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**Possibilities of widespread application of responsible innovation in
less developed countries from the perspective of the young
generation**

Doctoral theses

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University of Szeged
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1. Significance and purpose of the research

Due to the characteristics of the 21st century, the necessity of innovation processes is unquestionable (Inzelt – Csonka 2014). Research, development, and innovation (RDI) processes generate significant changes that can affect many areas of our life. Its favorable effects can also be experienced at the level of households (time spent on transport is reduced, administration has become easier and faster, life has become simpler), at the level of companies (increased productivity, increase in market share, expansion of transport options) and at the level of macroeconomy (economic growth, increased competitiveness). These positive effects are usually immediately visible, directly perceptible, and popular among members of society, thanks to the fact that they move society forward and encourage continuous development. However, in addition to the positive effects of innovation, negative side effects and disadvantages can also be discovered, which in most cases may appear indirectly, usually not immediately, in some cases only after years. Therefore, they only became apparent after the introduction, in the long term, and they can exert their undesirable effects for several generations (for example, freon gases in cosmetic sprays have been damaging the ozone layer for decades). Many times, the negative consequences cannot be clearly assigned to a specific development. However, post-treatment can be much more expensive than preventive measures, not to mention possible social, ethical, and environmental damage. This is the reason why the only way to avoid undesirable consequences is if the researcher or innovator tries to predict the effects of the innovation, including possible negative effects. All of this poses a significant challenge to innovation management.

In recent decades, the demand that RDI processes should be made more open and inclusive to ensure a sustainable future has increasingly come to the fore. For this purpose, it would be important to involve all interested parties in the RDI process, during which, in addition to the traditional RDI players (researchers, entrepreneurs, political decisionmakers and financial organizations), citizens and civil society organizations should also be part of the processes (Wilsdon – Willis 2004).

This logic gave priority to the current scientific and practical concept, **responsible research and innovation (RRI)**, which is gaining more attention all over the world. RRI seeks to predict and evaluate possible consequences and social expectations related to research and innovation, with the aim of promoting the realization of inclusive and sustainable research and innovation (L'Astorina – Di Fiore 2017). Compared to the traditional RDI, the concept of responsible innovation covers possible future effects and pays attention to the reduction of

possible unintended negative effects of innovation. The way how the theoretical results obtained so far in connection with responsible research and innovation can be transferred into practical application, into everyday life, also raises many scientific and practical questions, a significant number of which also address innovation management issues.

In recent years, countless effective methods have been developed to integrate responsible innovation practices into everyday decisionmaking processes (Fisher et al. 2006, Felt et al. 2018, Pavie – Carthy 2015, Tyl et al. 2011, Yaghmaei – Van De Poel 2021, Pavie et al. 2014, Porcari et al. 2016, Fisher – Schuurbiens 2013, Fisher – Maricle 2015, Yaghmaei et al. 2019). However, most of them do not suit for the widespread application of the concept of responsible innovation. The main reason for this is, on the one hand, that in most cases the practical testing of the methods is still rudimentary, so there are no long-term results (Lukovics et al. 2017a, Lukovics et al. 2019). On the other hand, another significant problem is that most current tools are based on self-reflection and try to influence the moral convictions of researchers (Lehoux et al. 2020). Not to mention, that the majority of the methods have been tested and successfully applied in the academic sphere, which means that these methods in their current form are not suitable yet for the application among corporate actors, as they are not adapted to the special characteristics of the business sector (Jarmai et al. 2020). Considering this, the widespread introduction and application of responsible innovation is limited (Jarmai et al. 2020). This is the main reason why – with the help of current methods –, the widespread application of the approach of responsible innovation is extremely slow.

Given that responsible innovation was mainly developed and applied in developed and modern economies (Buzás – Lukovics 2019, Lukovics et al. 2017), special attention should be paid to the social, ethical, cultural and innovation characteristics of less developed countries (Lukovics et al. 2017). Several research has highlighted that the innovation environment can significantly influence the success of the introduction and application of responsible innovation (Lukovics – Fisher 2017, Macnaghten et al. 2014; Setiawan – Singh 2015, Voeten et al. 2015).

