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Rethinking tourism through digital innovation?
Rural tourism entrepreneurs in Iceland

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Abstract

This PhD tackles the challenge of rethinking tourism through digital innovation with a focus on rural tourism lifestyle entrepreneurs in Iceland. Based on discussions on tourism development that address the urgent need to reduce the negative impacts of tourism on destinations, this PhD investigates the potential positive contribution of rural tourism lifestyle entrepreneurs in this regard in this regard through the use of digital innovation. The PhD particularly explores the interrelation between digital innovation and entrepreneurial dynamics in rural Iceland based on qualitative methodology, with information gathered through field studies, questionnaires, and semi-structured interviews with more than 60 tourism entrepreneurs and representatives from the tourism support system. Also, a rural hackathon is developed as an action research case study to show how approaches to applying digitalization in rural Iceland manifest in practice by engaging with the actors involved and identifying potentially absent actors. This PhD contributes to a deeper understanding of how small tourism practitioners perceive current tourism development and act in Iceland. Moreover, it showcases how these rural tourism actors understand and work with innovation and digital solutions and what their motivations are for doing so. This research emphasizes untapped knowledge by acknowledging entrepreneurs and their potential for rethinking tourism development, concluding with recommendations for practice and policy. The aim of this research is to bridge theory and practice and contribute to the academic field by providing knowledge of hitherto underexplored areas, both in Iceland and international context.

Keywords: tourism lifestyle entrepreneurs, rural Iceland, digital innovation, rethinking, innovation, degrowth

Útdráttur

Í þessari ritgerð er fjallað um stafræna nýsköpun og áskoranir fyrir endurhugsun ferðaþjónustunnar með áherslu á lífsstílsfrumkvöðla í dreifbýli. Útgangspunktur rannsóknarinnar er umræða um þróun ferðaþjónustu sem ávarpar þörf fyrir að draga úr neikvæðum áhrifum atvinnugreinarinnar á áfangastaði. Rýnt er í hvernig lífsstílsfrumkvöðlar í ferðaþjónustu í dreifbýli geta mögulega haft jákvæð áhrif með notkun stafrænnar nýsköpunar. Sérstök áhersla er lögð á að kanna samband stafrænnar nýsköpunar og frumkvöðlastarfs í dreifbýli á Íslandi. Byggt er á eigindlegri aðferðafræði og var gögnum safnað með vettangsvinnu, hálfstöðluðum viðtölum og með spurningalistum. Rætt var við 60 frumkvöðla og fulltrúa stoðkerfis ferðaþjónustunnar. Einnig var stofnað til lausnamóts (hakkaþon) og það nýtt sem tilvik í notendarannsókn (e. action research) til að draga fram hvernig ólíkar leiðir til að hagnýta stafvæðingu í dreifbýli birtast í verki. Rannsóknin skapar dýpri skilning á athöfnum og viðhorfum smárra aðila í ferðaþjónustu til þróunar ferðamála á Íslandi. Hún dregur fram hvernig þessir aðilar skilja og vinna með nýsköpun og stafrænar lausnir og hvaða hvatar liggja þar að baki. Rannsóknin veitir nýja þekkingu á möguleikum frumkvöðla til að taka þátt í endurhugsun ferðaþjónustunnar og setur í lokin fram tillögur um stefnu og aðgerðir til að efla slíkt starf. Markmið rannsóknarinnar er að brúa fræði og framkvæmd og skapa þekkingu á sviðum sem hingað til hafa verið lítt könnuð hérlendis sem og á alþjóðlegum vettvangi.

Lykilorð: Lífsstílsfrumkvöðlar í ferðaþjónustu, dreifbýli á Íslandi, stafræn nýsköpun, endurhugsun, nýsköpun, hjöðnun

To my parents
Elisabeth and Johannes
who are real 'doers' and entrepreneurs and continuously teach me how to set ideas in
motion.

Preface

During the course of my PhD, I have been involved in a wide variety of projects and collaborations. At the very beginning of my research, I co-founded Hacking Hekla, a rural hackathon, which provided me with valuable opportunities to actively engage and foster meaningful connections with numerous specialists in the field of tourism and innovation. While many of these projects and collaborations were not directly part of my PhD, they nevertheless influenced my research significantly. In the text of this thesis, my insights and experiences are integrated into the discussion as Research Stories, which are presented separately in gray boxes.

The overall aim of these stories is to introduce additional research material and illustrate certain aspects of the topic not covered in the main body of my empirical and conceptual work. Their style varies depending on the kind of information they provide.

A number of research stories that I labeled "Experience" are used to frame my personal opinions and the experiences I gained from projects or collaborations I was involved in while working on my PhD. Particular insights stemmed from my work with Hacking Hekla and the Icelandic Tourism Cluster, including observations of other research projects and conversations with tourism stakeholders and experts in the field of rural innovation. By illustrating my main storyline with these practical and subjective experiences, the Research Stories add depth to the empirical material and findings. I want to emphasize that these stories mirror my personal view of the situations and experiences described. Other researchers might have interpreted them differently.

Several of these stories provide additional background knowledge about my central narrative, including conceptual information. Examples include side-discussions of topics that are not necessarily essential for the understanding of this PhD but which may benefit the reader by providing a deeper understanding of the main discussion or glimpses of the broader picture. These research stories are labeled with "Background Knowledge". To better grasp the interrelationship between this PhD and the actual happenings occurring in the Icelandic tourism and innovation scene, I recommend that the Research Stories be read.

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List of Publications

Publication I   Falter, M. (2024). The role of rural tourism lifestyle entrepreneurs in rethinking current tourism development. *Journal of Tourism Futures*, Advance online publication.

Publication II   Falter, M., & Jóhannesson, G. T. (2023). The Value of Digital Innovation for Tourism Entrepreneurs in Rural Iceland. *Academica Turistica-Tourism and Innovation Journal*, *16*(2).

Publication III   Falter, M., Jóhannesson, G. T., & Ren, C. (2023). Hacking Hekla: Exploring the dynamics of digital innovation in rural areas. *Sociologia Ruralis*.

Publication IV   Falter, M. (Forthcoming). Exploring the Dynamics of Digital Applications in Icelandic Tourism: Insights from Stakeholders In García-Almeida, D., Gunnarsdóttir, G.Þ., Jóhannesson, G.T. & Guðlaugsson, T. (Eds.).*Tourism entrepreneurship: Knowledge and challenges for a sustainable future.* Palgrave.

Abbreviations

AI   Artificial Intelligence
FIERI   Fostering Innovation Ecosystem in Rural Iceland
ISO   International Organization on Standardization
NorReg   Nordic Regenerative Tourism
OECD   Organization for Economic Co-operation and Development
UNWTO   United Nations World Tourism Organization
VR   Virtual Reality

Acknowledgements

I was a horse trainer, a *hesta stelpa,* taking a sabbatical in the Icelandic countryside when the urge to return to the academic world suddenly strengthened. Before that, I worked as a regional development manager at home in Bavaria. While I love Bavaria, my professional path there did not quite unfold as expected.

Having spent a lot of time in Iceland, I was aware of the different dynamics there, especially in work environments. Maybe it is the rough and unpredictable weather that forces people to be flexible and resilient; I am not sure, but I came to understand that premade plans usually do not work out, and in most cases, things happen differently than anticipated. Against my usual sense of certainty in planning, I went with the flow during my sabbatical: I bought a horse and together we moved from the South of Iceland to the North and then back to the South, where I got in touch with the regional development association there and we exchanged experiences and ideas. Back then I was already playing with the thought of developing a rural hackathon, an idea that should in the later course of my PhD journey, play a major role. This was the starting point of my network building and showed me how easily things could be done by simply knowing and talking to the right people – even while training horses.

To say that I was lucky when Gunnar answered my request to be my PhD supervisor and invited me to an initial talk does not exactly express my gratitude for this four-year journey. Gunnar, thank you so much for your patience, your openness to my ideas, and your wonderful mentoring; I always felt guided but never restricted. Thank you, too, for your indulgence during these years, when I was too focused on "getting things done;" I now see the importance of a thorough literature review. Thank you for following up and counseling me through my participation in Hacking Hekla, FIERI, and more. I appreciate your interest and support even in projects not directly linked to my research. Thanks for accompanying me through this essential chapter of my life. I am looking forward to further collaborations and projects.

Thanks also to the rest of my supervision committee, Carina Ren and Wolfgang Dorner. Thank you, Carina, for your motivating energy and creative input, especially when designing my research methodology. Thank you, Wolfgang, for offering me a PhD position at Deggendorf and introducing me to the topic of the digitization of rural areas in Bavaria. Although the German context did not attract me, your offer definitely contributed to my curiosity about exploring Icelandic rural development.

I want to express my gratitude to all the wonderful people that I got to meet during the projects that were real milestones of my PhD, such as Hacking Hekla, FIERI, and NorReg. Thank you, dear all, for playing a key role in my journey. Working with you significantly shaped my perspective and the way I tackled certain challenges.

Oh, du Ausgeburt der Hölle!
Soll das ganze Haus ersaufen?
Seh ich über jede Schwelle
Doch schon Wasserströme laufen.
Ein verruchter Besen,
Der nicht hören will!
Stock, der du gewesen,
Steh doch wieder still!

Der Zauberlehrling, J. W. Goethe[1]

Brood of hell, you're not a mortal!
Shall the entire house go under?
Over threshold over portal
Streams of water rush and thunder.
Broom accurst and mean,
Who will have his will,
Stick that you have been,
Once again stand still![2]

The Sorcerer's Apprentice, J.W. Goethe

[1] https://www.deutschelyrik.de/der-zauberlehrling.html
[2] https://www.scottish-country-dancing-dictionary.com/sorcerers-apprentice.html

PART I: SYNOPSIS

1 INTRODUCTION

1.1 Aim and Research Objectives

Research Story 1 (Experience and Background Knowledge):
The Big Picture and Saving the World

"The Sorcerer's Apprentice" by Johann Wolfgang von Goethe is a poem about a wizard trainee who uses magical powers behind his master's back to perform his chores. He soon realizes that he is unable to control the consequences of using magic, which leads to chaos and danger. The poem metaphorically highlights the value of self-perception and the consequences of the misuse of power.

During the course of my PhD, I came across a paper by Urry (2010), who linked Goethe's legendary ballad to a modern society driven by capitalism and overconsumption. Just as the apprentice lost control over his magic spells, contemporary capitalism has escaped any control humans once had. The "spell" here becomes a metaphor for the global growth agenda and uncontrolled consumption, which have affected activities such as tourism and the rural areas where tourism often takes place. Seemingly rational choices have inadvertently led to the destruction of the environment.

When I started my PhD in late 2019, digitalization and innovation were trending in public and political discourses, and I wanted to explore these ideas in terms of rural tourism and entrepreneurship. Coming from a beautiful village in the Bavarian countryside and having spent much of my time as a *hestastelpa* (an Icelandic term for a female horseback rider) in the Icelandic countryside, I felt very strongly about making my own contribution to supporting rural areas. During my work as a regional development manager in Germany, however, I continually encountered the stigmatization of rural areas as places that were not attractive or appropriate for innovative or creative activities.

To gain a deeper understanding of this stigma, I made it an essential part of my PhD journey to engage in conversations with tourism stakeholders in Iceland. Participating in events and actively interacting with local people played a vital role in the development of my research design. The qualitative approach of this PhD was chosen deliberately with the aim of "going out there" and seeing what was really happening in the Icelandic tourism industry.

When I began this journey and started talking to tourism business providers in the Icelandic countryside about digitalization, I often heard, "No, this is not for me." However, both global and national discussions continue to insist on the importance of applying digital solutions to a variety of issues. At first, it was not entirely clear to me why digitalization should be deemed such an important part of tourism development plans when many business providers did not attach any great value to it. I often had the feeling that the public focus and official discussions on digital innovation were detached from both the reality and the bigger picture in terms of climate emergency. For whom or what was digitalization intended, and why was it important to foster it?

When I was well into the course of my research and had become involved in various tourism projects in Iceland and other Nordic countries, I took a step back and looked at my research from a bird's-eye perspective. I realized that the greater goal of innovating and applying digitalization in the tourism industry is to improve this industry and make it more sustainable. Why else would we change old habits, if not to make things better?

Just as the sorcerer's apprentice maneuvered himself into a chaotic situation that he could only solve with the right spell, humans now face the challenge of finding ways out of a growth-oriented spiral and the overconsumption of the Earth's resources. While this PhD does not tackle the big questions about saving the world, it explores how digitalization and innovation can contribute to improving tourism, which can impact the overall problem, albeit on a small scale. At the very beginning of my research, when I pitched my idea about Hacking Hekla, a rural hackathon project, at a seminar in the Westfjords in Iceland, the host of the conference and a friend of mine introduced me as "a researcher and a doer." In the pages that follow, I share my experiences and the insights I gained during my research, ranging from conversations with various tourism stakeholders to observations and even a direct intervention, when I tried to actually instigate change to see what would happen. I believe that sometimes we just have to go out there, try an idea, and then come back, reflect upon it, and try again. Asking questions and telling stories brings people closer together, and the closer we are, the easier it is for different stakeholder groups to understand one another. That might be the first step in tackling the bigger questions and saving the world.

This research investigates the role of digitalization and innovation as potential tools for rethinking tourism development in Iceland. The main objective is to explore the

dynamics of rural tourism entrepreneurship in terms of applying digitalization and innovation. Lifestyle entrepreneurs are prevalent in the tourism industry in the Nordic countries (Atladóttir et al., 2023); thus, I explore how these entrepreneurs understand and apply innovation and digitalization in their businesses. The research explores the value such practices may have in terms of rethinking tourism development and steering it toward more sustainable practices. In the latter part of this research, I further investigate how official representatives of the Icelandic support system for innovation and tourism understand digital innovation and what role they ascribe to tourism lifestyle entrepreneurs in this regard.

The reader should bear in mind that, despite the initial metaphor in my first research story, which is related to "saving the world" (see above), it is beyond the scope of this study to engage with environmental issues such as global warming or the specific threats posed to the tourism industry by climate change. In the framework of this PhD, *rethinking tourism* refers to the socio-economic and social challenges associated with tourism development viewed from a bottom-up perspective.

This is an exploratory study based on qualitative methodology. The data were gathered through field studies, questionnaires, and semi-structured interviews with more than 60 tourism entrepreneurs and representatives from the tourism support system. In addition, an interventional action research case study explores a practical example of a rural hackathon, showing how approaches to applying digitalization in rural Iceland manifest in practice by engaging with the actors involved and identifying actors that might be missing.

This PhD contributes to a deeper understanding of how small tourism practitioners perceive and act in Iceland. Moreover, it showcases how these actors understand and work with innovation and digital solutions, and what their motivations are for doing so. The aim of this research is to bridge theory and practice and contribute to the academic field of tourism research by providing knowledge of hitherto underexplored areas in both the Icelandic and international contexts.

1.2 Tourism Lifestyle Entrepreneurship and Applied Digitalization: A Path Toward Rethinking Tourism?

Recent wake-up calls (Sustainability Leaders United, 2016) have persuaded tourism practitioners and researchers to rethink the values and role of the tourist industry with increased urgency (Ateljevic, 2020; Hussain, 2021; Sheldon, 2020). A growing number of critical voices are being directed toward the environmentally damaging effects of growth-oriented thinking (Gren & Huijbens, 2014; Huijbens, 2021b, 2023). While questions of environmental sustainability and the pressing climate crisis are not the focus of this research, they do remain a matter of imminent concern for tourism stakeholders. In this PhD, the issue of sustainability is viewed from the perspective of small and family-sized tourism entrepreneurs. While these are indeed connected to larger environmental questions, the focus is on exploring how entrepreneurs relate to innovation and digitalization as possible tools for rethinking tourism.

Discussions of sustainability in tourism (including environmental issues) have been gathering momentum since the 1970s (Saarinen, 2021). The topic has become a central concern for public and private actors in tourism operations, policy, and planning,

especially since the publication of the United Nations' sustainability goals in 2015 (United Nations, 2023). However, sustainability has become a buzzword, which can dull critical thinking. Recently, the need to rethink sustainability actions has gained currency in both politics and academia. Beyond the public rhetoric, the practical challenge lies in identifying workable tools that provide alternatives to current growth-driven developments.

Approaches to rethinking tourism often manifest in the degrowth paradigm (Dredge, 2022; Fletcher et al., 2019; Hall et al., 2020; Lundmark et al., 2020; Saarinen, 2020), which stems from the concern that current consumption patterns will soon exceed the planet's capacity (Prideaux & Pabel, 2020), from environmental to social limits. This is also the case in the tourism industry. In light of the significant and growing contribution of tourism to global GDP, policymakers face a "wicked dilemma" (Prideaux & Pabel, 2020, p. 116), in which degrowth and other ideologies aimed at preserving the Earth's resources seem to contradict the imperative of economic development. This issue must be addressed not only through national policy but also at the local tourism industry level; the challenge lies in bringing these two together.

Tourism policy discourse in Iceland emphasizes fostering sustainability in future tourism development. The overall vision is to be "leading in sustainable tourism development" (Ferðamálastofa, 2020a, p. 1). Specifically, tourism decision-makers see the minimization of seasonality effects, such as the distribution of the visitor stream throughout the country, as key. A further goal of the tourism authorities is the inclusion and empowerment of small businesses in tourism development processes (Ferðamálastofa, 2020a; Stjórnarráð Íslands, 2023).

The Icelandic tourism industry consists of a wide range of generally small tourism businesses, many of whose owners are often referred to as tourism "lifestyle entrepreneurs" (Ateljevic & Doorne, 2000; Dias et al., 2022; Peters et al., 2009). These entrepreneurs have recently caught the attention of tourism researchers due to their potential for positively contributing to rethinking tourism with a view to "enoughness" (Sharpley, 2022, p. 2) rather than growth at any cost. These entrepreneurs frequently deviate from a purely economic perspective and instead prioritize limited growth, aiming for a level they personally find significant and thus enough (Sharpley, 2022). Several authors have argued for the need to include these entrepreneurs in general discussions on tourism development and the rethinking of current growth agendas (Atladóttir et al., 2023; Cederholm & Sjöholm, 2020; Margaryan et al., 2020).

This thesis investigates the potential benefits of digitalization and innovation in this rethinking process from the perspective of rural tourism entrepreneurs. Gaining an understanding of how rural tourism stakeholders perceive these concepts is a first step and an essential requirement for further measures, such as developing tools with which to apply innovation in practice.

Innovation can be approached from many different angles. In the classic Schumpeterian understanding, it is the invention of something new (Ruttan, 1959). Innovation in tourism is often linked to the application of technology (Gretzel et al., 2015b; Hassan & Rahimi, 2016; Hjalager, 2015).

This research ties digitalization and innovation to the tourism re-thinking process as possible means toward sustainability. It also asks if and how digital innovation can be applied in a meaningful way for the sustainable development of tourism in a rural setting.

Digital innovation, as it manifests in artificial intelligence (AI), service robots, and the Internet of Things, has received attention within both academia and policy circles as a potential tool to rethink tourism, enhance sustainable tourism development, and counteract further acceleration of growth-at-all-costs. Digitalization is currently reshaping the tourism

and hospitality industries. Its applications range from the use of big data and digital marketing to service robots and AI (Fusté-Forné et al., 2021; Gretzel et al., 2015b; Reis et al., 2020). Digitalization as a potential tool for fostering tourism sustainability has been addressed at the policy level. Iceland's tourism authorities envision Icelandic tourism to be "leading in sustainable development" by 2030 (Ferðamálastofa, 2020a). To achieve this, they see—among other things—the application of technology and innovation as essential tools, noting that it is imperative that future tourism positively affects local communities (Stjórnarráð Íslands, 2023).

Concrete examples of how applied digitalization can manifest in practice are often lacking. This lack of applied understanding of what digitalization actually is, how it could manifest in practice, and in turn how it can contribute to solving the current challenges of the tourism industry could hamper rural tourism practitioners from applying digital tools in their businesses.

The study area of this research is Iceland, which is described in depth later in this introduction. Approximately 92% (Ferðamálastofa, 2018) of international tourists visiting Iceland state that nature is the main reason for their visit. Most of the natural attractions marketed to international travelers are in rural areas, underlining their importance from an economic perspective. Despite the key role rural areas play for both locals and tourists in Iceland, smaller rural tourism actors do not seem to participate equally in decision-making processes compared to the larger companies that are mainly situated in the capital. Innovation and digitalization do not yet play the same role in the Icelandic countryside as they do in Reykjavík. Indeed, discussions and initiatives related to fostering innovation and digital applications occur primarily in the capital area, despite various creative examples of rural innovation.

Against this background, this dissertation examines four main research questions, which are presented in the next section.

1.3 Research Questions

This PhD consists of four consecutive publications to address the research questions outlined in Table 1.

