

Stakeholder contributions to commercialization and market creation of a radical innovation: bridging the micro- and macro levels

Anil Engez and Leena Aarikka-Stenroos

Unit of Industrial Engineering and Management, Tampere University, Tampere, Finland

Abstract

Purpose – Successful commercialization is crucial to innovative firms, but further investigation is needed on how diverse stakeholders can contribute to the commercialization of a radical innovation that requires particular market creation support. This paper aims to, therefore, analyze the key stakeholders and their contributive activities in commercialization and market creation, particularly in the case of radical innovations.

Design/methodology/approach – This study relies on qualitative research design including interviews with key stakeholders, such as regulators, scientists, experts, licensing partners, core company representatives and extensive secondary data. This single-case study concerns a functional food product, which is a radical innovation requiring the development of a novel product category positioned between the food and medicine categories in global market settings. Since its market launch in 1995, the involvement of multiple stakeholders was needed for its successful commercialization in over 30 countries.

Findings – Results uncover the contributions of diverse stakeholders to commercialization and market creation, particularly of radical innovation. Stakeholders performed market creation activities such as regulating the marketing and labeling of food products, conducting safety assessments, revealing and validating the positive health effects of the novelty and raising awareness of healthy living and cardiovascular health. The commercialization activities included distributing the products overseas, applying the ingredient to different food products and making the products available for users.

Research limitations/implications – This single-case study provides an overview of the positive stakeholder activities with contributions to market creation and commercialization of functional food innovations. Although the user perspective was not included in the empirical part of this study because of our focus on B2B actors, users of the innovation can contribute to R&D activities to a great extent.

Originality/value – The developed framework of stakeholders' contributive activities in radical innovation commercialization and market creation contributes to literature discussing market creation as well as commercialization within the marketing and innovation management research fields. This work also generates practical advice for managers who commercialize (radical) innovations.

Keywords Market creation, Commercialization, Innovation management, Stakeholders, Functional food, Radical innovation

Paper type Research paper

1. Introduction

The improvements in existing processes, services or products can be regarded as innovation, and it involves development, improvement and change, following the idea generation in an organization (O'Sullivan and Dooley, 2008). Successful commercialization is crucial for all innovative firms to stay in business and be profitable (Aarikka-Stenroos and Sandberg, 2012; Lin *et al.*, 2015; Marx and Hsu, 2015). It often requires involving diverse stakeholders as they can support the innovator firm in taking the innovation to the market (Aarikka-Stenroos *et al.*, 2017; Aarikka-Stenroos *et al.*, 2014; Reypens *et al.*, 2016). Commercialization is considered to be the final innovation

activity in the innovation process, defined as the dissemination of the innovation to the market(s) and generating profits because of this dissemination (Costa *et al.*, 2004; Crawford, 2008). Markets are the outcomes of intentional and designed actions for innovations to emerge, which require firms to engage in market-

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shaping activities in their favor (Fehrer *et al.*, 2020; Lipnickas *et al.*, 2020; Nenonen *et al.*, 2019). Multiple studies in the field of industrial, B2B and innovation marketing acknowledge the relevance of stakeholders throughout the innovation process (Aarikka-Stenroos *et al.*, 2014; Canning and Szmigin, 2016; Hao and Feng, 2016; Kazadi *et al.*, 2016; Lievens and Blažević, 2021; Lim *et al.*, 2017; Manser *et al.*, 2016; Reypens *et al.*, 2016). It is emphasized that the collaboration among stakeholders can boost the innovation diffusion, refine the innovation process and contribute to the development and implementation of innovations (Makkonen and Johnston, 2014; Schiavone and Simoni, 2019; Widén *et al.*, 2014). However, there is still a lack of empirical-based understanding of how diverse stakeholders can advance successful commercialization and market creation of radical innovations. To respond to this gap in the literature, the objective of this study is to identify the key stakeholders and their contributive activities for commercialization and market creation of a radical innovation. Our context for radical innovation is the functional food market.

Stakeholders are defined as “groups and individuals who have a stake in the success or failure of an organization” (Freeman *et al.*, 2010). Extant studies on stakeholders’ relevant inputs to innovation have acknowledged that these inputs can be studied from the perspective of commercialization of the particular innovation as well as from market creation and development of new business fields perspective (Aarikka-Stenroos and Lehtimäki, 2014; Hietanen and Rokka, 2015; Hillebrand *et al.*, 2015; Manser *et al.*, 2016; Nenonen *et al.*, 2019; O’Connor and Rice, 2013). Particularly in the case of radical innovations, for which markets do not yet exist and market structures and configurations are changing or developing, the line between commercialization and market creation can be thin and blurred (Aarikka-Stenroos and Lehtimäki, 2014; Möller, 2010). Radical innovations are developed with the aim of commercialization, and they are innovations that lead to the transformation of existing markets and creation of new markets (Leifer *et al.*, 2000). We argue that in order for a radical innovation to be commercialized and reach its users, the market actors should be aligned, existing market structures should be modified and a new market should be created. Commercialization is defined as a set of decisions that influence the product’s introduction and position in a market (Aarikka-Stenroos and Lehtimäki, 2014; Hultink *et al.*, 1997). Therefore, it is crucial to highlight the market creation aspect: the foundation of market creation lies in the interplay between the actors on the micro–meso levels and the market configuration on the macro–meso levels, which explains how markets are shaped and developed (Peters *et al.*, 2020; Storbacka and Nenonen, 2011; Windahl *et al.*, 2020). Microlevel includes the organizational and individual level and examines the smallest levels of interaction. Mesolevel includes established business fields and networks that determine technological trajectories through the activity patterns of techno-economic and social actors. Macrolevel includes sociopolitical actors such as nation states and political coalitions that influence slowly evolving sociotechnical landscapes (Möller, 2010). The focus of commercialization research is inherently on the micro- and mesolevels, as it examines an innovator company’s attempts to take a novelty to the market where stakeholders play an important role (Aarikka-Stenroos *et al.*, 2017; Aarikka-Stenroos *et al.*, 2014; Chiesa and Frattoni, 2011; Corsaro *et al.*, 2012; Driessen and Hillebrand, 2013; Nieto and Santamaría, 2007). Market creation

research, instead, applies a macro and mesolevels approach as it examines the market as a dynamic evolving structure that is modified when innovator firms introduce novelties in collaboration with stakeholders (Fehrer *et al.*, 2020; Lipnickas *et al.*, 2020; Nenonen *et al.*, 2019). Such dynamics can be seen where a new network of stakeholders such as codevelopment partners, distribution channel agents and ultimate users emerge (O’Connor and Rice, 2013; Sarasvathy and Dew, 2005). From this discussion, the interplay between commercialization and market creation comes into play.