Although responsible innovation is mainly applied in the academic sphere, it is also increasingly emphasized in the business environment (Jarmai 2020, Lubberink et al. 2017). Currently, we have limited information on the application of responsible innovation in the business sector (Yaghmaei 2018). Implementing the concept of responsible innovation within the business sector can be challenging, as business actors have different characteristics and goals (Ko – Kim 2020, Lubberink et al. 2017, Schroeder 2020). On the one hand, regarding companies, motivation and willingness to apply the approach of responsible innovation may depend on many factors, such as political incentives, institutional behavior or even their

business model (Stahl 2013), so it is not enough to motivate the innovation actors and influence their moral sensibility. In many cases, the consideration of the social and environmental effects of innovation can be hindered by the pursuit of profit maximization (Blok – Lemmens 2015), thus, in case of companies, it is also worth keeping market motivations in mind. Countless studies have highlighted that companies would choose to apply responsible innovation in the hope of short-term and mainly economic benefits (Ko – Kim 2020, Schroeder 2020, Lukovics – Fisher 2017, Buzás – Lukovics 2019, Lukovics et al. 2017). Companies will only be interested in applying responsible innovation if consumers demand it. However, it is important for companies to signal to consumers in some form that they are innovating in the spirit of responsible innovation, since if this is not made visible to the consumer, then the application of responsible innovation cannot represent a distinctive advantage. Signalling theory can serve this purpose. Based on this, it is important to examine what preferences and attitudes consumers have concerning products made in the spirit of responsible innovation.

In my doctoral thesis, the aim is to find answer to this double problem: firstly, how to promote the RRI receptivity of companies and how to motivate them to apply the concept, and secondly, how to effectively apply the concept of responsible innovation in less developed regions. Given that the young generation represents the consumers of the future and that they are more open to new things, this age group represents the most ideal target group from the point of view of my research, that is why I focus on them during the doctoral thesis.

Based on this, **the main goal of the doctoral thesis is to reveal how responsible innovation can be widely applied in practice and what the young generation's willingness to pay and preference for products made in the spirit of responsible innovation are.**

The novelty and significance of the research lies in the fact that theoretical and practical experts and decisionmakers deals with responsible innovation approach from the perspective of companies and the academic sphere. On the other hand, no significant research has yet been done on how consumers feel about innovation outputs made in the light of responsible innovation, and how they would relate to them. However, mapping the approach of consumers is essential, since if there is no demand for RRI from their side, then companies will not be interested in the application of responsible innovation, which may result in the concept of responsible innovation not being widely spread in practice.

During the doctoral thesis, I aimed to test the following hypotheses:

Hypotheses 1: For the young generation, public engagement is important when creating innovative products.

Hypotheses 2: The young generation considers the social and environmental responsibility of companies important when making decisions related to the purchase of innovative products.

Hypotheses 3: For the young generation, the price is the most decisive factor when purchasing innovative products.

Hypotheses 4: A possible responsible innovation label influences the purchasing decisions of the young generation for innovative products.

Hypotheses 5: The application of a possible responsible innovation label affects the profit maximization goals of innovative companies.

2. The structure of the thesis

The structure of the doctoral dissertation can be divided into five large logical units. After the introduction, **I dedicate the first logical unit (chapter 2) to the description of innovation.** In this chapter, I make a literature review on the topic of innovation, during which I discuss in detail what innovation means, what types it has, what characterizes it, and what role it plays in our modern economies. Innovation, as the engine of the economy, is present in all areas of our lives. In the 21st century, the number of radical innovations has significantly increased, which poses new challenges to innovation management. Radical innovations include emerging technologies, which are important to mention. In connection with emerging technologies, the issue of responsibility and its management is a priority topic, which I will also cover during the chapter.

In the second logical unit of the doctoral dissertation (Chapter 3), I describe **the literature background of responsible innovation.** In this unit I introduce the concept of responsible innovation, the description of the main elements of the concept, as well as the key elements that determine responsible innovation, and the dimensions that help its practical implementation. In this chapter, I also present the antecedents of the development of responsible innovation. Responsible innovation is used more in the academic sphere, but it is gaining more and more attention among companies, so it is important to mention the role and characteristics of RRI in the business sector. At the end of the chapter, trends similar to responsible innovation are presented.

In the third logical unit (chapter 4), **the tools and methods promoting the implementation and application of responsible innovation are introduced,** with the aim of highlighting the main challenges that must be faced regarding the implementation of

responsible innovation. At the end of the chapter, I covered the application of a potential **responsible innovation signal**. Considering this, it is also important to talk about **signaling theory and consumer preferences**. Literature review about signaling theory, consumer preferences, its concept, and the results of empirical research are essential for achieving the goal of the dissertation, as well as for empirical research. I also highlighted the essential difference between revealed and declared preferences in the chapter, which is important because one of the limitations of our empirical research stems precisely from the fact that the answers given by the respondents, that is, the declared preferences, and the actions of real decision situations do not necessarily the same.

The fourth large logical unit (chapter 5) includes **the presentation of our previous empirical experiences**. Among the methods presented in chapter 4, Socio-Technical Integration Research (STIR) stands out, which formed the basis of previously conducted empirical research. During the research, we first tested the STIR methodology among young, future researchers working in a post-socialist innovation environment, and then, as part of another research, we conducted a research covering 7 post-socialist countries, when we examined the possibility of applying responsible innovation in different innovation environment. The results of the research highlighted that in the case of less developed countries, it is important to adapt the methodology to the special characteristics of the innovation environment.