Table 1

Research Questions and Publications

Research Question	Paper/Chapter Addressing This Question
1(a): What is the role of tourism lifestyle entrepreneurs in rethinking current tourism practices with regard to degrowth and greater sustainability?	Publication 1
1(b): How can tourism actors' values and business intentions beyond economic growth foster sustainability in tourism?	Publication 1
2(a): What is the value of digital innovation for rural tourism entrepreneurs in Iceland?	Publications 1 and 4
2(b): How do rural tourism entrepreneurs in Iceland understand and apply innovation in practice?	Publications 2 and 4
3: What are the dynamics of applied digital innovation in rural Iceland?	Publications 1, 3, and 4
4(a): How do representatives of the Icelandic tourism support system assess the value of applied digital innovation as a tool to foster sustainable tourism development in Iceland?	Publication 4
4(b):What hampers the successful implementation of entrepreneurial endeavours of digital solutions in the Icelandic tourism industry?	Publication 3 and 4

Before proceeding to the outline of the thesis and the subsequent conceptual discussion, I briefly introduce the study area, which is essential to gain an understanding of the context of the research. Although it is not common to include such information in introductions, I find it important to clarify the specific focus of this study, which revolves around Iceland and its specific characteristics, to support the conceptual discussion.

1.4 Study Area: The Case of Iceland

The following section provides an overview of the study area of Iceland and briefly describes recent trends and challenges in tourism development before proceeding to a discussion of the theoretical framework employed in this research. As is typical for Nordic destinations, the tourism environment in Iceland is mainly characterized by family-run, small-to-medium-sized tourism businesses (Atladóttir et al., 2023; Jóhannesson & Huijbens, 2010). However, the biggest revenues in tourism are generated by a few market leaders that operate primarily out the capital area of Reykjavík.

Following the eruption of Eyjafjallajökull in 2010, Iceland received global media attention, resulting in its transformation into a sought-after tourist destination. Over the past decade, tourism has emerged as Iceland's primary economic pillar, with 2.3 million international visitors in 2018—a nearly seven-to-one ratio of tourists to inhabitants (Ferðamálastofa, 2021). In 2019, the year before the COVID-19 pandemic, Keflavík International Airport recorded 1,995,972 international visitors (Ferðamálastofa, 2019a).

Despite a significant decline in international arrivals during the pandemic, the tourism industry in Iceland has made a remarkable recovery, welcoming approximately 1.6 million visitors in 2022. Recently, the Icelandic Tourist Board reported an 87.9% year-on-year increase for the first three months of 2023 (Ferðamálastofa, 2022, 2023a). This rapid growth involves a series of challenges (Jóhannesson & Lund, 2019). Most tourists visit the capital of Reykjavík, which serves as the primary gateway into Iceland (Huijbens & Jóhannesson, 2020) with 75% of all overnight stays registered there in 2019 (Ferðamálastofa, 2019b). The spillover effect of this stream of visitors to the capital mainly affects its close surroundings and the South Coast region, which attracts 81% of tourists due to its natural attractions, including the famous Geysir hot spring (Ferðamálastofa, 2019a). In contrast, only 16% of tourists visit the remote Westfjords, while some 38% travel to the east of Iceland. This concentration of visitors in a small part of Iceland during the summer months has provoked discussions about crowding and over-tourism (Sæþórsdóttir et al., 2020b; Wendt et al., 2020). A media analysis (Sæþórsdóttir et al., 2020a) revealed how international commentators are increasingly pointing to Iceland as a "poster child for over-tourism" (p. 11) and feature Iceland in "no-go" lists (p. 2) due to crowding at the main tourist attractions, where natural attractions have visibly suffered.

Some 92.4 % (Ferðamálastofa, 2018) of the international tourists who visit Iceland state that its natural attractions are the main reason for their visit. Despite the key role that rural areas play for both locals and tourists, the countryside does not seem to be included in discussions on tourism development as much as the capital area. Innovation and digital applications do not yet play the same role in the rest of Iceland as they do in Reykjavík and other urban areas. Despite various creative examples of how innovation can be applied in the Icelandic countryside, most discussions and initiatives focus on the capital. For example, around 90% of all grants from the Technology Development Fund[3] are received by applicants in Reykjavík and the immediate surrounding area, which is surprising given that natural attractions in rural areas are the main reason people visit Iceland. Jóhannesson and Huijbens (2010) discuss how Reykjavík serves not only as the main gateway to Iceland but also plays a major role as a basecamp. The majority of visitors to Iceland stay overnight in Reykjavík (Ferðamálastofa, 2023a) but take daytrips to natural attractions.

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[3] Þingskjal 669 — 132. mál. (2019–2020). Svar ferðamála-, iðnaðar- og nýsköpunarráðherra við fyrirspurn frá Albertínu Friðbjörgu Elíasdóttur um stuðning við nýsköpun. https://www.althingi.is/altext/pdf/150/s/0669.pdf

Since the majority of the market leaders are situated in Reykjavík, trips and tickets to attractions in the countryside are often purchased in the city. This leads to economic leakages from the rural areas, which have few chances to compete with the market leaders. This could be a possible explanation for the uneven distribution of innovation grant applications between rural and urban areas. The imbalance of tourism being centered around the capital while the main attractions are in the countryside reflects the general organizational structure of tourism in Iceland, which is continuously under scrutiny.

Within a global context, rural areas are not seen as hotspots of innovation or places where creative things can occur and connections be made. Regarding technological development, digitalization and rurality are, in some cases, considered mutually exclusive; rural areas are seen as representing low levels of creativity and openness to new ideas and individuals, as well as limited access to expertise and knowledge due to factors such as the high cost of transportation (Gibson, 2010).

The interest of tourism decision-makers and policymakers in Iceland is increasingly shifting toward "smartification." Policies issued for regional development plans for 2018–2024 stress the need for research and development in digital solutions for rural areas (Stjórnarráð Íslands, 2018). They aim to increase business capacity, enhance digital technologies, and foster industrial innovation in sparsely populated and remote regions, specifically in small companies. The Icelandic Strategic Regional Development Plan aims to establish "collaboration with marketing agencies, regional consultancy services, and lifelong learning centers throughout the country to reach as many parties as possible" (Stjórnarráð Íslands, 2018, p. 16).

1.5 Outline of the Thesis

This PhD is a thesis by publication and is therefore divided into two main parts. Part I gives an overview of the theoretical framework of the research and a summary of the four peer-reviewed publications submitted within the framework of the PhD (three articles and one book chapter). It unites these four works into a coherent story and brings their conceptual frameworks and empirical findings into a common context. Part II is a compilation of the publications. Of the four manuscripts, two were published in academic journals (*Sociologia Ruralis* and *Academica Turista*), while the third article has been accepted for publication at the *Journal of Tourism Futures*. The book chapter has been accepted for publication and will be published in 2024 with Palgrave as a part of an edited volume titled *Tourism Entrepreneurship: Knowledge and Challenges for a Sustainable Future* (see García-Almeida, 2024).

Chapter 1 begins with a general introduction followed by the aim of the research, the research questions, and a brief discussion of the Nordic context, with Iceland as the main focus area. Chapter 2 introduces the conceptual discussion on which this PhD is based. It begins with a section about rethinking tourism with a focus on the degrowth paradigm. The following section is about innovation, including a short overview of how innovation is discussed in the context of tourism. In concordance with the aim of this PhD, which is to gain an understanding of how rural tourism actors understand and work with innovation, this section focuses on practical insights gained through the empirical research. A further focus is to shed light on the preconditions required to implement innovation. The next section provides an overview of digital applications in tourism. The increasing application of AI and service robots is reshaping the tourism and hospitality industries. This section outlines areas of digital application and addresses challenges and risks

regarding these developments. The last section of Chapter 2 discusses the potential contribution of tourism lifestyle entrepreneurs as agents of degrowth. After a brief introduction of the controversial concept of lifestyle entrepreneurs in the current body of literature on tourism, I link their level of embeddedness in local communities to tourism innovation and explore their potential impact on rethinking tourism and challenging the growth paradigm.

Chapter 3 introduces the research design and the methodologies, and methods used in the research. I begin by introducing the qualitative research methods, focusing on describing the action research that played a key role in the evolution of this PhD. The chapter also provides a description of the data gathering and analytical techniques.

In Chapter 4, I briefly summarize the four publications comprising the body of the research and describe how they build on each other.

The discussion in Chapter 5 addresses the key findings and overall contributions of this PhD based on the findings presented in the publications.

In conclusion, Chapter 6 reviews the limitations of this thesis and provides suggestions for further avenues of research.

In the conceptual discussion that follows, I present the underlying theoretical contributions of this PhD that are essential to addressing the research questions. I start by discussing the current trend of rethinking tourism development in terms of degrowth with the greater goal of enhancing tourism sustainability. From there, I present the concepts of innovation and digitalization as potential tools for rethinking tourism practices. Finally, I link the discussion to the concept of tourism lifestyle entrepreneurship.

2 THEORETICAL FRAMEWORK

2.1 Rethinking Current Tourism

Publication 1 addresses how growth is currently dominating global markets, and tourism is no exception. The continuous striving for growth manifests in excessive consumption that, in many cases, exceeds the Earth's natural capacities. The pursuit of economic growth in tourism, also referred to as "growth fetishism" (Higgins-Desbiolles et al., 2019; Viken, 2016) "is the core of the neoliberal and the market economy thinking" (Viken, 2016, p. 21). Mihalic (2020, p. 4) describes the unsustainability of contemporary tourism and a "sustainability concept-implementation gap." In practice, this manifests in, for example, overtourism, which contradicts tourism sustainability and mirrors the tourism industry's profit-seeking intention (Sharpley, 2021). The progressive increase of global tourist arrivals and international tourist receipts of USD $14,834 billion in 2019 (before COVID-19) undermines the tourism sustainability goals as stated in global and national tourism policies and promoted by tourism authorities (Sharpley, 2020). According to Higgins-Desbiolles et al. (2019), tourism authorities act according to neoliberal capitalism, which pursues scalable economic growth and hence contradicts sustainability at its core. Sharpley (2020) indicates a gap of understanding between tourism policy and academia, which "occupy a parallel universe to the practice of tourism" (p. 1933). Despite decades of discussing possible ways to foster sustainable tourism development, past initiatives have been criticized as having had little positive impact in practice. In recent decades, there have been many considerations related to finding ways to instigate sustainable tourism (Saarinen, 2020). Sustainable and responsible tourism have been predominantly under academic and public scrutiny and subject to extensive discourse (Mihalic, 2016; Saarinen, 2020). Both concepts have been criticized as having reached their limitations and thus failed to foster actual tourism sustainability (Gössling & Hall, 2005). According to the United Nations World Tourist Organization (UNWTO), sustainable tourism is "[t]ourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (n.d.).

   Despite initial positive contributions regarding recycling and reducing energy consumption, the practice has been subject to heavy criticism due to its focus on the needs of the industry. Instead of instigating change, the concept has turned into a "public relations tool for addressing the criticism of the impact of tourism" (Mihalic, 2016, p. 462) under the label of sustainability while actually supporting mass tourism and the pursuit of economic growth (Saarinen, 2021; Sharpley, 2020). The lack of a common understanding of what sustainable tourism actually implies in practical terms may have further hampered a positive association. Mathisen et al. (2022) criticize how public authorities tend to see sustainability as the interplay of economy, ecology, and society, neglecting ethical principles such as fostering wellbeing for humans and the environment. This aligns with Atladóttir et al. (2023), who point out the reactive nature of sustainable tourism and its ultimate goal of satisfying the needs of the industry, which is usually dominated by market leaders.

In contrast to sustainable tourism, the concept of *responsible tourism* is based on neoliberalism and aims to empower individuals to be responsible (Saarinen, 2021). This approach is based on the assumption that both travelers and tourism providers have the same understandings, values, and ethical norms regarding what responsible behavior entails, although it can be individually interpreted by the various visitors. Saarinen (2020) highlights that tourists tend to live for the moment and are on break from their daily lives, which can result in a more casual and relaxed approach with regard to responsible behaviors and values.

To instigate positive change in sustainable tourism development, current approaches must be rethought. Huijbens (2023) suggests an approach beyond abstract argumentations; emphasis should be placed on highlighting aspects of life that are meaningful to the actors involved. Through telling stories instead of defining theoretical concepts, values and worldviews can regain importance in the discussions and contribute to increasing understanding about what is meaningful to individuals (Huijbens, 2023). The imperative of shedding light on the involved stakeholders' values becomes especially evident in Publications 1 and 2. Through my qualitative methodology including semi-structured research interviews with rural tourism entrepreneurs, I gained insights into these actors' perspectives of tourism development in Iceland. This not only helped me to better understand the challenges entrepreneurs currently face in tourism development but also brought me closer to the entrepreneurs and their businesses. Allowing them space to share their thoughts and stories established trust, created a certain connection between myself and the entrepreneurs, and allowed me to better understand their motivations and what is meaningful to them as individuals who are more than just economic actors. The following research story about a regenerative tourism initiative in Iceland provides an example of how degrowth and rethinking tourism are tackled in practice.

2nd Research Story - Experience
Nordic Regenerative Tourism: Contemporary Approaches to Rethink Tourism
At the beginning of 2022, I became involved in the Nordic Regenerative Tourism (NorReg) project in collaboration with the Icelandic Tourism Cluster. Although my participation in this project was not related to my PhD research, my involvement in NorReg provided me with valuable insights regarding how rethinking tourism is approached in practice. The project goal was to develop a common understanding of regenerative tourism from a bottom-up approach. Various small to medium-sized tourism businesses were invited to share their views, thoughts, and hopes related to rethinking tourism. Through different workshops, the challenges these tourism entrepreneurs face in their own businesses and what they need to make their businesses more sustainable were explored.

Eventually, the NorReg participants identified three main focus areas for regenerative tourism: people, environment, and business. The pillar *people* comprised highlighting and supporting local culture in a way that both locals and visitors benefit. The participants addressed the necessity of communities becoming attractive, accessible, and transparent to every demographic group. The pillar *environment* involved establishing a balanced and diverse ecosystem through the consultation of experts and citizen science projects. In the *business* pillar, the participants identified the need to establish a holistic business landscape in which businesses support each other cross-sector, with a special focus on highlighting the value of local products and services (http://www.norreg.is; Atladóttir et al., 2023).

At the time of the writing of this PhD, the NorReg project was still ongoing, with approaches and tools in progress, so no conclusions about success could be made. However, the bottom-up approach as a potential method for including small tourism businesses in decision-making processes caught my interest.

A focus on maximizing economic growth leads to a world in which people define themselves according to their material wealth. With this PhD, and especially in Publication 1, I examine how shifting the focus to values beyond growth might be a way to interrupt this capitalistic spiral. Rethinking tourism to focus on the Earth (Huijbens, 2021a) and fostering sustainable actions that stem from individuals' beliefs and values are mirrored in the degrowth concept. The following section addresses values and worldviews and their role in rethinking ongoing growth agendas.

2.1.1 Values and Worldviews: Is Degrowth a Matter of the Mind?

Gibbons (2020) argues that the failure to implement sustainability is rooted in the fact that the values, beliefs, paradigms, and worldviews of tourism practitioners remain largely unaddressed. This reflects Latouche's idea of conviviality, in which degrowth implies focusing on the inclusion and well-being of all individuals in local communities rather than providing services for visitors and absorbing the financial gain of tourism (Latouche, 2007; Mihalic, 2020). Derived from the Latin *con* (with) and *vivire* (live), conviviality "focuses on people's capacity to control, collectively, the modern tools of industrial-capitalist society" (Ruiz-Ballesteros, 2020, p. 172). Mathisen et al. (2022) refer to the bigger picture, in which humanity is just one actor among many in the global ecosystem. They stress the imperative of acknowledging reciprocity and being aware of how our actions affect others in the ecosystem. Conviviality, in the sense of involving local stakeholders in tourism decision-making, could be a powerful tool to counteract current growth-driven development (Ruiz-Ballesteros, 2020).

To achieve sustainability, tourism must be rethought in a way that prioritizes the needs of local communities over those of tourists and tourism agencies (Fletcher et al., 2019; Higgins-Desbiolles et al., 2019). Mathisen et al. (2022) stress that responsible behavior is a matter of the "soul" (p. 2)—the values and beliefs of tourism stakeholders. The authors discuss how sustainable behavior entails personal attachment to a place and a community and is thus driven by "inner sustainability" (p. 2; see also Wen et al., 2021) instead of an outer reaction to guidelines and political requirements. This approach focuses on the inclusion and wellbeing of everyone in a community rather than on providing services for visitors and absorbing financial gains from tourism (Latouche, 2007; Mihalic, 2020). Fundamentally, degrowth moves the focus onto the "real needs of humans in a finite natural system" (Muler Gonzalez & Gali Espelt, 2021, p. 885) rather than stopping growth per se. A radical rejection of growth in tourism would be difficult, as various individuals and businesses are financially reliant on tourism or tourism-related actions (Mihalic, 2020). As Butcher (2021) argues, while growth is the origin of many problems we face in contemporary tourism, it is essential for the continued existence of tourism development. Total growth aversion and anti-capitalism would most likely result in poverty and chaos (Butcher, 2021; Latouche, 2007).

The best approach to instigate and foster tourism sustainability is still unknown; approaches are blurry, and the political focus on responsible tourism practices is "far from clear" (Viken & Dawson, 2016, p. 246). Various authors have argued that it is imperative to overcome the striving for economic growth and increased tourist arrivals as the main indicators of tourism success (Mihalic, 2020; Muler Gonzalez & Gali Espelt, 2021) and implement degrowth principles (Margaryan et al., 2020).

Degrowth is often referred to as a series of principles to be incorporated into existing thoughts and concepts (Fletcher et al., 2019; Muler Gonzalez & Gali Espelt, 2021). In contrast to the literal meaning of the word "de-growth," the concept is not about

downsizing per se or even the radical reduction of tourism (Hall, 2009; Sharpley, 2022); rather, it is about "the notion of 'right-sizing'" (Hall, 2009, p. 55). This rightness of size is dependent on location and can even manifest in an increase in visitors in certain places (Hall et al., 2020). Sharpley (2022) interprets degrowth as a lifestyle, with the planet setting the pace for human consumption and growth. The limits of growth are then measured according to the principle of "enoughness" (Sharpley, 2022, p. 2), which is determined by the natural extent of the Earth's capacities and the level of peoples' wellbeing.

Huijbens (2021b) furthers this concept, asking how tourism can shed light on and counteract the current exploitation of the Earth's natural capacities. By drawing attention back to the Earth, Huijbens (2023) calls for a "re-storying of our relations with planet Earth" (p. 5) and an awareness shift beyond neoliberalism, growth, and consumption. This rethinking of the meaning of changing one's mindset has recently gained momentum and is considered a possible approach to tackle the challenge of fostering tourism sustainability. Recently, both academic and private initiatives have increasingly emphasized implementing practical and creative solutions, such as research and the development of projects that focus on value and wellbeing. This holistic approach, where humanity is part of the "web of life" (Huijbens, 2021a , p. 122), shifts actions and focus to *earthly* matters and develops tourism in line with the needs and limitations of nature and local communities.

Finding alternative ways to address current growth agendas requires rethinking the way things are being tackled. The degrowth paradigm's suggested value shift requires tourism stakeholders, providers, and decision-makers to change their ways of thinking and adopt new habits. Doing something new or doing things in a new way leads us to the chapter about innovation. Being innovative plays a key role in such rethinking. Innovation can manifest in various forms, ranging from simply doing things differently to applying technological solutions. In the context of this PhD, I see innovation as a toolbox that could be meaningful for tourism stakeholders in instigating positive change. In the following section, I introduce the forms of the concept of innovation that I used in this study.

2.2 Innovation

2.2.1 Dynamics of Rural Innovation in Tourism

Just a few months after I started my PhD, the first COVID-19 wave hit Iceland. Initially, this resulted in social and professional life being shut down, reduced to the bare minimum. After a short time, as indicators began to suggest that it was likely that the pandemic would entail a longer period of social distancing and limited social life, the first signs of resilience began to show in the form of calls for innovative ideas, grants seeking innovation, and several online innovation events. It seemed that the only way to get through the pandemic was by applying innovation. This was especially interesting to me since my research focus was on innovation in rural tourism. However, the various innovation events, grants, and projects did not specify what "innovation" actually implied. It was advertised as a one-size-fits-all solution, and it seemed that nobody scrutinized the concept. This was the first time that I realized that "innovation" was a buzzword and was lacking a clear definition. The concept of innovation is broad and has been extensively discussed in the literature both in terms of rurality (French, 2022; Mann & Miller, 2022; Sept, 2020) and tourism (Brouder, 2012; Hall & Williams, 2019; Hjalager, 2012). In this research, I explore the

dynamics of innovation in relation to tourism entrepreneurship, especially in the rural context.

As mentioned in the initial research story, rural areas are often seen as lagging behind urban areas when it comes to the infrastructure required for innovative solutions. Moreover, rural areas are often considered unattractive for entrepreneurs or creative hotspots (Mayer et al., 2016). With my research, I investigate how entrepreneurs in rural areas of Iceland innovate and what those dynamics are like. Rural areas face different challenges than urban areas (Flora, 2022) in terms of community thriving and wellbeing. In order to adapt to and be resilient in the face of any kind of change (including tragedies, such as natural and economic disasters or a pandemic), rural areas need innovation (French, 2022). Due to the diversity of different rural areas, how this innovation manifests in practice is very place-specific. Innovation in rural areas does not follow a set pattern and cannot be predicted, as shown in Publication 3 through the example of an intervention carried out in rural Iceland. Publication 1, in particular, discusses how rural innovation often focuses on local communities, community wellbeing, and the thriving of local economic and social values. Hence, especially in rural areas, which are often remote, network formation and exchange between business peers are essential to access the knowledge that is necessary for responding to challenges (French, 2022) and, with regard to tourism, positively affect customer experience (Hjalager, 2015; Teng & Chen, 2021). Both Publications 1 and 3 touch upon this.

