turn of the century, the company expanded towards the east coast of the United States, to New York, where it initially imported and distributed cigarettes made in England. The family business, founded and operated during the first years by the Morris family can, from this time onwards, only be associated with the company by its name, as the ownership has changed before the expansion, whereby no further connection from the family to the company exists. After the expansion into the United States and the launch of iconic brands such as Marlboro in 1908, a dominant position in the traditional tobacco business was built from which internationalization was increasingly driven forward during the 20th century (Philip Morris International, n.d. I).
The company has completed many structural changes of an organizational nature, at the beginning of the 2000s Philip Morris Companies became the Altria Group. However, a demerge was carried out shortly afterwards in 2008 as the international activities were separated under the new entity Philip Morris International, while the parent company Altria Group continues to operate in the US market (Philip Morris International, n.d. II). The predominant reasons for the demerger of the international division of the tobacco business were "litigation, regulation, and declining sales" (Kumar, 2018, p.197). By the measure of dividing into two companies, the Altria Group intended to create two restructured entities that are more adaptable and effective in tackling its respective target market. This step enabled both companies to allocate resources more selectively towards market needs as well as it allowed both companies to respond more dynamically to regulatory and market changes through the streamlined organizational structure (Kumar, 2018). Nowadays, Philip Morris International is represented globally with its product and brand portfolio, which continues to include iconic brands such as Marlboro – the "world's best-selling international cigarette" – L&M, and, Chesterfield, in 180 countries and reaches a total market share of roughly a quarter of the total market for traditional combustible cigarettes (Philip Morris International, n.d. III). Despite these significant figures, the overall focus of

Philip Morris International has shifted to a new product range, marking a deliberate and radical departure from the more than 150-year-old traditional business of selling cigarettes.

2.2.1. The Birth of IQOS

In 2014, Philip Morris International made a bold strategic pivot with the launch of its heated tobacco product IQOS, marking the beginning of its transformative journey (Philip Morris International, n.d. IV). Although Philip Morris International never clarified the meaning of the name IQOS, it was often taken as an acronym for the phrase “I Quite Ordinary Smoking”, which was denied by the company (Seidenberg & Freeman, 2021). However, this coincidence can well be understood as an illustration of the mission Phillip Morris International is pursuing with its new product, in fact, “delivering a smoke-free future” (Philip Morris International, n.d. V). In this context, a critical question emerges: How did this initially paradoxical sounding mission originate, and in what ways can IQOS contribute to achieving its objectives?
It is instructive to illustrate the chronological development that began in 1964 with the publication of the US Surgeon General´s Report, which for the first recorded time in the literature suggested the harmfulness of cigarette consumption, however it took the tobacco industry until the 1990s, when they first publicly acknowledged that smoking cigarette is responsible for a wide range of serious diseases such as cancer and the fact that smoking may lead to premature death (Hall, 2007). This cause-and-effect relationship, which from today's perspective is undeniable and indisputable had remained unrecognized by the tobacco companies for four decades. As a matter of fact, even in 1997 the former CEO of Philip Morris Geoffrey Bible contradicted the connection in front of a court in Florida (Cummings, 2023), which shows that the truth has been opposed for a very long time.
Interestingly, as early as 1990, Philip Morris began already developing first prototypes, with the name Electrically Heated Cigarette Smoking System (EHCSS), that were designed as substitution products for a traditional cigarette. Compared to a traditional cigarette, which releases harmful toxins through the combustion of tobacco, the aim of the new smoking system was to expose the consumer to a less harmful chemical composition. The newly designed product range was named Tobacco Heating System and, as the name suggests, in this case the tobacco is not burnt but instead only heated to generate an aerosol. This pathway changing idea of a marketable substitution product was further elaborated on and immense research & development resources were continuously allocated to the project. As research and development activities progress, continuous enhancements are implemented, including

advancements in customer experience, design refinements, and adjustments based on “technological and scientific learnings”. This specifically refers first to the product itself including the weight, the convenience and the durability of the gadget, and second, to the smoking process, including, the composition of the ingredients the flavor, and the “puff-to-puff consistency”. Each developmental stage is predicated on the groundwork established in prior phases leading eventually to the evolution of the prototype THS 2.2, which is also commercially known as the first IQOS model. After its launch in Milan, Italy and Nagoya, Japan the expansion of the product into various Eurasian markets was rapidly performed. While the original launched IQOS version of 2014 has been continuously improved over the last few years, the modification “focuses on robustness, low maintenance, and ease-of-use”. With the customer at the heart of Philip Morris International´s strategy, the company continuously strives to ensure that the IQOS experience is as enjoyable and pleasant as possible (PMI Science, 2024).

To achieve this objective and to leverage the expansion of the cigarette alternative segment, the company has invested monetary resources of over 12.5 billion US dollars since 2008 in the new product portfolio. Only in 2023 were 709 million US dollar invested in R&D of which 99% were allocated to smoke-free products. By the end of 2023, the goods of the newly emerging segment of smoke-free products from Philip Morris International are available to customers in 84 countries and contribute to 37 percent of the group's net revenue, with a strong upward trend. It is expected that the segment grows double digit, between 10 to 15 percent, in the coming years. The flagship product, IQOS, is still at the center of this transformational journey, being the hub of the company´s operations. Yet, the product portfolio within this segment has significantly expanded to include a wide range of product offers that respond to different consumer needs and desires. The product portfolio is categorized in the two sub-categories Inhaled products and Oral products. The product category Inhaled products, which also contains IQOS, is subdivided into Tobacco containing and non-Tobacco containing products. The Tobacco containing product range refers to heat-not-burn products. Depending on the type of smoke attachment employed, the end consumer may also decide for a nicotine-infused, non-tobacco substrate, whereby heat-not-burn products can also be categorized as non-Tobacco containing. The product range of e-vapor products is exclusively categorized as non-Tobacco containing as this product design makes use of a liquid solution, which the end consumer inhales in order to release and absorb the nicotine. The second sub-category of smoke-free products is Oral products and is also divided into Tobacco containing and non-Tobacco containing product lines. Products such as snus and moist snuff allow the consumer to absorb nicotine through finely composed tobacco pillows that are placed on the mucous membranes in the mouth. The same principle of substance absorption is used in non-tobacco containing products, however the difference is that no tobacco is used. The name of the product line is nicotine pouches, which are similar to chewing gum and through which the consumer can ingest the nicotine. Philip Morris International is represented in all categories with its own products. This wide portfolio not only supports the company´s aspirations and its commitment towards the delivery of a smoke-free future but also enables it to shift strategically to reduced-risk products and integrated market solutions in accordance with the habits of the customers. The aim is explicitly not to acquire new customers, but to offer existing customers in the cigarette segment a less harmful option for switching. According to the company, this objective has been fractionally achieved by persuading more than 20 million cigarette smokers to abstain from cigarettes and making the switch to IQOS. In the company´s view, these individuals are now classified as smoke-free (Philip Morris International, 2024).

2.2.2. The Launch of IQOS – The Example of Japan

When stating that Philip Morris International vision is to "convince smokers to switch" from traditional cigarettes to smoke-free solutions and presenting the current key figures that have already been achieved, it is an oversimplified representation of the hurdles and efforts that need to be overcome to eventually keep consumers away from cigarettes. The difficulty is caused by the inherent challenge of traditional cigarettes, its high addictive potential, resulting in a significant risk of relapse among consumers. While smokers may initially experiment with the less harmful substitute products during a trial phase, this temporary adoption might fail to translate into long-term behavioral change. Therefore, it should be emphasized that behind the simple sounding challenge of "switching" lies a sophisticated and multifaceted marketing strategy employed by the company in which its entire business model is altered from a business-to-business approach to a consumer-centric approach. In fact, the focus is shifted from selling products primarily through intermediaries, which includes retailers and distributors, to solutions that allow direct engagement with the customer through specialized field personnel and direct customer service. The first country to attempt nationwide commercialization was Japan, where the openness of the technology and the high proportion of smokers in the population offered favorable conditions for the market introduction. This example shows impressively how Philip Morris International spared no effort to optimize the customer journey. The, at that time newly launched IQOS was presented primarily in person by trained personnel, which explained the usage and functionalities of the device and answered questions also with respect to occurring doubts regarding the compared harmlessness to traditional cigarettes, by sharing scientific evidence. In addition, consumers were provided with multiple touchpoints to learn more about the product. These included dedicated telephone and email support services, and web presence, resulting in over 15.000 interactions daily. To encourage consumers during their smoke-free challenge, initiatives such as the "30-Day Challenge" were implemented, which aims to keep consumers motivated through targeted email newsletters and active social media groups. After a very short time, the demand exceeded the supply, which, with high probability, further amplifies its desirability through the scarcity effect (Philip Morris International, 2017).

2.2.3. The Store Concept of IQOS – The Example of Germany

Drawing on Philip Morris initial commercialization concept of retail stores to directly engage with the customers, the concept was revived with the introduction of IQOS. These newly developed and created retail environments, with the simple and intuitive name of either IQOS shop or boutique, fulfills the critical purpose of a first-contact point, where the above-mentioned exchange with the trained personnel takes place. The shops serve as interactive hubs, where potential customers can experience the product and the technology firsthand. Not only the tangible product can be experienced, beyond that the customers can experience the brand and is invited through interpersonal interactions and face to face contact to establish a personal connection. This approach shows the perceived significance of human contact by Philip Morris International as the concept is reintroduced as vital component to building trust and loyalty to the customer.

The example of Germany, one of the biggest markets in Europe, provides valuable insights of how the physical store concept has been implemented as a central pillar of a customer-oriented marketing strategy. Philip Morris International is represented with a total of 21 stores spread across the whole of Germany. These stores can be categorized in two different concepts. The first shop concept is a permanent establishment, which means that its location is fixed and is a consistent point of contact throughout the year. The second shop concept is a temporary establishment, which means that the location is set up at specific locations for several months. This concept is also referred to as shop-in-shop concept, which provides more flexibility and reaches a broader audience as it can be installed at various locations. At all locations a range of services is offered, tailored to different customer segments. Potential consumers are invited to test the product, how it tastes, how it feels, how it is used. All senses of the customer are addressed at this stage. New customers are invited to buy the product at the shops and existing customers are invited to receive after sales services, such as the cleaning service, the reparation and guarantee service, and the software update service. It should be noted that all services are free of charge (IQOS, 2025).

When analyzing the locations of the stores it can be stated that these are not left to chance and are found in strategic locations. Permanent IQOS shops are located in urban centers of metropoles such as Düsseldorf or Berlin. In both cities, IQOS shops can be found near or on prestigious shopping streets such as Königsallee or Kurfürstendamm, which in fact belong to the most expensive shopping streets in Germany. Such locations provide huge brand visibility and serve as immersive brand experiences in the form of flagship stores.

Temporary IQOS shops are typically set up in shopping malls and on pedestrian streets, where a high volume of walk-in customers can be attracted, including potential customers who may not have originally planned to visit an IQOS shop.

"What we desperately need in business today: experience innovation" (Pine & Gilmore, 2013, p.35). Having this statement in mind, it is certainly no surprise that the entire set up of the IQOS shops, including design, layout and further factors, is precisely thought through. The IQOS shops can be compared to exceptional retail concepts like those of Nespresso and Apple, which understand their retail space not as a pure sales space but as immersive experiential environments. These concepts merge factors such as sensory engagement, personalized services, innovative minimalism, community and inspiration, which can also be discovered in IQOS shops. The generously and spacious designed areas offer the opportunity to discover and linger. A relaxed atmosphere is created by soft and natural colors, wood elements and bright light. Also, coffee is offered to the customers by modern, attractive, mostly young staff. Since IQOS is also a technological innovation, technological elements, such as digital advertising displays, play an important role in the IQOS shops, reinforcing their modern ambiance (Jackler et al., 2020). Overall, it can be observed that every emerging customer need is addressed, starting from the selection of the location ending by the design of the retail space. The impression arises that IQOS is positioned as a lifestyle, wellness product even though the product remains harmful. The traditional cigarette no longer takes place, and no association is made with traditional cigarettes, only when the advantages that IQOS has over traditional smoking are emphasized.

After thoroughly addressing the initial question, how IQOS can contribute, as claimed by the company, to a smoke-free future, by displaying its developmental evolution, portrayed as part of the overall segment of smoke-free products, underpinning the evolution by the provision of key numbers, and by presenting its go to market strategy based on the example of Japan and the IQOS shop concept using the example of Germany, the next section will display under which market circumstances Philip Morris International´s mission was established to be able to represent the context holistically, as the tobacco industry is highly regulated.