The fifth and last large logical unit (chapter 6) before the summary aimed to highlight the background and the results of the empirical research of the doctoral thesis. In this chapter, I describe the purpose and methodology of the empirical research, the target group of the research and the method of data collection. To achieve the goal of the doctoral dissertation, I use several methodologies at the same time in order to outline a more comprehensive picture. Accordingly, I conducted a questionnaire survey, supplemented by a MaxDiff and a choice-based conjoint methodology. In the chapter, I describe the main results and correlations, and finally I highlight the limitations of the research and further potential future research directions.

3. Literature review

In the 21st century, the scale and speed of technological development brings new challenges (Csonka 2020). As a result of social and technological changes (e.g. digitization, Industry 4.0), innovation has gained new momentum and is characterized by new features

(Inzelt – Csonka 2018). As a result, we have witnessed huge changes in the field of research, development and innovation in recent years, most of which can be attributed to the technological explosion, the globalization of technology or the shortening of the technological life cycle (Trott 2005). The main question is no longer whether innovation is necessary, the question is more about how to carry out innovative activities that can help us cope with the changed innovation environment (Inzelt – Csonka 2014). Today, the main question is how RDI processes can be implemented in accordance with sustainability, ethical, social and economic aspects (Buzás – Lukovics 2015). From the end of the 20th century, the number of radical innovations increased, and with it the importance of the issue of responsibility also increased and came to the fore (Inzelt – Csonka 2018).

Innovation is necessarily accompanied by unforeseen risks and uncertainty, which can have a negative effect in the long term (Buzás – Lukovics 2015). This is especially true for radical innovations, the number of which has increased significantly in the 21st century (Inzelt – Csonka 2018). **To avoid the uncertain future events and possible negative consequences, one of the most significant scientific and practical concept, the approach of responsible research and innovation (RRI) emerged.**

The concept can be interpreted broadly, so different approaches have been defined. Stilgoe et al. (2013, p. 1570) define responsible innovation as *“taking care of the future through collective stewardship of science and innovation in the present”*. According to Chorus –van Wee–Zwart (2012) RRI is a process that minimizes the unintended side effects of innovation production and use, and also incorporates social, environmental and ethical aspects into the innovation process. The formulation most often cited and used in European policy is attributed to von Schomberg, who highlights that responsible innovation is *“a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)”* (von Schomberg 2011, p. 9). According to von Schomberg (2013), responsible innovation can take place by involving the widest possible range of stakeholders, within the framework of mutual responsibility, in order to reduce any negative effects of innovation that may arise. In von Schomberg's (2013) interpretation, innovation is therefore the only answer to overcoming social challenges. **In this doctoral thesis, we rely on this interpretation and concept of responsible research and innovation,** due to the fact that this definition best summarizes the individual elements found in the various

definitions, and on the other hand, the international literature and the European Commission increasingly cite this (Buzás – Lukovics 2015).

Beyond policy makers, the concept of RRI has attracted the interest of the scientific community. It is important to highlight that the concepts of responsible research and innovation (RRI) and responsible innovation (RI) are generally used synonymously, but there are some differences between the two concepts. RRI is mainly developed within an institutional framework by political decision-makers (e.g. the European Commission), while RI was created in an academic and scientific environment (Burget et al. 2017, Owen – Pansera 2019).

To make abstract definitions of RRI more concrete and practical, theorists and policy makers have sought to operationalize the concept in terms of content and process. The practical application of RRI, the implementation of responsible research and innovation entails a collective and continuous commitment, in which case the realization of 4 dimensions is necessary (Owen et al. 2013):

Anticipation: During the RDI processes in the spirit of responsible innovation, anticipation is the first step, during which the possible effects of the innovation are systematically considered, whether those effects are direct or indirect. During the anticipatory dimension, the most important task is to identify, describe and analyze planned and possibly arising unintended economic, social, environmental or other effects. Of course, positive effects can also be identified, but to avoid negative effects, the focus is on exploring these effects. It is important to emphasize that it is not a forecast but involves a more open consideration of events and outputs that may arise in the future, with regard to the identification and management of uncertainties. During the anticipatory dimension, the ultimate goal is to define the possible outcomes and try to answer the "what if" questions and systematically rethink our RDI processes.

Reflexivity: In contrast to the anticipatory dimension, which mainly focuses on assessing the possible consequences of innovations, reflexivity provides a comprehensive picture of the personal perspective and behavior of the innovator, which includes the individual's assumptions, knowledge base, represented values and goals. The purpose of this dimension is to try to determine the attitude, the framework and ideas of the researcher or innovator through which they conceptualize and interpret the RDI process and its possible consequences.