The actors who are already embedded in an existing market structure can support the creation of a new market that is needed for the commercialization of a radical innovation, by companies. To succeed in this, apart from improving innovation’s technical performance, the focus should also be on assessing innovation’s readiness and match with the market. Support from diverse market actors, that is, stakeholders, such as value chain actors, regulators, experts, researchers and public organizations can help an innovator firm not only in successfully developing an innovation but also in enabling it on the market. For instance, Tesla created a new electric vehicle market by building the product and the required value chain for producing the batteries to run the vehicle, setting up compatible charging stations as well as the self-driving computer control systems. Not only it created a product but also the complementary necessities to create a new market and commercialize this radical innovation, which required the involvement of various types of stakeholders in the value chain. By understanding the full diversity of stakeholders and their contribution potential to commercialization and market creation, an innovator company can engage its stakeholders and align its goals with them. To address this objective, we present the research question of the study:

RQ. How do stakeholders contribute to commercialization and market creation?

To answer this question, we will map both the diverse stakeholders and their contributive activities in the commercialization of the focal innovation at microlevel and related market creation at macrolevel and their interlinkages.

We conduct a qualitative study piecing together the relevant literature on commercialization, market creation and the stakeholder approach and empirical based knowledge from a single-case study including versatile stakeholders (regulators, scientists, experts, business partners, core company representatives) and extensive secondary data. The single-case study concerns a functional food product, which is a radical innovation requiring the development of a novel product category between food and medicine categories in global market settings. Since its market launch in 1995, the involvement of many stakeholders was needed for its successful commercialization in over 30 countries. Single-case studies provide an empirically rich, holistic account of specific phenomena (Yin, 2003), and therefore, they allow researchers to examine stakeholder activities in more depth. The study contributes to the discussion on the stakeholder activities for commercialization and market creation of radical innovations especially from the perspective of the functional food context. The study also contributes to the market creation literature, innovation marketing and commercialization literature and to the stakeholders’ contributions to innovation development.

Functional food is defined to be any modified food or food ingredient that may provide a health benefit and reduce the risk of disease beyond the traditional nutrients it contains (Bloch and Thomson, 1995; Heasman and Mellentin, 2001). Industries such as medical equipment or functional food involve sensitive elements and typically encounter strict regulations because of primary health concerns. This aspect lets us consider a wide spectrum of stakeholders, including regulators and scientists involved in the study, which increases the stakeholder diversity and thus provides different perspectives on commercialization and market creation activities.

This work is structured as follows: following this introduction, relevant literature on commercialization, market creation and the stakeholder approach to innovation are presented in Section 2. In Section 3, the research methodology, the overview of the research context and the radical innovation case are covered. In Section 4, stakeholders in the functional food industry and their activities in commercialization and market creation are presented. In Section 5, the summary of the results are presented. In Section 6, we conclude the paper, discuss our theoretical contributions and managerial implications, and present the limitations and directions for future research.

2. Theoretical background

In this section, we present our theoretical building blocks, starting from commercialization and market creation and their activities and then show how stakeholders are seen to be engaged in such activities, in the light of the extant research knowledge.

2.1 Commercialization of radical innovation driven by a company – microlevel approach

Commercialization involves marketing communications, internal training, global launch and distribution (Chiesa and Frattini, 2011; Guiltinan, 1999; Hultink *et al.*, 1997; Jolly, 1997). O'Connor and Rice (2013) argue that one part of the commercialization process is the creation of a new business, which may include new markets, new revenue models and new partners. Commercialization process of a radical innovation starts with the innovator firm and develops as other actors are involved to shape a new market that is needed for the radical innovation. Regardless of the success potential of the innovation, all companies need support from their industrial and innovation networks to execute an effective commercialization process (Aarikka-Stenroos *et al.*, 2014). As the timing of setting up the relationships is essential in the commercialization process, it is advised that firms start building up relationships in advance, constantly seek feedback, work with partners and share resources (Perks and Moxey, 2011). The key commercialization activities of the innovator firm are listed as:

- planning the timing of the innovation's preannouncement and launch;
- forming long-term partnerships with critical actors in the network to disperse innovation tasks and resources;
- targeting the innovation at any specific segment;
- facilitating adoption by changing customers' mindsets favorably toward the innovation;
- creating awareness and educating the market;

- designing, configuring and positioning the innovation and its functionalities in a way that it meets early adopters' expectations; and
- launching the product only when the development of the product configuration is complete (Aarikka-Stenroos and Lehtimäki, 2014; Chiesa and Frattini, 2011; Perks and Moxey, 2011).

2.2 Market creation driven by diverse stakeholders – macrolevel approach

Innovation and particularly radical innovation trigger and anticipate changes in the market structure (Storbacka and Nenonen, 2011). New business fields around innovations emerge, as discussed by Möller (2010) with the example of the emergence of functional foods based on biotechnology, in comparison with traditional food networks. The actors and stakeholders in such settings should be able to perceive, interpret and construct the meaning of an emerging business landscape for markets to be created (Weick, 1995).

The emergence of a new business field deals with two aspects: exploring for future business in a changing environment and the construction and communication of a development agenda, targeting commercial applications. The business fields framework portrays sociotechnological structures that facilitate the emergence of markets (Möller, 2010). These structures are explained through macro-meso-microlevel layers. The macrolevel includes public authorities, political agents and cultural value systems, which influences the emergence of new industries through regulatory and policy support (Georgallis *et al.*, 2019). The mesolevel includes established business fields where the path to new markets is developed through evolving knowledge bases and activity patterns of actors, which modifies the macrolevel landscape. Microlevel has an influence on changes in the current established business fields. The actors who are involved in science and technology-based innovation activity are regarded as innovation niches who act as incubators for radical innovations and provide opportunities for radical knowledge creation. Innovation niches prompt changes at the macrolevel regarding regulations and policies. Proactive companies intentionally influence innovation niches to change the meso- and macrolevels to construct new markets. However, the markets might not necessarily evolve as managers expect, because of uncertainties in the process (O'Connor and Rice, 2013) and collective action problems (Struben *et al.*, 2020). The market creation activities are listed as:

- formulating unique technological designs and commercially viable product applications;
- influencing financial institutions, business partners, component and system suppliers and pilot customers on the value-creation potential of the new application concept;
- scaling up production and distribution networks;
- providing important regulatory rules and technological standards;
- forming collaborative networks;
- fostering new resource linkages among stakeholders to improve value creation and shape the market; and
- influencing the actions of legislators and regulators for ensuring compliance with law (Kaartemo *et al.*, 2020; Möller, 2010; Nenonen *et al.*, 2019; O'Connor and Rice, 2013).