As in other sectors, tourism innovation is essential for responding to fast-changing global competition (Sørensen & Hjalager, 2020). Tourism is not an easily defined sector and is affected by sectors that do not appear linked to it (Hjalager, 2015). For example, EU transnational corporations, such as infrastructure provision and the principles of consumer protection, are connected to tourism and shape the sector subliminally. Hence, tourism innovation is often a combination or variation of existing innovative services rather than a "breakthrough innovation" (Zach, 2016, p. 273). Innovation outside the tourism sector affects tourism, and, to some extent, tourism innovation is a response or consequence of external changes (Hjalager, 2015). Therefore, tourism innovation can manifest in diverse ways (Hjalager, 2015), including product, process, managerial, institutional, and marketing innovation (Hjalager, 2010). Businesses need strategies that foster innovative behaviors and business improvement to maintain a competitive advantage in the global tourism market (Hansen et al., 2019; Ottenbacher, 2007). Challenges like the sustainable use of natural resources require innovative thinking and solution-oriented approaches (Madanaguli et al., 2022).

In the following, I discuss innovation beyond economic growth and describe how I approached and worked with innovation as a concept in my research journey.

2.2.2 Understanding Innovation

Although innovation is frequently discussed in current tourism entrepreneur literature (Hansen et al., 2019; Jaafar et al., 2015; Romão, 2020; Sørensen & Hjalager, 2020; Tuomi et al., 2020; Williams, et al., 2020; Zach et al., 2020), it is often considered "too fuzzy a concept to be measured and accounted for" (OECD/Eurostat, 2018, p. 1). There is no recipe or one-size-fits-all solution for what innovation looks like in practice. The following research story shows how some of the tourism entrepreneurs I interviewed expressed innovation graphically. The inserted graphics serve solely as illustrations of how wide-ranging perceptions of innovation can be; their content should not be interpreted at this point.

3rd Research Story - Experience
Icelandic Tourism Entrepreneur: What is Innovation?
In my research interviews with tourism entrepreneurs throughout rural Iceland, my intention was to gain an understanding of how these tourism actors perceive innovation. The various discussions on how innovation has become a buzzword have manifested in Iceland, where even local busses in Reykjavík announce events such as Innovation Week. In order to look beyond this expectation-loaded buzzword, I asked my interviewees to illustrate the concept of innovation. The following sketches demonstrate how individually perceived innovation is in practice.
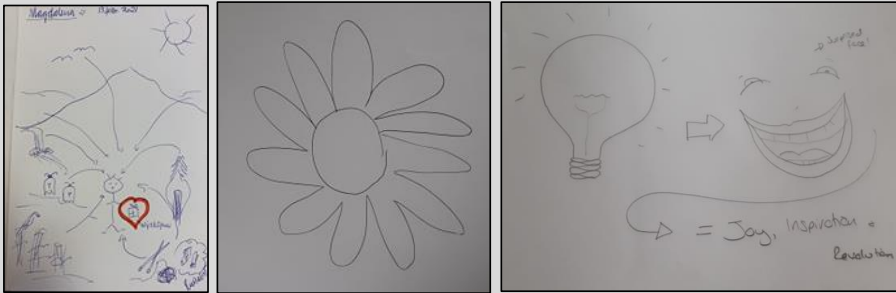
Joseph A. Schumpeter, an Austrian political economist who saw innovation as the "essential function of an entrepreneur" who initiates and establishes new production functions, described the core of innovation as the process of creating new ideas that add value to society or an individual (Ruttan, 1959, p. 597). The following research story highlights the importance of a common understanding of a concept such as innovation when working with it actively in a project or group. Despite the many discussions and definitions of innovation in academic and non-academic literature, the clarification of what is really meant when talking about innovation was decisive in my work with the research project FIERI, which I briefly introduce in the following research story.

According to the ISO, innovation is "a new or changed product, process, model, method, etc., realizing or redistributing value" (Innovation Management System, 2023). In the current Oslo Manual, the OECD describes innovation as "a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)" (OECD/Eurostat, 2018, p. 20). The key takeaway from these definitions is that products, services, or projects must in some way be novel and add value in order to be considered innovative. Both terms—"novelty" and "value"—are perceived subjectively by different groups and individuals. What is new or novel in one place may be outdated in another. Hence, innovations do not necessarily need to be new inventions to instigate groundbreaking change. Hjalager (2014) emphasizes that it is ultimately the users who decide a product's, project's, or service's level of innovativeness.

2.2.3 The Value of Innovation: Value Beyond Growth

As discussed, calls for fostering innovation beyond the sole aim of generating economic growth have recently become louder (Boluk et al., 2020; Butcher, 2021; Demiroglu & Turhan, 2020; Fletcher et al., 2019; Hall et al., 2020; Lundmark et al., 2020; Muler Gonzalez & Gali Espelt, 2021; Saarinen, 2020). The concept of "enoughness" (Sharpley, 2022, p. 2) indicates that value beyond growth does not necessarily mean an aversion to growth, but rather refers to finding the right size of growth (Hall, 2009). As explained in the chapter on tourism lifestyle entrepreneurs (Chapter 2.4), various entrepreneurs are driven by various motivations. Their efforts to innovate are not necessarily growth-driven. The determination of whether the outcome of innovation is beneficial depends on the underlying values individual entrepreneurs link thereto. Hence, the goals of some entrepreneurs may not align with the values established in a society. Similarly, with regard to the idea of novelty, the concept of value is a subjective determination. Discussions on innovation rarely address the fact that the concept of innovation is not positive per se (Hjalager, 2014). Consider, for example, disruptive innovations such as peer-to-peer accommodation platforms like Airbnb, which provides alternative accommodations to the

conventional hotel industry (Zach et al., 2020). Although they add value to the economy, such innovations can have a tremendous negative impact on the tourism industry and cause significant damage to businesses that are based on traditional (and thus sometimes outdated) methods (Hjalager, 2014). In particular, digital solutions based on new technologies can place traditional processes under scrutiny and even replace them by offering easier handling and access (Zach et al., 2020).

French (2022) discusses how inventions with high levels of innovativeness and a breakthrough effect on existing market structures are more likely to develop in urban rather than rural areas due to differences in infrastructure, clustering of businesses, and access to knowledge. This creates the false picture that rural areas lack innovation. Innovation in rural areas often extends beyond the aim of financial gain and instead focuses on community wellbeing. French (2022) introduced the term "social innovation" (p. 4), which relates to the requirements to meet local social needs and points out how rural innovation, as a result of that, often happens in a rather low-key way. This aligns with the belief that innovative behavior is a common reaction of rural inhabitants to cope with change (Flora, 2022).

The insights from the following research story were acquired through my participation in the FIERI project. The research story serves to exemplify the sometimes blurry boundaries regarding whether a project or idea is innovative by definition or simply adding value.

Is Value Enough to Be Innovation?
The FIERI team translated the OECD's and the ISO's definitions into practice to contribute to understanding how these theoretical definitions manifest in practice. I encountered various instances during my PhD journey, both within and outside of the FIERI project, that challenged whether an example could be classified as an "innovation" based on the ideas of novelty and value. In the following, I present three of examples.

Example 1: The Farmer and the Diesel Motor
In this example, an Icelandic farmer's tractor broke down during the annual hay harvest, and bad weather was approaching. In agriculture, the hay harvest is among the most important times of the year, as feed for the livestock depends thereon. Rain during a hay harvest can destroy the annual harvest. To avoid this type of agricultural catastrophe, the farmer removed the motor from his truck and connected it to his broken tractor to finish the harvest.
Conclusion:
The FIERI team concluded that this example can be seen as applied innovation, and both key components (novelty and value creation) are met. Although the farmer did not re-invent the wheel, his creation was valuable, as it saved his hay harvest. A truck engine is not novel but being attached to a tractor places it in a new context.

Example 2: A Gas Station in a Remote Fishing Village
We discussed whether a gas station with a small supermarket and coffee shop in a remote fishing village could be defined as innovation. At first, this sounds ridiculous. Upon closer inspection, we realized that such a micro service center was a major advantage for the local population. Apart from saving time, this gas station offers the locals a place where they can meet and exchange ideas on a regular basis.
Conclusion:
After a long discussion, the FIERI team concluded that the service center does not meet the novelty factor. The value creation, however, is immense. This example is crucial in understanding that projects can be valuable without being innovative.

Example 3: A Locally Developed Tourism App with Limited Funding
In discussions with tourism consultants, we encountered a locally funded app intended to foster tourism sustainability. We discussed the hypothetical example of an entrepreneur who had an idea to solve an existing challenge in local tourism by modifying an app. Local funding is usually very limited.
Conclusion:
Although apps for a specific tourism service can be highly novel, the value requirement in this example are most likely not met. Due to limited funding, such apps often fail to scale up and hence lack a wide-ranging user base. Moreover, the limited funding is generally insufficient for the marketing expenses that would be necessary to increase download numbers.

As demonstrated, an increase in economic value does not necessarily align with increased social value and local wellbeing, and vice versa. In the rural context, in particular, value is often disconnected from financial gain. For example, the construction and management of a community hall for a small rural municipality is not innovative per se and does not generate economic revenue. However, it adds tremendous value to the community as an event location and meeting place. Indeed, Leick and Lang (2018) discuss value beyond growth in the rural context, highlighting the key role of local actors and network formations for fostering local innovation. Identifying "local heroes in the business community" (Leick & Lang, 2018, p. 219) supports the formation of local networks, which are key, as they enable individuals to exchange knowledge and build connections (Lyons, 2021) and hence allow often remote rural areas to access knowledge beyond the reach of individual community members (French, 2022). The following section sheds light on the imperative of networks as a base for the social capital that drives rural innovation.

2.2.4 Creative Communities and Social Capital: Drivers of Innovation

In the current "post-industrial economy" (Mellander & Florida, 2021, p. 6) and era of globalization and digitalization, large and physical industries are no longer necessary for a community to thrive. Instead, people and their skillsets are increasingly seen as resources by itself to foster innovation and community prosperity. Mellander and Florida (2021) refer to this rise of "knowledge econonom[ies]" (p. 6) in their discussion of social capital. Social capital is a wide ranging concept, and an in depth exploration thereof would exceed the scope of this PhD. Summarily, it implies added value in terms of resources, trust, and social relationships within a group or community, which underpins the necessity of creative hubs for innovation processes (Ihlen, 2005). The concept of social capital was largely shaped by sociologist Robert David Putman and social philosopher Pierre Bourdieu. While Bourdieu (2011) saw social capital as a common good of a certain community, Putnam viewed it as a community asset that simplifies processes for the members involved. Social capital in the context of this PhD follows Putnam's (1994) description: "features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit" (p. 7).

Through discussions on human capital, people's skillsets and capacities to be creative have gained importance. This reverses the traditional approach to fostering a thriving community; instead of an industry that creates workspaces and thereby attracts people to a community, the challenge lies in creating hubs that attract creative people who are motivated to become part of a local network and find solutions to challenges. Florida et al. (2008) refer to these networks as the "creative class" (p. 616), highlighting the importance of attracting creative people for a place to thrive and foster innovation.

Here, the focus shifts to network as a resource, and location moves into the background. As Feld (2012) indicates, "a location that hits critical mass enjoys a competitive geographic advantage over places that have yet to attract a significant number of creative-class individuals" (Feld, 2012, p. 24), regardless of whether the location is remote, rural, or urban. Thus, fostering rural innovation and moving beyond traditional approaches to creating value requires a critical mass of people who think outside of the box and attempt different methods to create value, either for themselves or on a bigger scale. According to Gibson (2010), creative processes require face-to-face interaction, highlighting the significance of innovative meeting places for like-minded people (Leadbeater & Oakley, 1999) to facilitate knowledge exchange and accumulation that support entrepreneurship and innovation. Scholars have argued that cluster building and innovative networks strengthen a region's capacity to attract creative actors (Feld, 2012; Huijbens & Jóhannesson, 2014). Innovation requires a creative space that supports interaction among various actors within clusters and facilitates an exchange of experiences, knowledge, and competence for developing a successful entrepreneurial scene (Fuglsang & Eide, 2012). Due to less interaction and smaller social networks, social capital is often considered lower in rural areas (Mayer et al., 2016) and lacking the critical mass required for driving rural innovation. According to Lyons (2021) rural innovation often discontinues because of a lack of network effects.

Creative hubs and creative communities in rural areas are discussed in Publication 3, which outlines Hacking Hekla, a rural hackathon in Iceland. In this case study, I describe the challenges and opportunities related to implementing digital innovation in rural Iceland by addressing the importance of the creative class and the challenge of identifying and activating them. I refer to Hacking Hekla in the following section, in which I briefly address the communication gap between governmental authorities and rural (tourism) entrepreneurs as a possible obstacle to rural innovation.

2.2.5 Miscommunication Between Authorities and Entrepreneurs: An Innovation Gap?

There are various circumstances that can negatively impact innovative development in rural areas, some of which are addressed in depth in Publication 3. Official discussions about innovation and entrepreneurship demonstrate that innovation is perceived as a priority by the authorities, both globally and in Iceland. Obaji and Olugu (2014) see the government as being responsible for laying the groundwork and outlining requirements for entrepreneurial activities. In contrast, Feld (2012) sees a gap between the government and entrepreneurs, with the government often lacking understanding of what laying the groundwork for entrepreneurship actually means. Goebel et al. (2020) further point out how local communities are often not included in decision-making processes related to tourism development in their own areas and hence lack opportunities to present their ideas and shape development according to their needs.

Mazzucato (2018) highlights the risk aversion of governmental and public authorities as a potential reason for the lack of governmental initiatives, simultaneously stressing that policy alone cannot be blamed for the lack of innovative developments. The author refers to a two-part discussion of the accountability of innovative development. The tendency is to depict the state as a provider of the essentials, whereas private businesses are seen as the driving force behind creativity. It is not sufficient to place responsibility on the state and blame it for not fulfilling expectations related to the development of innovation systems in rural areas. The ideal role of the state in innovation policy is initiating and propelling. Its function should be to bolster the economy toward innovative technological solutions, not carry it (Mazzucato, 2018).

During my many conversations with various rural entrepreneurs and tourism stakeholders during the fieldwork, I often encountered frustration from the rural entrepreneurs, who stated that the support system did not provide them with the support they actually needed due to a lack of communication with the authorities. Publication 2 addresses this matter and outlines some entrepreneurs' critical viewpoints of the Icelandic grant system, which seems to be focused on projects with scalable growth intentions. Moreover, the setup and format of the grants have been criticized as being too complex to be accessed by interested entrepreneurs, who sometimes lack the skills to perform such analytical tasks.

6th Research Story - Experience
A Monument to the Unknown Bureaucrat in Downtown Reykjavík

The governmental focus on hierarchy instead of networks, as criticized by Feld (2012), is exhibited metaphorical in the 1994 *Monument to the Unknown Bureaucrat* by Magnús Tómasson in downtown Reykjavík. The statue shows a typical public servant with a briefcase; however, his head is covered by a giant rock. In the FIERI project, we discussed this statue as a metaphor for the stereotype of a narrow-minded bureaucrat who follows a "business-as-usual" mentality, despite his head being covered with a giant rock, as a symbol of the resilience of creative thinking and innovation and the mantra-like sticking to bureaucracy.

The 7th research story shows the potential roots of the this criticism towards local governments and municipalities. The blunt criticism of "not getting it" could be indicative of a knowledge gap and a lack of communication about the support required for innovation and entrepreneurship. In the Schumpeterian conception of innovation, the issues of technological change and the growth of total productivity are closely connected (Ruttan, 1959). Hence, in the following, I move on to discussing innovation through the lens of digitalization.

7th Research Story - Experience
Buzzwords – A Lack of a Common Understanding

While writing this PhD, innovation was playing a significant role in Iceland, and not only in terms of tourism. Due to this ongoing innovation momentum, I sometimes got the impression that national and local authorities felt pressured to answer calls to foster innovation by implementing projects whose value they did not fully understand. The Hacking Hekla events fit in this official call to foster innovation; thus, it sometimes felt that some of our partners chose to collaborate with us to be part of the innovation movement rather than because they saw the actual value in a collaboration.

With Hacking Hekla, we saw ourselves as agents of innovation by introducing tools for creative thinking to rural locals and providing them with relevant networks and connections. The Hacking Hekla journey consisted of five hackathons throughout rural Iceland between 2020–2023. Each was done in collaboration with partners from rural destination management organizations or regional development associations. These collaborations often differed significantly from one another. While some participants brought their own initiatives and ideas, others were more observers and had less input on how to start a rural hackathon. It seemed that the partners who had clear ideas of their understanding of innovation followed a vision and were ambitious to co-create the event with us. They had ideas on which local partners could be invited and were keen on taking ownership in the project.

In some collaborations, however, it seemed that the value of a hackathon could not be seen by the partners; they could not always see the benefits of having an event that brings local creative minds together and encourages them to brainstorm about a particular challenge. In these collaborations, we often were confronted with difficult questions, such as the following: How many participants do we need so the project makes sense? How many project pitches will be there? What does this benefit to our area? Will there be new companies? When and how many?

Our partners—in almost all cases representatives from local official institutions and therefore governmentally funded—seemed to be very solution-oriented. The questions they asked sometimes gave us the impression that the value of a project must be visible and countable, and they did not always consider that fostering rural innovation may extend beyond delivering hard facts. A few of our partners ironically referred to the innovation networking events in Reykjavík as a mundane series of "cocktail parties," further highlighting the lack of acknowledgement that innovation is a social process, and networking and exchanges between like-minded people play a significant role in a project's success. Indeed, these "cocktail parties" have the potential to be a hub where like-minded people meet, exchange ideas, and eventually work together on projects.

In general, I felt more validation for the Hacking Hekla approach from partners who were involved in other innovation projects and had connections to other entrepreneurial communities. The pressure of some of our partners' expectations that Hacking Hekla events would significantly change an area's level of innovation was sometimes overwhelming. It made me think that if all actors in a rural support system had a general understanding of what innovation implies and how it can look in practice, events like Hacking Hekla might be more successful.

2.3 Digital Innovation

2.3.1 Digitalization: The 4th Revolution

The current era of digitalization-driven development is referred to as 4th Revolution, which marks an age of breakthrough technologies based on virtual reality (VR), artificial

intelligence (AI), smartification, robots, and big data (Tussyadiah, 2020) that are disrupting conventional service industry and travel behaviors. The term "4th Revolution" can be traced to major global economic changes that occurred in the past. The 1st Revolution refers to the industrialization that was the starting point for mass production (Tuomi et al., 2020). The 2nd Revolution, or the technological revolution, was an era of significant innovations, including electric power, and the 3rd Revolution, also known as the Digital Revolution and the Information Age, was the era of the internet, which radically changed the service landscape, business models, and work environments (Tuomi et al., 2020).

Like "innovation," "digitalization" has become a buzzword both in academia and policy making (Zuti, 2021). This vagueness manifest for already in a semantic unclarity of the terminology digitalization, which is abstract and vague (Schumacher et al., 2016; Wolf & Strohschen, 2018). This shows in an inconsistent use of the term in the literature, where "digitalization" and '"digitization" are used synonymously (Wolf & Strohschen, 2018). "Digitization" refers to the technical transformation from analog to digital data, whereas "digitalization" involves the social implications of increased technological applications (Bloomberg, 2018). The inflationary use of "digitalization" results in an unclear understanding, which is also the case in terms of tourism (Gretzel et al., 2015b).

Discussions on fostering digitalization have gained momentum on the global, national, and regional levels (Sept, 2020; Tsekeris, 2018; Wittmer & Linden, 2017). The goal of applying digital solutions is to positively impact living and working standards and contribute to increasing sustainability and global inequality (Wolf & Strohschen, 2018). In the Nordic context, NordRegio, an international research center for regional development and planning established by the Nordic Council of Ministers, has indicated the potential for digitalization to positively contribute to strengthening the competitiveness of rural areas (Randall et al., 2020). This idea has been further discussed by the OECD (2020). Digital applications such as for example drones could reduce transport costs and hence contribute to increasing the attractivity of rural areas for businesses and entrepreneurs. Enhanced digital applications further lessen distances by being less dependent on physical presence and locations (OECD, 2020).

The Icelandic government promotes the increased application of digital tools. The Icelandic Regional Development Plan 2022–2026 envisions leadership in digitalization and encourages Icelandic companies to apply digital solutions to foster expanding and resilient business environments[4]. The fast-changing impact of digital solutions on the working environment has also been addressed by the World Economic Forum (WEF); market prognoses indicate an increased adoption of digital tools in the work environments in the coming years (WEF, 2023a). Such changes affect the dynamics of the tourism industry in many ways, and the application of digitalization in tourism has the potential to positively impact customer satisfaction (Tuomi et al., 2020).

In the following, I discuss the application of digital solutions in tourism and use "digitalization" and "digital innovation" as synonyms, as I understand digitalization as a form of innovation based on technological and digital applications. I start by providing an overview of applied digitalization in tourism and then link the discussion to the overall question of if and how digitalization can become a tool for fostering tourism sustainability.