2.2.4. The Tobacco Industry and its Regulations

It is necessary to contextualize the development of IQOS not only within Philip Morris International, but also within its broader market environment as the tobacco industry belongs to the most controversial and most regulated industries in the world.
Throughout its existence the tobacco industry is a classic example of an oligopoly "with a few big companies whose market shares have not largely changed over the last years" (Rajani et al. 2023). In total the international tobacco market only comprises five major companies, of which Philip Morris International is one. Other major companies are British American Tobacco, Japan Tobacco International, Imperial Brands, and China National Tobacco Corporation. They are also commonly referred to as the Big 5 and the past has shown that this market structure, characterized by the high concentration of a few powerful companies, allows them to assert their interest towards policy makers and the public through significant financial resources. In fact, the study shows that out of 90 analyzed countries, in 77 countries the market participants with the highest market share are one of the Big 5 and this trend is even increasing in all markets from low-, middle-, to high-income countries. Interestingly to note is that Philip Morris International is leading the number of countries where it is the company with the highest market share with 38 countries. Generally speaking, this positioning enables them to exert considerable influence on regulatory frameworks, often through targeted lobbying initiatives (Rajani et al. 2023).
The most far-reaching international initiative against smoking and against the commercial interest connected to smoking, supporting an evidenced based protection of the public health was the WHO Framework Convention on Tobacco Control presented in 2003 and entered into force in 2005.

The reason for the development of this framework was the negative impact of smoking on the global community (WHO, 2023). In previous years, various institutions, such as the World Bank, had already drawn greater attention to the issue and called for stronger regulation (World Bank, 1999). The figures are substantial and state that over 8 million people die from the consequences of smoking every year, whereby passive smoking is not even included. The declaration of intent is signed by 182 nations and provide clear measures for governments and policy makers that aim to help the 1.3 billion smokers worldwide to quit smoking, not to attract new smokers and to minimize negative effects for societies and their health systems and their prosperity as it also demonstrably contributes to poverty. The upon agreed tobacco control measures cover a wide range of different spectrums, including smoking bans in public places, such as restaurants and bars, advertising bans in radio and television, the use of graphic deterrent images on packaging, the imposition of heavy taxes, and efforts to curb illicit trade (WHO, 2023).

The extent of tobacco control measures that were eventually imposed or are planned to be imposed vary widely from country to country reflecting different socioeconomical conditions. In some nations, tobacco control policies are exceptionally stringent as in some nations in Europe. For Example, Ireland charges the highest price of 15,40 Euro for a pack of Marlboro and is ranked at the very top in the implementation of anti-smoking measurers with a score of 82 from 100 in a European comparison. In contrast other countries adopt a more liberal approach as for example Switzerland which, with a score of 35, occupies the second last place in Europe (Joossens et al., 2021). The report states "Switzerland seems to be more interested in the well-being of the tobacco companies than the health of its citizens" (Joossens et al., 2021. p.15), which is a very interesting statement when considering that Philip Morris International headquarter is located in Lausanne, Switzerland.

In addition to traditional cigarette consumption, the focus is also set on heated tobacco products as "these products are harmful to health", thus, classified as dangerous. Particularly, the long-term effects on human health remain unknown due to the absence of long-term studies (WHO, 2023). The measures that are monitored by the WHO are categorized in the following pillars (2023):

- Monitor tobacco use and prevention policies.
- Protect people from tobacco use.
- Offer help to quit tobacco use.
- Warn about the dangers of tobacco.
- Enforce bans on tobacco advertising, promotion and sponsorship.
- Raise taxes on tobacco.

In summary it can be concluded that the tobacco multinationals have encountered considerable headwind since the beginning of this millennium, forcing them to radically recreate their business models, as the traditional business of selling combustible tobacco products has been declared with an expiry date. Even if the transition to an entirely smoke free future will take decades to shift completely, the direction is set, and the tobacco multinationals are working in high gear to remain at the forefront in this evolving sector. In particular Philip Morris International, exemplary in the proactive shaping of the industry and leading the transformation, has announced high ambitions as the company aims to shift two third of its revenue streams to smoke-free products by 2030 (Philip Morris International, n.d. VI).

3. Methodology

This aim of this papers is to analyze the case of the company Philip Morris International and its measures to remain competitive in the long-term in a changing business environment, for which a qualitative analysis approach is recommended. Gerring states that a “qualitative work is expressed in natural language” (2017, p.18) and that the “defining feature of qualitative work is its use of noncomparable observations” (2017, p.18) emphasizing the uniqueness of a case study as the circumstances will never be identically transferable. This means related to the case of Philip Morris International that it cannot be applied unconditionally to other industries or companies that are for instance not subject to the intense pressure of regulators, differ in the competitive structure of an oligopoly, or where the financial power is not as present as in the tobacco industry. However, an attempt is made to identify key components and causal factors that provide an insight into the case at hand, which can also be an indicator for the understanding of similar business cases. In the following it is explained how this work has proceeded to capture complex and nuanced insights into the development of a still evolving business model.

3.1. Research Design and Theoretical Framework

As mentioned in the prior paragraph a qualitative study approach is applied. In order to systematically frame the paper, the concept of dynamic capabilities is employed throughout this work, categorizing during the data collection process as well as in the analysis, insights into the three interrelated pillars, sensing seizing and transforming, of dynamic capabilities. Each of the three pillars were described in the literature review and provided clear guidance in the development of the interview questions and the subsequent analysis of the findings.

3.2 Data Collection and Analysis Method

This work aimed to rely on primary data sources in the form of interview conductions. For this purpose, a questionnaire was developed based on the ideas of a semi-structural interview design and embedded in the structure of the dynamic capability's framework.
Following the recommendation of Adams, who mentioned that for a semi-structured interview it is advised to establish a guide, that groups the interview in "planned topics, and questions" that the interviewer wants "to be addressed" (2015, p.496), this work groups the open-ended questions in the three pillars of dynamic capabilities. The advantage is that a loose structure is provided to ensure that all key topics are addressed, while it also allows flexibility to ask follow-up questions, clarify responses, or to shift focus when unexpected areas of interests are coming up. The interview guide and the interview transcript will be provided in the appendix.
Potential interview partners were contacted via LinkedIn whit a standardized text that explained the topic of the dissertation and kindly asked for the persons interest in participating in this work. The contacted persons were mainly part of the upper management of Philip Morris International and who have been a considerable time with the company. The assumption was made that this criterion ensures the potential participants possess the requisite knowledge and experience of strategical nature within the company to provide in-depth insights. In total 19 persons were contacted of which two responded and only one was available for an interview. During the conduction of the interview the participant clarified that the insights shared were derived exclusively from publicly available sources, hence, no confidential information was disclosed. For this reason, the data collection was extended to secondary data in the form of, annual reports, the company's website and further valuable sources. This approach helped to validate the interview data and provide a richer context considering the low response rate.

For the data analysis, the insights were divided into three pillars of dynamic capabilities, mirroring the categorization of the interview. This approach enhances conceptual clarity, while mapping and structuring the data from different data sources.

4. Findings

In this section the findings are systematically aligned to the Dynamic Capability framework to illustrate the specific actions of this case study in each stage of the process. While the classifications are helpful it is worth noting that the distinction between stages can be fluid.

4.1. Sensing

In this section Philip Morris International crucial initial actions towards an entire strategic shift are consolidated and described. The data shows that the starting point of the radical strategy shift, with smoke-free products at its core, was strongly influenced by environmental factors, in particular due to reinforcing regulatory constraints, which jeopardize the traditional cigarette business. The positive image of cigarettes from the last century, established by iconic advertising figures such as the Marlboro man, who infused a sense of adventure and freedom into smoking, or the women´s liberation movement during the 1920s which redefined smoking as an act of women empowerment and fought against traditional gender norms, are increasingly becoming a phenomenon of the past. The health consequences of smoking are coming into the spotlight, not only in the public perception but especially by the regulators. This was recognized by Philip Morris International at an early stage. At a time when the world community has agreed on the target to combat tobacco consumption, but the exact details of respective measures have not yet come into force. Notably, this business endangering information was not only taken seriously, but it was even understood as a significant entrepreneurial opportunity to conquer a future market whose design could only be sketched out at that time. As stated by Minhos this is the time, when the company "decided to really go bold" (Appendix 2) and began to publicize the harmfulness of cigarettes on the companies' channels, which marks the first step of moving away from cigarettes. On closer inspection, this is likewise a potentially dangerous step, as it implies that the public relations work of recent decades has also been proven wrong. On the other hand, this step is inevitable and a matter of time, since the scientific evidence was strongly pressing. Either way, Philip Morris International has decided to embark on a path of self-empowerment by articulating a clear positioning, thus enhancing its "corporate credibility"

(Appendix 2). In this context it is also important to mention that such a step can only be taken when the highest levels of the company stand behind the decision and defend it against doubts from external stakeholder such as shareholders as in fact every single product of the product portfolio is negatively affected in the first moment.

This brings us to the second point that was identified as crucial during the sensing stage, the results open experimentation in technological product development that was based on science. An supporting factor why Philip Morris International could be offensive is due to the degree of confidence that results from the experience of developing products and innovations that were conceptualized for a scenario in which a post cigarette era was explored. This has contributed to a plausible and feasible mid-term projection in which cigarettes could coexist with a newly developed product by transcending imaginative limitations to which competitors may have been exposed. Thus, a fundamental openness towards the scenario of new information that emphasizes the role of research and development as described by Teece (2007) was already provided. The gained experience and the progress, including failures, that were made have greatly facilitated a sharper focus in the area of new product developments and led to its consideration as a future opportunity.

4.2. Seizing

As previously stated, the seizing stage is about implementing the right measures, allocating resources and taking calculated risks in a situation in which a company considers change due to either internal or external factors as necessary. Now, having stated that Philip Morris International has gained experience in exploring the field of non-smoking products during the sensing stage, the company decided to intensify actively the exploration of this evolution pathway during the seizing stage. Therefore, the company has decided to allocate future investments exclusively in research and development towards the segment of alternatives to traditional cigarettes. Thus, the financial resource allocation of research and development investments towards traditional cigarette alternatives represents 99% of the overall investment budget, amounting to a billion-dollar commitment that includes a dedicated workforce of several thousand over recent years. The interview reveals that this process was highly scientifically driven. Starting by investigation the cause of toxin formation leading to solution approaches that were eventually abandoned for several reasons including legal and customer acceptance matters. For example, research was carried out on the tobacco leaves or other ways of nicotine uptake have been investigated, such as eating tobacco. Throughout the investigation of numerous approaches to develop marketable substitute products, Philip Morris International acquired immense interdisciplinary expertise. For example, it was understood that smoking is for many consumers a ritualistic behavior, which decreases the chances of consumer acceptance when an alternative consumption method is established. This could even lead to high relapse rates. Furthermore, the company understood that a viable design of product should avoid an over-engineered product usage design, it should rather stick to an intuitive and user-friendly experience to facilitate a smooth adoption by consumers.

While the company gained awareness of the stated commercialization factors, it could not disregard that the ultimate product has to be less harmful than cigarettes, while it is not allowed to attract new consumers. To ensure this difficult challenge the company draw inspiration from the methodologies of product testing from the pharmaceutical industry as the only company within the tobacco industry. The approach is divided in four phases. In the first phase harmful toxins were systematically identified. In the second phase the identified toxins were tried to reduce. In the third phase the product was tested on volunteers. When the third phase provided favorable results, the product was deemed ready for the market launch. If one of the phases was not passed, the product was rejected. In phase four, the final stage, the post-commercialization is monitored to evaluate the long-term impact of the product on the consumer. This unique multi-phase approach in the tobacco sector led to the development of IQOS, the today's number one product of Philip Morris International in the segment of cigarette alternatives. This innovative procedure that has been continuously improved over several years and will be improved in the coming future is the fundament on which the smoke-free product segment is build. Ranking as the 37th largest applicant for patents in the EU symbolizes the significant effort that is made to develop the segment, but it also shows the companies effort to safeguard the intellectual property that is gained during the developmental stages (Appendix 2).

The findings of the seizing stage can be summarized in two essential measures. First, Philip Morris International approached proactively the occurring challenges by continuously and massively fostering innovation in research and development by providing huge financial resources combined with an open minded, scientific approach, which even allowed to change organizational and procedural structures. Second, the commitment towards the chosen approach requires decision-makers support. They must demonstrate enduring resilience and persistence, as negative setbacks will occur and neither scientific evidence nor the moment of a breakthrough is predictable. Hence, Philip Morris International demonstrated a willingness to embrace massive change combined with perseverance.