Diverse stakeholders are needed to undertake the market creation activities. As markets are dynamic structures that are intentionally initiated by market actors (Storbacka and Nenonen, 2011), it is important to consider the diverse stakeholders who can shape those structures and thus make the market structure more favorable for innovation commercialization.

2.3 Stakeholders contributing to innovation via commercialization and market creation support

Next, we build an initial understanding of how stakeholders can contribute to market creation of innovation and commercialization. According to the well-established stakeholder theory (Freeman, 1984), stakeholders include diverse groups or individuals involved in achieving an organization's objectives. Studies applying the stakeholder approach to innovation development (Driessen and Hillebrand, 2013) and commercialization (Aarikka-Stenroos *et al.*, 2014) have identified diverse contributive stakeholders. These are listed as employees, the mass of users and customers (lead users, boundary spanners and communities), suppliers, manufacturers, media, universities, public organizations, expert organizations, investors, financiers, competitors, communities, policymakers, regulators, governmental bodies, political groups, trade associations and trade unions, who can contribute by facilitating and accelerating further adoption, performing practical commercialization tasks and creating markets for innovations.

Regarding market creation for innovation, Kaartemo *et al.* (2020) discuss indirectly how stakeholders can contribute via institutional work, for example, by rule and price setting, generic campaigning and defining market boundaries and terms. Particularly in complex social and political contexts, the significance of the collaboration of multiple stakeholders in market creation has been pointed out by numerous scholars (Anderson and Gatignon, 2008; Hietanen and Rokka, 2015; Humphreys, 2010). Although collaboration is emphasized for market creation, the process may be hindered by prominent firms that dominate their industry that fail to come to an agreement on certain issues because of differing interests and backgrounds. This is especially relevant for markets that are emerging at the convergence of distinct industries and for firms that have no prior or inadequate experience of inter-industry cooperation (Ozcan and Santos, 2015).

Humphreys (2010) argues that new market creation is a political and social process, which is affected by the external environment of the firm or industry. To influence this external environment consisting of divergent stakeholders, economic, psychological, political and public relations related skills are required to address the needs and concerns of each stakeholder group (Freeman, 1984). Changing the regulatory, cultural-cognitive and normative structures by facilitating the constant flow of information can lead to the legitimization of new market creation (Humphreys, 2010; Kim and Mauborgne, 1999). Legitimation here means the process of making a practice or institution socially, culturally, and politically acceptable (Suchman, 1995). Transforming the regulatory structure requires a shift in the rule-setting and monitoring activities of authorities, while changing the cultural-cognitive structure implies shifting the taken-for-granted understandings about an organization or innovation. Lastly, changing the normative structure involves changing the norms and values in the social environment (Humphreys, 2010). To change these structures,

collective action is needed that paves the way to market formation (Lee *et al.*, 2018).

3. Research methodology

3.1 Research design and the case

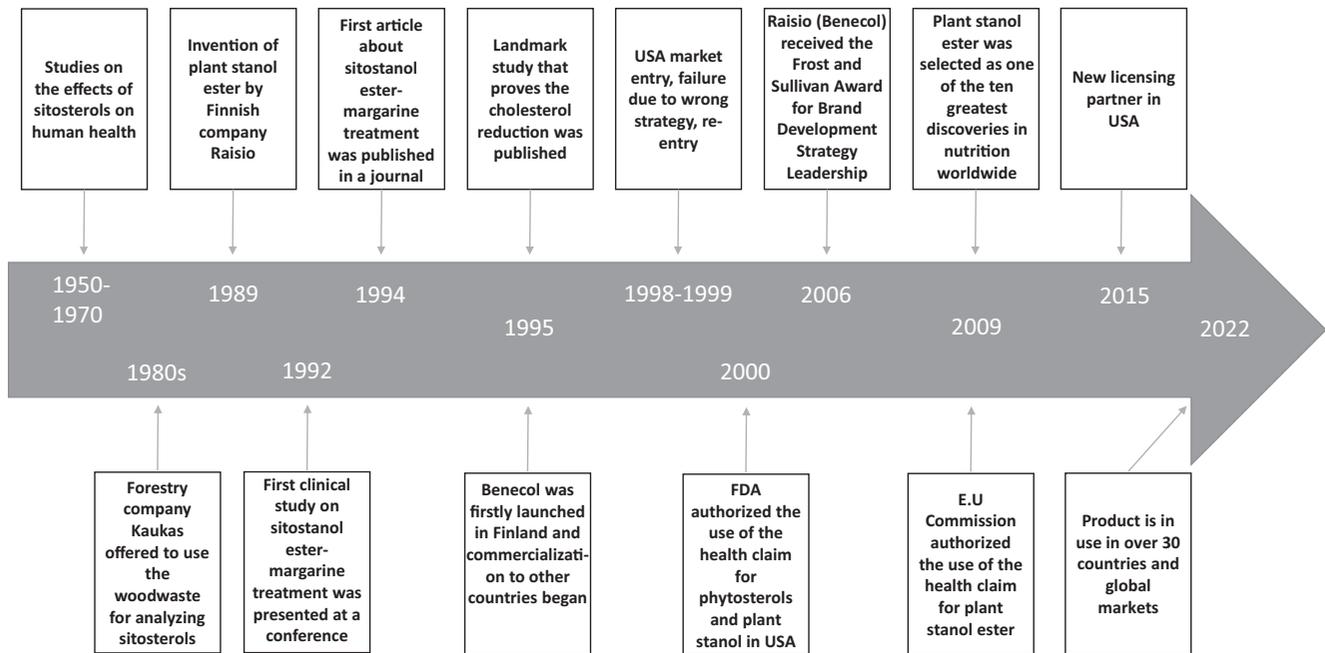
We have chosen and studied a radical innovation case, following the procedure of theoretical sampling (Patton, 1990) by analyzing a functional food innovation – a novel product category between food and medicine. We examined the commercialization activities by the innovator company, the stakeholders involved in related activities as well as market creation that was needed for a “novel to the world” innovation. Functional food has been defined to be any modified food or food ingredient that may provide a health benefit and reduce the risk of disease beyond the traditional nutrients it contains (Bloch and Thomson, 1995). The innovation in our case is a technology-based healthy food innovation that was launched by Raisio in 1995 and has been commercialized with the brand name Benecol. It is a vegetable fat spread that lowers cholesterol with its unique ingredient, plant stanol ester, that aims the prevention of cardiovascular diseases and is therefore categorized as a functional food in the markets. As the innovation concerns human health, a multitude of stakeholders was involved in its commercialization and market creation process over the years. Many medical studies and experiments were conducted by scientists and primary health-care actors to test the viability and positive health effects of the main ingredient (Miettinen *et al.*, 1995; Athyros *et al.*, 2011).