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[4] Þingsályktun um stefnumótandi byggðaáætlun fyrir árin 2022–2036. (2023). https://www.althingi.is/altext/152/s/1383.html

2.3.2 Applied Digital Innovation and Smart Tourism

Fusté-Forné and Jamal (2021) describe the radical structural change that the COVID-19 pandemic set in motion in the tourism industry. It contributed to shifting the roles of robots from solely increasing efficiency to providing enhanced, faster, and contactless service (Chiang & Trimi, 2020). The COVID-19 pandemic was an impetus for the tourism and hospitality industries to improve in terms of digital applications in order to stay competitive in times of social restrictions and limited mobility (Fusté-Forné & Jamal, 2021). The limitations of social distancing during the pandemic hastened digital development, with increased use of service robots driven by AI, big data, and intelligent automation (Fusté-Forné & Jamal, 2021). The progressive deployment of service robots is changing the tourism industry, gradually replacing "human-to-human interactions [with] human-to-robot interactions" (Fuste-Forne, 2021, p. 1). Hence, the ongoing influence of digital innovation has started to impact the dynamics in tourism and hospitality services (Tuomi et al., 2020).

The digitalization of the tourism industry also involves discussion about smart tourism (Ardito et al., 2019; Gretzel, 2018; Li et al., 2017; Williams et al., 2020), which emerged from the concept of smart specialization (Markkula & Kune, 2015; McCann & Ortega-Argilés, 2011). Smart tourism involves a broad scope of technologies, is based on information and communication technologies (Jovicic, 2019; Roopchund, 2020), and is described as "technical, data-driven, system-oriented and service-dominant" (Liburd et al., 2017, p. 4). It is a meaning-enriched and context-driven application of technology (Gretzel et al., 2015a). The link to VR, AI (Del Chiappa & Baggio, 2015), and social media indicates that tourism innovation is user-driven and responds to the needs of smart tourists, who are also referred to as "travellers 2.0" (Magasic & Gretzel, 2020, p. 5) or digital natives, which emphasizes the omnipresence of emerging technologies in daily applications (Skaletsky et al., 2017). Due to their novelty, smart concepts lack a clear definition. According to Giffinger and Haindlmaier (2010), "smart" implies a general ambition to improve living conditions. The literature agrees that smart city concepts imply features designed to improve quality of life with regard to sustainability through the use of information and communication technologies (Giffinger & Haindlmaier, 2010).

In the past decade, There has been a tremendous increase in discussions about smart tourism, both in practice and in the literature (Buhalis & Amaranggana, 2013; Ferras et al., 2020; Gretzel, 2015b; Kim & Kim, 2017; Lamsfus et al., 2015; Ren et al., 2018; Skinner et al., 2018). Potential applications of digitalization in tourism include cloud computing, data analytics, cybersecurity, digital marketing and digital forms of communication, blockchain, AI, the Internet of Things, and augmented reality (AR). Smart applications are increasingly replacing conventional information channels, such as tourist guidebooks (Mieli & Zillinger, 2020), contributing to reshaping the tourism and hospitality industries. Delving into all these fields would exceed the framework of this PhD. However, tourism research has recently focused on studying the impact and application of AI and service robots in different areas of the tourism and hospitality industries (Chiang & Trimi, 2020; Gretzel & Murphy, 2019; Ivanov & Webster, 2020; Park, 2020; Reis et al., 2020; Tussyadiah & Park, 2018). The OECD defines AI as follows:

> … a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments. When applied, AI has seven different use cases, also known as patterns, that can coexist in parallel within the same AI system. (OECD, 2019)

In the following sections, I discuss digital applications in tourism by examining applied AI, the automated processes performed by service robots, and the challenges that often accompany them.

2.3.3 Applied Digitalization in Tourism: Automating the Service Industry

Increasing use of AI and service robots is significantly shaping the tourism industry. Robots, which were originally used in factories and heavy industries (3rd Revolution), are moving into the service sector, where they are becoming part of the human environment (4th Revolution). Service robots are programmable smart tools designed to support human efficiency (Park, 2020). Their purpose is not limited to increasing productivity; their role as social supporters is becoming increasingly important (Fuste-Forne, 2021). Areas of deployment occur either in "back-office or business-to-business" settings (Murphy et al., 2021, p. 3); thus, they are not always directly visible to the customers. Publication 2 demonstrates that AI is generally associated with visible applications. However, only recently have digital applications entered "the realms of tourism and hospitality operations, including consumer-facing ones" (Tussyadiah & Park, 2018, p. 1). In tourism and hospitality, they are mostly deployed to positively contribute to consumers' travel experiences (Park, 2020) by assisting both tourists and tourism providers. Typical examples of back-of-house activities include maintenance work, gardening, dishwashing, and housekeeping, whereas front-of-house activities imply customer involvement and therefore direct interaction with service robots (Ivanov & Webster, 2020). Service robots are implemented to enhance customers' experience and convenience by providing extra benefits (Belanche et al., 2021) and contributing to a higher level of personalized service. Robots are increasingly used to welcome and assist travelers by, for example, providing them with information at the front desk or replacing human chefs or waiters in the form of AI-driven "eatertainment" (Fusté-Forné & Jamal, 2021).

AI offers further potential touch points between service providers and customers even before a customer arrives at their destination (Alt, 2021). Such pre-trip processes are intended to increase efficiency, for example, by providing instantly customized real-time information to potential customers through chatbots or virtual assistants. These work with algorithms and predictive data analytics based on customer data that is gathered through, for instance, social media platforms (Tussyadiah, 2020). Through data analysis and identifying and matching customers' key attributes, AI can significantly contribute to more targeted and personalized customer communication (Tussyadiah et al., 2021). AI-powered systems do not focus solely on personal customer data but also consider factors such as weather and traffic conditions, when tailoring recommendations (Tuomi et al., 2020). Such specific real-time suggestions and the instant development of individualized offers simplify decision-making processes for customers and save time. This positive impact on the customer experience can increase the likelihood of reaching customers and lead them to purchase the advertised services (Alt, 2021).

AI and automation also contribute to travel convenience and industry development by offering high-quality service 24 hours a day, seven days a week, as robots do not need to take breaks (Ivanov & Webster, 2020). However, the rise of automation leads to questions about the future of tourism development. The following section sheds light on the challenges and risks of an increasingly automated and AI-driven tourism industry.

2.3.4 Challenges and Risks of Applying Digitalization in Tourism

According to Tussyadiah (2020), a future in tourism characterized by AI and service robots must also be investigated from a social perspective—an approach that is lacking in the current body of tourism literature (Chan et al., 2022; Gretzel, 2011; Tussyadiah, 2020). This section discusses digitalization in tourism through a social lens; this is also reflected in Publication 2, in which I discuss possible reasons why tourism entrepreneurs reject the application of digital innovation in their businesses.

Digital advances and the emergence of new technologies are often rejected by tourism practitioners and customers, which conflicts with a future of tourism development that is increasingly embracing digital applications. Consumer acceptance plays a key role in successfully implementing new technologies (Murphy et al., 2021). The interviews with tourism entrepreneurs in rural Iceland revealed that this restraint stems primarily from a fear of the unknown and a lack of trust in their abilities to understand and apply new technologies (Publication 2). I observed a tendency of middle-aged and older rural tourism providers, in particular, to be dismissive of digital tools, simply stating, "This is not for me." Rejection of digital solutions is often rooted in a lack of technological knowledge (Kumar & Shekhar, 2020), which then leads to discomfort or shame when using or learning new technology. Discussions of technophobia and technology embarrassment often include mention of being overwhelmed by the challenge of changing one's processes (Chan et al., 2022). *Technophobia*, a feeling of anxiety about applying technology, is often related to unfulfilled expectations or bad past experiences with technology and can negatively influence people's openness to new technology (Tussyadiah et al., 2020). Digitalization, as it manifests in automated processes and customer–technology interactions, significantly changes the role of the tourist through co-creation and active participation in service processes. For example, by interacting with a service kiosk instead of being assisted by a human employee, the tourist's role changes from consuming to performing. In their study about technology embarrassment, Chan et al. (2022) describe how uncertainty related to operating such technology (e.g., self-service desks) can provoke feelings of embarrassment in customer–technology interactions. Users with high levels of public self-consciousness (Chan et al., 2022) are particularly afraid of public humiliation when interacting with automated service features, which often results in these individuals not using automated service processes.

Studies have shown that users often choose human-to-human service over customer–technology interactions (Chan et al., 2022). However, since the COVID-19 pandemic, contactless service has evolved dramatically and is being applied more widely. For example, at the international airport in Iceland, the only way to check in luggage is through self-service desks at specific times of day. Technophobic consumers who are "vulnerable to social scrutiny" (Chan et al., 2022, p. 2) are forced to use the automated service, which can negatively impact their travel experience.

Travelers with little digital know-how might not only experience an adverse travel experience; their lack of access and skillsets related to automated processes may keep them from using the services. Various researchers refer to this phenomenon as the "digital divide:" a gap between people who have a high level of access to new technologies and hence benefit from its use and people with little, limited, or no access to such technologies (Rooksby et al., 2002). The scope of access to digital applications varies substantially among individuals, with members of rural communities often being more disadvantaged. This can result in a downward-spiral-like social division (Gunkel, 2003), and those who lack skills and access to technology become progressively disadvantaged in a world where

information is increasingly provided through digital channels (Rooksby et al., 2002). Thus, the digital divide does not solely manifest in a technical lack of access but includes a social component as Publication 3 shows on the example of the intervention of Hacking Hekla. In order to bridge this divide, the motivation of underserved groups needs to be animated. A social lack of access can only be overcome when digitalization adds clearly identifiable benefits and value to people's lives. An open mindset toward digital applications and understanding the possible benefits thereof are essential for digital transformation. It is vital to make digitalization understandable for customers in order to make automated processes appear less threatening and thus easier to access (Tuomi et al., 2020).

The European Union measured the gap between rural and urban inhabitants regarding basic digital skillsets and found that rural residents lag 14% behind individuals in urban areas (European Union, n.d.a). When people have less knowledge about how to employ information technology and technological developments, they find the implementation of digital applications less appealing. Lacking technical skillsets and an understanding of the implications of digital applications often leads to a misconception of what digitalization in tourism looks like in practice: an industrial tourist industry in which guests are served solely by machines. Thus, the transformation of tourism toward an increasingly automated industry arouses fears of losing human-to-human interaction (Tussyadiah, 2020).

Tussyadiah and Park (2018) stress that the increasing deployment of technology, such as service robots, significantly impacts the dynamics of the tourism industry. The shift from interhuman encounters to human–robot interactions drastically influences visitors' experiences. Tourism has been mainly characterized by service quality based on interactions between hosts and guests. The progressive automation of processes will ultimately change these dynamics and impact the industry.

Existential fear is a further reason for restraint in applying new technologies. The 4th Revolution is often linked to the fear of employment loss as technology takes over workplaces (Tuomi et al., 2020, 2021). Indeed, one of the perceived main benefits of applied automation in tourism is the intended reduction of labor costs, which supports the general fear of automation eliminating jobs (Tuomi et al., 2020). Labor costs are high in the tourism industry, and robots offer a less expensive alternative with expanded availability. The WEF predicts a changing work environment that will affect 23% of all jobs; 83 million jobs will be eliminated, while 69 million new jobs are expected to be created (WEF, 2023b). According to the Future of Jobs Report 2023 (WEF, 2023a), opinions on whether automation will contribute to job loss are ambiguous. Tuomi et al. (2021) explain that technology either supports, substitutes, differentiates, improves, or upskills jobs and tasks in the tourism industry.

In the following, I briefly outline the future of tourism development in the era of automation.

2.3.5 Impact of AI on Future Tourism Development

Working conditions in tourism are often poor. Long work hours, seasonal contracts, low wages, shift work, and dull and repetitive tasks are often standard in this industry (Wendt et al., 2020). Digital solutions may contribute to overcoming staff shortages and improving the working conditions. Dangerous and mundane jobs, such as waste-sorting, dishwashing, and kitchen-related jobs, where chefs are often exposed to stressful situations under the influence of extreme heat and toxic fumes, also fall into this category (Murphy et al., 2021; Tuomi et al., 2020). Tuomi et al. (2020) argue that digitalization does not necessarily

eliminate jobs but leads to changes in employment (Tuomi et al., 2020). By deploying robots for specific tasks, humans have opportunities to work on meaningful tasks requiring problem-solving skills and emotional intelligence. A work environment that reduces dull and dangerous tasks and allows human laborers to dedicate their time to more meaningful jobs fosters social sustainability as described in the UN's sustainable development goal (SDG) 8, Decent Work.

Tuomi et al. (2020) emphasize the indispensable role of the human workforce as a key aspect of what they refer to as "employee-centered […] human–machine cooperation" (p. 9). Chiang and Trimi (2020) further indicate the benefits of human–robot cooperation, highlighting that the status of technological development is not yet ready for a working environment without humans. However, an increase in the transformation toward a technology-driven tourism industry requires an adaptation of skillsets and employee re-education. A challenge in this reskilling process is that not all current tourism employees have the capacity and prerequisites to change. Although digitalization creates more jobs than it eliminates, some low-skilled workers who are being replaced by machines and automation might not have the necessary skillsets and knowledge to adapt to the changed task profile (European Union, 2019).

The positive change that can be instigated through digital applications depends on whether tourism stakeholders make use of and find a tool meaningful. Research Story 8 underlines this psychological barrier.

8th Research Story - Experience
The Case of Iceland: Improving Working Conditions in Rural Tourism with the Help of Robots?

In my research interviews, I discussed the benefits of decent work through technology with a tourism entrepreneur from South Iceland who saw great benefit in technological development. The crucial factor preventing them from making use of such technology was a lack of qualified staff with an open mindset toward technology. The interviewee described how their attempts to introduce digital tools, such as digital marketing channels or self-check-in kiosks, to the staff were continuously rejected because the employees feared being replaced by machines. The interviewee, who was very frustrated about this narrow mindset and lack of ability to realize that digitalization means a changed work environment with more interesting tasks for the human workers, stated the following:

> I'm saying, I actually tell them, that's why I want you to be greeters, I want you to be the guys that welcomes them, telling them the stories.
> *Tourism Entrepreneur, South Iceland*

The interviewee, who is involved in tourism businesses in Reykjavík, observed differences in mindsets and approaches toward digital innovation between rural and urban tourism employees, finding urban tourism workers more open to applying and learning digital tools.

> It is so funny because if I bring in a guest into the areas in Reykjavík when I have a trainer in service management, everyone is super interested. And I see the day after they start to use the methodology that they have been taught the night before. In [the countryside] I do the same and they just make fun of it and think it is stupid, they just don't want to play along. *Tourism Entrepreneur, South Iceland*

The majority of tourism businesses in the Nordic countries are micro, small, or medium-sized (Atladóttir et al., 2023), often referred to as lifestyle entrepreneurs. In the following, I discuss this type of entrepreneur and explore their potential role in rethinking current tourism development.

2.4 Tourism Lifestyle Entrepreneurs

2.4.1 Rethinking Tourism: A Holistic Approach

Small tourism providers have been found to positively affect the degrowth paradigm. However, they have gotten little attention in this regard and are not sufficiently included in discussions about rethinking tourism (Margaryan et al., 2020). It has been argued that a precondition for tourism lifestyle entrepreneurs to positively affect the rethinking process is to give them a voice in tourism development (Brouder, 2012; Gibson, 2006; Mihalic, 2020).

Historically, entrepreneurship has been associated with the classic Schumpeterian approach (Schumpeter, 1999), the pursuit of economic growth (Fu et al., 2019), and the ability to take risks (Dias & Azambuja, 2022). Business oriented (Dias & Azambuja, 2022) or growth oriented (Fu et al., 2019) entrepreneurs demonstrate high-level business skills that are often fostered through innovation and creativity, and they measure success by business growth. The tourism sector, which consists largely of small- and medium-sized tourism enterprises, attracts lifestyle entrepreneurs (Bredvold & Skålén, 2016; Peters et al., 2009), who are often described in the literature as the counter-piece to growth-oriented entrepreneurs and as having ideological business intentions; hence, these entrepreneurs are often labeled "atypical entrepreneurs" (Cederholm & Sjöholm, 2020, p. 25). In the late 1990s, Shaw and Williams (1998) observed different types among this group of small-scale entrepreneurs, distinguished as *non-entrepreneurs* and *constrained entrepreneurs*. Constrained entrepreneurs are growth-oriented, but they often lack know-how and financial resources (Skokic & Morrison, 2011; Ioannides & Petersen, 2003). Non-entrepreneurs mirror lifestyle entrepreneurs (Skokic & Morrison, 2011) except that, instead of economic growth, their perceived business success lies in their happiness with a certain lifestyle (Dias & Azambuja, 2022; Fu et al., 2019). The desire to live in a specific area or being integrated in a social network plays a key role in such an entrepreneurial life (Dias & Azambuja, 2022) and supports the assumption that tourism lifestyle entrepreneurs are more common in rural areas (Bredvold & Skålén, 2016). However, some authors argue for a more nuanced spectrum beyond the polar classification of a "real" entrepreneur versus a lifestyle entrepreneur (Dias & Azambuja, 2022). Researchers have emphasized tourism lifestyle entrepreneurs as important drivers for rural entrepreneurship in remote areas (Sörensson et al., 2019) and for attracting tourism workers to rural areas (Schilar et al., 2018). That these actors place quality of life before economic growth raises concerns about their business success and contribution to innovation (Sørensen & Grindsted, 2021). Critics argue that the low entry barriers to the tourism industry (Komppula, 2013), such as little financial investment or required expertise, attract lateral entrants (who are often lifestyle entrepreneurs) from outside the tourism sector (Bredvold & Skålén, 2016; Skokic & Morrison, 2011). Often, their motivation for operating a business in a particular area supersedes the need for formal business training, management, and expertise (Peters et al., 2009). As such, critics have been cautious about the absence of professionalism they bring to the tourism industry, especially their lack of engagement with marketing, technology, and digital activities (Cunha et al., 2020; Skokic & Morrison, 2011).

2.4.2 Business Intentions and Values

Schilar et al. (2018) stress that the focus on lifestyle rather than on maximizing growth does not imply that lifestyle entrepreneurship leads to unprofitable businesses, as tourism lifestyle entrepreneurs do not limit growth per se but find a balance between economic and non-economic goals (Dias & Azambuja, 2022; Sörensson et al., 2019). Indeed, Cederholm and Hultman (2010) observed economic gain in lifestyle entrepreneurship where "a market ethos is simultaneously rejected and embraced" (p. 14). A tourism lifestyle entrepreneur's approach does not imply financial ruin but rather a selective focus on niches beyond mass markets (Ateljevic & Doorne, 2000). The focus of a lifestyle entrepreneur on personal and ideological values creates authenticity, which may lead to positive socioeconomic outcomes (Cederholm and Hultman (2010), see also Czernek-Marszałek et al., 2020) and contribute to customer satisfaction (Peters et al., 2009). Thus, the values that tourism lifestyle entrepreneurs ascribe to both their business location and their local community can create economic springback effects (Jack & Anderson, 2002).

Research about the facets in which lifestyle entrepreneurship manifests and how tourism lifestyle entrepreneurs construct their role in the discourse of tourism is scarce (Bredvold & Skålén, 2016; Dias & Azambuja, 2022). According to Fu et al. (2019), the focus is currently on practicality and less on the underlying theory, thus underscoring the need for further research.

2.4.3 Embeddedness

Various researchers have shown interest in exploring entrepreneurship and economic actions in the context of social structures. In the 1980s, Mark Granovetter coined the term "embeddedness" (Granovetter, 1985; McKeever et al., 2014), which refers to entrepreneurs being part of a social construct that impacts their capacity to use social or economic resources (McKeever et al., 2014). Academic discourse about the embeddedness of rural tourism lifestyle entrepreneurs comprises a wide range of approaches (Wen et al., 2021), and a holistic overview of the discussion would exceed the scope of this PhD. Hence, I only touch on the vast body of embeddedness literature, focusing instead on the local community perspective.

Embeddedness extends beyond simply developing social networks; it entails the interaction of individuals on the social and the economic levels in a local context (McKeever et al., 2014) and requires mutual trust among the actors involved (Akgün et al., 2010). Such a relationship emerges through interaction and participation with the local community in daily life (Dias et al., 2023). McKeever et al. (2014) compare the feeling of being included in a social construct to "cliques and informal clusters" (p. 7) within which members establish their own values and standards. Local embeddedness also contributes to an entrepreneur's local identity construction (Bredvold & Skålén, 2016). To belong, the dynamics and variety of lifestyle entrepreneurs and their cultural, social, and business relations must be considered (Skokic & Morrison, 2011). Indeed, the role they play in the local community determines the value the community ascribes to them, and vice versa. Local embeddedness can be enhanced by, for example, involving stakeholders in community-centered activities and organizing collaborative events. Including a variety of stakeholders can be helpful in spreading a community's network effect (Dias et al., 2020), which can positively affect a community's efficiency.

In Chapter 2.4, I discussed the interrelationship between social capital and innovation. Social capital and embeddedness are also closely connected. While

embeddedness refers to networks and the level of social inclusion in a community, social capital refers to the resources an embedded member can draw from these networks (Ihlen, 2005). Various authors have indicated how becoming a part of the local structure (Bosworth & Farrell, 2011; Dias et al., 2023) and familiarizing oneself with the local actors, customs, and conventions can make an entrepreneur's life easier. Often, embedded entrepreneurs save time and experience lower transaction costs in their daily businesses by solving business affairs interpersonally in casual conversations rather than through formal paperwork (Czernek-Marszałek, 2020). However, embeddedness can also restrict an entrepreneur's business activities (McKeever et al., 2014). The impact of being embedded depends on the entrepreneur's skills to network and manage a business and is influenced by political setting (Bosworth & Farrell, 2011). Local knowledge is not only a resource but also a limitation to innovation if unassimilated (Hoarau, 2014). Akgün et al. (2010) use the term "underembedded" to refer to an entrepreneur failing to make use of local potential. The capability to exploit knowledge and make use of local assets is imperative for innovative activities. Entrepreneurs that lack such skillsets can fail to transform local knowledge into innovative tourist experiences (Dias et al., 2023; Hoarau, 2014; Yachin, 2019).