4.3. Transforming

The last process of Dynamic Capabilities is transforming and in the case of Philip Morris International, the dimension was set into motion by the BBC interview with the companies CEO in 2016. Even though IQOS was launched two years before, in 2014, and the first experiences in commercializing the product was gained, the interview marked a decisive moment in which not only the public but also Philip Morris International internally was informed about the long-term strategy shift of exiting the traditional cigarette business. This announcement has shocked the huge majority of employees, as there had been no prior internal communication that indicated that such a drastic strategic shift was planned. The interview provided a fait accompli to all stakeholders simultaneously and irrevocably committed the corporation to a strategic position from which no reversal is possible. Further such a way of informing everyone has prevented the direction from being jeopardized by excessive discussions that could have arisen in advance. Although the announcement understandably sparked anxiety among employees, as it increased the level of uncertainty and the concerns about their job security in the future, it provided a clear guidance on the company's strategy. Recognizing the potential for internal discord, Philip Morris International initiated the development of a new corporate identity, with sustainability and customers at its core, and a new corporate culture, the PMI DNA that aimed to unify the workforce. The new corporate culture follows the three principles "we care, we are better together, we are gamechangers" and was able to decrease concerns as the segment of smoke free products created a new perspective and it was also clear that the cigarette business would continue to be essential in the short to medium term in order to finance the transformation. In regards of the corporate identity, the company has developed in recent years towards a customer centric corporation that acknowledges customer feedback in full as "consumer's feedback is driving product innovation and our commercial practices". For example, by incorporating customer feedback into the product development such as adjusting number of sticks, improving the battery life or offering different colors for the device, the number of dual users; cigarette smokers that are using IQOS or other substitute products from time to time, could be decreased. Another example of the incorporation of customer feedback is the introduction of the so called "science machines" in IQOS stores that visualizes the difference between IQOS and traditional cigarettes to make the comparison more accessible to the customer (Appendix 2). It is pointed out that these adjustments need to be made on an ongoing basis, since customer needs are evolving, thus it is a process of continuous learning.

5. Discussion

The findings of this work illustrate that Philip Morris International has responded to regulatory challenges with the implementation of multidimensional transformation process which are reflected in many operational areas of the company. The company has proved to recognize and correctly interpreted the developments of the recent past and adapted its actions accordingly as for example the construction of an immersive retail experience, the substantial investments in research and development, the implementation of pharmaceutical standards, a new culture and a customer centric business model. All the mentioned factors demonstrate Philip Morris Internationals dedication to self-reinvention and the shift towards smoke-free products. However, these initiatives also raise critical questions regarding the overall efficacy and ethical implications of the transformation strategy.

First, although it is highlighted that Philip Morris International has promptly recognized the restricting regulatory constraint and adapted its mission, it is also part of the truth that the company has made many efforts over the previous decades to delay this development while economically benefiting from the loose regulations, which were also strongly advocated by the company. As a result, smoking was trivialized for longer than necessary and contributed to more people starting to smoke and becoming addicted. Therefore, the decision to change the direction on the basis of regulatory constraints remains debatable.

Secondly, the massive investments towards research and development of new products and the commitment to innovation is commendable from a strategic perspective but it also could be perceived as an aggressive approach to capture future market opportunities. Since Philip Morris International is leading by far the development of cigarette alternatives and is now demanding regulators to further tighten measures against cigarette consumption, it could be assumed that such a step fosters the creation of an economic moat, thereby placing competitors at a disadvantage.

Thirdly, the substitution products on the market are less harmful than cigarettes but still possess health risks for the consumer, which also needs to be further investigated in the future. This creates a contradiction when the company's public commitment to a smoke-free future is shared, while the current solution to the issue of smoking is a product that remains harmful to the consumer. This fact discloses that future product developments are necessary in order to able to speak genuinely of a smoke-free future.

In summary, this critical evaluation shows that even though the strategic measures are methodically robust and innovative, they might not adequately address the underlying public issues related to tobacco consumption. However, the example of Philip Morris International represents a significant improvement and might have an exemplary effect that indicates to competitors that such a massive step might lead to an economical advantage, incentivizing them to adopt a similar approach. The evaluation should also take into account that a transformation of the market cannot be achieved within a short period of time. It is a long-term project without a precisely defined time frame and Philip Morris International is only at the beginning of the process having achieved remarkable results and identifying further areas of applications in which can be tapped into in the future.

6. Teaching Notes

This paper proposes the case of Philip Morris International transformation towards a smoke-free company as a real-life business case that provides opportunities for in-depth analysis and discussions for courses of undergraduate and graduate students. In the following is explained how this case study can facilitate critical and engaging discussion in Business Ethics and Corporate Social Responsibility courses and conceptual implementation of frameworks in Strategic Management and Corporate Strategy courses to explore theoretical and practical dimensions.

6.1 Synopses

The case study provides insights in the tobacco industry, which is dominated by a small number of multinationals that hold significant market power and who sell cigarettes. The addictive nature of the product and its harmfulness for the consumer was responsible for the implementation of regulatory measures during the last two decades, which are intended to restrict tobacco consumption. As companies as Philip Morris International have built their success historically on the sale of combustible cigarettes there is now a threat to the existing business model. Until now, Philip Morris International is the only company that has publicly committed to a smoke-free future and started to shape this path. The issues and challenged that this strategic shift caused from a managerial perspective as well as from an ethical perspective are summarized in the above paper and provide a basis for a vivid discussion and analysis in a lecture setting. Students will be equipped with a case on which they are enabled to apply analytical frameworks such as Dynamic Capabilities and enhance their critical evaluation skill.

It also allows the creation of creative future scenarios, as the transformation of this case has just begun.

6.2. Process of Analysis

In the following two processes of analyzing the case are proposed for different subjects: first, for the course Strategic Management and second, for the course Corporate Social Responsibility.

Starting with the process of analysis for the course Strategic Management it is important to establish a shared understanding of the analytical framework and the case itself. Therefore, the concept of Dynamic Capabilities and the underlying pillars will be explained to provide the analytical framework. The second part will focus on the external and internal environment of Philip Morris International. The process of understanding the case is accompanied by a joint application, which aims to initiate an open discussion about the categorization of the collectively discovered key factors during the process that are eventually attributed to the sensing, seizing and transforming pillars of Dynamic Capabilities. This application step is designed to help students transfer the concepts they have learned to a real-world scenario. The intermediate objective of this approach is to develop jointly an analysis that is framed in Dynamic Capabilities that outlines the firms' capabilities relative to the industry. Having mentioned that the transformation of Philip Morris International and the industry is right at the beginning, the students will be invited in the second part of the lecture to gather in small groups and to generate scenarios of strategic alternatives for the future. The students will have to create assumptions of how the industry will develop in coming years and accordingly develop strategies for these scenarios from the perspective of Philip Morris International. The strategies and assumptions of the different groups will be presented in front of the class and challenged by peer students. This approach should enable students to develop realistic implementation plans on how to position the company in the future based on self-created assumptions. This not only puts students in a position to evaluate and analyze the past, but more importantly to draw conclusions for future scenarios.

The second process of analysis is designed for the course Corporate Social Responsibility. Similarly, this approach will also be divided into two parts in which a common understanding of the case is provided at the beginning. The difference in this approach is that it will focus on the tobacco industry and the regulatory development throughout the last century and the beginning of the current century. Further the actions of Philip Morris International to prepare for the future are introduced. When having established a common understanding of the case at hand, the claim to forbid cigarettes with immediate effect is shared with the class. This claim is the fundament for the second part of the lecture, in which the class will be dividend in three Groups. The first Group will play the role of Philip Morris. The second group will play the role of Regulators. The third group will represent the interest of the competitors. The challenge is to find a consensus that the health of the population will not be exposed to the consequences of smoking while an immediate prohibition would position Philip Morris International in a favorable, almost monopolistic position. The aim is to sign a letter of intent which all parties can agree on. This roleplay will be followed by an evaluation of the students to find out which party has prevailed best and to discuss the possible consequences.

6.3 Analysis

For the first proposal of the case in a Strategic Management course the group work will be evaluated in form of a presentation, in which the student specifically answer what assumptions they made in regards of the future regulatory frame. Then they have to explain which strategic actions are being taken to manage the assumptions. The answer needs to be provided in a conceptual framework such as Dynamic Capabilities. The expected outcome is a joint analytical framework and strategic recommendations that investigates strategic alternatives that reflects an understanding of the chosen framework and to identify these from a managerial role.

In the second teaching scenario in a Corporate Social Responsibility course, the discussion with three parties will help students to develop a personal assessment for this sensitive case. The assignment will be to write an essay answering the question what strategy should be pursued from a regulatory point of view to achieve the Social Development Goals 3 which states Good Health and Well-being. The essay analyzes the case and introduces the stakeholders' perspectives. Eventually a strategic recommendation should be formulated which shows a critical examination of the case and states potential challenges that might occur during the implementation of the proposed strategy.

7. Conclusion and Limitation

With an emphasis on the Dynamic Capabilities framework, including the processes sensing, seizing, and transforming, this work has investigated the strategic transformation of Philip Morris International. The work demonstrates how a company can modify its core competencies to meet changing market conditions caused by regulatory pressure and provides an in-depth analysis in a chronological order of the specific measures at each developmental stage from traditional cigarettes to its smoke-free product portfolio, which is led by IQOS. While this case illustrates how a company can innovate and restructure its business model in response to external circumstances it also raises ethical issues.

Despite the contribution of the study, it faces some limitations. First, the findings applicability to other industries is limited as the tobacco industry represents a particularly regulated industry that heavily affects the positioning of market participants, which the example of Philip Morris International shows. Thus, the case lacks generalization.

Second, the low interview response rate limited the data collection process, which might have impacted the complexity of the internal viewpoint. Additionally, it must be noted that secondary sources from publishers other than Philip Morris International itself were only rarely to be found, which could have created a slight bias.

Further research should include longitudinal data and a broader database to fully capture the strategic transformation in the light of the mentioned limitations.

8. Reference List

A - Bibliography

Adams, W. C. (2015). Conducting semi-structured interviews. Handbook of practical program evaluation, 492-505.

Barreto, I. (2010). Dynamic capabilities: A review of past research and an agenda for the future. Journal of management, 36(1), 256-280.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*.

Cummings, K. M. (2003). A promise is a promise. Tobacco Control, 12(2), 117-118.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic management journal*, *21*(10-11), 1105-1121.

Gerring, J. (2017). Qualitative methods. Annual review of political science, 20(1), 15-36.

Hall, W. (2007). cigarette century: the rise, fall and deadly persistence of the product that defined America.

Jackler, R. K., Ramamurthi, D., Axelrod, A., Jung, J. K., Louis-Ferdinand, N. G., Reidel, J. E., Yu, A. W. Y., Jackler, L. M., & Chau, C. (2020, February 21). *Global marketing of IQOS: The Philip Morris campaign to popularize "heat not burn" tobacco*. SRITA. http://tobacco.stanford.edu/iqosanalysis

Kumar, B. R., & Kumar, B. R. (2019). Altria Group's Spin-Off of Philip Morris International Inc. Wealth Creation in the World's Largest Mergers and Acquisitions: Integrated Case Studies, 197-201.

Pine, B. J., & Gilmore J. H. (2013). The experience economy: past, present and future. In Handbook on the experience economy (PP.21-44). Edward Elgar Publishing.

Rajani, N. B., Hoelscher, J., Laverty, A. A., & Filippidis, F. T. (2023). A multi-country analysis of transnational tobacco companies' market share. Tobacco Induced Diseases, 21, 03.

Seidenberg, A., & Freeman, B. (2021). IQOS is not an acronym: a call to researchers and journals. Tobacco control, 30(3), 356-358.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic management journal*, *18*(7), 509-533.

Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. Strategic management journal, 28(13), 1319-1350.

Wang, C. L., & Ahmed, P. K. (2007). Dynamic capabilities: A review and research agenda. International journal of management reviews, 9(1), 31-51.

B – Other References

Doz, Y. (2019). The strategic decisions that caused Nokia's failure. INSEAD, https://knowledge. insead. edu/strategy/strategic-decisions-caused-nokias-failure.

Joossens, L., Olefir, L., Feliu, A., Fernandez, E., Smoke Free Partnership, & Association of European Cancer Leagues. (2021). The Tobacco Control Scale 2021 in Europe. Smoke Free Partnership, Catalan Institute of Oncology. https://www.tobaccocontrolscale.org/wp-content/uploads/2022/12/TCS-Report-2021-Interactive-V4.pdf

IQOS (2025). Entdecke die neuen IQOS Shop-in-Shops:21x in Deutschland – lerne uns kennen! Retrieved (01.02.2025), from https://www.iqos.com/de/de/news/iqos-news/iqos-shop-in-shops-entdecken.html#:~:text=IQOS%20kommt%20jetzt%20zu%20dir,Produktwelt%20–%20live%20und%20zum%20Anfassen.