Deliberation/inclusion: The goal of the deliberative or inclusive dimension is to involve the widest possible range of society/public in the RDI processes. This includes actors

directly involved in RDI processes, members of society and all indirectly involved actors. At this stage of the process, the main goal is to comprehensively discuss the vision, goals, emerging issues, and dilemmas with stakeholders, which can be done through a public dialogue or even a debate process, during which the public and different stakeholders can share their own point of view about the innovation. If this dimension is successfully implemented, the involvement of the wider public can result in valuable, otherwise hard-to-reach information, which can support the legitimacy of decisions and help eliminate potential uncertainties and conflicts related to new technologies on the other.

Responsiveness: The purpose of the previously mentioned three dimensions is to explore, analyze and thereby improve RDI processes and results. On the other hand, during the responsive dimension, we focus on the ability to change routines, structures, and systems, that can help to adapt to changing circumstances and new opportunities.

Responsible research and innovation can be considered an umbrella term that includes several topics (in most cases, these are referred to as key elements). In order to make the implementation and application of RRI smoother and more understandable, the European Commission formulated 5 main key elements, the consideration of which can also help us to develop responsible research and innovation processes (EC 2014):

Public engagement: According to the European Commission, this key factor has a vital role, since its goal is to jointly shape the future by involving members of society and civil organizations. It is important to involve as many stakeholders as possible in the process of joint creation. Public engagement is a key element that corresponds to the third of the previously mentioned dimensions, the deliberative dimension.

Open access/science/innovation: This key element is aimed at making research data and results freely available and encouraging their reuse. The main idea is that the innovation process should be opened to all stakeholders, with a special emphasis on the involvement of end users, since the innovation process can work best when knowledge and ideas flow freely. Among the RRI dimensions, this key element can be compared mainly to the anticipation and reflective dimension, and it is also closely related to the deliberative dimension.

Gender equality: On the one hand, this key element refers to the creation of a gender balance within each research group, and on the other hand, it means focusing on the gender dimensions of RDI processes and their content.

Ethics: In order to properly address social challenges, research and innovation must respect fundamental rights and the highest ethical standards.

Science education: Under this key element, we can understand, on the one hand, the efforts made to make the scientific career more attractive, and on the other hand, the efforts to develop the general scientific literacy of the population and to increase the involvement of citizens in the scientific life.

The fact that a new kind of approach of innovation has emerged does not mean that innovation processes have been irresponsible, it only emphasizes that the negative effects of innovation on individuals, society and the environment have been taken into account less or not at all for the sake of economic growth and profit maximizing goals (Blok – Lemmens 2015). Responsibility can be interpreted as an extension of the concept of innovation, where responsible innovation can be understood as the sum of innovation and stakeholder involvement, while also taking into account ethical and social aspects (Blok – Lemmens 2015). Thanks to this extension, innovation processes will be better able to find a balance between economic profit, and social and environmental interests (Blok – Lemmens 2015).

4. Methodology of the doctoral thesis

In order to achieve the goal of the doctoral thesis, **to assess how responsible innovation can be widely applied, as well as what preferences the members of the young generation have for products made in the spirit of responsible innovation, it is necessary to examine what preferences young people have regarding RRI.** In accordance with this, I examined how the members of the young generation (Generation Z), from the point of view of consumers, feel about products and services made in the spirit of responsible innovation, and what factors they consider important during their purchases. I aimed to assess which product features are important to the younger generation and which ones are less important when a completely new product is launched, and what the usefulness is perceived by consumers. I also examined what product features consumers look for when purchasing a new product. During this research, I focused on assessing the purchasing preferences of the young generation and the level of usefulness they perceive.

During this research, the primary focus was directed towards Generation Z, encompassing an investigation into their consumption preferences. The selection of this demographic stems from its notable receptiveness to environmentally conscious and sustainable consumption practices, as well as its heightened inclination towards embracing innovation and novel experiences. The study sought to gain comprehensive insights into the specific preferences and patterns that characterize the consumption behaviors of Generation Z (Grail Research 2011, Pál – Töröcsik 2013).

The empirical research is built upon three main pillars, aiming to obtain a comprehensive understanding of the preferences of the younger generation regarding responsible innovation. Various methods were selected during the research, each serving distinct purposes and meeting specific expectations. The combined application of these diverse methods allows for a more intricate analysis of the target group's preferences, contributing to the formation of a more nuanced and comprehensive picture.