In this study, qualitative analysis of a single case and multisourcing methodology (interviews and extensive secondary data) are used. The case can also be considered to be a distinctive case (Patton, 1990), as plant stanols/sterols were among the ten greatest innovations in nutritional research introduced in the years between 1976 and 2006 (Katan *et al.*, 2009). Benecol has been one of the first functional food products that created a completely new market category and attracted many licensing partners from around the world; thus, it is an optimal case to study commercialization and market creation facilitated by stakeholders to form a totally new product category. The case allows us to examine both microlevel commercialization activities by the innovator company (via detailed interviews with top management) and macrolevel market creation activities by stakeholders (via documents and interviews with stakeholders) and to map stakeholder contributions that occurred during a long timeframe. The case applies historical analysis that allows examining large-scale phenomena such as market creation. The timeline of the important events in Benecol's commercialization process and related market creation is illustrated in Figure 1.

3.2 Data gathering

Multisourcing and various data collection methods were used to capture the viewpoints of both business actors and societally relevant stakeholders. The primary data includes semistructured interviews with open-ended questions to internal and external stakeholders. As secondary data, an extensive set of over 100 documents are examined: media articles on Benecol's commercialization, market creation and stakeholders; scientific research on plant stanols

Figure 1 Timeline of the important events in Benecol’s commercialization and market creation



published in various academic journals; the innovator firm’s website for comprehensive information on the relevant stakeholders; and publicly accessible documents and books, which enabled to identify the stakeholders involved in the study. The LexisNexis news search engine was used to gather relevant news articles. The data sources are listed in Table 1.

The interviewees represent different key stakeholder roles: commercial and legislative counselors from a regulatory authority, public health expert, scientist, science and nutrition communication manager from the innovator firm, the inventor of Benecol, the brand/marketing director of the innovator firm and two business partners from the value chain. The interviewees were selected based on their experience and their contribution to Benecol’s market creation and commercialization process over 20 years. The interviews were retrospective, aiming to track the outcomes of market creation and commercialization activities over the years. They were conducted face to face, online and recorded. Different interview questions were designed according to stakeholder type, to uncover their specific activities. The details of the conducted interviews are listed in Table 2.

3.3 Data analysis

In the analysis phase, thematic content analysis was used, and the focus was on identifying the events, decisions, activities, opportunities and challenges in the market creation and commercialization process from the primary data. As an example of thematic analysis, business partner from the USA stated, “People don’t eat margarines in US so we came up with new products such as chocolate chews and coffee cream.” Business partner from Indonesia also stated, “The challenge is coming from the ingredient that it must be consumed after you have a meal. This is a problem in Indonesia since they (people) don’t eat bread. Therefore, we need to exist in that liquid food format.” These statements were interpreted to explain the market creation activity of the business partners, which is labelled as making product adjustments to meet consumer preferences in the local markets. The expert opinion leader stated, “We started to have a project not just for patients but in the community of North Karelia and asked people to change their diet to reduce saturated fat, increase vegetable, fruit, and berries consumption. And later on we also took the salt issue because salt is something that increases blood pressure. There is a

Table 1 Data sources

Source of data	Details
Interviews	2017: 4 interviews with the innovator firm 2018: 6 interviews with regulatory authority, public health expert, innovator firm, business partners from the value chain and scientist
News articles	>100 news articles about Benecol and lowering cholesterol were retrieved from sources such as The Daily Telegraph, The Guardian and The New York Times (1996–2019)
Websites	>10 websites of Benecol in different regions, Ministry of Agriculture and Forestry of Finland, Finnish Food Authority, European Food Safety Authority and related industry associations such as European Atherosclerosis Society
Publications	>50 journal articles and a book on Benecol, plant stanol ester, functional foods and cardiovascular diseases

Table 2 Overview of interviews

Actor type	Role	Date	Duration	Theme
Regulatory authority	Commercial and legislative counsellors (food division, food safety unit)	26.04.2018	52 min	Novel food regulation and product authorization procedure
Opinion leader	Former director of a research and development institute and current member of Finnish Parliament	21.05.2018	45 min	Awareness creation on cardiovascular health and healthy diet
Innovator	Science and nutrition communication manager	11.06.2018	52 min	Communication activities targeting consumers and health-care professionals
Innovator	Inventor and brands and marketing director	2017	120 min	Regulations, abroad markets, communication activities targeting consumers and health-care professionals
Business partner	General manager	13.06.2018	45 min	Competitive environment, consumer preferences, product variations, regulations in the market
Business partner	Business unit head	25.07.2018	35 min	Competitive environment, consumer preferences, product variations, regulations in the market
Scientist	Contributor to the research of plant stanols	04.07.2018	87 min	Activities that contributed to the research and validity of the health claims of plant stanols

model explaining how the risk factors predict heart disease and we know how the risk factors have reduced. Out of the individual risk factors, half of the reduction in heart disease mortality seems to be explained by cholesterol reduction and it is mainly diet.” This statement was interpreted to explain the market creation activity of the opinion leaders, which is labelled as creating risk awareness on certain issues in the society and explaining the potential impacts of the issues.

Secondary data, particularly news articles in Benecol and Raisio’s history, enabled us to analyze the critical stakeholders in the fields of science and medicine, regulation, market and society. Based on the analysis and data triangulation from the combination of primary and secondary data, we created in the final model a figure depicting the multidirectional interactions among stakeholders.

4. Diversity of stakeholder contributions to commercialization and market creation of a radical and societally relevant innovation

Next, we discuss the results of the case analysis and the contributions of the diverse stakeholders to the commercialization of the innovative product, Benecol, and market creation of functional foods. To provide an overview of our results, Table 3 concludes the stakeholders who influenced the innovation commercialization (microlevel) and market creation (macrolevel), partly contributing also via value chains (mesolevel). The stakeholder types and their contributions to market creation and commercialization are listed in Table 3.

4.1 Stakeholders contributing particularly at macrolevel market creation

4.1.1 Regulatory authorities

Based on the case analysis, regulatory authorities were found to be one of the significant stakeholders that contributed to the creation of the functional food market and commercialization of its products. The European Food Safety Authority (EFSA) is the authority that conducts safety assessments for all food products marketed in Europe, therefore the assessments by EFSA are needed to launch functional food products on the

market. Another key stakeholder in this case are the legislative and commercial counselors from the Ministry of Agriculture and Forestry of Finland. The scope of work of the relevant regulatory authorities is listed in Table 4.