Philip Morris International. (2017). Philip Morris International Sustainability Report 2017. https://www.pmi.com/docs/default-source/pmi-sustainability/transforming-our-business.pdf

Philip Morris International. (n.d. I). Key milestones. Retrieved (15.12.2024), from https://www.pmi.com/who-we-are/key-milestones

Philip Morris International. (n.d. II). About us FAQ. Retrieved (15.12.2024), from https://www.pmi.com/faq-section/about-us-faq

Philip Morris International. (n.d. III). Building leading brands. Retrieved (15.12.2024), from https://www.pmi.com/investor-relations/overview/building-leading-brands

Philip Morris International. (n.d. IV). Celebrating 10 years of smoke-free progress. Retrieved (15.12.2024), from https://www.pmi.com/our-progress/celebrating-10-years-of-smoke-free-progress

Philip Morris International. (n.d. V). Statement of purpose. Retrieved (15.12.2024), from https://www.pmi.com/statement-of-purpose

Philip Morris International. (n.d. VI). PMI announces ambition to become a more than two-thirds majority smoke-free company by 2030. Retrieved (15.12.2024), from https://www.pmi.com/our-progress/pmi-announces-ambition-to-become-a-more-than-two-thirds-majority-smoke-free-company-by-2030#:~:text="By%202030%2C%20our%20ambition%20is,we%20are%20already%20demonstrating%20today."

Philip Morris International (2024). Integrated Report 2023. Retrieved (18.12.2024), from https://www.pmi.com/resources/docs/default-source/ir2023-documents/pmi-integrated-report-2023.pdf

PMI Science (2024). History of THS: From early development through decades of innovation. Retrieved (15.12.2024) from https://www.pmiscience.com/en/products/heated-tobacco/ths-technology-development/

World Bank. (1999). Curbing the epidemic: governments and the economics of tobacco control. Tobacco Control, 8(2), 196-201.

WHO. (2023). Tobacco. Retrieved (15.12.2024) from https://www.who.int/news-room/fact-sheets/detail/tobacco

9. Appendix

1: Interview Guide

Sensing:

- How did the initial idea of IQOS emerge within PM, what were the circumstances of the market?
- What factors (internal/external) signaled the need for a shift to non-smoking products?
- How did regulatory and social pressure influence the decision to explore alternatives to cigarettes?

- Were multiple projects considered and funded initially, or was the focus set on IQOS from the beginning?
- (If several projects were considered) How were potential opportunities evaluated/ prioritized during the early stages of the transition?

- How did competitors respond to the early development of IQOS? Were there any notable reactions?
- How did customers perceive the introduction of IQOS compared to traditional products?

Seizing:

- How were investments allocated across different stages of the development and during market entry?
- Were any other product innovations deprioritized / delayed focusing on IQOS?

- How did regulatory changes and societal attitudes towards smoking shaped strategic focus on IQOS?

- How did PM engage with different stakeholders during the shift?
- Were there any partnerships that were crucial during the development and rollout of IQOS?

Transforming:

- What significant challenges occurred within the company during the transition? How were they overcome?
- Has there been a cultural shift? How was it perceived by employees? Did they feel empowered of threatened by the change?
- How were concerns or resistances among employees addressed during the shift?
- How did customers respond to IQOS and how did it change over time?
- What lessons were learned from customers feedback?

Future Outlook:

- What do you see as the next evolution beyond IQOS?
- Do you expect a complete shift from cigarettes to IQOS in the foreseeable future?

2: Interview

Rui Minhos

One of the criteria that I believe that it's fundamental for the journey and the future of the company is these regulatory decisions and approvals because it confirms how robust the science is, and considering the regulatory and fiscal frameworks, constraints the company have because it's a tobacco or nicotine-containing product. These independent decisions from regulators are really important to inform people about alternatives that exist.

Joshua Jovanovic

It also enables you to work in a regulatory frame, right? You got some certainty and uncertainty is decreased.

Rui Minhos

Absolutely, because it's like in pharma, when you have a new chemical entity or a new medicinal the product. The reason why some authorities, like the European Medicine Agency, have this scientific advisory board is to help companies developing studies to show the benefit risk ratio for the new products. Because when we go to the area of biotech and new medicines to treat cancer, metabolic diseases like diabetes and so on, so forth, or even genetic therapy, it's brand new for both sides, both for the regulator and for the company that is trying to put together a scientific package to present to the regulator. The clinical development of the product is done in love together with the regulatory authorities. With the tobacco industry, we got in 2007 some guidelines from FDA, but we were the first ones putting the scientific package together and presenting to the regulatory authorities. These regulatory decisions basically showcased, is that what you have put together is sound from a scientific point of view, but it's also robust from an epidemiological point of view, looking at the impacts on the future.

Joshua Jovanovic

Let's start with the questions. We have a structure going from the past to the present and maybe also to the future, just to have an entire picture of the case. Well, I would say if there's something, a particular thing you're talking about which needs to be evaluated a little bit more, then we just go into this direction and otherwise we stick to the questions that I have shared with you.

Rui Minhos

The questions that you share with me, they were pretty good because now that I'm putting my scientific head again, it helped me significantly. The reason why is because basically you are asking the questions with a perspective that I don't know much, I want to know more. And this is the majority of the people that you are interacting from a scientific point of view. Basically, when I went through these questions, I immediately... When I read them, I went, Oh, this is good to help me reshuffling my narrative about this because the question said And your share are pretty much the questions I'm facing on a daily basis, either from journalists or even scientific key opinion leaders, when you have the first contact, because the majority Both of them are a bit surgical about what we are doing in terms of transformation.

Joshua Jovanovic

It's also interesting for me because I looked a lot on this topic right now and it's still difficult to find a lot of information on it. You have to really go into regulatory documents and analyze them to get an idea of it, how it developed. Even then, it's difficult to understand.

Rui Minhos

Our website, PMI. Com, PMI Science, the PMI statement of purpose and the sustainability reports have been evolving and getting better year after year to try to explain this transformation journey. But if we go to the first question when you ask, how did the initial idea of IQOS emerge within Philip Morris and what were the circumstances? We need to go back probably to 1990.

Joshua Jovanovic

1993?

Rui Minhos

1997. Because this was the moment that the company decided to put on their website proactively smoking kills. Obviously, not the website. Basically, in their conversations to shareholders, they start being proactive and upfront saying smoking kills. Smoking is harmful. Smoking is the primary cause of disease and so on, so forth. Why? Basically, you had, if we go to 1963, when the first report from Surgeon General established a relationship between smoking and lung cancer and other diseases, the reaction from the CEOs of the majority of the tobacco companies was really a shame because when they said that now this relationship is not well established, the lack of corporate equity or corporate reputation, it's coming from there. A few years later, it was clear to everybody that pregnant women that were smoking the babies were smaller, comparing with pregnant women that were not smoking during the pregnancy. And the CEO of PMI back that time, decided to say that, but did you ask women if they like to have big or smaller babies? Because the majority of human likes to have smaller babies, which is plain compared to the current other societal expectations towards a big corporation. These are some examples why the tobacco industry has today a low reputation or a bad reputation and the corporate equity is at the level of weapons industry and so on, so forth. After acknowledging that smoking is a primary cause of diseases, in 2007, the company with more massive communication via web, they decided to really go bold, saying that smoking kills and we are going to proactively have health warnings, even in countries where these health warnings are not required. This was the moment that you see that the company was acknowledging that it's important from a credibility point of view and also from a corporate social point of view, corporate social responsibility point of view to acknowledge the harmful effects of smoking. After that, you start getting some insights from regulators in the US Congress when they were discussing the tobacco law at the moment of spin-off of Philip Morris International in Altria in 2008, there were some calls to actions that you should develop less harmful products. This was combined somehow with World Health Organization framework, Convention for Tobacco Control, from the Convention for Tobacco Control FCTC, that they put it out a group of articles trying to develop a range of supply demand and harm reduction strategies that tend to improve the health of a population by eliminating or reducing the consumption of tobacco and the exposure to tobacco smoke.

If you combine the comments and the call to action from the politicians the decision makers, with this statement from regulators, which is the case of the WHO, that one of the tobacco control measures should be harm reduction strategies. Initiated new way of thinking and way of working in the company that started with a very strong investment in R&D to develop less harmful ways for tobacco nicotine consumption.

Joshua Jovanovic

Just at this point, one question. This means we are starting right now from 2008 on, right?

Rui Minhos

This is for you difficult to find because there are a lot of information that was not available publicly because you have to go to primary sources, articles, publish, and so on, so forth. This is something that you find in the digital world as we know today, because the moment that you have a massive access to web and you have corporate websites, you have YouTube, and search engines like PubMed, M-base. These are the moment that the scientific information and basically all the scientific magazines start being digitalized. It's the moment that you start getting more information. So, there is a moment in time that helps clarifying the story, but it's very difficult to find the data. This is something that you need to talk with people that are already retired, but I had the pleasure and the luck to work with 10, 15 years ago when I joined the PMI. I remember that, and we will discuss this later, when I joined the PMI, we were talking about NGPs. These products were called NGPs, next generation products. But before that, they were called preps, potential reduced exposure products. After NGPs, we were calling them RRPs, reduced risk products that are in different levels of development.

Now we call it smoke-free products because all of them don't have combustion, so they don't generate smoke. This is a journey.

Joshua Jovanovic

It's like an evolution path.

Rui Minhos

Exactly. It's evolution path, really. There is a moment that it's very difficult for you to find data and information. After, I would say, 2010, you start getting a lot of data, 2008, 2010. But in 2008, you have this spin-off from Philip Morris International from Altria. Altria remains the owner of the majority of trademarks of Philip Morris in the United States. And this is the moment that the executive senior management team and PMI started investing significantly in alternatives. Other research facilities in Singapore were created. We started shutting down research centers that were mostly focused on cigarettes and we start opening new ones and transferring these scientists to state-of-the-art facilities to investigate and develop alternatives to cigarettes. The first alternative or the first, let's say, halfway that we thought it would be the right way to do it was to reduce the potential harmful constituencies in cigarettes smoke. We knew that cigarettes smoke, it was the main exposure to tobacco smoke, primary, secondary, and third level of exposures were all of them related with smoking-related disease. The primary exposure is the mainstream smoke that smoker entails. The second and exposure, let's call it like this, is when you are exposed to smoke that the smoker exhales. The third-hand smoke, it's the residues of the smoke that stay on your clothes, on the walls, and so on and so forth. Here, the evidence is not well established because what is being... What is seen to this environment, to the close of the walls, and so on and so forth is carbon nano base particles that exist in cigarettes, smoke and doesn't exist in the in smoke-free products. But the main force of toxicity in terms of exposure is the inhalation. Primary and secondary smoke is very well established because you inhale it. Third hand smoke is not clear how carbon nano base particles that are still to a wall, it will get into your lungs. But this was the first, let's say, pathway of research, how can we reduce the formation of these constituents? There were several possibilities, knowing that the origin of these carcinogens is coming from the burning of certain vegetable proteins that you have in the tobacco leaf. If we manage to reduce the level of these proteins in the tobacco leaf, probably when we burn the leaf, there will be less formation of these carcinogens. This was the moment that the company starts developing what we call the good agriculture natural practices to reduce the levels of pesticides in the tobacco growing, addressing the issue of youth working in tobacco growing, and at the same time, they realized they were trying to develop this genetic sequence of the tobacco leaf to manipulate genetically the seed in a way that you develop tobacco crops, genetic modified, that doesn't form these proteins that once were developed and lead to carcinogen. But this immediately was abandoned why GMOs, genetic modified organisms, are forbidden or were forbidden back that time in a significant number of countries. Therefore, even if you go on that pathway, it will be very difficult to implement the good agricultural practices. I don't remember exactly the day that the US the surgeon general put it out, another report, identifying that the issue was the burning. It was combustion. We knew that it was combustion, and we were trying to reduce the level of a break of source from a chemical point of view that could lead to carcinogen. Then the question came out, and we should eliminate combustion at all. If we heat tobacco instead of burning It was the first product I offer PrEP, potential reduced exposure product that was woven, that you were putting the cigarette, a normal cigarette, inside and you were eating the cigarette instead of burning it. We launched this product in Poland and Germany. It People hate it.

Joshua Jovanovic

Why did people hate it?