As a first step, a **questionnaire survey** was conducted with the aim of assessing the importance of key elements of responsible innovation (public engagement, ethics, and open innovation), as well as the significance of specific product attributes within these elements, in the decision-making process of the respondents. Our expectation regarding the results of the research was to understand the general importance attributed by members of the younger generation and, specifically, during their purchasing decisions, to the key elements of responsible innovation. Likert-scale questions were employed during the questionnaire survey to measure the strength of respondents' preferences. However, the questionnaire did not provide insights into which factors the respondents consider most and least important in their purchasing decisions. To address this gap, additional methods were employed.

During the questionnaire, we gained insights into the strength of preferences for key elements related to responsible innovation. However, we did not receive information regarding the most important product features for the younger generation and those they consider less important in their purchasing decisions. Additionally, we are interested in understanding the prioritization and ranking of these factors. To address this, we employed **MaxDiff analysis**. During the application of this method, respondents were required to select the most and least important product attributes. In contrast to the questionnaire-based approach, the MaxDiff analysis does not measure the strength of preferences using a numerical scale; instead, respondents are choosing from the options presented to them. Consequently, the potential for bias in mapping the preferences' order can be considered minimal. Through the MaxDiff analysis, we were able to identify the most and least important factors from the point of view

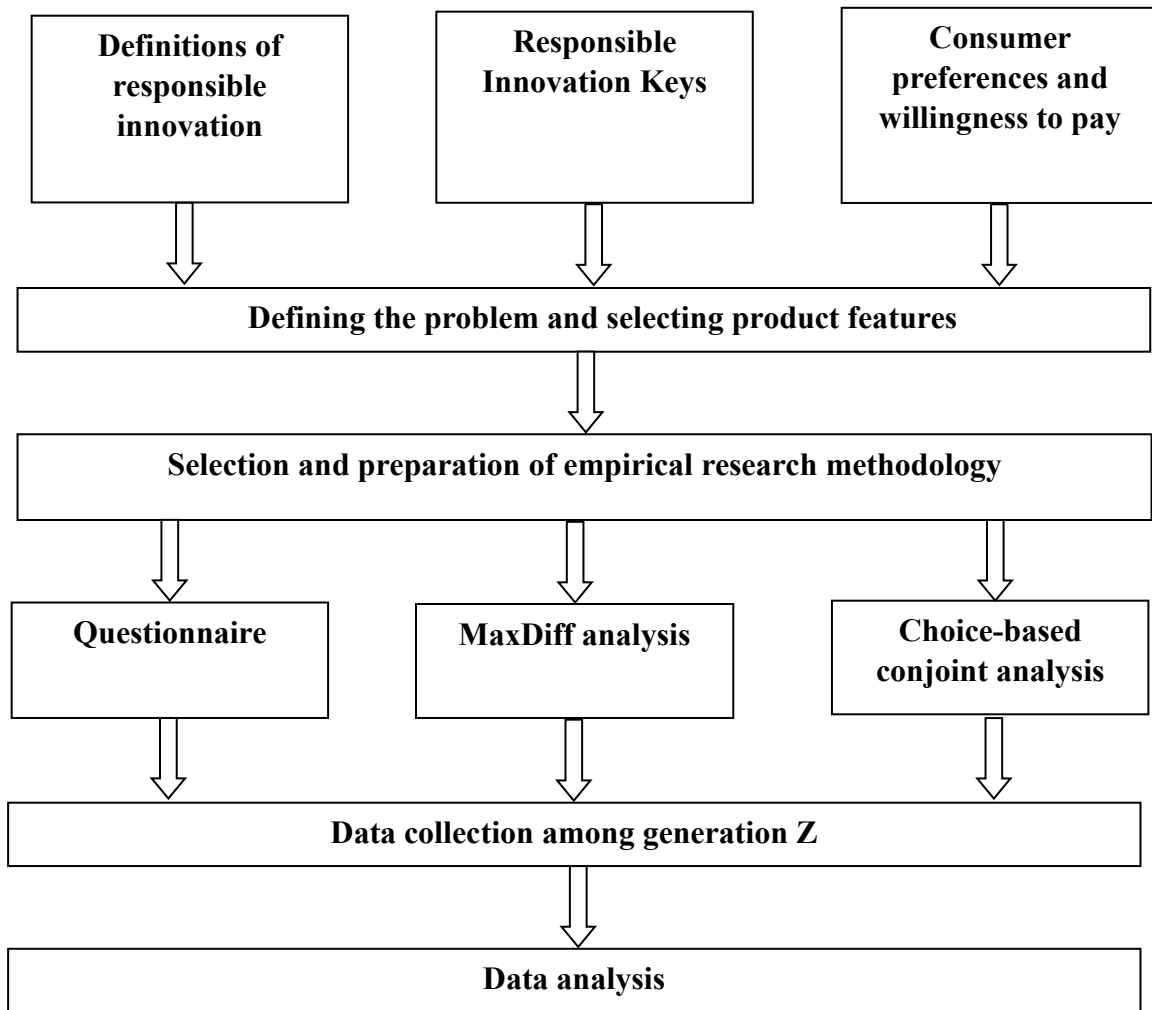
of the respondents. However, we did not receive information regarding the utility of individual product features from the respondents' perspective, and to what extent these features influence their purchasing decisions.