The level of an entrepreneur's embeddedness is crucial with regard to whether it fosters or hampers their innovativeness. In an article about "the paradox of embeddedness," Uzzi (1997, p. 1) discusses the risks of over-embeddedness, where close collaborations and networks might limit an entrepreneur's level of innovativeness. Closely tied networks may be reluctant to grant access to outside members and therefore miss out on new contacts and ideas, which negatively affects their level of innovation (Uzzi, 1997).

In the next section, I look deeper into the interrelationship between local knowledge and innovative entrepreneurial activities.

2.4.4 Local Knowledge and Innovation

Informal bonding through networks—that is, being embedded—can facilitate access to insider knowledge (Jack & Anderson, 2002), also known as local knowledge (Farrell et al., 2010). Local knowledge is often tacit and "experiential knowledge that we know but cannot easily tell" (Zhang et al., 2015, p. 1030). Due to its place-based specificity, local knowledge is difficult for competitors to access and imitate (Dias et al., 2023; Hoarau, 2014) and can provide an entrepreneur with a marketing advantage when competing with large businesses (Dias & Azambuja, 2022; Dias et al., 2023). Tourism lifestyle entrepreneurs can use local knowledge to create tourism products (Dias et al., 2023); it allows them to tailor their products to a place's history and identity. Hence, local knowledge enables tourism lifestyle entrepreneurs to be innovative (Dias et al., 2021) and may be the "fuel that drives innovation processes" (Hoarau, 2014, p. 135).

Innovation is a tool for creating valuable experiences for tourists and reacting to the fast-changing demands of the tourism industry (Hoarau, 2014). Small businesses are closer to their guests than large companies and can easily address individual demands, which enables them to develop more authentic tourism experiences as a form of co-creation. Hence, some researchers see tourism lifestyle entrepreneurs as a driving force for innovative destination development (Dias & Azambuja, 2022; Dias et al., 2022), as they create and serve niche markets that respond to the *zeitgeist* for mindful travelling. Mindful tourists are generally interested in foreign cultures and local environments, resulting in more caring and respectful behavior during their travels and greater awareness of their

impact as a tourist (Errmann et al., 2021). Refocusing tourism marketing onto conscious consumers aligns with the aforementioned earthly tourism (Huijbens, 2021b). Especially since the tourism crash caused by the COVID-19 pandemic, calls for approaches to rethink leisure and tourism to include more mindfulness have re-emerged and gained momentum (Fusté-Forné & Hussain, 2023; Stankov et al., 2020).

Dias et al. (2021) posit that the characteristics of lifestyle entrepreneurs exceed management skills or business intention, for example, different levels of willingness to apply innovation, ranging from the "only if really necessary" mindset to systematically applied innovation and creative types exploiting niche opportunities. Due to their often-observed lack of resources for investments (Yachin, 2019), tourism lifestyle entrepreneurs usually do not foster radical innovations but rather contribute to exploring new leisure trends (Peters et al., 2009). Hence, tourism lifestyle entrepreneurs play a key role as experienced consumers (Peters et al., 2009) whose aim is to contribute to developing products that they perceive as lacking. Such innovative product development often allows the entrepreneurs to survive economically, even though they are not primarily economically motivated (Ateljevic & Doorne, 2000).

9th Research Story - Experience
Holly – A Tourism Entrepreneur in the South

Holly is a tourism lifestyle entrepreneur in the small fishing village of Vík í Myrdal in South Iceland. In recent years, Vík has turned from a mere service center into an attractive tourism destination with various tourism providers offering food and activities. Holly runs a small coffeehouse out of a food truck at the local campsite and places a lot of emphasis on sustainability, using local products, and providing a cozy meeting place where both locals and visitors can enjoy her coffee and cacao specialties. Similar to her motto, "a hug in a mug," her intention with her micro business is to give back to the community that welcomed her warmly when she moved to Vík several years ago.

Her coffeehouse on wheels, which has its own micro coffee beans roastery, was a great success from the start and caught national media attention. When I asked Holly about potential plans to scale up her business and offer additional services online, she emphasized that her main goal was to serve the customers that come to her shop, stating the following:

> I'm so scared of doing it online in case I can't keep up with all the demand.
> I just don't want to put myself in a situation where I sell everything online and then I am left with nothing in the bus, which is actually the heart of the business.
> *Holly, Tourism Entrepreneur*

2.4.5 Tourism Lifestyle Entrepreneurs as Agents of Degrowth

The freedom to operate in a chosen location is often the primary incentive for tourism lifestyle entrepreneurs (Dias et al., 2022; Sörensson et al., 2019). Passion about a specific place positively affects business performance, entrepreneurial success, and entrepreneurs' level of sustainability (Dias et al., 2023; Fu et al., 2019). Schilar et al. (2018) the choice to establish a business at a certain rural location with the concept of place attachment. This often shows in benevolence, which refers to a sense of caring about the place (Kibler et al., 2015). Such caring, whether it stems from emotional or functional motivations, has the potential to positively influence an entrepreneurs' actions toward a place (Wen et al., 2021). *Functional caring* refers to perceived practical value in terms of the degree to which a place materially provides what a business model requires (Liu et al., 2016). In contrast, *emotional caring* refers to a personally perceived sensation of place attachment. According to Wen et al. (2021), tourism lifestyle entrepreneurs who care emotionally and functionally are likely to use and encourage the use of local products and services (Cunha et al., 2020),

and they actively pursue nature protection and local value creation (Morrison, 2006). Recently, this has caught the attention of academia, as fostering local value creation through innovation aligns with global and national sustainability policies. Mathisen et al. (2022) refer to this caring as "inner sustainability," meaning that sustainable actions stem from an entrepreneur's aspiration to positively contribute to their surrounding environment and local community. Some authors see tourism lifestyle entrepreneurs as "agents of degrowth" (Margaryan et al., 2020, p. 41) who act and lead their businesses in a sustainable default mode.

10th Research Story - Experience
Hákon- A Tourism Entrepreneur in the East

Hákon runs a hotel in Neskaupstaður, a small fishing village in East Iceland, which is about an eight-hour drive from Reykjavík. Hákon jokes that the likelihood of meeting his friends, who live in Reykjavík, on a trip to Spain is higher than them visiting him in Neskaupstaður. Due to the high prices of domestic flights, East Iceland is often perceived as a very remote area with few opportunities to physically mingle with friends and family who live in the capital area. Here, local communities and networks play an even more vital role than in other, less remote municipalities. Hákon describes how the remoteness influences his sense of responsibility for the local community. According to him, his hotel would probably be more business-focused if it was more centrally located. Instead, he tries to positively contribute to the local community of which he and his business are an essential part.

> But I don't make maybe money of this party. But we are responsible towards the community, we are part of the community, this would not happen if it was not our hometown and if we were not a vital business for the town. If we were just one of the hotels in the South, it would be much easier, we would just say "No, we don't make money with this", so.
> *Hákon, Tourism Entrepreneur*

In general, small tourism businesses seem to be more interested in environmental and social issues than growth-oriented actors are (Sørensen et al., 2021). Margaryan et al. (2020) believe that lifestyle entrepreneurs seem to have found out for themselves, what the "right size" means in terms of business growth. As discussed in the Introduction and in chapter 2.1. about rethinking current tourism, I use the concept of degrowth in the sense of "enoughness" (Sharpley, 2022, p. 2) and "right-sizing" (Hall, 2009), notions that are place-based and cannot be achieved through one-size-fits-all approaches. Various researchers have indicated how essential it is to acknowledge that tourism lifestyle entrepreneurs differ vastly and cannot be treated as a single entity. Hence, their impact on sustainability practices varies as well between the individuals. These entrepreneurs have different value bases—"different sustainability DNAs" (Sørensen & Grindsted, 2021, p. 3)—to contribute.

Degrowth in the context of tourism is still an under-researched area. Little is known about the role of small businesses, whose value bases seem to align with the above-discussed degrowth principles.

2.4.6 Tourism Lifestyle Entrepreneurs in Iceland

With the increasing development of Icelandic tourism, rural Iceland in particular has undergone significant changes, with 12.5% of all jobs now in the tourism sector (Ferðamálastofa, 2022). Especially in the countryside, tourism has become a tool with which to enhance local economic growth (Gunnarsdóttir & Jóhannesson, 2016), which many rural local individuals have made use of. With interest in Iceland as a tourist

destination increasing, more individuals in the often remote countryside are seeing tourism as a possible source of income. Helgadóttir and Sigurðardóttir (2008) point out horse-based tourism as an example of rural locals who saw an opportunity in the increasing number of visitors to Iceland within their lifestyle. Similarly, Sigurðardóttir & Steinthorsson (2018) give the example of Icelandic horse farmers who became entrepreneurs by offering tourists an experience with Icelandic horses.

At the time of the writing of this PhD, 3,900 businesses were registered with the Icelandic Tourism Board (Ferðamálastofa, 2023b). However, this list is not filtered according to number of employees or other classifications; rather, it is a simple overview of companies registered as businesses with any connection to tourism. These are quite diverse and range from international food chains, such as Subway, to local libraries, large tourism companies, and small family run tour providers (Ferðamálastofa, 2020b). Statistics Iceland provides quantitative insights into the size of existing tourism businesses, showing that an average tourism business in Iceland had 3.3 employees in January 2020 (Statistics Iceland, 2020). This aligns with the statement of Atladóttir et al. (2023): micro and small-sized businesses are the prevalent group of businesses in the Nordic countries, including Iceland.

In recent years, there have been several initiatives by both the Icelandic Tourism Board and the Icelandic Tourism Cluster to include small tourism businesses in international programs dealing with, for example, digitalization or tourism sustainability. Examples of this include Ratsjáin[5], a tool that offers tourism providers support in fostering their innovation capacity, and Tourbit[6], an EU-funded project that offers small tourism businesses support in learning and applying digital solutions in their businesses. Despite these initiatives, tourism lifestyle entrepreneurs are seldom identified or discussed in policy circles. Through my involvement in projects such as Hacking Hekla and FIERI, I observed that network formation mainly happens through informal channels. Despite discussions on lifestyle entrepreneurs gaining importance in the academic context (Gunnarsdóttir & Jóhannesson, 2016; Helgadóttir & Sigurðardóttir, 2008; Sigurðardóttir, 2016), they receive little attention in public discourse.

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[5] https://www.icelandtourism.is/en/innovation/
[6] https://tourbit.eu/

3 RESEARCH DESIGN

3.1 Research Methodology: Qualitative Case Study Design

In this chapter, I introduce my research design, methodological approach, and the concrete methods I applied. A key part of this PhD is exploring the potential role of Icelandic tourism lifestyle entrepreneurs in rethinking tourism and gaining understanding of the value different tourism stakeholders see in the application of digital innovation as a tool to foster tourism sustainability. To better understand the dynamics of current tourism development in Iceland, I chose a qualitative methodological approach that allowed me to have direct contact with various tourism stakeholders in a way that fostered open dialogue in a positive atmosphere.

This thesis embraces a phenomenological approach to understand people's lived experiences, a philosophical background that is more and more included into tourism experience studies (Fendt et al., 2014). Phenomenology was founded by the German philosopher Edmund Husserl with the aim to link science to the 'Lebenswelt', which can be translated with "life world" (Kvale, 1996, p. 54). Approaching qualitative interviews through this philosophical lens granted me insights into the interviewees' life worlds and allowed me to understand how these interviewed tourism stakeholders actually perceive and experience current tourism development.

Embracing phenomenology as a philosophical background to my research design aligns with Fendt et al., 2014 who point out how phenomenological studies allow "the subject's voices to be heard" (p. 403). In line with Frechette et al. (2020), who argue for phenomenological methodology to gain in-depth understanding and "getting at the 'so what?'" (p. 11), my goal with this research design was to gain insights into the various tourism stakeholders' perspectives. More concrete, I structured my research design applied as a case study design consisting of two pillars.

The main pillar focused on attaining in-depth insights into the worldviews and beliefs of rural tourism lifestyle entrepreneurs and other stakeholders in relation to digital innovation and tourism development in rural Iceland. Data were gathered through semi-structured interviews as well as a review of policy documents and relevant literature. The second pillar explored the challenges and opportunities related to applying digital innovation in rural Iceland, involving rural locals in this process. The method applied in this pillar was action research, including semi-structured interviews and participant observations. Figure 1 illustrates my research design graphically and demonstrates the two pillars on which the research was built.

Figure 1

Research Design

RESEARCH DESIGN

Qualitative Case Study Design (Tourism Lifestyle Entrepreneurship) Main Pillar	**ACTION RESEARCH** Side Pillar

Semi-structure qualitative interviews
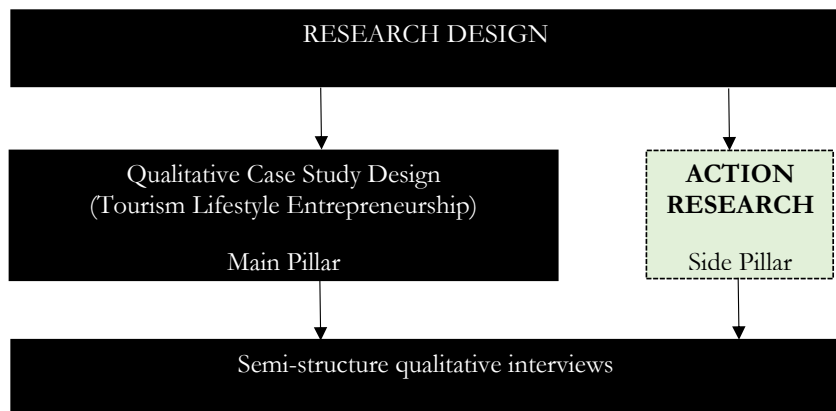
A repeated theme was the potential communication gap between rural tourism entrepreneurs and tourism decision-makers. As mentioned, discussions about finding ways to foster sustainable tourism development have been ongoing for years. In practice, however, the impact of sustainability in tourism is limited (Sharpley, 2020).

The research design I chose allowed me to be close to the various tourism stakeholders and let them present their viewpoints "how it really is" (Fendt et al., 2014, p. 410). Hence, I see my PhD as a link bridging theory and practice. By actively engaging with various rural tourism stakeholders, both through semi-structured interviews and action research, this qualitative approach revealed the dynamics of current tourism development from a bottom-up perspective.

3.2 Research Methods: Pillar One

My objective with the first research pillar was to explore the worldviews and beliefs of rural tourism lifestyle entrepreneurs and other stakeholders in relation to digital innovation and tourism development in rural Iceland. This pillar was based on empirical data gathered during the qualitative fieldwork and used for Publications 1, 2, and 4. Each of these three papers includes three independent, consecutive case studies. The case study in Publication 1 illustrates how Icelandic tourism lifestyle entrepreneurs contribute to sustainability by focusing on the wellbeing of their local communities instead of solely on economic growth. The case study in Publication 2 sheds light on the various types of tourism entrepreneurs and the potential implications their views have on tourism development. The case study in Publication 4 explores tourism stakeholders' views on the challenges and opportunities related to applying digital innovation in Icelandic tourism, with the goal of fostering tourism sustainability. All case studies were based on data gathered from semi-structured interviews. Publications 1 and 2 were based on the same round of data collection, while the data for Publication 4 were gathered later in the PhD research process. Table 2 illustrates the interrelation and usage of the data sets in the various publications. In

the first pillar, 44 semi-structured interviews were conducted, 34 of which were with tourism entrepreneurs, two with representatives of the Ministry of Industries and Innovation, and eight with representatives of various destination management organizations or regional development associations. The interviews with the tourism lifestyle entrepreneurs were set up via the snowball technique. With regard to the interviews with representatives from the ministry and the tourism support system, a purpose sample technique was used. Before I started my PhD, I worked as a horse guide in a small tourism business in the Icelandic countryside. The hotel had been certified with the Nordic Swan Ecolabel[7] and was well connected in the area. Hence, from the very start of my research journey, I had access to tourism stakeholders whose mindsets were in line with sustainability and innovation. From there, I established further contacts, including with the Icelandic Tourism Cluster. Becoming part of their network provided me with valuable contacts to tourism entrepreneurs throughout Iceland, who in turn indicated other interview partners. The potential interview partners were all contacted via email, where I introduced myself and the research project shortly. Only when they showed interest, I sent them a more detailed project description such as a declaration of consent, before the research interviews were conducted.

Of the 34 rural tourism lifestyle entrepreneur interviewees, 16 were tour/activity operators, nine were accommodation establishment operators, and eight were catering business operators; their ages ranged from 30–70 years. The majority of the businesses were small and micro sized entrepreneurs and family run. Most were open year round, but the peak operation period for all of them was the summer months. The number of employees varied between seasons, from no additional employees in winter months up to 40 extra employees in the busy season. The biggest share of the interviews was conducted along the South Coast (11), followed by East Iceland (7), North Iceland (6), West Iceland (5), the Westfjords (3), and Reykjanes (1). Although the interviewed entrepreneurs in this study were all SMiEs, their business intentions varied significantly. The vast majority were lifestyle entrepreneurs. The rest had a more economic and global perspective on the tourism sector and could hence be classified as growth and business- oriented entrepreneurs whose business intentions were economic growth and scalability. The classification of the entrepreneurs took place during the data analysis process and is described in more detail in Publications 1 and 2. The following tables provide an overview of the interviewees' characteristics.

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[7] Sustainability Certificate in the Nordics (https://www.nordic-swan-ecolabel.org/)

Table 2

Research Interviews, Pillar I

	Number	Interview Location	Date	Duration	Used in
Rural tourism lifestyle entrepreneurs	34	Online On-site	07/2020 - 03/2021	45–90 minutes	Publication 1 Publication 2
Ministry representatives	2	online	10/2022	1 hour	Publication 1
Representatives of rural tourism support system	8	Online On-site	03/2023 - 06/2023	1 hour	Publication 4

In the semi-structured interviews, the laddered question technique (Price, 2002) was applied. As implied in the name, questions build up, resembling a metaphorical climbing on a ladder. Applying this technique allowed the questions to be arranged in an order that led from a general discussion to deeper matters of the topic. I started the interviews with broad questions about the entrepreneur's business and how they got started. This not only served as an icebreaker but also gave me valuable insights into why and how the interviewee became entrepreneurially active. From there, I moved on to the main part about innovation and digitalization. To better understand how the entrepreneurs personally interpreted innovation, I offered to literally illustrate on paper how they saw innovation. This aligns with Fendt et al. (2014), who encourage the application of a variety of creative methods to assist the interviewee to express themselves best. The majority of the interviewees made use of this offer. Research Story 3 shows a sample of these illustrations. I usually started with small talk before the interviews, ensuring a trusting interview atmosphere. Hereby I got the feeling that through sharing my own experience and connections in the tourism industry, I was able to cultivate a sense of camaraderie with the interviewees, which influenced my perceived role as a researcher. In many cases I felt rather like a peer than an external researcher.

3.3 Research Methods: Pillar Two – Action Research

The second pillar of my research design explored the dynamics—the challenges and opportunities—of applying digital innovation in rural Iceland. The data in this pillar stemmed from an event that I co-organized and conducted. Above, I referred to this method as a side pillar, as I applied action research solely for Publication 3.

My personal ambition to try something in practice and instigate change motivated

me to found a rural hackathon, which I called Hacking Hekla. A hackathon is an invention marathon where inventors, entrepreneurs, and other creative people collectively program in an extreme manner over a short period of time. Hackathons offer a platform for founders, students, and entrepreneurs to exchange experiences. They can work on a business idea, start-up, or product from scratch, and the result can be an app, a website, or any other digital creation. In the past few years, hackathons have become a popular tool for working jointly on projects (De Götzen et al., 2020), as explained in Publication 3. The name Hacking Hekla stemmed from Mount Hekla, which is an active volcano in South Iceland. In the framework of this project, it symbolizes energy and empowerment as well as the countryside and rurality. My intention with Hacking Hekla was to foster digital innovation in rural Iceland, and the hackathon project became a key aspect of my PhD. The field study of Hacking Hekla was first and foremost an intervention. This meant, in a wider sense, bringing science and various key actors in the Icelandic countryside together to create an approach to instigate change and then evaluate the outcome. Due to my own involvement in the organization and operation of Hacking Hekla, I decided to adapt the methodology of action research to my research design, which is discussed below in more detail.

Due to the fact that Hacking Hekla was the first hackathon to focus explicitly on fostering digital innovation in rural Iceland, I saw great potential to gain new insights into such dynamics by observing and being part of novel learning processes. As shown in Figure 1, I collected data through semi-structured qualitative interviews, questionnaires, and participant observation. In total, 17 experts that supported the event as mentors, keynote speakers, or judges, were interviewed, as illustrated in the following table.

Table 3

Research Interviews, Pillar II

	Number	**Interview Location**	**Date**	**Duration**	**Used in**
Hacking Hekla mentors, keynote, judges	17	Online	12/2020 - 02/2021	30–45 minutes	Publication 3

In the following section, I discuss my choice of action research as a methodological approach and link it to the intervention of Hacking Hekla.