Rui Minhos

Because you were eating the cigarette from external point of view, so external eating. The first material in contact with the source was the paper. Can you imagine when you try to burn some paper and smell it? It stinks. Imagine the taste. It was really bad. It was a very important failure to learn that peripheral eating or external eating, it's not an acceptable product. That's how we start looking at IQOS. The first prototype of IQOS, you have an eating plate inside of a tobacco stick. It was not tobacco leaf anymore, because if you need to have an aerosol, you cannot have smoke, you need to manipulate the leaf to have a bit of glycerin and propylene glycol, that were the materials used by it seeks to generate the aerosol. The idea was to combine the powder coming from the tobacco leaf that has nicotine with glycerin and propylene glycol in the right proportion. To generate an aerosol. That people could get the nicotine and the exhale already with the nicotine out. Then you need to make sure that this aerosol is respirable. What does it mean? It means that the droplets of water in the aerosol that are formed because you have the glycerin and propylene and glycol, have the right that is capable to pass your mouth, the throat, and reach the available level in the lungs, the liver nicotine. If the drops are too big, they will impact on your throat next to the cough and vomit center, nervous center, and you cough or you vomit. If the droplet is too small, they don't have the right weight to reach the lungs to deliver nicotine. That was another level of development of our scientists to develop the right proportion, the right temperature to heat tobacco, to deliver nicotine in a consistent and effective way with the right designs of droplets in the aerosol. It took us, I would say, probably a decade.

Joshua Jovanovic

How many resources were putting into this process? I mean, how many people were working on it, in how many countries?

Rui Minhos

1,000 scientists. Basically, you start with the quality by design of the product, which is developing a product without combustion, addressing all these physiological and physical needs. The moment that you have an MVP, a most viable product, you need to test it. First, from a normal clinical point of view with standard talks, system talks, and so on and so forth, then clinical point of view, the clinical trials, and then the actual use study. We will enter into details later on. But coming back to the initial question, how did the initial idea of IQOS emerge within PMI was to address the harm reduction strategies, acknowledging that people very likely will continue to smoke and probably With the level of knowledge about the harmfulness of smoking, they will start looking for less harmful alternatives because back then, if we were looking at the quitting rate, they were even lower than they are today. Today, you have probably 15% of quitting rate, meaning that one and a half person out of 10 are able to quit altogether. If you go to five years range, probably then less than one people out of 10 is capable to quit altogether. So, knowing this, it will be important to develop less harmful ways of ticketing consumption.

Joshua Jovanovic

This also erases a way, for example, to create something which is totally different from smoking. It needs to be somehow smoking or an evolution of smoking because people don't think about quitting.

Rui Minhos

Yes. Here we enter in the more complex world, which is the addictions. I have been engaging with the addiction's experts in the three regions when I was working in a scientific engagement for PMI. And all of them said that there is a genetic predisposition for addictions. And the addiction is not always... That's why you have people that are addicted to alcohol, you have people that are addicted to smoking, you have people addicted to sports, you have people addicted to gambling. And nowadays If you have people that are addicted to be watching Netflix, for example. And this is related first with the real mechanism you have in your brain, which is dopamine that gives us the satisfaction, but it's also related with behavioral aspects that they are very difficult to explain.

I will give you my personal example. When I quit smoking in 2008, I was not touching I was smoking a cigarette for a long, long time. And I was smoking more. I was not smoking at home because I hate the smell. I was smoking. Smoking was not allowed anymore in the offices. So I was coming out to smoke a cigarette. But where I was smoking in the car, but I was opening the window. When you wanted a car jam, I was opening the window, lighting up the cigarettes with my hand out. I was not smoking with the windows closing and so on and so forth. Even a few years after the quit smoking, every time I was stuck in the car jam, I was opening the window automatically, and I need to have chewing gas or water. My hand and heart need to move. The reason why I cannot explain you from a scientific point of view. But even today, after almost 20 years of quit smoking, when my car stops in the traffic, I open the window, I have a sip of water, or I need to have chew gums. If I'm driving, I'm okay, but if I stop, I need this. I behave like this. This is just anecdotal, but it shows that it's not holding the nicotine addiction. There is a behavioral aspect that you need to take something to your mouth. That's why IQOS was developed in this format. But even though despite the product that's being developed to be as close as possible to a cigarette, there are certain behaviors and routines that are completely different from a cigarette. You don't use the lighter anymore. You need to have your battery charged. You need to clean your device. These new routines make it that is not easy for people to switch completely. Even being equivalent from a kinetic point of view in terms of nicotine delivery, there are certain aspects that people don't like or don't want to switch. Either they don't like the taste, for how you can explain that in a market like Portugal. It was a non-mental market. Mental cigarettes had only 3% when we launched IQOA. Nowadays, 60% The intent of the market is mental. So, people move away from cigarettes because they have some flavors in this product, because if you go to the full flavor variant, people don't like it because you are heated, you are not burning. The taste is different. So, there was no idea. IQOS was not the main idea or the only idea in the beginning. The idea was to develop less harmful ways for nicotine consumption that could reduce the harms of smoking. Nowadays, the narrative is different. Nowadays, we want to develop less harmful ways of nicotine consumption. and we want to stop selling cigarettes. Because we know that we have a viable product, we have the science, and it's not a viable product. You have a portfolio product that try to address smoker's expectations and smoker's preferences. Because not everybody is switching to this. You have people that switch to this, which is an electronic cigarette closed system. You have people that prefer the open tank systems that they play with the power of the battery and flavors. You have people that prefer nicotine pouches or snooze. You have today a phenomenon in certain markets that we call a poly-usage, that depending on who these people are and who is around them, they use different products. You have people that... We have dual use of combustible cigarettes and IQOS in the United States in the studies that we have 30% of people are dual users. Even though the level of harmful constituent's exposure is being reduced, was of FDA, they have done that assessment. But you have people, for example, in the office because they cannot smoke or use a cigarette or heat the tobacco, do they use the nicotine pouches? When they're at home, they use the cigarettes because they don't like the smell of heated tobacco. But when they are in the balcony or in the terrace, they use IQOS. Nowadays, you have this phenomenon in a very small percentage because these products are new. But people it's a strategy to have people moving away from cigarettes that is the most harmful way of nicotine consumption because they have combustion. This is related also with the second question you had there that what factors internal and external signaled the need for a shift to non-smoking products? The first one is acknowledging the fact that despite the cessation and the prevention efforts from WHO and different government as around the globe. You have around 1-2% smoking prevalence reduction year-on-year. But due to the demographic reasons, the absolute number of smokers have been increasing significantly. Nowadays, you have around one billion smokers in the world. It's one out of seven. The that continue to smoke cigarettes. That is the most harmful way of nicotine consumption. The need to shift to less harmful products is aligned with societal expectations every Everybody is concerned what we call the noncommunicable diseases, the obesity, diabetes, smoking, the lack of physical activity and so on, so forth. And the societal in general is trying to reduce the risk of developing these diseases, adopting healthier lifestyles. So, knowing that it's not because IQOS is healthier, but knowing that you have the knowledge and the financial power to invest in less harmful ways of nicotine consumption, and you have a significant number of people still smoking cigarettes, it makes sense for a company like ours to develop those alternatives. In terms of regulatory and social pressures that influence the decision to explore these alternatives. Basically, it's all the above: call to actions from decision makers, new approaches from regulators, and also societal expectations in terms of healthier lifestyles. There is also one thing that nobody can ignore because this company ignored it 30, 40 years ago, is that nowadays, nobody has doubts that cigarettes is the most harmful way of nicotine consumption, that smoking kills is the primary cause of serious disease and deaths. It's also avoidable cause. What is surprising is that even knowing this, people continue to smoke. People continue to consume nicotine and cigarettes. So there here is a call to action from PMI that it's important to inform people that for the ones that will otherwise continue to smoking cigarettes, today they have a less harmful alternative. But the best option is never start or quit altogether. It's the only way to minimize the risk of developing smoking-related diseases.

Joshua Jovanovic

One question in this regard is, how does it economically make sense to shift to non-smoking products for PMI?

Rui Minhos

It does make sense when you have in the senior management team people that are very much looking forward and with innovative thinking. When our CEO back that time in 2016, in an interview to BBC said that our future is to stop selling cigarettes, is to stop selling Marlboro. Everybody was shocked. No one in the company was aware that he was thinking or about to say what he did say. To give an example, I was in the HQ back that time working in a regional role, and our colleagues on communications panicked because our phone didn't stop ringing for three days in a row and they didn't know what to say. The company was not ready to address those questions. Then We had a phone call with the CEO, and he said, look, it's my responsibility to think the strategy of this company 10 years from now. There is one thing that I'm pretty sure We are not going to end up like Nokia. We are not going to end up like Motorola. We are not going to end up like Kodak. If we don't transform our business in 10, 15, 20 years from now, I don't know exactly when, but we'll be out of business. It's my responsibility as CEO to put the company in innovative research and development of the product's track that there is no way back. And if I have a problem or question or ask to anyone in my senior management team, what would be their opinion before saying what I said, everybody was probably trying to convince me that I was wrong. By not doing that, I surprised everyone, even the external audience, but most important, I put the company on the track that there is no way back. Nobody can be against the strategy that I put it out three days ago, not even shareholders, because now the street knows where we are going. It makes sense if you don't become obsolete. It makes sense because the level of knowledge we have, we do have about smoker's preference, what we have studied in the cigarettes, in terms of carcinogen, so on, so forth, trying to reduce the harm when we're still looking at the cigarettes. And nowadays, we have something completely different. Putting out the level of knowledge we do have with the right financial resources, we will end up something very positive, either for the company and to the consumers in general.

Joshua Jovanovic

So, you're actually able to create a win-win situation long term that way.

Rui Minhos

Absolutely. If you look at the company financials, it's a good example. The shipment rates of smoke free products are now reaching probably the 15-16%, and these products represent already 40% of our total revenues. So, by the end of the day, from a business point of view, these new alternatives are profitable. The moment that you have scale up completely your industrial blueprint, they are being profitable. Far from We don't break even the level of investment that was done because it was massive. We continue investing in further studies and developing new products and so on and so forth. We have a vision to have a portfolio of products that go beyond tobacco and nicotine in the future.

Joshua Jovanovic

When you're saying this, it implies that you have a vision. Is it also connected to a date, like the vision 2050 or whatever?

Rui Minhos

Look, in 2025, we have communicated to the street that in 2025, we would like to have $1 billion coming out from smoke-free products. That vision has evolved. That date has evolved. Why? And this is also the lack of experience of our SMT in this area. You don't control the time of science. When you are doing research, sometimes you are lucky and you get the results and the answer to your scientific question, sometimes take a bit longer than expected. One of the companies we have acquired three years ago, they have a prototype and the patent for inhalable has Aspirin that can be very interesting from an emergency point of view. But their product failed some KPIs in phase one. And this was communicated to the street one year ago.

Joshua Jovanovic

In a clinical trial?

Rui Minhos

Clinical trial, yes. Phase one. The reason why it failed is because the formulation is a bit unstable. You have very good results and very poor results, very good viability in certain subjects, less good viability in other subjects, which when you are in the pharma business, you know that when you have a pharmaceutical form for inhalation that behaves this way, the problem is the design of the device that delivers the drug and not the drug per se, because aspirin doesn't have any problem. We know aspirin for 40, 50 years, and we are still discovering new therapeutical benefits of aspirin. Anti-clocking is just one of them, but pain killer, migraine, treat fever, you name it. Tentive of indications, different range of doses for certain indications. There are studies on aspirin, for example, for rheumatoid arthritis and you name it. From a safety point of view, it's very well-known as well. Nobody's discovered, despite the stomach effect of aspirin, nobody's discovering side effects or undesirable effects in aspirin in the last 10, 15 years. So, if the product is somehow stable, it's not an issue related with the chemical entity, it's an issue related with the device. You have to go to the drawing board and improve the device. You know this in pharma. The biggest risk and cost for a pharmaceutical company is when they reach phase 2 or phase 3 and they discover a huge safety issue and they have to abandon the program. When this happens, you have already probably $1 or $2 billion invested that you have to throw to the pin.

When you need to improve the device, probably you are delaying the launch of the product in one or two years, but with the right people in the right stage and the right facilities, you will be able to fix it. So, this is just to say that yes, we had the vision. We still have the vision; the timeline will be a bit more flexible. So, the following question Were multiple projects considered and found initially or was the focus set on high cost from the beginning? Basically, the focus in the beginning was developing less harmful alternatives. IQOS was just one of the propositions. When we start communicating to the investors and to the street, our portfolio of products, we had four platforms. We had platform one, which is IQOS. We had platform two that was also a heat tobacco product. But instead of electronically heating, you had a carbon heat source on the edge of... It was a cigarette, but you have a carbon source on the edge of the cigarette. You were lighting with a special lighter like induction because you need to light it from the top and not from the side. And the idea of this product was to have a chipper and launch the product in emerging countries, low-min and income countries that don't have the electronic footprint or capabilities that normally in most developing countries we do have.