Building upon this, we augmented our primary research with a third pillar, employing **choice-based conjoint analysis**. The conjoint analysis aimed at gaining a deeper understanding of the preferences of the younger generation, which was not feasible through the questionnaire survey and MaxDiff analysis. Through this method, we could obtain a more comprehensive picture of respondents' preferences and the utilities associated with individual product features. This segment of our research aimed to uncover not only the preferences of the respondents but also the utility of specific product features and the impact of these features on purchasing decisions.

With the combined application of three methodologies, we obtained a comprehensive picture of the factors influencing purchasing decisions of the younger generation and their preferences for products created in the spirit of responsible innovation.

In summary, the methodology of the research is illustrated in the figure below (Figure 1).

Figure 1. Methodology of the research



Source: own construction

Data collection and recording are conducted with the assistance of Sawtooth Software. The collection of the answers took place under controlled conditions with personal presence in Szeged, during which the captured data is securely stored in the cloud using the software.

5. The most important results of the doctoral thesis

Based on the results of the empirical research, after testing the hypotheses described in the introduction, I came to the following conclusions:

Thesis 1: In addition to the engagement of society, the young generation considers the existence of ethical aspects and open access to be very important when creating innovative products.

During the empirical research, we examined the importance of involving society. Within this, we covered the involvement of consumers, experts, as well as universities and research institutes. Based on the results, we can highlight that it is important for members of the younger generation to involve consumers, experts, universities and research institutes in the RDI processes. Overall, 76% of the respondents regarded it important to involve the widest possible range of society in RDI processes. In response to the question of how much importance respondents place on purchasing products and services that take into account the opinions of a wide range of society, the majority indicated a preference for the presence of this factor, with 60% considering it rather important.

Based on the results of the questionnaire, it was observed that the younger generation finds it important to involve them as consumers in the research and innovation processes. The majority of respondents (89%) considered it important that consumer needs are assessed during the RDI processes of companies. In contrast, only 69% of respondents believed that asking for consumer opinions was an important factor in their purchasing decisions.

In terms of involving experts, we observed that 97% of the respondents believed it would be important for the RDI processes to take expert opinions into account. This proportion was 93% regarding how important they consider it to be when purchasing products that have been created with the involvement of experts.

In connection with cooperation with universities and research institutes, we found that it is a less important factor for the young generation (proved to be important in 64%) compared to the involvement of consumers and experts.

In the context of public engagement, informing consumers holds significant importance. The younger generation considers it important (61%) for companies to provide them with information regarding the development of products and services. The results also showed that 82% of the younger generation thought it important to ask their opinion about the characteristics of innovative products. 73% also thought it was important to use products and services during their purchases in which consumer needs were also taken into account.

In the case of conjoint analysis, we investigated the usefulness of individual product features for the young generation. When involving society, we found that it is not the most important aspect for the young generation (responsibility for the environment and society turned out to be more important). However, they consider it important that companies also involve

members of society in the RDI processes. And, besides the developers, at least to a small extent, members of society are also asked about the properties of the products. Based on the preferences of the young generation, it can be highlighted that the possibility that only developers participate in RDI processes is not an acceptable alternative at all.

Regarding accessibility to RDI data and informing consumers, members of the younger generation believe it would be important for at least some of the research data to be accessible, and they completely reject the idea of no data being made available to them at all.

Based on the empirical results, it can be concluded that among the key elements of responsible innovation, not only public engagement, but also the importance of ethical behavior and innovation processes were examined across several factors during the research. We explored the role of animal testing, compliance with EU ethical standards, environmental considerations, as well as perceptions of vegan, organic, child labor-free, and fair-trade products.

Based on the results of the questionnaire survey, it is evident that the respondents considered it very important for the RDI processes to take place within ethical frameworks. Members of the younger generation expressed their preferences regarding the use of animal testing, with 82% indicating a preference for products and services to be produced without the use of animal testing. In terms of purchasing decisions, 76% considered it important to choose products and services that have not been tested on animals.

With the help of the questionnaire, we also obtained information indicating that it is important for the younger generation (88%) that companies comply with the ethical standards set by the EU during the production of products and services. Furthermore, 85% of respondents expressed the importance of choosing such products and services during their purchases.