3.3.1 Action Research: Originality and Strengths

The action research model was established by Kurt Lewin in the mid-1940s. Lewin's theory for action research arose because he felt restricted by studying social problems in a "controlled, laboratory environment" (Dickens & Watkins, 1999, p. 130) with little reference to reality. Lewin criticized the scientific fragmentation of elements in social sciences into quantifiable units. According to him, such research cannot lead to any realistic conclusion. Action research describes the active involvement of the researcher in problem-solving and decision-making processes and goes beyond traditional research methods (Coughlan & Coghlan, 2002), which often focus on producing measurable knowledge and facts and are connected with positivism. Positivist classic research focuses on following patterns and "verifying theories" (Park, 2020, p. 4); the main intention is generating substantial knowledge and facts, and the researcher plays an observing role. The intended result is the creation of knowledge and a context-free, measurable, and logical outcome (Coughlan & Coghlan, 2002).

In contrast, an action researcher takes an active part in the research. Hence, action research is also referred to as "research in action [instead of] research about action" (Coughlan & Coghlan, 2002, p. 222). Instead of describing and observing, action research is intended to offer solutions to problems (Dickens & Watkins, 1999) that are identified beforehand. Rather than simply discovering and proving their findings, the action researcher is also in charge of the actual implementation of the research (Foster, 1972).

Lune and Berg (2017) hint that every researchers' desire is instigating change through their research, which was the case for me when founding Hacking Hekla. Hjemdahl and Aas (2017) claim that the role of the researcher in traditional research is often one of an "outsider" in the sense of that they remain detached from the real happenings of the project (p. 113). In order to become an "insider," the role of the researcher must shift. Thus, action research contributes to narrowing the gap between the researcher and the research participants (Kumar, 2014). When the researcher is more involved in the process, they are closer to the research environment and community, meaning they have the chance to adapt the research to the needs and interests of the participants.

Dickens and Watkins (1999) point out the high levels of efficiency and flexibility

of this "marriage between theory and action" (p. 2) when attempting to instigate change through research, as I experienced through the intervention of Hacking Hekla. The role of the researcher shifts from a neutral perspective to one that acknowledges that research is part of a social construct (Bengtsson et al., 2022). I experienced this not only in Hacking Hekla but also through my participation in the FIERI project, which was not directly part of my PhD but had many interfaces. Both projects provided me with access to groups of interested people, ranging from individuals to representatives of the rural support system whose intention was to learn and contribute to fostering rural innovation. Being part of these projects, getting to know the people, and participating in both casual and project-related conversations not only gave me insights into the dynamics of these projects but also opened doors for me to reach out to various potential interview partners.

3.3.2 Hacking Hekla Research Design: Action Research versus Participatory Action Research

Although an in-depth discussion on the various forms of how action research can manifest in practice would exceed the scope of this chapter, I briefly differentiate between action research and participatory action research as is often distinguished in literature. This clarification is crucial, as it enables the reader to appreciate the specific benefits and justifications behind my chosen methodology.

Lewin's action research approach has been criticized as being vaguely defined and not offering a concrete description of what it entails (Dickens & Watkins, 1999), especially regarding the researcher's level of involvement in the research project. Based on Lewin's initial approach, the concept of participatory action research was introduced in the 1950s and 1960s (Thiollent, 2011). As the name implies, participation plays a major role in this concept. Participatory action research requires the total integration of the participants in all steps of the research process (Dickens & Watkins, 1999; McTaggart, 1991). In contrast to Lewin's definition of action research, which does not specify the level of the researcher's involvement, participatory action research requires the active collaboration and co-creation of research participants, with the goal of finding a solution to the research problem (Goebel et al., 2020).

The methodology applied in this PhD was action research in line with Lewin's approach. The fact that Hacking Hekla was a pilot project—a rural hackathon has, to my knowledge, never before been attempted in rural Iceland—aligns with Lewin's idea of conducting experiments to achieve change (Dickens & Watkins, 1999). In the case of Hacking Hekla, my role was that of a project co-founder and organizer. I was actively in touch with both the participants and the supporting experts who contributed to the event as mentors, keynote speakers, and judges. I was in charge of communicating the event's mission to the participants and explaining what problems and challenges they should tackle in their brainstorming sessions. At this point, I stepped out of the active process and took on the roles of project organizer and observing researcher. Due to the fact that I did not actively contribute to finding solutions and hence my low level of participation, I decided to follow the action research rather than the participatory action research approach.

3.3.3 Action Research: Benefits and Limitations

In relation to the overall aim of this PhD to explore the involvement of rural tourism entrepreneurs and the potential of digital innovation as a tool for rethinking current tourism practices, action research has the potential to positively contribute to tourism sustainability

(Goebel et al., 2020). Key is the active involvement of the stakeholders. Shifting the research aim from creating knowledge "with communities and not for them" (Goebel et al., 2020, p. 427) might foster interest in contributing to the decision-making process and taking necessary actions. The involvement of various stakeholders, including tourism businesses, local communities, individuals, and policymakers, contributes to a holistic approach to finding common ground when tackling challenges (Goebel et al., 2020). This form of co-creation fosters mutual learning and an evolving understanding between the participating stakeholders and the researcher, which I referred to previously as a bridge between theory and practice.

As action research identifies challenges and needs in a community and identifies possible approaches to addressing them, it is essential to identify the key community members to include in the research project. Indeed, action research is based on the actions of "ordinary people participating in collective research on 'private troubles' that they have in common" (Lune & Berg, 2017, p. 137). In the case of Hacking Hekla, the local and national development plans were calling for increased entrepreneurial activities and the application of innovation and technology in local communities in the Icelandic countryside. Hacking Hekla was a response to this vision. Hence, the entire action research process was based on the assistance of the community. According to Dickens and Watkins (1999), active involvement in a project encourages peoples' "psychological ownership of facts" (p. 132). In the action research process, the higher the level of involvement, the more participants are interested in the outcome of the study. Thus, the research becomes more accessible to individuals outside of academia (Lune & Berg, 2017).

The fact that action research usually begins with little knowledge to build upon and depends primarily on observation and learning techniques has led to a range of critical views. Action research implies a desire to take action, so critics argue that it is not a research design per se (Kumar, 2014) and that it supplies itself with its own view of science, disregarding objectivity (Cohen et al., 2013). Foster (1972) proclaimed the Lewinian approach to be manipulative in some instances; the previously mentioned description of action research as "research with little action or action with little research" (p. 1) mirrors the experimental and potentially manipulative sides of action research. The allegation of a manipulative character can be traced to the fact that the action researcher knows their envisioned research results beforehand. Thus, action research bears the risk of being steered in a desired direction instead of the matter at hand actually being explored. In addition to being criticized as "utopian and unrealizable" (Cohen et al., 2013, p. 304), some researchers point out a lack of scientific depth in the results achieved through action research. Because the research occurs while a project is being conducted, critics find it doubtful that the action researcher can retrieve scientifically in-depth results while simultaneously coping with changes that emerge during the research project (Dickens & Watkins, 1999). This leads to the issues of reliability and validity. Veracity in qualitative research has often been questioned (Kvale, 1996) due to the researcher's closeness to the participants and events. In the following, I briefly discuss the reliability and validity of qualitative data and describe how I ensured both in this PhD.

3.4 Reflexivity: Reliability and Validity of the Research Study

Ensuring research reliability and validity implies trustworthiness (Kvale, 1996) and is crucial to credibility. Reliability refers to the level of truth and representativeness of the data and reflects the idea of a replicable research approach (Golafshani, 2003). In qualitative research, however, replicability may be limited due to the researcher's actual presence—and hence potential influence—during the data gathering. Golafshani (2003) refers to the importance of "trustworthiness" (p. 601) in a discussion of reliability. According to Kvale (1996), qualitative research must have a consistent strategy, for example, the consistent usage of the same words in the interview questions throughout a study. Validity refers to the "truth and correctment of a statement" (Kvale, 1996, p. 236) and addresses the question of whether the research reveals the knowledge the researcher intended. By ensuring validity, a researcher states that their research is conducted according to the actual and original research plan and that the results are truthful (Golafshani, 2003).

With regard to the methods of the main pillar, I took several measures to ensure the reliability and validity of the data. In terms of reliability, I focused on ensuring consistency (Kvale, 1996) in the interviews. Interview guides were developed and followed throughout the semi-structured interviews. This helped me maintain a neutral position and not ask leading questions. Using the same wording in all the interviews further ensured that the interviewees' answers would not be influenced by a biased choice of wording. However, the questions served more as a guideline than a strict manuscript. If another potentially relevant topic arose, I allowed myself the flexibility to adapt the interview questions accordingly.

The research guide also supported the validity of the data, as following the research plan helped me not be distracted by other potentially interesting topics. To attain detailed and truthful answers, I attempted to establish trusting relationships with the interviewees by explaining my research background and the procedure of the interview and conducting as many interviews as possible in person. While connecting personally with the interviewees, I tried to create a safe space that encouraged open and honest communication. Due to the COVID-19 pandemic, data gathering was mainly online in spring of 2020. However, I did not get the impression that the online communication diminished the interpersonal trust. In contrast, the entrepreneurs seemed to feel comfortable enough to share their thoughts, hopes, and fears with me. I had already established relationships with some interviewees through Hacking Hekla, NorReg, or FIERI, which lowered the barriers to talking openly and honestly even further.

All interviews were recorded, transcribed, analyzed, and coded with ATLAS TI and MAXQDA based on the techniques of grounded theory (Strauss & Corbin, 1994), and themes were identified through rounds of open and axial coding. The interviewees were informed about the content and extent of the study and how I would analyze the data. To further contribute to the credibility and trustworthiness of the data, I offered interested interviewees the possibility of further involvement by sending them the transcripts of their own interviews and drafts of the article for feedback. However, very few interviewees made use of that offer.

Previously, I mentioned the criticism of the level of objectivity in action research. I interpret this criticism as a critique of the reliability and validity of action research. Therefore, I briefly describe in the following how I responded to this in the second pillar of my research design.

The fact that the researcher was also involved in the organization and implementation of Hacking Hekla did not, contrary to the criticism above, adversely affect the results of the study. There was little room for manipulation, as I kept myself out of the hackathon process and did not influence the participants' brainstorming processes. In my role as an organizer, I mainly provided practical information about the event; in all other areas, I took on the role of an observing researcher. This role was maintained throughout the process. My suspicions or thoughts about any possible outcomes were withheld. By remaining neutral, I tried not to have any influence on the results. However, I do not deny that my involvement and interpretation of the study include a certain subjectivity. Further, the timing of the event and the people involved significantly affected the outcome of the study.

In the following chapter, I guide the reader through the storyline of this PhD, which consists of three research papers and one book chapter. In conclusion, I discuss the research limitations and provide suggestions for further research.

4 SUMMARY OF PUBLICATIONS: RESEARCH STORYLINE

This PhD consists of four peer-reviewed publications. In the following section, I interconnect these pieces to present the overall storyline of my PhD.

4.1 Publication 1

Title: The Role of Rural Tourism Entrepreneurs in Rethinking Current Tourism Development

Abstract:

Discussions on tourism development address the urgent need to reduce the negative impacts of tourism on tourist destinations. Despite decades of trying to find potential ways to foster sustainability, current tourism development is still mainly driven by political interests and growth agendas. In spite of concepts intending to improve sustainable tourism development, negative dynamics, such as overtourism and the exploitation of nature and local communities, dominate the current reality of tourism. This article focuses on the concept of degrowth as a potential solution for rethinking tourism policy and practices to ensure greater sustainability. Its aim is to explore the gap between these policies and the academic theories on instigating sustainable change and the reality of the tourism industry, which is primarily driven by economic motivations, such as growth. To explore this dichotomy, this paper investigates the values of tourism lifestyle entrepreneurs. Small businesses are the most dominant group in the industry in terms of numbers. I contend that researching their perspectives on current developmental trends could lead to valuable insights into how to tackle the gap between theory and reality. This paper also explores how the degrowth paradigm may promote sustainability in tourism, as well as the potential role that tourism lifestyle entrepreneurs could play in this development. The discussion is illustrated by a case study on tourism entrepreneurs in Iceland. The findings indicate that various tourism stakeholders have different approaches to growth, with many tourism lifestyle entrepreneurs embracing degrowth practices by acting according to their value base, albeit sometimes unconsciously. This focus on aspects other than growth could potentially encourage tourism lifestyle entrepreneurs to contribute to sustainable development. This research emphasizes untapped knowledge by acknowledging entrepreneurs and their potential for rethinking tourism development, concluding with recommendations for practice and policy.

Status: Published in _Journal of Tourism Futures_

Falter, M. (2024). The role of rural tourism lifestyle entrepreneurs in rethinking current tourism development. _Journal of Tourism Futures_, advance online publication. https://doi.org/10.1108/JTF-09-2023-0205

In Publication 1, I state the overall problem and emphasize the global urgency to rethink tourism towards sustainability. The findings indicated that different tourism

stakeholders have different approaches to growth, with many tourism lifestyle entrepreneurs tending to embrace degrowth practices by acting according to their value base, albeit sometimes unconsciously. This focus on aspects other than growth could potentially encourage tourism lifestyle entrepreneurs to contribute to sustainable development. This paper explores the viewpoints of tourism lifestyle entrepreneurs and their role in tourism development, particularly noting where policy and academic discussions on fostering tourism sustainability do not match with the ongoing growth agenda in the industry.

In Publication 2, I move beyond the overall problem statement and explore the case of Iceland. As established, new technologies, digitalization, and innovation could be used as tools to foster tourism sustainability in practice. Thus, I focus on digital innovation as a potential tool for tourism sustainability in the case of rural Iceland. By zooming in on how rural tourism entrepreneurs understand and apply both innovation and digitalization, this paper allowed me to draw conclusions on the challenges and chances of applying digital innovation as a potential tool for fostering sustainability.

4.2 Publication 2: Co-written with Gunnar Þór Jóhannesson

Title: Dynamics of Digital Innovation for Tourism Entrepreneurs in Rural Iceland
Abstract:
This paper explores digital innovation and entrepreneurial dynamics in rural Iceland. It provides knowledge about the status and value of digital innovation among rural tourism entrepreneurs in Iceland and investigates if and how digital innovation becomes meaningful to them. Apart from answering the question of "what is going on the ground," it describes rural tourism businesses' level of involvement in innovation and digital applications. Despite recent discussions about smart tourism and the necessity of digital innovation in the global tourism industry, the study revealed that innovation and digitalization are not necessarily interrelated in the understanding of rural Icelandic tourism entrepreneurs. This exploratory research follows a qualitative methodology based on 34 semi-structured interviews with rural tourism entrepreneurs in Iceland. The study adds both practical and scientific value to the body of literature by contributing to gaining understanding about the missing link between policy and practice.
Status: published in *Academica Turistica*

Publication 2 demonstrates the interviewed entrepreneurs' general interest in digital innovation. The areas of application in their businesses, however, differed widely. The majority of the entrepreneurs that I classified, according to the literature review, as tourism lifestyle entrepreneurs saw value in digital innovation in terms of marketing and advertising. Automating service processes on-site or deploying service robots, however, did not align with their ideas of a personal service–customer relationship and image of Icelandic tourism, with its rough and unspoiled nature. In contrast, the few entrepreneurs that I classified as growth-oriented saw value in applying digitalization on-site and recognized the potential benefits of automated service processes, such as saving time and

financial resources. While the lifestyle entrepreneurs feared a loss of personal touch, the growth-oriented entrepreneurs saw an opportunity to increase their personal interaction with guests through the time they saved by automating dull and repetitive processes. One of the main findings was that the potential benefits of digital innovation in tourism are not clearly communicated or understood by all tourism lifestyle entrepreneurs. By differentiating between growth-oriented and lifestyle entrepreneurs, this paper brought to the foreground that the tourism industry is not a uniform group but consists of a variety of different business providers and entrepreneurs with various business intentions. When implementing a digital strategy for Icelandic tourism, it is imperative to acknowledge this and find ways of communicating that reach all groups equally.

After having investigated the value and role digitalization and innovation play for rural tourism entrepreneurs, Publication 3 delved further into applied digitalization in rural Iceland. This publication consists of a detailed case study investigating prospective approaches to enhancing digital engagement in rural Iceland. The paper describes the challenges and opportunities related to organizing and conducting a rural hackathon in Iceland with the aim of finding digital solutions to foster rural innovation and sustainability. This paper plays a key role in the storyline of this PhD. Publication 1 outlines the growth paradigm that hampers rethinking tourism in a sustainable way. Publication 2 investigates how tourism actors perceive tools that could be applied to rethink tourism successfully. Publication 3, in contrast, is an exploratory paper based on action research that describes and analyzes the dynamics and challenges of applying approaches that aim to foster digital innovation in rural Iceland. Instead of solely pointing out gaps, this paper contributes to revealing potential obstacles hampering the application of digital and innovative tools.

Through my own active participation in Hacking Hekla hackathon organization and conduction, this paper contributed to gaining a deeper understanding of the dynamics of rural innovation through co-creation. The intervention of establishing the rural hackathon Hacking Hekla with the goal of finding digitally innovative solutions to rural challenges in South Iceland, failed to attract rural locals to participate in the event. The conversations with the involved innovation experts showed that discussions about digital innovation were omnipresent on the levels of the support system and tourism consultancy. On the ground, however, these discussions had not yet gained the same level of importance. The mention of the ambiguity between "us," the organizers and digital innovation experts, and "them," the skilled rural locals that we wanted to address and have participate in the event, demonstrated how different groups respond to different keywords. While "we" felt like part of a push for innovation, "they"—the rural locals—did not feel addressed and hence did not register for the event. This lack of understanding and a common language was also showcased at the level of the rural support system. While we, the hackathon organizers, saw the event as the starting point of a process to foster digital innovation in the countryside, some of our partners seemed to expect visible solutions to be developed during the event. Some could not see the long-term benefits of different creative and like-minded people coming together, forming networks, and trying to find solutions to tackle the development challenges of the area.

4.3 Publication 3: Co-written with Gunnar Þór Jóhannesson and Carina Ren

Title: Hacking Hekla: Exploring the Dynamics of Digital Innovation in Rural Areas

Abstract:

This article explores entrepreneurship and innovation in rural communities in Iceland based on the case study of Hacking Hekla, a rural hackathon. The main objective is to describe the dynamics of rural entrepreneurship and innovation as conveyed through the implementation and perceived outcomes of the hackathon. Digitalization is often proposed as a new all-purpose method in regional development to respond in an innovative way to rural challenges. However, when turning to the fine-grained practices of development, the role of the digital becomes less clear. Hackathons are often conducted to achieve instant economic and societal change. Through the example of Hacking Hekla, we research the challenges and outcomes of creative interventions and critically explore the value of innovation, digitalization, and entrepreneurship in the context of rural tourism development in Iceland. Based on action research, we use the hackathon as a tool for knowledge generation and to intervene in regional policy discourse. Qualitative data were collected through semi-structured interviews. The study demonstrates a gap between regional policies emphasizing digital innovation and innovation practices on the ground and underlines that strengthening entrepreneurship in rural communities is a complex process, the effects of which may only show in the long-term.

Status: published in *Sociologia Ruralis*

With Publication 4, a book chapter, I shift my focus away from lifestyle entrepreneurs and towards the tourism support systems. Publication 1 and 2, in particular, hint at a perceived gap between rural tourism entrepreneurs and the tourism authorities. With publication 4, my intention was to gain insights into the viewpoints and dynamics of the tourism support system. The focus hereby is to detect potential obstacles that hamper entrepreneurial initiatives to be successfully developed and applied in Icelandic tourism development.

4.4 Publication 4

Title: Exploring the Dynamics of Digital Applications in Icelandic Tourism: Insights from Stakeholders

Abstract:

Digitalization in tourism increasingly influences entrepreneurial activities and plays a key role in fostering sustainability. A specific example of digital innovation in tourism is the growing significance of digital applications (apps), which have been proven to enhance communication with tourists. This trend aligns with the UN's Sustainable Development Goal 9, which targets resilient and sustainable industry, innovation, and infrastructure. The current chapter focuses on the value that representatives of the tourism support system attribute to digital innovation. Potential obstacles that could impede the successful implementation of entrepreneurial endeavours of digital solutions in the Icelandic tourism industry are discussed, and three examples of digital innovation in Iceland are examined:

an entrepreneurial app, a digital platform initiated by destination marketing organizations, and the development of an Iceland-specific app that could foster tourism sustainability by providing targeted information to manage the flow of visitors to popular attractions. These three examples demonstrate how the success of digital solutions depends on gathering significant market awareness and creating a large user pool. Due to their focus often being limited to a specific locale, these applications frequently fail to achieve sufficient user downloads to cover the development costs, scale up, add value, and become effective tools for tourism development in Iceland. This chapter reveals that while the tourism support system recognizes the value of digital solutions, the widespread implementation of successful tourism apps at the national level is lacking. The reasons for this phenomenon and potential effects on entrepreneurial endeavours are discussed.

Status: accepted: García-Almeida, D., Gunnarsdóttir, G.Þ., Jóhannesson, G.T. & Guðlaugsson, T. (Eds.). (2024). *Tourism entrepreneurship: Knowledge and challenges for a sustainable future*. Palgrave.