That product was also a failure. We spent, I don't know how much. No idea, but thousands and thousands of dollars trying to develop a viable product. We had the science coming from IQOS because we knew that heating tobacco was the best proposition. But can you imagine that the carbon-eating source was releasing carbon-based nanoparticles? So, same as cigarettes. They were not being inhaled in the mainstream smoke, but they were exposed in the second-hand smoke. The other challenge we had with P2 was if you have a carbon heat source, literally burning at 450 degrees for 10 minutes, and the usage experience was six, what would you do with that fire, that it for four minutes burning at 400 degrees. How you extinguish? That was the challenge. First, we developed a part of the special lighter. You had a how you open the beer bottles to remove the carbon tape. You had people throwing it to a bottle of water with a bit of water in the end. It wasn't local, but it shows that sometimes our engineers, they were so focused to developing a heat and tobacco product.

They were not smokers. They forgot the practicalities. But again, it was important for us to learn from those mistakes as well. P2 program was the button. That was the moment that people decided, okay, we have tried from left and right, top and bottom. We didn't manage to find a viable alternative to deal with the carbon heat source. It's better to abandon. P4 is the electronic cigarette, and you our peripherality of products. We have been focusing closed systems to avoid any manipulation and situation led to the evaluate in the United States in 2019, that people were putting other ingredients and develop a typic pneumonia. We have two different technologies, the normal weaken coil for disposables and what we call the mesh technology that was developed by us, which is made in ceramic and secures that you have always the same level of nicotine in each single puff. This is important for consumer acceptance for people to move away from cigarettes. It's also important from a safety point of view because you don't have the dry puff situation. Dry puff is when you don't have liquid anymore and you puff, you have an over-heating in the system, and you are exposed to some metals that you have in the system. In ceramic, you don't have metals. When the liquid is at the low level in the cartridge and having

this mesh system, the system immediately stops when you don't have enough liquid, and you don't have the overheating, and you don't have the bad taste in the end of the cartilage.
So IQOS was not the main product. The main goal was to develop less harmful alternatives. IQOS stays in the portfolio of products because you have here two things that are very important. It's what we call the fundamentals of the harm reduction equation. You need to have a product that reduce the individual risk when people are using it. This product needs to develop consumer acceptance in order that people can switch from cigarettes to this product. And the combination of these two factors will bring the population harm reduction or population net benefit. There are two or three things here that are very important. To have a to achieve to have harm reduction or population net benefit, this product cannot trigger initiation or be a barrier to cessation and this links to consumer acceptance. So, a consumer cannot be prouder to use these products than cigarettes. Otherwise, you will have more users, more people consuming nicotine. And it should not preempt people to quit when they are motivated to quit. The level, the quitting rates needs to remain stable year after a year when you launch this product. Let me give you one example. Let's imagine that this product, ICUS, reduces individual risks in 80 %. And 90% of the people are capable to switch completely. This product reduces the individual risk in 90 %, but only 50 % of the people are capable to switch completely. It means that the population at benefit of this product is higher than this one. But if all of a sudden more people start consuming nicotine with this product than with this, the equation is different as well. So, the idea was always to develop new products that were able to reduce individual risks, bring the individual risks down closer to the smoking cessation benefit it, but at the same time being acceptable to consumers in order that they can switch and move away from cigarettes that is the most harmful way of nicotine consumption. To address the different variables in this situation, you need to have a portfolio of products that reduce individual risk in different ways, that address different consumer preferences to bring again the population that benefit. Heated tobacco, if you go to UK, the most popular, less harmful alternative is a cigarette. If you come to Portugal, the most popular, less harmful alternative is heated tobacco products. If you go to Sweden, his snoose and nicotine pouches. You have the cultural aspect of consumer preference as well. That's why you need to have a portfolio of products to address different levels of consumer preference and different levels of affordability as well. Because a less harmful way in the views of PMI, it's not only for people who are purchasing power. You need to democratize somehow the access to these alternatives. Any question on this one?
Joshua Jovanovic

No. It's really interesting. So clear and such a huge system behind it that you need to construct conceptually before you start actually to work on it. It's very insightful.

Coming to the next question: if several projects were considered, how were potential opportunities evaluated, prioritized during the early stage of the transition?

Rui Minhos

Very good. So basically, if we go to the beginning of our conversation, you understood that we start with the quality by design. We need to understand that any kind of product we develop cannot have combustion. That's the key fundamental exception. The moment that you don't have a product with combustion, you need to have the aerosol. This is also part of the quality by design. Then you do what we call the aerosol chemistry and physics to see if by eliminating combustion, we are reducing the formation of harmful and potential harmful constituent. Then let's call it toxic compounds to simplify. Because this designation of harmful and tertiary harmful constituent, it's coming from regulatory lists. FDA put it out, a regulatory list of harmful potential harmful constituencies that need to be measured by any applicant to a modified risk tobacco product within the FDA. Then, they have also a list of HP&C that needs to be further reduced in tobacco products to reduce their harmfulness. Then the International Agency on Research on Cancer they have also a list of harmful potential for constituent. What PMI did was combine all of these lists, and we end up, because some of them are common, you know, and came up with a list of what we call a PMI 58, each PNC's list, that combines the toxic compound from all the regulatory lists. So, the moment that you have a product without combustion with the right aerosol chemistry and physics, you need to demonstrate that there is a significant reduction in the formation of this toxic compound. And here you use what we call it the standard. It's purely analytical chemistry. It just works in the lab. If the product you have developed is not reducing the formation of toxicant. It's abandoned. The example of P2. They reduce the formation of toxicant in the mainstream smoke or mainstream aerosol, it's the right terminology, but they have carbon-based nanoparticles being emitted in the carbon heat source. The design of the product has safety issues, cannot continue. The moment that you have this reduced information you go to what we call it standard toxicology. To show that we reduce the formation of toxicants, we have a reduction in toxicity in the regulatory toxicology measures. Hamsters, neutral red uptake, micro-nucleus test and so forth. The same testing you do for food supplements, for medicinal products and so forth, and for a new chemical entity is that you found in nature, and you want to know what the risk of the human being is exposed to these substances, you have this standard toxicology. So, at the moment that you have demonstrated to reduce information, reduce the toxicity, you start looking into animal models to see if this less toxicity translates into the reduction of risk of developing smoking-related diseases in animal models. You start combining this data, the acute and chronic toxicity studies, with in vitro systems of toxic Systems, what we call it systems biology, where sometimes you combine cells of lung, heart, liver, kidney on the ship and then you expose them to smoke, the aerosol of the product candidates, and you see the differences in biological impact. Again, if the product passes this test, you go to clinical studies. In clinical studies, clinical trials, you will be looking at if the reduction of formation translated in the reduction of toxicity translates also in the reduction of biomarkers of exposure. And later on, if it reduces or induce changes in biomarkers of clinical risk, and by doing combining all of these studies, you will end up knowing what the impact of these new products in the biological response for people will be that move away from cigarettes. And you compare this with the smoking cessation data. Again, if the product has this analysis, you go to reduce the exposure and risk, and later on consumer and perception and behavior to assess the elements of consumer acceptance and to assess whether this new product is not triggering the cessation or being a barrier to smoking cessation. And all of this data will help you calculating the population harm reduction or the population net benefit. Basically, all of these steps were inspired from pharma industry when they developed a new medicinal product. They start quality by design, finding new chemical entities. They study the toxic profile of these new chemical entities using animal studies, the majority of them. Then you go for phase one clinical trials where we're trying to see how the drug distributes in the human body. Then you go to Phase 2, which is dose finding studies to find what is the right dose from a You go benefit point of view versus safety and risks. Then you go to Phase 3, which is normally the actual use study, where you have already patients with that disease, and you try to treat them with the right dose that was identified in phase 2. And then the product is okayish to put all the data in the regulatory file and present to the regulatory authorities. Phase 4 is the post-commercialization data when we start looking at, especially, pharmacovigilance and so on and so forth to see if there are some side effects that were not detected during the three phases of clinical trials. Basically, you have used the different stages to develop a new product from pharma industry and you invest it to your home reality. But is the same thinking behind.

Joshua Jovanovic

This model, or the way the pharma industry is developing new drugs, was it even used by PMI before the development of non-smoking products?

Rui Minhos

It was brand new. PMI was the first and the only one doing it. That's why it's very challenging to have independent scientific verification because you were the only ones or the first and the only ones doing this for the time being. For example, when you look at system stocks, the in vitro systems, cell systems that I explained to you the organs don't shape the lung, heart, kidney, and so on and so forth. Basically, we know from epidemiological data that when you are exposed, to the cigarette smoke. This induces changes at the molecular level on your cells. These changes, these cell changes translate translates into damage into tissues. It translates into damage into organs. And the cumulative change over time leads to smoking-related diseases. What you know also from an epidemiological point of view in terms of smoking cessation, when people quit smoking, the level of changes induced by the genetic material in the cells is lower, less changes in cells, less changes in tissues, less changes in organs. Over time, you start reducing the risk of smoking-related disease. If you have this in vitro cell systems, you can easily calculate the difference between the biological impact of cigarettes smoking exposure, aerosol exposure. Because in the group of rats that have been exposed to high-cause aerosol, I see some changes in the liver. It's normal. They have been over-exposed to nicotine because the nicotine concentration, compared to the animal was exposed to the smoke of cigarettes, is 10 times higher. So, the liver that has a rule to remove all of the chemical entities in your blood, they need to deal and clean huge amounts of nicotine become slightly bigger. It's like when you go to the gym and start doing weightlifting, higher the weight, higher will be the volume of your muscle to move the weight. So, this is to show what? You have to adjust sometimes the standards and the guidelines to your own reality. If you want to compare apples with apples, you need to modify the method of OECD. It cannot be maximum dose for this because you have a bias, significant bias. You need to find other way to normalize and be able to compare the groups of rats A, rats B, cigarette, smoke, IQOS aerosol. And what we did was volume.

Joshua Jovanovic

Let’s come to the next questions, which is about the competitors and how they reacted on PMIs actions?

Rui Minhos

Well, the first reaction from the competitors. Basically, when we launched IQOS because there were already some competitors in the e-cigarettes business, the electronic the cigarettes business with a very low-quality proposition. They have been always, and they still are, mostly focused on the cigarettes business. Some of them have e-cigarettes in the portfolio, but they are significantly lagging behind in terms of product development and scientific data. PMI is the only economic operator saying that we want to stop selling cigarettes. The other competitors, what they are trying to do is to compete in this smoke-free products franchise, but positioning their products has more alternatives to consumer instead of stop selling cigarettes. The vision of PMI is clearly stop selling cigarettes and replace all nicotine consumption by these less harmful ways of.

Joshua Jovanovic

So that means by now you're the only company who's able to sustainably change their market environment?

Rui Minhos

We are the main economic operator. Let me give you some quote, put some numbers behind. In Portugal, we were the only ones Our competitors came to the market one year ago, and we have 97-98 % share of market. What they are trying to do is they are reducing prices significantly, both from the devices and the consumables to try to gain share of market. But again, their product is really lagging behind in terms of development. I gave you the example of peripheral heating, you remember. Yeah. The majority of them, they are still using peripheral heating in their technology, which is the first prototype that PMI launched that was really not working.

Joshua Jovanovic

I mean, it's interesting. They are trying to do something which you said is not working, like 10, 15 years ago.

Rui Minhos

They tried to... Then we go, for example, PMI is the 37 largest patent applicants in the EU. The reason why we do this is also to protect our implant property, but also to share our knowledge in terms of scientific methods, product developments, and so forth. What they have been trying to do is to improve significantly the peripheral heating system because it's the cheaper one, easiest to manufacture. We have also peripheral heating in our portfolio, which is a very cheap product that we are not commercializing in the EU. We are building the scientific package because it's different to launch it in other countries. But for nowadays, in terms of heating tobacco, you have heating by induction inside of the tobacco, which is this most, let's say, modern platform, IQOS luma. You have the peripheral heating that we are preparing to low-middle-income countries. You have the pin-based system, which is similar to the former versions of IQOS, but it's a pin that you use. You have different types of heating tobacco, again, to have different price points and so on and so forth. Also, because in the beginning, we were dependent from one-on-one manufacturer. Nowadays, we have several manufacturers as well.