Among these organizations, the Finnish Food Authority and MMM are the Finnish authorities that are responsible for novel food regulation; the EFSA and European Commission are higher-level European regulatory authorities. In this regulatory chain, although the last decision is made by the European Commission, EFSA has the greatest authority and has the most influence on a marketed product regarding safety assessments and the validity of the health claims. The authorization procedure of a novel food in Finland is illustrated in Figure 2.

In this authorization chain, the activities performed by the depicted regulatory authorities help create the market by evaluating the novelty level of the food products and assessing their safety, as these activities ensure that products carry no risks to health. To give an example, some activities performed by MMM are explained by the Commercial Counsellor and Legislative Counsellor respectively:

I am in charge of drafting new legislation, implementing current legislation, helping interpreting legislation as my background is in functional foods and gene technology. We are taking care of a regulation that regulates everything novel entering into the food chain. Safety is the main concern for novel foods.

One area I am responsible for is food labeling including health claims and nutrition claims. There is a link to functional foods because when a company comes up with a new innovation, it tends to claim a health benefit.

Another example clearly explains the crucial role of regulatory authorities in commercialization and market creation. When the company decided to enter the markets in the USA, they faced problems. US market entry was delayed for about six months because of a wrong strategy applied by Benecol’s worldwide marketing partner, as it decided to market the product as a dietary supplement, which was not the product’s right category according to the US food regulation requirements. The US Food and Drug Administration (FDA) later approved the product as a regular food with the “Generally Recognized As Safe” status, which made it possible for Benecol to be launched in the USA. In the USA, functional foods are still an unclear product category for

Table 3 Stakeholder types and contributions

Type	Contribution	
	Market creation (macro)	Commercialization (micro)
Regulators	<ul style="list-style-type: none"> Allowing society to start accepting the novelty Drafting new legislation, implementing current legislation Conducting and evaluating risk and safety assessments 	<ul style="list-style-type: none"> Authorizing products to be marketed and sold Providing guidance on the authorization procedure
Scientists	<ul style="list-style-type: none"> Generating objective scientific knowledge Publishing articles, attending seminars and conferences around the world and thus disseminating the knowledge 	<ul style="list-style-type: none"> Increasing the credibility of an innovation Revealing the functionality of the innovation/novelty through studies and experiments, which can be used as marketing argument for a product
Experts as opinion leaders	<ul style="list-style-type: none"> Creating risk awareness on certain issues in the society and explaining the potential impacts of the issues Influencing public perceptions and producers' actions to shift to operations that are more sustainable Publishing articles, attending seminars and conferences around the world and thus disseminating the knowledge 	<ul style="list-style-type: none"> Increasing the credibility of an innovation Making the network actors more aware of the benefits of the innovation
Business partners in the value chain	<ul style="list-style-type: none"> Providing access to local user base in different countries Making product adjustments to meet consumer preferences in the local market and thus ensuring the fit between innovation and different market settings 	<ul style="list-style-type: none"> Distributing the products locally and making them available for users Contributing to the diffusion of the innovation by representing the innovation in local markets
Innovator firm	<ul style="list-style-type: none"> Managing the innovation network by facilitating constant information flow between stakeholders 	<ul style="list-style-type: none"> Initiating the innovation process by discovering or inventing the novelty
Media	<ul style="list-style-type: none"> Raising awareness on healthy living and cardiovascular health 	<ul style="list-style-type: none"> Communicating the value that a product or service would create for its user
Users	<ul style="list-style-type: none"> Using the innovation and experiencing its benefits at first hand 	<ul style="list-style-type: none"> Providing feedback about the products' strengths and weaknesses Carrying out word-of-mouth marketing
Health-care professionals	<ul style="list-style-type: none"> Changing the attitude on markets 	<ul style="list-style-type: none"> Recommending the product personally to the users Conveying the product information to the users who are the target audience
Associations	<ul style="list-style-type: none"> Organizing educational sessions for health-care professionals for awareness creation 	<ul style="list-style-type: none"> Mentioning the innovation in their guidelines

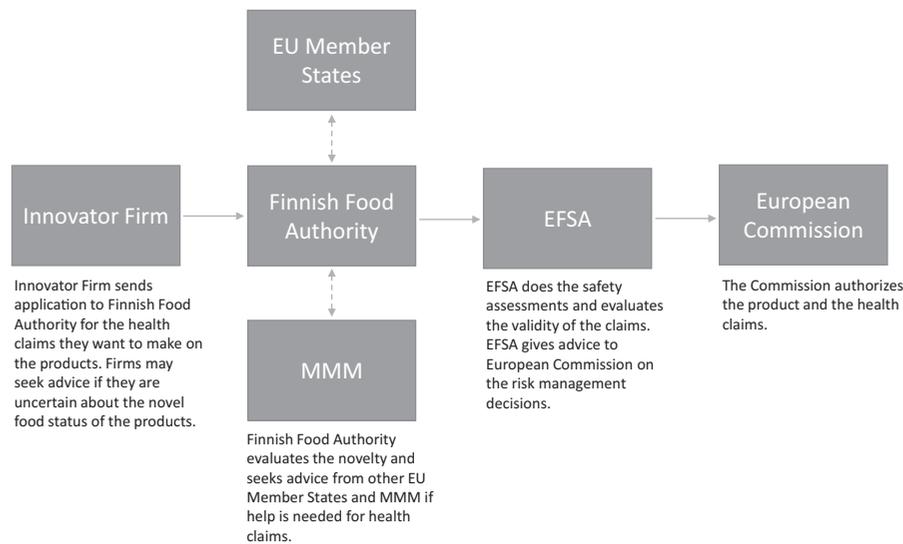
Table 4 Focus areas of regulatory authorities

Organization	Scope
Ministry of Agriculture and Forestry of Finland (MMM)	MMM is responsible for the legislative work on food products as part of the Finnish government and it collaborates with European Union (EU) institutions to get support in decision-making
Finnish Food Authority	The Finnish Food Authority is a centralized body operating under MMM. It conducts risk assessments and scientific research
European Food Safety Authority (EFSA)	EFSA is the agency of the EU that provides independent scientific advice and communicates on existing and emerging risks associated with the food chain
European Commission	European Commission is an institution of the EU, responsible for proposing legislation, implementing decisions, upholding the EU treaties and managing the day-to-day business of the EU

FDA. Functional foods are regarded as foods with health claims and subject to the Federal Food, Drug, and Cosmetic Act.