Through the focus on how digitalization can contribute to tourism sustainability, the four research pieces form a coherent storyline that builds on one another. The fourth publication responds to the Sustainability Development Goal 9, which aims for fostering sustainable infrastructure and innovation. The establishment of mobile applications of smart phones has the potential to positively contribute to this goal.

The book chapter discusses examples of applied digitalization in Icelandic tourism and discovers that representatives of the tourism support system see different value in digital innovation as a tool for fostering tourism sustainability; many criticized the lack of linking several projects and initiatives. Instead, regions or institutions often initiate their own ideas, regardless of whether similar projects exist elsewhere. As a result, digital initiatives, such as tourism apps, often fail to scale up and achieve a strong user pool. Hence, resources are often invested in different initiatives addressing similar challenges.

5 DISCUSSION

My intention with this PhD was to investigate whether current tourism development can be rethought through digital innovation, with a special focus on the potential role of tourism lifestyle entrepreneurs. The research questions focused on the dynamics of how rural tourism entrepreneurs in Iceland value and work with digitalization and innovation and addressed the potential role that rural tourism lifestyle entrepreneurs might play in the current discussions on rethinking tourism towards sustainability. I tried to approach the overall research question through four consecutive peer-reviewed publications, which are summarized in the previous section.

Looking at this PhD objectively, a lack of understanding, acknowledgement, and exchange among various groups of tourism stakeholders stands out as a commonality in all four research publications. This aligns with the literature review, in which gaps or divides were discussed in the context of rurality, tourism development, and the application of technology. This specific gap was found to manifest on different levels. The main level is the lack of communication and understanding between tourism authorities and tourism businesses. The second level is the gap between tourism authority institutions, while the third level shows a general lack of understanding and knowledge among tourism businesses. In the following, I show how I detected, acknowledged, and worked with these gaps in the various case studies of this PhD and address my understanding and approach to trying to bridge these gaps.

5.1 The Role of Tourism Lifestyle Entrepreneurs in Rethinking Tourism Toward Degrowth and Sustainability

This section tackles the following research questions:

> 1(a): What is the role of tourism lifestyle entrepreneurs in rethinking current tourism practices toward degrowth and greater sustainability?
> 1(b): How can tourism actors' values and business intentions beyond economic growth foster sustainability in tourism?

5.1.1 Lack of Acknowledgement: The Tourism Industry Consists of Various Players

In this PhD, I explored and observed the worldviews, visions, and values of tourism lifestyle entrepreneurs in rural areas, with the goal of understanding their role in current tourism development in Iceland. I put special emphasis on exploring their role regarding digitalization and innovation trends and the official national tourism policy in Iceland, which aims for becoming leaders in sustainable tourism development.

As shown, discussions on tourism lifestyle entrepreneurs are often ambiguous (see Ioannides & Petersen, 2003); they are seen as potential agents of degrowth and accused of lacking business sense and skills with regard to the tourism industry In Publications 1 and

2, I acknowledge the challenge of talking about tourism lifestyle entrepreneurs as a uniform group. Ateljevic and Doorne's (2000) description of tourism lifestyle entrepreneurs—"small-business owner-managers […] between commercial and lifestyle goals and strategies" (p. 380)—is unclear and allows for the question of whether every tourism business owner who is finding a balance between their lifestyle aspirations and economic ambitions automatically counts as an "agent of degrowth."

In this research, I regard tourism lifestyle entrepreneurs as professionals with a sense of place who care for their local community. Their characteristics and values align with the degrowth paradigm (Demiroglu & Turhan, 2020; Lundmark et al., 2020). I acknowledge that there is a wide range of businesses that may fall into the classification of tourism lifestyle entrepreneur according to the literature that do not act according to this value base and hence have little to no contribution to the current tourism rethinking process.

In the context of finding alternatives to growth-driven tourism, tourism providers with a sense of place and community have increasingly been pointed to as important actors who can positively contribute to counteracting social, socio-economic, and natural exploitation on a local scale. However, these tourism providers are not considered key actors in the current rethinking process by tourism authorities but rather actors that "do their thing anyways" (see Publication 1). This exemplifies how tourism practitioners and tourism authorities seem to coexist with few interfaces. This manifests in a lack of data and concrete information about tourism businesses in Iceland. The Icelandic Tourism Board keeps track of all registered tourism businesses in Iceland without classifying them according to their size, number of employees and annual turnover. This lack of information on the characteristics of Icelandic tourism businesses, impedes the possibility of identifying different types of tourism businesses and communicating with them individually. In light of the increasing academic interest in tourism lifestyle entrepreneurship in term of rethinking and degrowing current tourism development, the question arises of how these actors can be included in the process of rethinking and degrowing current tourism development when the data needed to identify and thus reach out to them is missing.

This lack of acknowledgement seems to be mutual; as Publication 2 revealed, many entrepreneurs do not rely on collaborations with the government but instead find support in their local communities, which underlines the idea that tourism providers and tourism authorities co-exist without many interfaces. The impact of this absence of touch points between the executing (tourism provider) and organizing (tourism authorities) levels was addressed by several interviewees; some tourism providers find the offers and programs from the support system insufficient and inefficient.

The findings of this PhD show that tourism lifestyle entrepreneurs positively contribute to tourism development in line with the official goals envisioned by tourism authorities. My observations and conversations, however, indicated a lack of collaboration. Hence, although the goals of these groups are similar, they seem to coexist with little exchange or interaction. This can also be seen in the literature on the gap or a divide between groups in rethinking tourism (Sharpley, 2020). In the following, I briefly describe my approach to addressing this gap in my PhD.

5.1.2 My Approach to Tackling this Gap in my PhD Research

The interviews with tourism entrepreneurs, representatives of the local support system, and national authorities showed that these stakeholder groups have similar values. The tourism

lifestyle entrepreneurs prioritize sustaining themselves through their businesses while supporting their local community and surroundings. The representatives of the local support system (such as the tourism authorities) follow the national vision of the country leading in sustainable tourism. In my role as a researcher, I was able to gain in-depth insights into the viewpoints of these different stakeholder groups by listening to their stories. I found that the official goals align with the values of the tourism lifestyle that are about care for their local community and surroundings. By communicating with each other and sharing their views and ideas, these stakeholder groups could be more efficient in their actions. However there seems to be little interest in such exchange. The semi-structured interviews with the tourism lifestyle entrepreneurs provided insights into these actors' worldviews and values as well as their hopes and fears regarding current tourism development in Iceland. Although I was, in most cases, a stranger, they were willing to share their thoughts and opinions, giving me the impression that I got to know them and where they are coming from. This familiarity seems to be exactly what is lacking between the entrepreneurs and the representatives. Many interviewees saw themselves as rather detached from the national strategy, whereas others expressed clearly their dissatisfaction with official measures and the government's perceived lack of interest in their business operations and needs (Publication 2).

Open conversations between tourism authorities and tourism businesses is an essential starting point for collaboration. The next section discusses mutual acknowledgement and valuing other stakeholders' viewpoints and opinions. I explore the value of digital innovation for rural tourism entrepreneurs and how they understand and work with it in practice.

5.2 The value of digital innovation for rural tourism entrepreneurs in Iceland

This section addresses the following research questions:

> 2(a): What is the value of digital innovation for rural tourism entrepreneurs in Iceland?
> 2(b): How do rural tourism entrepreneurs understand and apply innovation in practice?

As shown in Publication 2, the interviewed tourism entrepreneurs' opinions of smart tourism, automation, and other applied digital innovation in tourism differed greatly. One of the main findings of this paper was that interest in applying digital solutions was linked to business motivation, which ranged from growth oriented to desired lifestyle. Some of the growth-oriented interviewees criticized the small-sized and lifestyle entrepreneurs as "dinosaurs" for not taking advantage of the benefits of digitalization. As shown in the literature review, these benefits can range from, for example, better working to AI-driven data collection and analysis for individually tailored marketing and more effective communication with tourists (Tuomi et al., 2020). The majority of interviewed tourism practitioners were rather hesitant about a more automated tourism industry and applying smart features to their own practices. They often believed that their (small) businesses and the surrounding remote and unspoiled nature mismatched with digital development.

If the majority of tourism entrepreneurs see no obvious benefits in a more automated tourism industry, the likelihood that this development will succeed is low. It is beyond the scope of this research to investigate whether or to what extent enhanced

digitalization would instigate positive change in particular businesses or regions. However, the restraint and lack of interest in applying digital solutions hints at a gap of understanding 'on the ground'; in the sense of a distorted and limited view on the happenings in the tourism industry. It is likely that this gap stems from a lack of interaction between tourism authorities and tourism businesses. Notably, this absence of exchange does not mean that there is no information flow from the tourism authorities. Rather, it refers to the tourism support system not always presenting information in a way that tourism entrepreneurs can understand and make use of it. At best, a lack of open and transparent communication can lead to a only partial understanding of a situation. 'Not getting it', could result in, at worst, a failing to adapt to the changes that accompany an increase in global automation. Processes that could make tourism entrepreneurs' lives easier or to positively affect community wellbeing and tourism sustainability are often rejected; thus, the lack of mutual exchange and understanding impacts tourism development, may negatively affect consumers' interest in applying digital solutions, and, in extreme cases, even leads to technophobia (Chan et al., 2022). Hence, knowledge and understanding are key when trying to instigate change through innovation. A lack of knowledge about the characteristics and perspectives of the main group of tourism providers hampers the adoption of new technologies and processes. As shown in the literature review, smart tourism using AI extends beyond the application of service robots and the Internet of Things. In particular, analyzing customer data and developing individually tailored tourism experiences is an essential area of tourism development in which AI is deployed in the background and not visibly recognizably as such.

The majority of the tourism entrepreneurs expressed interest in using digital innovation in marketing. However, not all have a full understanding of the wide range of automation or digitalization application options. The spectrum of what digital solutions can entail in practice is not communicated transparently enough by the tourism authorities, leading to a distorted picture of a robotized service industry in which manpower is substituted by machines. Again, this lack of understanding seems to be mutual. From my conversations with representatives of the tourism authorities and support systems, I did not get the impression that they knew how the Icelandic tourism businesses work and whether they understood digitalization. Comprehensive data is, to the best of my knowledge, missing. A survey on digital marketing conducted by the Icelandic Tourist Board in 2020 is an example of how superficial insights can create a distorted picture of reality. The survey provided quantitative data regarding Icelandic tourism businesses' actions and interest in digital marketing initiatives. However, there are no explanations for how these numbers come together. In contrast, in my research interviews, the tourism entrepreneurs stated that they had not yet allocated time for digital marketing training and explained how the daily business routine simply does not allow them to allocate time in digital trainings. A quantitative survey, however, does not provide such further explanation *why* no digital trainings have been achieved. Such a lack of *informative* information may further deepen the gap between the understanding of tourism entrepreneurs and the support system, leading to a wider disparity between these groups.

5.2.1 My Approach to Tackling this Gap in my PhD Research

My approach to addressing the divide between groups of tourism stakeholders was linked to the imperative of mutual acknowledgement and interest in understanding each other. As the case of applying digital solutions shows, it is essential that the support system and tourism entrepreneurs understand one another equally for digitalization to be developed

and implemented. Abstract concepts—which technological matters often are—are prone to misunderstandings due to their complexity. My research revealed how in-depth conversations between stakeholders can clarify potential confusion and should therefore not be substituted by surveys. Surveys cannot provide the same insights into emotions, values, and beliefs as interpersonal interviews. The interviews I conducted also showed me the importance of non-verbal responses, which can range from frowning and hesitating before answering to smiling ironically or giggling nervously. Establishing trust and minimizing the fear of the unknown are key when trying to apply something new. My research did not answer the question of whether a more concrete understanding of AI, automation, and digital innovation would actually affect the motivation of tourism businesses to utilize these in their own businesses. However, overcoming this divide is the first step to exploring further dynamics.

This section showed how a lack of understanding between groups negatively affects efficient and targeted development. In the following, I delve deeper into this theme and discuss the impact of not understanding buzzwords when trying to apply them in practice.

5.3 Dynamics of Digital Innovation in Practice

In this section, I address the following research question:

> 3: What are the dynamics of applied digital innovation in rural Iceland?

The role of the tourism support system is to provide tourism businesses with information and assistance regarding business development in line with the overall goals and vision of Icelandic tourism policy. The interviews with the different tourism stakeholders revealed that it must be clear whether all involved parties have the same goals. As a first step, it is essential for tourism businesses to identify their goals, motivations, and values. The second step is to clarify if these aspirations align with the overall Icelandic tourism vision.

My participation in FIERI and Hacking Hekla showed me the importance of clarifying buzzwords and creating common ground with regard to knowledge and understanding in a project. In this PhD, I often use the term "buzzword" to refer to both innovation and digitalization. My first encounter with a buzzword was when establishing the pilot event of Hacking Hekla in South Iceland and trying to get creative locals interested. As discussed in Publication 3, there seemed to be an "us" and "them" dynamic, and while keywords—or buzzwords—such as "innovation," "creative," and "brainstorming" raised the interest of those already working with these concepts, the people we actually wanted to reach—locals with fresh minds who had not yet heard much about such concepts—remained uninterested.

Several statements from regional development plans and the official tourism vision stressed the imperative of being innovative and applying innovation without actually explaining what this could mean in practice. As discussed in the research stories, some representatives of the local support system who participated in Hacking Hekla struggled to grasp how networking and the coming together of creative minds could benefit innovative rural (tourism) development. I often got the impression that local authorities were under pressure to be innovative without actually understanding what 'being innovative' could mean. This lack of understanding could be contributing to the communication gap between tourism entrepreneurs and the support system. Strategies like applying digital solutions in

tourism are usually introduced top-down, which has also been the case in Iceland. However, if the idea of how digitalization or innovation manifests is not clear at the tourism authority and support system level, it can result in tourism businesses also having a distorted understanding.

With regard to Hacking Hekla, a lack of understanding about the concepts on the support system level resulted in a failure to identify and recruit the relevant people for the event. We often had to step back and acknowledge that our collaborating support system partner did not have the same understanding of "fostering digital innovation in rural areas" as we did. Thus, we engaged in direct conversation with these partners and clarified that, to us, implementing innovation meant reaching out to a wide range of interested rural individuals to stimulate creative momentum. In most cases, such conversations led to an "aha-moment" that enabling our partners to contribute to the project according to our vision and helping us communicate our vision to the event's participants and other partners. Hacking Hekla serves as an example of a domino effect, where lack of understanding on one level can lead to confusion on other levels.

Being restraint due to a lack of understanding also applies to tourism lifestyle entrepreneurs and the value they ascribe to the application of digital innovation. The question of whether digital innovation is valuable for tourism lifestyle entrepreneurs in rural Iceland depends on their individual understanding thereof. The fact that one of the interviewed tourism entrepreneurs referred to a "broken system" when asked about their relationship with tourism authorities might indicate the root of this communication gap. Such a gap can negatively affect tourism businesses' development, as discussed in Publication 2 on the example of the grant system. A lack of insights into the dynamics of tourism businesses makes it challenging to provide support in a top-down system. Therefore, the businesses' needs must be identified and linked to the current tourism development plans, and any offerings must be adapted in such a way that the businesses can make use of them. When exploring the communication gap at the institutional level, I got a similar impression: it seemed more important that new projects are being instigated rather than already existing initiatives being used and brought together. As discussed in Publication 4, this could result in an inefficient use of resources, and entrepreneurial initiatives.

5.3.1 My Approach to Tackling this Gap in my PhD Research

The issue of being hesitant or uninterested in something because of a distorted understanding was apparent in Hacking Hekla. As discussed, the distinction between "us" (the locals) and "them" (the experts, innovators, and tech-savvy researchers) was likely a reason for the low level of local participation in the event. As Publication 3 discusses, low levels of local interest indicate that implementing digital innovation in practice is a process that takes time. Instigating change does not require only hard facts and information on how digital solutions can be beneficial. Through the intervention of Hacking Hekla, I learned how important trust-building approaches are and how to identify channels of information with which rural (tourism) actors are familiar. For example, Publication 3 describes how acceptance and interest in Hacking Hekla increased after local businesses and well-established individuals became publicly involved in the event's marketing.

Although Hacking Hekla was not a tourism hackathon per se, these learnings align with the importance of mutual acknowledgement and exchange among tourism stakeholder groups. When instigating change and introducing new methods, projects, or products into a (rural) community, success is closely connected to identifying and involving relevant

stakeholders who are embedded in the particular local community. By gaining the trust of a few well-established individuals, it is easier to gain access to the rest of the community.

5.4 Digital Innovation as Tool to Foster Tourism Sustainability

This section addresses the following research questions:

> 4(a): How do representatives of the Icelandic tourism support system assess the value of applied digital innovation as a tool to foster sustainable tourism development in Iceland?
> 4(b):What hampers the successful implementation of entrepreneurial endeavours of digital solutions in the Icelandic tourism industry?

While Publications1–3 primarily explored how rural tourism businesses and locals understand and work with digital innovation in practice, Publication 4 investigated applied digital solutions at the level of the tourism authorities and the support system. A special focus was hereby on exploring potential obstacles for the successful implementation of entrepreneurial endeavors of digital solutions in the Icelandic tourism industry. Since mobile applications for smartphones (apps) are the most evident manifestation of smart tourism in practice, Publication 4 focuses on investigating the value the tourism support system ascribe to tourism apps as a potential tool for sustainable tourism development.

Through the example of "Wapp" app, a hiking app developed by an Icelandic entrepreneur, "upplifðu", a travel platform instigated by Icelandic DMOs, and the idea of an official Iceland Tourism App, I approach some of the challenges and opportunities, the representatives of the tourism support system in Iceland saw in this regard.

The success of digital application depends to a big part on a sizeable user pool, which cannot be achieved when several digital initiatives with similar aims co-exists without being connected to each other. Publication 4 discusses this through the example of "upplifðu", which is a joint initiative of several regional development offices in rural Iceland to create a platform for generate itineraries for tourists—a service that is already offered by Íslandsstofa, the official marketing office for Icelandic tourism. Some representatives of the support system voiced heavy criticism of this project due to the high costs associated therewith and stated that it would have been more efficient to merge with the existing tool provided by Íslandsstofa.

The Wapp app had been mentioned as a prime example how entrepreneurial initiatives can contribute to fostering tourism sustainability by some of the interviewees of publication 4. Up until now, the app has not been integrated in a scaled up strategy that would make it accessible to a larger user pool.

The lesson I drew from this case study was that tourism decision-makers do not think the same about the potential positive role digital innovation could play in tourism development. Furthermore, the understanding of how digital innovation might manifest in practice seems to vary widely among individuals, which influences the initiatives that are implemented. These results are directly linked to those mentioned previously: open and transparent conversation between various tourism stakeholders is vital when trying to instigate change. This example further indicates divide between tourism stakeholders. In this case, a clearly communicated overall strategy might have led to ways of connecting the two projects, increasing both awareness and access and saving on costs.

In this regard I discuss the role of the government in terms of setting the ground for entrepreneurial activities. In the chapter I suggest to increase multi-levelled collaborations

to foster digital development. The role of the tourism authorities lies hereby in giving the digitally underdeveloped Icelandic tourism industry a top-down "push". This aligns with Mazzucato (2018), who emphasizes the government's crucial role in creating networks and collaborations that serve as a foundation for grassroots empowerment and provide support for the success of entrepreneurial initiatives.

5.5 Recommendations

All of the mentioned gaps stem from a lack of communication and understanding on different levels. This PhD provides insights into several approaches to potentially bridge these divides. Due to the relatively small sample size, the findings do not allow for general conclusions to be drawn about the tourism industry in Iceland. In the following, I briefly summarize the recommendations that can be made based on my findings.

Initiatives that foster open and transparent communication between tourism stakeholders are recommended. In-depth conversations with tourism stakeholders provided me with valuable insights. If the scope of this methodology were expanded and included interviews with a larger pool of tourism stakeholders, it is likely that more extensive perspectives could be gained.

To foster transparent communication between the stakeholder groups, the use of buzzwords should be minimized, and concepts should be explained. In addition, I suggest the increased implementation of bottom-up interventions similar to Hacking Hekla or the FIERI project. To instigate change, connecting with the stakeholders involved is essential. These two projects demonstrated the power of bringing relevant stakeholders together and creating momentum to instigate change and a feeling of being in the right place with the right people. This sentiment primarily stemmed from the workshops' small and relatively informal nature. The intimate setting and relaxed tone contributed to a sense of inclusivity and camaraderie. Although we, the hosts, established the structure, offered guidance, and assigned tasks to the participants, we also sought to maintain approachability and be part of the learning process. The positive feedback we received from various stakeholders, including academics, representatives of the support system, entrepreneurs, and tourism business owners, showed that our efforts were highly regarded and deemed valuable. Thus, I strongly recommend continuing to offer programs that facilitate workshops in similar formats to foster opportunities for collaborative engagement, and offer platforms for stakeholders to come together and exchange ideas in more informal settings. Imperative is the acknowledgement that the tourism industry consists of a wide range of different actors who require different ways of communication. Hence, acknowledging that there is no one-size-fits-all solution when applying rural innovation is essential.