During the questionnaire, the younger generation expressed their opinion that it is a very important factor (95%) that the production of products and services does not harm the environment, and that companies give special attention to environmental protection. They also pay attention to this aspect during their purchasing decisions (92% consider it important).

During the MaxDiff analysis, we observed that, in terms of preference ranking, environmentally friendly, child labor-free, sustainable, and cruelty-free products and services ranked highest. However, vegan, organic, and fair-trade product features were considered less important. We examined the results based on demographic data and found that for female respondents, vegan products were the most important, followed by cruelty-free and child labor-free products. For males the brand, ease of use, price, and safety proved to be the most important features.

During the conjoint analysis, members of the younger generation perceived environmental impact and cruelty-free product features as the most important factors. The research highlighted that cruelty-free and environmentally friendly innovation processes are highly influential for the younger generation. These factors are considered among the most crucial when making purchasing decisions. It can be stated that, for the participants in the study, animal testing is entirely unacceptable, and they unequivocally reject it. Regarding environmental considerations, only environmentally friendly or neutral alternatives are deemed acceptable for them.

Regarding open access, it can also be stated that, during the questionnaire, research data accessibility, consumer informing, consideration of consumer opinions, and the quantity of tests were deemed more important for the surveyed youth. According to the conjoint analysis, the accessibility of RDI data is not the most decisive factor for the younger generation, but they believe it would be important for at least some of the research data to be accessible. They completely reject the idea of no data being made available to them at all.

The results of empirical research indicate that involvement of the society is a highly important factor for the younger generation. However, in addition to this, ethics and open access have also proven to be significant. Based on the above, we accept the hypothesis, with the addition that beyond public engagement, ethics and open access also have a positive impact on consumer decisions. The results show that the public engagement is of outstanding importance, it is already an essential factor for the young generation to ask their opinion during innovation processes, as well as to involve the widest possible range of stakeholders, thus laying the foundation for the socially desirable and socially accepted innovation results. Overall, based on the results of the questionnaire, the involvement of consumers and experts can be considered of particular importance for the young generation. They also consider it an essential element to be able to express their opinion regarding innovative products, and for companies to take them into account during the RDI processes, as well as to comply with ethical standards.

Thesis 2: The young generation considers the social and environmental responsibility of companies to be particularly important when making decisions related to the purchase of innovative products.

The results of our empirical research confirmed that environmental and societal awareness plays a significant role in the purchasing decisions of the younger generation. During the questionnaire, it was observed that considering environmental impacts is extremely

important for members of the younger generation, as 95% of them believed it is crucial for companies to prioritize environmental protection in their RDI processes.

Respondents expressed that it is very important to them (92%) that companies prioritize environmental and societal responsibility in the production of products and services. In the spirit of environmental and societal responsibility, it is of outstanding importance for companies to ensure an adequate quantity of tests during the innovation processes. This is vital for guaranteeing sustainable RDI outcomes and aligning with the interests of the environment and society. In this regard, it can be observed that most respondents find it important (94%) for a product to undergo as many testing processes as possible before entering the market.

Similar results were obtained during the MaxDiff analysis. Prioritizing environmental and societal concerns, as well as sustainability, emerged as important factors from the perspective of the younger generation.

In case of conjoint analysis, considering environmental impacts was of primary importance, and the surveyed young individuals proved to be completely dismissive of environmentally harmful products. Regarding the number of tests, it can be stated that they expect at least average testing due to the interests of the environment and society, and below average testing is entirely unacceptable to them.

Based on the results, we accept the hypothesis since both the literature and the findings of the primary research indicate that the younger generation pays special attention to choosing products and services whose production processes consider societal and environmental values.

Thesis 3: For the younger generation, environmental and societal responsibility is a more important factor than price in the purchasing decisions of innovative products.

During the empirical research, we did not specifically address price in the case of the questionnaire survey; therefore, we primarily rely on the results of MaxDiff and conjoint analysis. Based on the findings of the primary research, it is evident that, during MaxDiff analysis, the younger generation clearly considered price as the most crucial factor. More than 17% of the respondents indicated that price determines their purchasing decisions. However, environmentally friendly and sustainable product features closely followed price in the order of importance. The results also indicate that, for females, environmental factors prove to be more important than price. However, for males, price is among the primary considerations. A notable characteristic of the research subjects is that, as university students, the majority either has no income or a relatively low one. This suggests that those in the lowest income category attach much greater significance to price.

During the conjoint analysis, we also examined the role of price, revealing that environmental considerations and ethical behavior (animal-testing-free RDI processes) play a more significant role than price. According to the results, for the younger generation, the lowest price would be the most preferred option, but they are willing to pay a higher amount in certain cases. However, they would not accept the highest price category. The findings suggest that members of the younger generation are willing to accept a higher price for products and services that are free from animal testing. The same trend was observed for environmentally friendly products, where they would be willing to choose a more environmentally friendly alternative even at a higher price.