Regulations in some countries can be strict and challenging, and obtaining approval for product registration or a health

claim may require repetitive clinical trials for different product types, which can be time-consuming and expensive. The requirements and rules for getting approval to market a food product differ on various continents and might even vary in countries on the same

Figure 2 Authorization procedure for novel foods in Finland: stakeholders assessing risks and claims of the novelty

continent, as is the case in Asia. As the authorization that is granted in the European Union (EU) is valid in many countries, it is convenient for a food company that intends to market its products in Europe. Especially in Asian countries, the long process of product authorization may be a bottleneck for a company and require substantial resources. Furthermore, it may prevent small- and medium-sized enterprises from entering Asian markets because of inadequate resources. However, Benecol was able to become authorized in many Asian markets despite the long authorization processes, and its presence was secured with newly developed products that meet the needs of the consumers in this region. This success paved the way to shape the functional food market in Asia in its favor. As stated by the Benecol's inventor:

There are some country-specific requirements for product authorization. The approval process can be very complicated and might have to repeat some of the experimental animal studies that have been done to prove the product's safety. For example, if stanol is to be added to a yogurt product and to a soymilk product, separate clinical trials might be needed depending on the country regulation (Translated from Finnish).

4.1.2 Scientists

The empirical results uncover that scientists contributed to the research and validity of the health claims of plant stanol ester, the main ingredient in Benecol. Their work on plant stanols and experiments conducted with different doses of daily consumption revealed the health benefits of plant stanols, contributing to the creation of a novel functional food for a new market and attracting many global audiences. The research group's findings on the effect of different doses of stanol consumption on serum cholesterol levels validated the impact of the innovative ingredient (Miettinen *et al.*, 1995; Athyros *et al.*, 2011), enabling other stakeholders to rely on this knowledge. Using different types of equipment, scientists measured the functionality of the arteries. As stated by a Professor of Medicine at the University of Helsinki:

We analyzed the plaques that block the arteries and analyzed the vascular effects of Benecol, measured how the arteries are functioning before and after the use of Benecol. We measured how much blood enters to a very small area in a limited time.

Scientists contributed by publishing journal articles about the effects of plant stanols and attending cardiovascular seminars and conferences around the world to explain the positive health effects of plant stanols to health-care professionals. This promoted the market creation of the innovation in many regions, as some of these scientists possess an excellent reputation in the field of plant stanol and sterol research.

4.1.3 Experts in public health as opinion leaders

Another important group of stakeholders in the case was public health experts who shape other stakeholders' perceptions of the innovation and influence their willingness to adopt it. In this study, public health experts were found to hold the status of opinion leadership in the field. In this case, we refer to a specific individual who has been recognized by public and who has great impact on society. Here, the key opinion leader is the former director of the National Institute for Health and Welfare of Finland (THL) (2009–2013). He was formerly the director of the North Karelia Project initiated in 1972 in Finland. The initiative succeeded in reducing the male coronary heart disease mortality rate by 73% in 25 years in the North Karelia region and by 65% overall in Finland (Puska, 2002). He was also a member of the Finnish Parliament. Thus, the opinion leadership relied on both specified expertise and status/legitimacy, thereby strengthening the relevance of expert commentaries given by the key expert opinion leader of the focal case.

Because of wide, compelling experience in the focal field, including his studies and knowledge on the risk factors of cardiovascular diseases and his success in improving the diet of a nation, he was later involved in the commercialization activities of Benecol. He gave conference speeches and spoke at annual meetings of Benecol's business partners, explaining the positive health effects of Benecol's main ingredient, plant stanol ester, which raised interest in this innovative ingredient. The growing trend and attitude toward healthy eating among consumers have prompted some other companies in the industry to develop similar healthy food products:

We spread all kinds of health information for the adoption of a healthier diet and lifestyle, but we realized that this was not enough. We needed products to convey the message so that it would be easier for people to switch to healthier eating habits.

This movement and effort promoting healthy eating led by a public health expert and also other companies increased the demand for such products that have health benefits and promoted the emergence of the functional food market, particularly for the cholesterol-lowering products. In this case, the public health expert's previous efforts in the North Karelia Project to lower the cholesterol levels of a population and being a well-known expert in the cardiovascular field made it easier for wider audiences and companies to trust him and his recommendations, which created awareness and facilitated Benecol's diffusion in various regions.

4.1.4 Media

Based on the secondary data, we share some examples of information about Benecol that have been published in various media over the years, and we discuss how the news associated with Benecol led to progression of its commercialization and market creation.

Right after its launch in the UK, the company made a deal with Carol Vorderman to be the face of Benecol's UK marketing campaigns in press ads and on TV as a part of its commercialization strategy. As Carol Vorderman was a well-known and well-liked celebrity in the UK, Benecol's diffusion in the UK market accelerated.

The firm was involved in several campaigns that increased its visibility in public, such as the campaign for Women Against Cholesterol to raise awareness of the risk factors related to high cholesterol. Additionally, the awards that the company received, such as the Frost and Sullivan Award for Brand Development Strategy Leadership for demonstrating superior market growth, increased the credibility and strengthened the brand image of the company in many markets. The company also used unconventional ways to promote the brand, such as sponsoring a classical music radio show that was popular especially among over 55 years olds, the brand's target audience.

4.2 Stakeholders contributing at microlevel, to company's commercialization efforts

4.2.1 Complementing business partners in the value chain: licensing partners from the USA and Asia

With regard to value chain partners in the Benecol case, business and licensing partners using the same ingredient in diverse end products, ranging from margarine to beverages, contributed primarily to the commercialization and secondarily to market creation in several ways. To create functional food markets in different countries, companies need to consider consumer preferences and dietary trends in those countries. Therefore, local product adjustment strategies were applied to attract consumers in various countries and to create the user base for the market. Benecol's business (licensing) partners from very different global market contexts from the USA and Indonesia explained their perspective on commercialization as well market creation of an innovative product.

The licensing partner from the USA is a food manufacturing company that produces spreads and cooking products and is

best known for its olive oil-based margarine-like spread. American consumers tend to eat less fat spreads than consumers in Europe, therefore product adjustments were made in the content of the Benecol spread. The efforts were directed to the products that are widely consumed particularly by consumers in the USA. As explained by the general manager of the business partner from the USA:

People don't eat margarine in the US, therefore, we came up with new products under the Benecol brand, such as chocolate chews and coffee cream.

Using health claims on packaging and in marketing channels influences the buying decision and eases the commercialization of products. The wording of the health claim on the packaging of a certain product might be different in different countries depending on the food and safety regulations of the country in question. As stated by the general manager of the US business partner:

In the European markets, it is possible to claim that using Benecol reduces cholesterol by 10%, but such claim is not allowed in US. The Food and Drug Administration of the US allows the claim that 2 grams of stanol or sterol may help reducing cholesterol levels.