Joshua Jovanovic

This means you're not producing it yourself. You actually got some suppliers who are responsible for the manufacturing.

Rui Minhos

Yes. For the device, we have... Okay, It's like apple. The innovation and R&D ecosystem are in the HQ Switzerland. Appel is in California, but then you have factory in Asia because in terms of electronics, they are the best and cheaper producers. But the development of the product is being done by us in Switzerland. The moment that you start building a franchise, a smaller and medium-sized companies start seeing that what you are capable to achieve, they start developing prototypes as well. So some of them... Nowadays, you have products in portfolio that have been from A to Z developed by us, but you have also some acquisitions that you got a product in the stage of development and together with your knowledge, leveraging on your knowledge from micros, you are trying to speed up the development of these new products with different heating systems. But again, it's always important to have consumer acceptance in the perspective and also different affordability and so on, so forth. I can tell you that this one, with the induction heating system, is by far the one that is closer to a cigarette. The other ones, yes, they can be cheaper, but the consumer experience is not as good as these ones. But the pin system costs €10, this one cost €60. The level of technology is completely different. The quality of the consumables, quality in terms of using experience, not quality in terms of manufacturing. Because here you have all of our factories where we manufacture our consumables are GMP ready? GMP is the same standard that the pharmaceutical industry use. If one day I want to manufacture a medical product there, I can. I just need to get the certification from a drug I would say.

Joshua Jovanovic

Is it also strategic move to a certified GMP?

Rui Minhos

It's not yet. I will put things in a different way. When you are building a brand-new factory from scratch, it's better that you be ready and capable to address all of the certifications that could be required in the future. A GMP factory is something that you cannot transform, or you can buy another one and adjust. It will always have some failures and gaps in the process unless you build it by design. That's what we did with the brand-new factories we have for Icons. All of them are GMP ready because in the future we don't know.

Joshua Jovanovic

It's interesting. It means when you were thinking about the manufacturing of IQOS, you were already thinking about the next step, what is coming next.

Rui Minhos

Correct. Let's imagine. When we start building the factory in Bologna, the greenfield, the factory was inaugurated in 2014, and we start building in 2009. The application to FDA with a bunch of science we do have for IQOS was filled in 2017. We didn't know if FDA will require a GMP certificate or not, because FDA, they have the responsibility to regulate and assess tobacco products, but they are also Food and Drug Administration. So, their core of expertise is in medicinal products. Their equity and reputation are on medicinal products. Can you imagine if someone working for the Tobacco Research Center within FDA decides to bring the standards for the drug agency to tobacco, you will be in big trouble. So that's why when we build a factory by design, we wanted to have GMP ready to not be caught on a difficult situation in the future in case FDA decided to be more restrictive or more demanding in terms of quality standards.

Joshua Jovanovic

That's interesting. It's already referring to the next question somehow because the next question is about investments. The allocation of investments and how they may shift or might have shifted during the phases.

Rui Minhos

The moment that the company decides to go on this path, 99% of our investments in research and development are allocated to smoke-free products. Only 1% is for facilities and cigarettes business.

Joshua Jovanovic

Am I understanding it correctly, that investments shifted to non-smoking products, this means during all phases - P1, 2, 3, and 4 And then, it IQOS turned out to be the best product, and then the investments shifted or allocated to IQOS entirely or not?

Rui Minhos

Not entirely. Basically, look, if you ask me high cost over prioritized, yes, it was. The reason why? Because it was the most valuable platform and you need to continue building the data that show case that, yes, in the long term, from a pretty logical point of view, I'm capable to reduce the risk of smoking related diseases by X%. And this requires continuing studying the benefits of this product. Secondly, you need to do a lot from an epidemiological point of view. You need to, on a regular basis, and when I say on a regular basis, it is every two, three years, assess the levels of initiation and the impact on smoking cessation of these products to see that and to substantiate that you are having a population net benefit by moving away people from sequence to these products. You cannot afford to launch a product with this level of investment and all of a sudden, everybody's using the product just because it's fancy and it has nice electronics or

I like the taste. If this If this is the case, you need to be the first one advocating for proper regulatory measures to reduce the levels of initiation.

That's why, and we have them already, we have the user access cessation, youth access prevention programs in certain countries to avoid that miners start using nicotine via these products. In the EU, this is not an issue. Basically, if you look at the data from the European Journal, this data shows, 80% of the people, for example, in Portugal, they start smoking with box cigarettes. Only 1% is saying that we start smoking or using nicotine in IQOS, which is very, very low. But again, you need to study this on a regular basis. In Portugal, IQOS has now more or less 25% share of market. 1% of initiation is really, really low. If I look at the happy data we have in the last cross-sectional study we did in 2021, we did also with Ricardo, a Catolica with a sample of 10,000 people, the level of initiation was 0. 5, so quite low. But in terms of investments, the priority has been IQOS. We kept investing on P3, P4. P2, there was a moment that it was abandoned. I cannot say exactly when, but all of a sudden, this is a big company. We have more than 80,000 people in our deal who 1,500. All of a sudden, you stop hearing about P2, that means that we abandon probably the developer that product. But there was a moment that from a regulatory strategy point of view, we were always looking at P2 as a viable proposition, even knowing the challenges that the R&D team was having on the carbon tip. When we were advocating for regulatory frameworks, we were having some flexibility to accommodate P2. In certain countries, you need to have standards for the harmful, potentially harmful, constituent. We decided probably to abandon P2 also because you cannot have a right standard for a smoke-free product that P2 will be compatible with because of the combustion you have in the carbon tip. The challenges were not only from a safety point of view, they were also from a regulatory point of view if you want to create a quality standard for this product.

Joshua Jovanovic

Let’s move to the customers, how did customers perceive the introduction of IQOS compared to traditional products before the investment?

Rui Minhos

This is a nice one. First, it's not easy to switch, as you understood already. You have to address consumer preferences. Nowadays, and rightly so, there are several regulatory restrictions. Advertising is banned. You cannot communicate in magazines, TV, and so on, so forth. We are okay with that as a company because this is a product with nicotine and nicotine is addictive. But in such regulatory environment, it's very difficult and hard to consumers to understand the differences of this product compared to cigarettes, especially in terms of health benefits. Here, if you combine the restrictive regulatory environment, the lack of information inhibiting users, and the low corporate reputation of PMI with the fact that we are the ones that have the science and the data, the level of independent scientific verification is scarce. And then despite the regulatory approvals from FDA, FDA is the only one with this such advanced regulatory scrutiny and approval, the consumers are struggling to understand the benefits of IQOS vis-a-vis cigarettes. The majority of them thinks that this is the fancy cigarette that Philip Morris developed just for marketing purposes. And the current regulatory frameworks don't allow the company to communicate that this product is less harmful than cigarettes. In addition, even if we were allowed to do so, if we look at our opinion service like one, we did with Ricardo in Catolica, they don't think we are a credible messenger. That said, if you combine all of these, the consumers are struggling a little bit to understand the benefits of the product.

Joshua Jovanovic

Is there a strategy to overcome this issue of accessing the customer?

Rui Minhos

There is. Look, the strategy is first Share with the regulators. Decision makers, they have this that these products are different. You should have regulatory frameworks that could help inform the consumers about the different options that are currently available in order that they could make an informant decision. I think nowadays, nobody has doubt that smoking is harmful. And the best way to minimize the risk is to never start or quit altogether. But I believe very few know that you have less harmful ways of nicotine consumption, especially the ones that will otherwise continue to smoke cigarettes that are the most harmful way of nicotine consumption, I would say. So, I would say that we need to present the science to key decision makers, regulators. We need to create programs and partnership to universities and academic world to accelerate independent review of our science. And I would say that more regulatory approvals, the ones we have from FDA will be needed. But this is somehow related with differentiated regulatory frameworks.

Joshua Jovanovic

And I mean, it's not that you are being in power of the situation. You can just try to inform within the legal framework.

Rui Minhos

Our message to media, to the street, is that with the right regulatory framework and governmental support, in 10 years from now, we will be in condition to stop selling cigarettes in the significant number of countries. But if we do it today, we are confronted with this question quite often. Why if we are so convinced about the future of these alternatives and the main part on public health, why we don't stop selling cigarettes immediately? If we do that without this regulatory framework, basically the market space that will be leaving, they will be all fine by our competitors. A lot of people continue smoking cigarettes.

Joshua Jovanovic

They probably just change the brand.

Rui Minhos

Yeah, there are probably... I don't have the exact, but I did this exercise many years ago. There are 45 countries in the world where PMI is not present, and people are smoking cigarettes. It's not because we are out of business that people stop smoking.

Look, nowadays, we need to keep investing in innovation and in new product alternatives, scientific substantiation of these new alternatives. At the same time, we need to advocate for differentiative regulatory frameworks. But by the end of the day is still the cigarettes business that are funding the activities for the new products. If you look at Portugal, 75% of the market is cigarettes. Here, I'm not talking about share of market. I'm looking at the data from customs authorities related with how much units have been released into consumption. Seventy-five % is cigarettes, around 13 % is heated tobacco products, and then you have all your own ASICs, cigars, and cigarillos. So, let's look at the head of the Ministry of Finance. If I need to get money out of tobacco sector, it's by increasing taxation of cigarettes that I will make the numbers. Because three-fourth of the market is cigarettes.

So how do PMI engage with different stakeholders during the shift? You already discussed this. Were there any partnerships? Of course, yes. Look, with the companies I share with you, we have now several manufacturers. In the past, it was only one. But Similar to the pharma industry, we are not the ones doing our studies. When it comes to clinical studies, we use the same clinical research organizations that the pharma industry use. Why? We are not experts in the clinical research. These people, these organizations, they are. The level of requirements from competent authorities, the requirements of the medical investigator and so on and so forth, they are so huge that it's better that you outsource to the subject matter to pursue other than you try to do it by your own and then you screw up. Because the level of money invested, you cannot play with it. We have several partnerships with universities. We have several partnerships with other companies to develop our products. We have also partnerships. I want to call it a partnership. It's basically we buy the services, we launch. We say it like this, look, I want to see that these people have to continue smoking cigarettes and each of these products, they will see how close they are with the benefits of cessation.

Then the clinical research organization, does the study design, they present to PMI, they define the KPIs, and then we say if we agree or not. There will be a discussion between our clinical team and the other clinical team, and then we found an agreement about the right KPIs and so on and so forth, and then we go and we execute the study. All of our clinical trials, they are available in the clinical trials database on the web. So everybody is fully transparent. And the entities, the countries where the studies are running and the entities that are running the studies as well. And then what significant challenge occurred within the company during transition? How were they overcome? We already discussed this story of the CEO, you remember?

Joshua Jovanovic

Yes, in this situation, I'm quite interested in how employees were actually seeing the situation. There's an entire new product and a potential threat to the known business field

Rui Minhos

Before getting there, it was a challenging process, I would say. After the communication of the CEO to the BBC, everybody realized that, Okay, we will be moving away from cigarettes. The question is how much time or for how long I will keep my job if I'm working on cigarettes. That was that. But then, a few years later, the business strategy was having sustainability at the core. By doing this, the idea was to have a net positive in society. The first thing to have this net positive impact on society, we need to stop selling cigarettes. This brought clarity into the business strategy, why transformations make sense for PMI Why sustainability makes sense to be at the core of our business strategy? Obviously, the most important materiality topic is cigarettes, and therefore we need to stop selling It's our biggest contribute to the sustainability is by stop selling cigarettes. Obviously, people working with cigarettes, they were somehow threatened that over time with proper external support, there were some consultancy companies helping us improving the internal comms, improving the message. Also, some internal change management programs. This allowed the company to become more united and losing the feeling that, yeah, I'm working for our piece. I'm in the first league. You are working for cigarettes. You are secondary, you are in second league. Then the A new culture came up, what we call a PMI DNA, that are grounded in three pillars. We care, we are better together, we are game changers, and with different behaviors for each pillar. And this helped us keep going with one team. And there was also some clarification and internal communication that guys don't be concerned because the cigarette business is still found on the transformation of PMI and R&D activities. Without the cigarette business, we won't have the money to do this.

Joshua Jovanovic

And again, it seems to be an evolutionary pathway

Rui Minhos

Exactly. You see nowadays, imagine that you have a lot of people moving from cigarette business to the area of smoke-free products, even at the innovation and product development level. But you also see a lot of people separating from the company. So either you have the right behaviors, the right knowledge, and the right attitude to address this transformation. And this is summarizing these three pillars. We care, we are better together, we are game changers. Or the company immediately realized that, okay, I need to have a new profile to do this job.