Based on the primary research, I reject the hypothesis, as the results indicate that, for the younger generation, price remains a highly influential factor in purchasing decisions. However, there is a higher preference level for environmental and social responsibility.

Thesis 4: A potential responsible innovation label positively influences the purchasing decisions of the younger generation regarding innovative products.

Based on the empirical research results, we observe that, for the younger generation, informing consumers continuously about the characteristics of innovation outputs during the production of products and services proved to be a more important factor in 61% of cases. Consequently, the use of innovation indicator labels may be advantageous for innovative products.

From the results obtained during the conjoint analysis, it is evident that indicating the innovative features of the product on the packaging did not prove to be the most crucial factor for the younger generation. According to the respondents' answers, there was no significant effect observed for indicating the innovative features on the packaging in the case of product characteristics. However, these findings are contradicted by the fact that environmentally friendly, cruelty-free, vegan, and organic products were deemed important factors for the younger generation. These product characteristics become known to consumers only when companies signal them in some form, which is facilitated by signaling theory and various labels. Thus, it is possible that consumers take these signals into account, even if not consciously.

Based on the above, I accept the hypothesis. Although representatives of the younger generation did not directly perceive the application of labels on product packaging as important, they were not rejecting either; instead, I received neutral responses. During the primary research, concerning preferences for individual product characteristics (such as environmentally friendly, organic, cruelty-free), it can be stated that manufacturers generally

signal these product characteristics on the products. Consumers can identify their preferred product characteristics based on these signals, however often not consciously.

Thesis 5: The application of a potential responsible innovation label for the profit-maximization purposes of innovative companies has a positive impact because market actors are willing to offset the cost of RRI in their purchases.

The results of the primary research have shed light on the importance of the existence of responsible research and innovation processes for the younger generation. The findings have highlighted that three key elements of responsible innovation—ethics, societal engagement, and open access—are of paramount significance for the youth. Accordingly, members of the younger generation expect companies to involve a broad spectrum of society (including consumers, experts, decision-makers, etc.) in their RDI processes, seeking their opinions to ensure socially desirable outcomes. Furthermore, they consider adherence to ethical standards as crucial, in line with sustainability and a sense of responsibility towards the environment and society. Lastly, in the spirit of sustainability and societal responsibility, they regard compliance with ethical standards as of paramount importance. Finally, representatives of the younger generation would also anticipate a commitment to open access, transparency, i.e., the extensive disclosure of research data. In summary, the data from the primary research have revealed that it is an important expectation for the younger generation that companies conduct their RDI processes in the spirit of responsible research and innovation.

Considering this, I accept the hypothesis; that is, it would be beneficial for companies to switch to processes centered around responsible innovation, as there is a demand for this from consumers. However, it is important that until companies do not communicate their responsible innovation processes to consumers, they may not necessarily realize the associated benefits. Therefore, it is recommended to introduce and implement a responsible innovation label that, on an economic basis, concurrently enables compliance with environmental and social expectations alongside with profit maximization goals.

The aim of the doctoral thesis was to assess how and under what conditions responsible innovation could be more widely applied, as well as to identify the preferences of the younger generation towards products developed in the spirit of responsible innovation. For companies wishing to adopt responsible research and innovation in their research, development, and innovation processes, it is encouraging news that, based on the examination of consumer preferences, consumers would be open to responsible innovation. The results draw attention to

the potential distinct advantage for companies in implementing responsible research and innovation, particularly when communicated to consumers. Consequently, the application of a potential responsible innovation label could provide a solution to the apparent conflict between a company's profit maximization goals and social responsibility. Products labeled with RRI might attract consumers willing to incur additional costs, thus allowing companies to pursue RRI without compromising on higher profits due to associated increased costs.

Furthermore, by employing the product labeling, we would not only appeal to the moral sensitivity of researchers and innovators but also provide economic motivation for companies. This means that companies focused on profit maximization as a primary aspect of their business policy, as well as those facing challenges in everyday survival (especially SMEs and businesses in less developed regions), might find interest in implementing responsible research and innovation. The application of RRI could lead to additional resources in the long run for these companies.

The results of the doctoral thesis suggest further research directions that worth investigating in the future. The practical application of responsible innovation, and experiments examining it from the consumer perspective are still limited. The findings indicate a consumer demand for responsible research and innovation, but it raises the question of how open the corporate side is to this demand. The results of the doctoral thesis can provide a suitable foundation for additional research directions. It would be worthwhile in the future to investigate the potential introduction of a responsible innovation label from the corporate perspective.

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