The partnership with the Indonesian business partner started in 2008 and since then, no other competitor has entered the functional food business in Indonesia, making the Finnish company the market leader in this area. In the Indonesian case, the main consideration for a partnership with Raisio and incorporating Benecol products in the product range was the uniqueness of the ingredient. Having the approval from regulators for claiming health benefits of plant stanol ester enabled the Benecol brand to appeal to the partner and create a market, as it is the only brand that can use and contain plant stanol ester in Indonesia. The business unit head (BUH) of the Indonesian business partner explained the reason behind the partnership with Benecol:

Since Benecol's plant stanol ingredient is acknowledged by institutions, healthcare professionals, and medical bodies and has exclusivity, we wanted to use the Benecol brand in our cholesterol lowering product range.

The healthy food products are differentiated with different price levels and the health claims in Indonesia; therefore, they are regarded as a new product category that is subject to different regulations, monitoring and safety assessments, which created a new market network. The BUH explained the advantage they gained over their competitors and increased consumer awareness after obtaining permission to use the health claims in 2014:

Since 2014, we have been able to claim the cholesterol lowering effect on the packaging and due to that, people are now more aware of the effects of plant stanol. However, we still need to provide education because Benecol is not like medicine.

4.2.2 Health-care professionals

Benecol products as a preventive solution for high cholesterol are recommended in different health-care systems around the world. Health-care professionals are crucial target groups in the local markets; informative and factual messages on the unique health enhancing qualities of the novel product are needed to target those who meet patients. Therefore, the innovator firm realized that it is extremely important to train primary health-care actors to promote the health benefit of a product to public to set up the user base for the innovation. As these actors are in

close contact with patients, they can influence product diffusion with their product recommendations. Therefore, health-care professionals act as one of the supporting forces in the commercialization of functional foods. As stated by the Science and Nutrition Communication Manager of the Innovator Firm:

Communication toward healthcare professionals is of high importance since these experts are influential and can spread the health benefit information of Benecol to those who have high cholesterol levels and who need cholesterol lowering products and treatments. We develop marketing materials for our business partners to guide healthcare professionals in their regions. We also work with opinion leaders who are aware of the latest science in the field of cholesterol lowering and influence the opinions of other healthcare professionals.

Both information spread by health-care professionals and direct consumer communication messages can impact marketing efficiency, and they complement each other. The degree of the emphasis that is put on a certain type of communication depends on the health-care system of the country. Having an approved health claim for plant stanol ester in different regions is crucial in the context of both health-care professional and consumer communication. This is an important step in commercialization, which provides a positive brand image to the firms that can obtain this valuable key criterion.

4.2.3 Associations

In addition to the health-care professionals' contribution to the market creation of Benecol in different regions, several associations around the world (e.g. European Atherosclerosis Society, European Society of Cardiology, International Atherosclerosis Society, American Diabetes Association and the National Heart Foundation of Australia) mention the use of plant stanol ester to be an effective way to lower cholesterol in their dyslipidemia treatment and cardiovascular disease prevention guidelines. These associations act as a group of actors that feed health-care professionals with relevant information. In the congresses of these associations, innovator firm-sponsored educational sessions have drawn the attention of health-care professionals to this alternative way of lowering cholesterol, which has promoted Benecol in various markets.

5. Discussion

5.1 Key stakeholders' contributions to commercialization and market creation of radical innovations

We studied the activities of multiple stakeholders and how they facilitate the creation of a new market on the macrolevel and make it possible for an innovation to be commercialized because of increased adoption, on the microlevel. These results and insights based on empirical research data also reveal the interactive nature of market creation and commercialization. We argue that, as our case results show, stakeholders' contributions regarding commercialization activities directly address the innovation marketing goals of the focal innovator company, whereas their contributions to market creation are more on the societal level and thus require deeper involvement from the macrolevel actors and scientists to change the market structure. Therefore, very diverse contributions from various contributors are needed to advance the commercialization and market creation of a societally relevant innovation. These include scientists, public health experts as opinion leaders, regulatory

authorities (ministries, risk management authorities and regional commissions), (primary healthcare) professionals in different countries, associations, complementing business partners from the value chain, media, users and managers of the innovator company. These actors contribute:

- directly to the commercialization efforts of the innovation led by the innovator company (e.g. business partners distributing the products locally, thus making them available for users);
- directly to market creation (e.g. regulators conducting safety assessments and assessing the validity of the health claims) that makes the markets more favorable to the commercialization activities by the innovator company; and
- to the intersection of these two above activities, thereby fortifying the dynamics and change in the markets, as multiple contributors' contributions accumulate and fortify each other in the momentum (e.g. scientists validating the functionality of the innovation/novelty through studies and experiments that enable regulators to allow the innovation at macrolevel and business partners to gain more profit from the innovation, which supports both the innovator's and its business partners' commercialization efforts at the micro- and mesolevels).

Our study showcases how actively involving scientists and public health experts in market creation activities provide benefits to the innovator firm and increases its credibility. The good reputation of scientists and public health experts makes it possible for business partners to trust the innovator firm's innovation and assess how much they can create value from it, which also encourages them to initiate a partnership with the innovator firm. Having participated in academic conferences and seminars and having published scientific articles about the benefits of the innovation in well-established journals, scientists and public health experts as opinion leaders have the power to indirectly influence business partners and expert actors that encourage consumers to adopt and use the innovation. Scientists seem to play a major role by validating the value of the innovation and related impacts, particularly when the product concerns a societal issue, such as public health. The scientific experiments by scientists are also needed to prove that the product is safe to use, causes no harm and generates the intended positive effects.

The commercialization and market creation process may be negatively affected by certain stakeholders. For instance, market entry of Benecol to the USA was temporarily hindered by FDA because of the wrong strategy applied by the licensing partner at that time. A competitor that has a similar product in markets where Benecol exist may sue the company for the similarity of the brand name. Such examples show that it is important to consider these stakeholders that might hinder the process.

5.2 Modelling the commercialization and market creation of a radical innovation via stakeholder contributions

While stakeholder contributions to commercialization activities are mainly supported (and initiated) by the focal company whose innovation is commercialized, contributions to market creation activities take place on macrolevel and market structure level. These cover both direct contributions to market creation (regulators' ability to control what can be marketed and how) and

indirect or interlinked contributions (scientists’ ability to both guide societally relevant stakeholders’ actions and validate the value of the innovation marketed by business actors). When putting these together, we see that market creation entails cocreating and renewing market structures, allowing innovations (particularly radical innovations) to emerge and to be commercialized. Finally, we develop a model that captures how stakeholders contribute to commercialization and market creation of radical innovations (Figure 3).