Joshua Jovanovic

But is this the case in the cigarette business or in the non-smoking business?

Rui Minhos

Both. Because even for people working at the cigarette business, they need to look at the cigarette business. The cigarette business nowadays is how can we keep our share of market without increasing volume? This is a challenge. We don't want to increase volume. We are reducing volume, but we need to keep our profitability and keep our share of market. When you look at tobacco products, tobacco brands, we are the owner of the two principal or main brands worldwide, Marlboro and Chesterfield. And here, Marlboro has been the company flag for years. There is a lot of heritage, equity, you name it. We don't want to be the Marlboro company anymore. We want to transform. But this is an iconic brand So having Marlboro being the brand, the number two or three brand in the cigarettes business, that's not acceptable for our shareholders and for PMI.

Joshua Jovanovic

So you want to have stable market share in a shrinking market?

Rui Minhos

We want to reduce shrinking the market, reducing volume, but we want to keep our share of market. And in the cigarette business, Marlboro needs to be the number one brand. In Portugal, for example, the number one brand is already called Terreya, the consumables for it, the tobacco product. But we have a factory here. We are the eighth biggest exporter, 90 % of our volume of the factory is to export in the EU. And the guys in the factory, their vision is very interesting because the factories compete between factories to accommodate and to get volume. They are saying that we want to stop selling cigarettes and the last cigarettes smoke will be a Marlboro and manufactured in this factory. For example, if you want to get volumes for the factory here in the Albarac in Sintra, you need to You have your costs down and the quality index very high. Have time quality index, no accidents, for example, with employees and so on, so forth. Every year in the end of Q3 and Q4, they look at all the factories, different KPIs, and they reallocate the volumes for production next year. This mindset is the one that came a few years later after the decision from FDA for people that work for cigarettes, don't feel that they are second league. They know they have a role. Cigarettes are still fouling the business and the transformation. Secondly, within cigarettes, we need to be the best ones. Marlboro needs to be the number one brand, and this factory should be the last one being shut down. If we do a tour in the factory, it's in people mindset that if we do our job well and the cigarette volumes keep declining as they are, there will be a moment in time because we are so good, and the factory will be converted. The mindset is mostly positive, looking forward, not the mindset that it was the case in 2016. We are done. We are a factory of cigarettes. We'll be out of business in five, six years. It's exactly the opposite. More things. How do customers respond to likely the change of our time. Very good. The day that we know the answer to this question, we will be successful, very successful in the business information and in selling IQOS Because first, it's not clear what the consumers are looking forward. What we know is our sales performance with IQOS resembles very much the adoption curve for new technologies. You have the innovators, more or less 2. 5%, early adopters, more or less 13. 5%, early majority, late majority laggards. Every single mature market on IQOS struggle to move from the early adopters to the early majority. Innovators, good. Rapidly, IQOS gain the majority of market, 1 or 2%, early adopters, after two, three years of commercialization, the majority of markets... You have some exceptions, but the majority of markets in four or five years after commercialization, they were around these 13.5%, 15% share of market. Moving from the early adopters to the majority, everybody is struggling. Portugal is around 23% share of market, and we are struggling to keep growing and switching people from cigarettes to smoke-free products. More advanced markets like Japan, they got a huge struggle between early adopters and early majority. And now they have around 60, 70% of the market is already the tobacco. They are struggling with laggards. So basically, the change to IQOS is facing the same challenges when people need to embrace new technologies. And obviously, the pain points to acquire consumers that are still smoking cigarettes and the way they evolve along the journey, the consumer journey is different from market to market, culture to culture, region to region. We are still learning a lot.

We have learned this three, four years after launching ICOS because that's why we became, in the last few years, what we call the consumer-centric organization. We are always looking for consumer's feedback, and this consumer's feedback is driving product innovation, is driving our commercial practices. Even the development of the product. Nowadays, IQOS you can have two sticks in a row because people were saying, one stick is not enough. Sometimes I would like to have a second one, but then I need to wait for five minutes to charge my order. We have evolved the battery and so on, so forth to one charge of the order allows you to use two products.

Joshua Jovanovic

Do you know what the people are doing in this case? Do they say, okay, well, in this case, I switch back to cigarettes?

Rui Minhos

When you don't have the right product, they will switch back to cigarettes. We have reduced significantly the level of the proportion of dual users by improving the device. And dual users in Portugal, they were around 40%, and now we have reduced it to 25% with the new device. The level of conversion is also higher, around 90%. With the former version of the device, it was 70 %. And this is purely based on consumer's feedback. The first device, to give you the example, you have a top lit that was opening and you were removing the device like this. It was breaking so often that we were getting 30% of the devices were being replaced within the guaranteed period, the warranty period. With consumer feedback, we moved to the lateral opening. And nowadays, with this version, you don't have the lit anymore. It's this lit those folds, that is very flexible, doesn't break. You can remove it and change with different colors. So, people can customize their device. And the device is much more user friendly with recycled materials as well.

Joshua Jovanovic

It seems like IQOS developed to a lifestyle piece as you can customize it and design it fitting to your personality.

Rui Minhos

No, it's a funny thing because When you go to the cigarettes market or a cigarettes business, people like to show that I'm smoking Marlboro. This is not a brand that is so well known as Marlboro. So what people prefer with this brand is not showing that they are using IQOS. I can customize my device and have a different device. Even with this color, I can have a different lit with a different color that will differentiate me from my clique. As we start getting customers' feedback from me, why it's relevant to have different colors and so on, so forth. People like it. Obviously, being a consumer-centric organization is exactly this. You have to address consumer needs. But we learn a lot about…

Joshua Jovanovic

You'll probably continue to learn, right? I mean, it's still evolving.

Rui Minhos

Yes, we continue. Look, sometimes when you go For example, you go to a IQOS shop and people ask you, I would like to see the difference between cigarette, smoke, and their, so of these products. We have what we call a science machine where you can have cigarettes, you will have the cigarettes burning and the IQOS is heating at the same time. You have two glass tubes, and you see the impact on the filter pad of cigarettes, smoke, and IQOS. The reason why we did this, which is very simple from a technical point of view, is because people wanted to see the difference. If you show the difference in a PowerPoint or a picture or a filter pad that was already used in the past, it's not enough. They want to see it. They want to see a column full of smoke, a column with the aerosol, and in the end, the result. We are learning with this journey as well.

Joshua Jovanovic

Future Outlook – What do you see as the evolution beyond IQOS

Rui Minhos

Look, as I said, the company has a vision to have some revenues beyond tobacco nicotine. The KPI has been evolving. I think looking at the performance of IQOS across the globe and the fact that we are about to launch in the United States, I think for the time being, you have a lot to do and to prove in IQOS before we're thinking next step. Next step that is already thought and in our pipeline is going beyond to buy a nicotine. Pharma and health and well-being is an area of interest. Medicine or cannabis. I have seen a joint venture that was created last week between PMI, Vectora Pharma, and a Canadian company to celebrate studies and so on, so forth. I think it'd be interesting in the future. It's a top business the medical cannabis. I think the more we learn about the science behind and the rules that these products can have in terms of health and well-being, it will be interesting to see. We have, for example, the biggest market for medical cannabis is in Israel. Because due to this decades of military conflict they have, the majority of men and women, they need to have a period in the army. The majority of them, and I don't know exactly the data today, but when I was in scientific engagement in the past, the number of them taking cannabis with medical prescription is huge. The way they consume cannabis is with burning, smoking. They have a small pipe, but they smoke it. And we have call to actions from the Israeli government to develop heated consumables with medical cannabis, with cannabis for them to use on Icons. The reason why we have not done that is because, again, in terms of investment priority, we could not park our R&D program to focus on one market that will be Israel because it's not competing. The device can be the thing, but you cannot have contamination of our tobacco manufacturing lines with cannabis. Can you imagine we need to have full dedicated industrial development center, full dedicated facility to medical cannabis. This is a huge investment. Each factory can cost at least three €400 million. We cannot build just one for one single market. We need to have a prototype MVP. Do the studies like we did for IQOS. It will take five, six years. I know we had risk sharing. We do it with the Israeli government with their own investment, and we land our knowledge how to do it, but they didn't want that back that time. So again, I believe that the demand for using these platforms in other areas will come naturally as long as the product become more popular, and you have more regulatory decision It's like the ones we got from FDA already.

Joshua Jovanovic

Interesting, this brings us to the very last question. Do you expect a complete shift towards IQOS?

Rui Minhos

Absolutely. With no doubt, I think as we already said that with the proper regulatory and fiscal framework and governmental support, it's possible to stop selling cigarettes within 10 years. I will give you the example. Eu has the objective by 2040 to have tobacco-free Europe. What you call tobacco-free is smoking preference below 5%. If you use the same KPI to have a cigarettes-free market, having a cigarettes preference below 5%, Sweden which snoose they are already smoking free. We have 6 % of smoking preference. It won't be difficult with small nudge. Sometimes it's more than that informing people that look, this product is a soundful way to continue cigarettes smoking. I will be increasing 20% taxation on cigarettes. I will keep this one flat for three years for people to switch. And then you will see. I think it is pretty much feasible

Joshua Jovanovic

Well, I think the same actually, for example, in Europe. But I'm very interested how it will look like, for example, in Africa, where the infrastructure is not as developed as here.

Rui Minhos

I had a project with Rwanda. Rwanda, they have 7% back in 2019, 7% smoking prevalence. A significant share of a decent market coming from South Africa, so on, so forth. This was not in the numbers, governmental numbers. But the government from Rwanda said, look, the prospects of the Rwanda economy to grow is huge. People will have more purchase power. They will be looking forward to most developed countries' ways of living, and they look at Europe, for example, and Belgium, 20% of the people, smoke cigarettes. These guys, the moment that they have some money on their profits, they will start smoking because they believe that this will bring some status. I want to support that. I would like to help you Because you have this smoke-free vision to have Rwanda being the first smoke-free country in the world. The ask was, you set up a currently center in Rwanda, do you help us putting together a regulatory agency like FDA United States. We have plenty of students that would like to study in Europe. They will go for post-docs and so on and so forth. We had some post-doc

scholarships in R&D. They will learn how to do the science of these products. They will come back, they will work on FDA in Rwanda. I will give you the regulatory framework you want to put the company on the track that nobody will smoke cigarettes. They will use smoke-free products. We will generate the data you need about the effects of IQOS long term. I spent one week there. I started visiting some hospitals. In Rwanda, you have 40% of incidence of chronic bronchitis and pulmonary obstructive disorder. It doesn't make sense. If the guys are smoking only 7%, if the cigarettes smokers are 7%, and they have 40% of incidence of a major smoking-related disease, where this is coming from? And surprise, surprise. They cook with firewood.
So All in all particles they inhale all the crap coming from the wood. So they don't smoke, but they have related disease. It's very similar to smoking with the disease. And we abandon the program. We cannot set up any data or any studies in the environment that you have such a confounding factor. I can help I'm moving away to IQOS, but I cannot build kitchens for everybody. No. I don't want to start cooking with gas. You see? This is just to answer that in Africa, it's possible why not?

Joshua Jovanovic

Yeah. This is what I meant. I mean, it probably takes a longer way to reach the same goal.

Rui Minhos

Because the guys are open-minded, especially in countries where, for example, AIDS and other diseases. I have been having with a huge prevalence in the last year. They are open to hear about harm reduction. If people are not stopped smoking, if you give them a less harmful alternative, you will reduce the burden of smoking-related diseases. In countries like Africa, the harm reduction approach resonates a lot and there is other thing that they have that in Europe, you don't see often. They don't have ATOs, Anti-Tobacco Organizations, they're doing advocacy. Their opinion is less biased in terms of, Oh, this guy 30, 40 years ago, they did this, they did that. I don't know. They have also most pressing issues to deal with than with tobacco. If someone arrives there and say, You have your solution to reduce smoking-related diseases, and you don't need to do too much, you just need to adjust your regulatory framework, and I will train 20, 30 medical doctors to do this study. But the guy will say, Okay, very positive.
I will reduce my health care expenditure costs. I will train my people with the European standards. My credibility is already damaged because I'm low the country here in Africa, it won't hurt to have a project with PMI. I think, honestly, from a company point of view, what we need is to have an engine, infrastructure capable to have IQOS in more countries. Because having two business that will be easily separated, it's not easy. In the markets where we have more pricing power, which is the more developed countries, you are also the market That's

where we have the biggest regulatory constraints. It's difficult to have focus on less developed countries.

Joshua Jovanovic

Thank you very much for the entire interview. Thank you very much for two hours answering all those questions. It's been really interesting.