6. Conclusions

6.1 Theoretical contributions

Our empirical analysis of the diverse stakeholder activities for market creation and commercialization of a radical, societally relevant innovation generates contributions to several research streams.

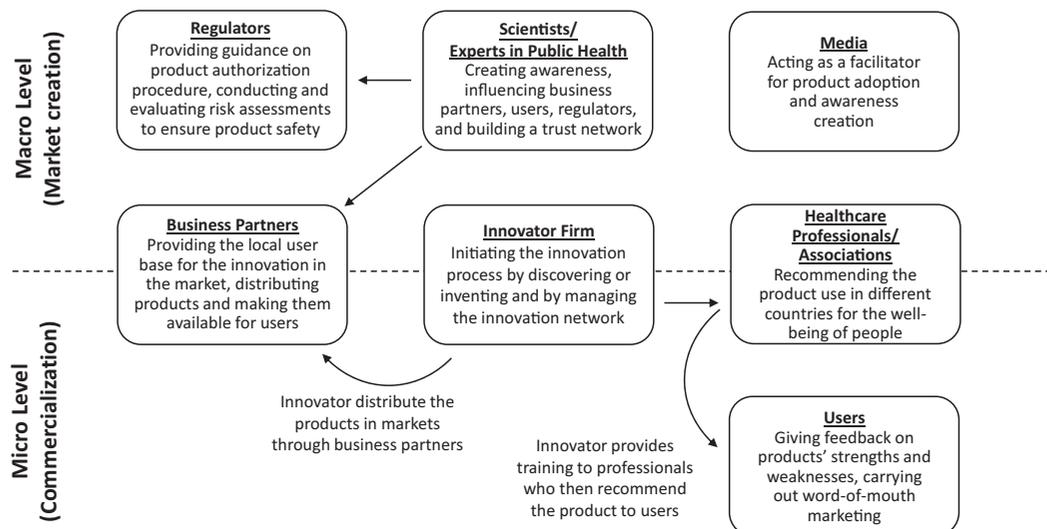
First, we contribute to the market creation literature, bringing forth the diverse stakeholders’ contributions to market creation of innovations. Building on the argumentation that single actors facilitate the market creation of an innovation (Fehrer *et al.*, 2020; Lipnickas *et al.*, 2020; Storbacka and Nenonen, 2011), our empirical study showcases how diverse actors affected and changed the perception of the relevance of the functional foods in society and on the markets. Following the emerging and radical business fields literature (Möller, 2010), our study shows how innovator companies can use experts and scientists that can influence stakeholders at the microlevel, such as suppliers, distribution and customer networks, and stakeholders at the macrolevel, such as regulatory authorities in sociotechnological structures for the creation of a new market. Second, we contribute to the innovation marketing and commercialization literature, as our empirical analysis of stakeholder contributions to commercialization clarifies the activities that are needed to support commercialization efforts and innovation diffusion in markets (Aarikka-Stenroos *et al.*, 2014; Chiesa and Frattini, 2011; Makkonen and Johnston, 2014; Schiavone and Simoni, 2019). We show how the activities of seven types of stakeholders influence the commercialization of

radical innovations along with their contribution to the facilitation of an innovation’s market creation in global settings. The results of this study are aligned with earlier insights that diversity of actors improve the commercialization outcomes (Corsaro *et al.*, 2012) and that stakeholder marketing capabilities have an impact on organizations’ performance in the long term (Hillebrand *et al.*, 2015). Third, we have contributed to the discussion on stakeholders’ contributions to innovation development (Driessen and Hillebrand, 2013; Hillebrand *et al.*, 2015) by developing a framework that captures the supportive activities of stakeholders in creating markets, commercializing the radical innovation, and interlinkages between them (Aarikka-Stenroos *et al.*, 2014). As our final contribution, we clarify the relationship between market creation and commercialization of radical innovations, which support each other. We underline that to commercialize a radical innovation, the existing market structures should be modified in favor of the radical innovation to emerge via commercialization.

6.2 Managerial implications

The study generates practical advice for managers who commercialize (radical) innovations, beyond food innovations and functional food industry, and need support in market creation as well from diverse stakeholders. The research findings indicate that the focus of the collaborative activities with stakeholders should not be restricted only to R&D activities but should also focus on commercialization and market creation. In the first stage of the commercialization of a radical innovation, managers should be in close contact with the regulators in the target market to comply with the health claim regulations. Many commercialization decisions by companies are strongly linked to the development stage of market and needed market creation, and managers should acknowledge this carefully. For example, in our case, applying for the feasible product category before launch has been crucial, as the products may be placed in different categories in different countries. An undeveloped, not-yet-created market

Figure 3 Stakeholders in commercialization and market creation of radical innovations and their interlinkages



missing a feasible product category may cause companies lose revenue because of market launch delays.

Our study also shows that companies should involve very diverse stakeholders in radical innovation commercialization and related market creation, for example, regulators could guide the innovator companies in their attempt to launch their radical innovations and the managers should proactively seek feedback from the regulators regarding market regulations. Active cooperation with scientists and societally legitimate experts plays an important role in creating a market, credibility and building a successful brand image. The key point here is to involve these stakeholders well in advance and establish shared goals and interests. Feedback from business partners in value chain on marketing practices and new product development activities would enhance the collaboration and communication among parties and introduce and educate on new ways of doing business and task partitioning, thereby improving the commercialization efforts. For example, in our case, licensing partners provided important contributions to commercialization and market creation by providing information on how to adjust product features and contents based on the user habits in target markets. Such learnings from business partner stakeholders would provide innovator companies better returns on their investment to enter new markets.

6.3 Limitations and future research

This study is based on a single case study and explored the major stakeholders and their activities in the functional food industry. Our findings on relevant stakeholders and their contribution to market creation and commercialization can be generalized to many other industries and business settings. As innovation activities in the food industry have increased in the last decade (e.g. innovations such as pulled oats), the findings of this study can be generalizable not only to the functional food industry but also to the food and health-care industry where health is a concern. Stakeholder contributions are also relevant in many societally grounded settings that involve experts and regulators (e.g. environmental, sustainable and circular economy innovations). Although the user perspective was not included in the empirical part of this study because of the nature of the numerous viewpoints of user perspectives and because of our focus on B2B actors, users of the innovation can contribute to R&D activities to a great extent by using the innovation themselves, further developing it, forming innovation networks and providing feedback (Lettl *et al.*, 2006). Therefore, we call for further research to include user perspective in more detail when examining stakeholders' involvement in market creation and commercialization of radical innovations.

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Corresponding author

Anil Engez can be contacted at: anil.engez@tuni.fi