6 RESEARCH LIMITATIONS

As mentioned, I saw my role in this journey as not only making theoretical contributions but also actually *doing* something. My focus on practical implementation enabled me to bridge tourism practices and theories. Despite its theoretical contributions on degrowth and digital innovation in a rural setting, my PhD has a strong focus on tourism in practice, as reflected in the choice of research design and the application of action research. Action research is often criticized for unclear contributions because the researcher is too busy taking part to observe and analyze the happenings. To some extent, this might be true. However, practical and action-based research allowed me to be involved in networks and view processes from an insider perspective, which gave me the unique chance to both observe and interact with rural tourism stakeholders. This gave me the opportunity to explore the stereotypes that I encountered in-depth, for example, regarding tourism lifestyle entrepreneurs' lack of will to apply digital innovation

Despite the valuable insights I gained through conversations with tourism stakeholders and the lessons learned from Hacking Hekla and the FIERI project, my research encountered certain limitations. It was not possible to investigate the role of digitalization as a potential tool to foster tourism sustainability in Iceland. The conversations with the representatives of the tourism support system showed that digital solutions are seen as positively contributing to tourism sustainability, my thesis does not provide concrete examples of how this could be done. Moreover, while many of the interviewees in Publication 4 criticized Upplífðu as a failure, more research would be needed to support that claim. To explore the interrelation between sustainability and the application of digital solutions, concrete examples must be investigated. To the best of my knowledge, no such examples could be identified at the time of data gathering. Given the tourism support system's emphasis on the application of digital innovation, it is highly likely that such initiatives will be developed in the near future.

Hacking Hekla did not provide concrete insights into the dynamics of digital innovation in rural areas, as most of the participants focused on non-digital innovation. Hence, the intervention contributed little to the initial goal of fostering digital solutions to solve the various challenges the particular area was facing. This further underlines the limited existence and scope of digitalization in the tourism sector and in rural areas in Iceland at the time of data gathering. The same can be said about my intention to describe how lifestyle entrepreneurs in the tourism industry understand and work with digital innovation. In contrast to my expectations of gaining insights into plans for incorporating automated processes into their businesses, smart applications were, for the most part, not considered meaningful. Finally, the small sample size, in light of the 3,900 tourism businesses registered in Ferðamálastofa, may be regarded as a limitation.

In the following and final section, I propose concrete directions for future research.

11ᵗʰ Research Story - Experience
The Counter Spell: Returning to the Big Picture

When I think about the ongoing discussions about rethinking tourism, the "right size" (Hall, 2009), and the application of innovation and digitalization to instigate change, I often think about Auður Vala. Auður Vala is a tourism entrepreneur and the owner of a hotel, restaurant, and wellness spa in Borgarfjörður Eystri, a remote fishing village in the East of Iceland. I first met Auður Vala in the summer of 2021, when we sat in the lobby of her hotel. Borgarfjörður Eystri is part of the program known as Fragile Communities and about 70 km away from Egilsstaðir, which is the next closest town and service center. The only road to Borgarfjörður Eystri is 94, which leads through a winding mountain pass. It is not unusual that the inhabitants of Borgarfjörður Eystri are cut off during the winter due to harsh weather and impassible road conditions.

As I was driving down the winding serpentine road, the brakes of my car became hot, and I was relieved when the small fishing village appeared after the last turn, where I was meeting Auður Vala for a research interview.

In 2011, Auður Vala and her husband opened the first part of their hotel, which they had rebuilt in an old fish plant that was once the heart of the village. Many people called them crazy for investing in such a remote and fragile place. However, their intervention was a success. As I was chatting with Auður Vala, there was a constant bustle of local and international guests. In the open kitchen right behind the lobby, the kitchen staff were experimenting with a new recipe and obviously having fun. Their spirits and good energy were significant and promoted a friendly atmosphere in the hotel.

Notwithstanding the remote location of Borgarfjörður Eystri, the town feels alive. Hótel Blábjörg not only attracts tourists but is also a popular meeting place for locals to dine out. In the winter, it is the only restaurant in the area. The local community, the village, and the nature surrounding her business play a major role in Auður Vala's philosophy. In her wellness spa, guests can book seaweed baths—with seaweed that Auður Vala collects herself from the ocean outside of her front door—and her restaurant works to a large extent with locally sourced and produced ingredients. In the hotel's bar, guests and locals can enjoy homemade gin specialties and *Landi*, a traditional Icelandic liquor that Auður Vala brews according to an old family recipe.

Sustainability plays a major role in Auður Vala's business approach, which can be traced to the remote location of Borgarfjörður Eystri.

> We are so far away, all the groceries and so on. Everything is located in Reykjavík. So you can't go further, you have to go to Egilsstaðir and it is really expensive. And sometimes you can't count on it also. So we have turned to do everything by ourselves. So that's why sustainability is a big part of my company.
> *Audur Vala, Business Owner East Iceland*

Sustainability has become a key element of Audur Vala's business philosophy, and she is constantly rethinking her strategy and tools to become even more sustainable. Communication with hotel guests is paperless. All rooms are equipped with iPads that guests can use to order dinner or book treatments in the spa. Despite applying and acknowledging the benefits of technology, Auður Vala and her staff place great emphasis on maintaining personal contact with their guests.

> Of course it costs something, but I really think it is worth it because I'm always trying to have things in one place and do things more simply for staff members. But there I'm also seeing cause we are always thinking about sustainability and the environment. No papers. Nothing.
> *Audur Vala, Business Owner East Iceland*

When I reflected on my encounter with Auður Vala, I saw how my whole PhD—the interplay of rethinking tourism, degrowth, lifestyle entrepreneurs and digital innovation—came together. Driven by her beliefs to do and create something meaningful, she and her family contribute to strengthening a once fragile village by creating work for locals and changing the energy of the place into a creative one—it is a place where things are happening. Inspired by the surrounding nature and history, Auður Vala applies both innovation and digitalization to an extent that aligns with her personal and business intentions, with the ultimate goals of fostering sustainability and creating value for her guests, the local community, and her own lifestyle. In the discussions on rethinking tourism, this hotel in the remote East Fjords of Iceland may have little impact, but for the village of Borgarfjörður Eystri, it has been a game changer.

To me, entrepreneurs like Auður Vala are role models, acting sustainably in line with the current *zeitgeist* of innovation and technology. As I was driving back up the winding road to the mountain pass, my thoughts drifted to the Sorcerer's Apprentice and his despair of finding the counter spell that would save him. Maybe people Auður Vala are already using the counter spell. Having been in Borgarfjörður Eystri, it does seem like it.

7 CONCLUSION: REVIEWS AND FURTHER RESEARCH

With regard to the initial discussion of saving the world, the example of Auður Vala and her business provides another perspective on the Earth's state of emergency. Auður Vala's country hotel showcases the interplay of digitalization and innovation as a tool to foster tourism sustainability on a microscale. Metaphorically speaking, the Earth, in this microcosm, is saved for the moment. The question that remains is how can we make use of this knowledge on a larger scale? I see my PhD as the foundation for this discussion. By having conversations *with*—not *about*—the involved actors, I endeavored to detect gaps. Linking these findings to the big picture and the discourse on degrowth, digital innovation, and sustainability in tourism is one of the main contributions of this PhD.

My research connects theory with practice and theoretical discussions with the worldviews of tourism actors, giving them a voice. As a next step, it would be interesting to identify and conduct follow-up interviews with other tourism lifestyle entrepreneurs and representatives of the tourism support system. By expanding the scope of the interviews to include a broader range of tourism actors throughout rural Iceland, more data could be gathered and analyzed, and additional conclusions could be drawn. Interviews with more tourism stakeholder groups, for example, market leaders and large tourism companies, could potentially highlight other gaps and contribute to a deeper understanding of the dynamics of the tourism industry in Iceland.

Another interesting next step would be a quantitative study to classify the registered tourism businesses in Iceland and attain an overview of the motivations and values on which they are based. Individually-tailored communication between support system representatives and tourism lifestyle entrepreneurs could be developed with the goal of offering more efficient support to the various tourism stakeholder groups.

As mentioned, the intention of including action research in the research design was to instigate change through the insights gained at Hacking Hekla. At the time of the writing of this PhD, it was not possible to state whether Hacking Hekla had instigated any change, which could be interpreted as a limitation of the research. However, as discussed in Publication 3, innovation is a long-term process. As the mentors, keynote speakers, and judges of Hacking Hekla emphasized, the event planted a metaphorical seed of innovation; there is potential that it will develop further, but there is no guarantee. Analyzing the success of Hacking Hekla from a solution-oriented perspective, one could say that the intervention was a failure since no significant new businesses or job opportunities came of the event. Looking at the intervention more objectively, however, Hacking Hekla can be seen as a learning process that potentially set a long-term development process in motion.

Following Hacking Hekla event described in this PhD, the team and I ran four further events across Iceland. Analyzing these events in depth could hold significant value. Exploring how the dynamics changed with different collaboration partners and participants could be a topic for future research. Gaining insights into how dynamics develop when instigating innovation with the same project over a longer period could be interesting for future work. Hence, I see the necessity for future research to explore if and how such interventions can instigate change. As a possible next step, qualitative research with the Hacking Hekla collaboration partners could be conducted. It would be especially interesting to explore how they retrospectively perceive their experience with the rural hackathon and if they would find a follow-up event meaningful. In the case of follow-up events, further research could be conducted and comparisons with the pilot project could

be made. This could indicate whether and how such events actually contribute to an area's level of innovation.

In conclusion, I want to return to the importance of adding new stories rather than new abstract argumentations when trying to rethink tourism and instigate positive change (Huijbens, 2023). My thesis comprises a series of stories from various tourism stakeholders. In particular, it gives the tourism lifestyle entrepreneurs a voice. It is important to tell stories that showcase what is meaningful, and to whom, and why (Huijbens, 2023). I see my PhD as a single story that brings the various tourism stakeholders a bit closer to one another by simply helping them understand each other.

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PART II: PUBLICATIONS

Publication 1: The Role of Rural Tourism Lifestyle Entrepreneurs in Rethinking Current Tourism Development

The role of rural tourism lifestyle entrepreneurs in rethinking current tourism development

Magdalena Falter

Abstract

Purpose – Discussions on tourism development address the urgent need to reduce the negative impacts of tourism on tourist destinations. Despite decades of trying to find potential ways to foster sustainability, however, current tourism development is still mainly driven by political interests and growth agendas. In spite of concepts intending to improve sustainable tourism development, negative dynamics, such as over-tourism and the exploitation of nature and local communities, dominate the current reality of tourism. This article focuses on the concept of degrowth as a potential solution for rethinking tourism policy and practices to ensure greater sustainability. Its aim is to explore the gap between these policies and the academic theories on instigating sustainable change, and the actual reality of the tourism industry, which is primarily driven by economic motivations such as growth.

Design/methodology/approach – To explore this dichotomy, this paper investigates the values of tourism lifestyle entrepreneurs. Small businesses are the most dominant group in the industry in terms of numbers. I contend that researching their viewpoint on current developmental trends could lead to valuable insights into how to tackle this gap between theory and reality. This paper also explores how the degrowth paradigm may promote sustainability in tourism, as well as the potential role that tourism lifestyle entrepreneurs could play in this development. The discussion is illustrated by a case study based on interviews with tourism entrepreneurs in Iceland.

Findings – The findings indicate that various tourism stakeholders have different approaches to growth, with many tourism lifestyle entrepreneurs tending to embrace degrowth practices by acting according to their value base, albeit sometimes unconsciously. This focus on aspects other than growth could potentially encourage tourism lifestyle entrepreneurs to contribute to sustainable development.

Research limitations/implications – The examples discussed in this paper are locally limited and cannot be generalized due to the small size of the interviewed sample group. The scalability of individual entrepreneurs' impact is limited due to their small size.

Practical implications – The actions and values applied by these tourism lifestyle entrepreneurs demonstrate how degrowth can be manifest on a small scale: growth is only embraced up to a certain limit, so it oes not exceed social and environmental capacities; from that point on, community well-being plays the key role. This study demonstrates the untapped knowledge tourism lifestyle entrepreneurs could provide to rethinking the tourism industry.

Social implications – This study demonstrates the importance of shedding more light on ethical issues and values beyond growth in both academic and political discussions. Addressing tourism lifestyle entrepreneurs as smaller-scale actors of tourism degrowth could be a meaningful starting point for holistically rethinking tourism and give them a voice.

Originality/value – This research emphasizes untapped knowledge by acknowledging entrepreneurs and their potential for rethinking tourism development, concluding with recommendations for practice and policy.

Keywords Degrowth, Tourism lifestyle entrepreneurs, Rethinking tourism, Value beyond growth

Paper type Research paper

Introduction

The economic role of tourism has increased globally over the past two decades, as seen from the increase in annual international arrivals. Global climate change raises questions about human

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consumption and how we should adapt our user behavior to minimize its effects in terms of environmental damage. This discussion is particularly relevant to tourism. Some researchers argue that the question of *if* we need to change has been answered; instead, we must now ask *how* we should change (Demiroglu and Turhan, 2020, p. 214). As a result, calls are growing for tourism practitioners and researchers to rethink the values and role of tourism to respond to the current challenges of environmental destruction and global warming (Mathisen *et al*., 2022; Sharpley, 2020).

The tourism sector consists of numerous players with different characteristics and business motivations. However, global tourism development has been driven mainly by political interests based on economic growth and growth-oriented agendas (Mihalic, 2020). Arguably this sole focus on profit hampers creative approaches to enhancing effective, sustainable forms of tourism that benefit both locals and visitors.

Over time, concepts such as ecotourism or "responsible" tourism have been introduced to tackle this dilemma (Sharpley, 2020). However, these notions may still be driven by ulterior motives such as economic gains, and often result in greenwashing (Sharpley, 2020). Recent studies (Demiroglu and Turhan, 2020; Fletcher *et al*., 2019; Lundmark *et al*., 2020) have voiced strong criticism of past discussions on fostering tourism sustainability, noting how they remain fixated on growth and fail to tackle issues such as environmental and social exploitation.

By contrast, the paradigm of degrowth is beginning to gather momentum as a potential starting point to actually implement sustainability in tourism while counteracting touristic overconsumption (Hall, 2009; Sharpley, 2022). Degrowth has been discussed in the context of a place-bound "right-sizing" (Hall, 2009), in line with a concept of tourism development that is determined by the Earth's natural limits (Huijbens, 2021), yet can also provide environmental and community well-being (Ruiz-Ballesteros, 2020). The past and current discussions on how tourism literature has addressed the dilemma of fostering tourism sustainability, point out a certain ambiguity also often referred to as trouble with tourism (Ren, 2021). On the one hand, there is an urgent call for action to save the Earth, on the other hand, global tourism continues growing and increasing in economic value. A case in point is Iceland, where the official tourism strategy envisions the country becoming a leader in sustainable tourism (Ferðamálastofa, 2021), yet actual tourism development appears to be growth-driven. This is manifest in the steady increase of international arrivals and expansion of touristic infrastructure, especially in the capital Reykjavík and the popular South Coast region. Some researchers link this growth to mass tourism (Sæþórsdóttir *et al*., 2020a, b), in marked contrast to the goals envisioned and communicated by the Icelandic tourism authorities.

This contradiction between the vision of a sustainable global tourism industry and the actual reality, which deviates extremely from this aspiration, shows that practitioners have yet to realize a form of tourism that takes both environmental and social aspects into consideration. Despite more than four decades of academic and political discussions on fostering tourism sustainability, the fundamental challenges posed by the industry remain unchanged.

Hence, I wonder if a possible response to this dilemma may be to break the links between policy and practice. The actors that are substantially involved in tourism on the ground are small, medium-sized, and micro-scale tourism businesses (Atladóttir *et al*., 2023). According to Peters *et al*. (2009), they are the prevalent form of enterprise in the industry, often classified as so-called "lifestyle entrepreneurs." This paper explores how these practitioners perceive current tourism development, with the aim of gaining new insights into why actual activities in the tourism industry differ significantly from aspirational visions of sustainability.

My goal with this paper is to investigate this gap in relation to tourism development in Iceland, exploring how tourism differs in reality from the goals envisioned by the authorities. To investigate this question, I aim to look beyond the academic discussion of tourism sustainability and engage with the viewpoints and opinions of tourism lifestyle entrepreneurs in rural Iceland. Specifically, this article explores the following research questions: What is the role of tourism

lifestyle entrepreneurs in rethinking current tourism practices toward degrowth and greater sustainability? In addition, how can tourism actors' value bases and business intentions beyond economic growth foster sustainability in tourism? With this paper I hone in on the business intentions of lifestyle entrepreneurs, which often differ significantly from solely growth-oriented entrepreneurs. Their way of operating their tourism businesses can potentially affect the communities, environment, and attractiveness of tourist destinations and positively contribute to sustainable tourism development. Using this case study of Icelandic practitioners and their viewpoints, I examine the degrowth agenda as an alternative for measuring business success.

Tourism degrowth, but how? A conceptual discussion

According to Lenton *et al*. (2019), mankind is currently in a state of "planetary emergency" (p. 5), with a global ecological footprint that exceeds the Earth's natural capacities by 175% (Global Footprint Network, 2023). Since the early 1990s, the issue of sustainability has risen to the fore in tourism (Saarinen, 2020), and numerous public and private initiatives have been implemented. The urgent need to rethink global tourism (Higgins-Desbiolles *et al*., 2019), and to balance community needs, environmental issues, and economies (Hall and Wood, 2021), is evident in both academic discussions and policy-making. Topics such as sustainable and responsible tourism (Mihalic, 2020; Sørensen and Grindsted, 2021), and the concepts of eco-tourism, well-being, regenerative tourism, and degrowth have all recently surfaced in the literature on tourism (Butcher, 2021; Hall and Wood, 2021).

The role of growth in sustainable tourism has raised questions about its impact on societies and the environment (Sharpley, 2020; Sørensen and Grindsted, 2021). According to the United Nations World Tourist Organization (UNWTO), sustainable tourism is "[t]ourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (n.d.). This aligns with Rasoolimanesh *et al*. (2023) who discuss how sustainability in tourism is often envisioned as the balanced interplay between social, economic and environmental requirements. There is a consensus among tourism researchers that conventional sustainability practices create a false image of positive change (Gibbons, 2020). Measures intended to foster sustainability often result in the reverse, by greenwashing authorities' economic motives (Sharpley, 2020). Mathisen *et al*. (2022) critically refers to how public authorities tend to see sustainability as the interplay of economy, ecology, and society; hereby ethical issues such as fostering well-being for humans and the environment often fall short. Several researchers even see "sustainable tourism development" as an oxymoron, or contradiction in terms (Saarinen, 2020), as it prioritizes economic growth over community well-being and environmental protection (Sørensen and Grindsted, 2021). This aligns with Atladóttir *et al*. (2023), who point out the reactive nature of sustainable tourism and its ultimate goal of satisfying the needs of the industry, which is usually dominated by market leaders.

Mathisen *et al*. (2022) criticize the top-down nature of policy on sustainability in tourism, fostered through the UN's sustainable development goals (SDGs), which they argue often lead to an accumulation of sustainability certificates instead of actions. They refer to the current state of the industry as an "exploitation of natural and cultural resources for profit accumulation" (p. 3).

According to Higgins-Desbiolles *et al*. (2019), tourism authorities act according to the values of neoliberal capitalism, which pursues scalable economic growth and therefore fundamentally contradicts sustainable ambitions. For example, Sharpley (2020) argues that over-tourism hinders the sustainability of the tourism industry and reflects its profit-seeking intentions. Given the continuous increase in worldwide tourist arrivals (before COVID-19), "the trajectory of tourism on a global scale contrasts starkly with the policies and principles of sustainable tourism development" (Sharpley, 2020, p. 4).

Degrowth

The pursuit of economic growth in tourism, also referred to as "growth fetishism" (Higgins-Desbiolles *et al*., 2019) "is the core of the neoliberal and the market economy thinking" (Viken, 2016, p. 21). Various researchers argue for abandoning the pursuit of economic growth and discarding an increase in tourist arrivals as the main indicator of tourism success (Mihalic, 2020; Muler Gonzalez and Gali Espelt, 2021) calling instead for practitioners to implement degrowth principles (Margaryan *et al*., 2020; Prideaux and Pabel, 2020)). Turning away from growth altogether will prove difficult, however, as various stakeholders in tourism rely on its economic success (Mihalic, 2020). As Butcher (2021) argues, although growth is the origin of many of the problems we face in contemporary tourism, it is indispensable for the continued development of the sector; total growth-aversion and anti-capitalism would likely result in poverty and chaos (see also Latouche, 2007). Trying to save the Earth whilst simultaneously fostering tourism development is the lynchpin of the degrowth paradigm gaining momentum in the debate on tourism sustainability. Many scholars view degrowth as a set of principles that can be integrated into established perspectives and beliefs (Fletcher *et al*., 2019; Muler Gonzalez and Gali Espelt, 2021). In contrast to the literal meaning of the word "de-growth", the concept is not about downsizing *per se*, nor even the radical reduction of tourism (Hall, 2009; Sharpley, 2022), but is rather about finding "the notion of 'right-sizing'" (Hall, 2009). This rightness of size is dependent on location and can even manifest in a visitor increase in certain places (Hall *et al*., 2020). Sharpley (2022) interprets degrowth as a lifestyle, with the planet setting the pace of our consumption and growth. The limits of growth are then measured according to the principle of "enoughness" (Sharpley, 2022, p. 2), which is determined by the natural extent of the Earth's capacities and the level of peoples' well-being.

There are two main streams of discussion on the degrowth paradigm in the current body of tourism literature. One branch sees the key to degrowth as lying in political decision making, while the other sees it as resting on an ethical approach that demands a change of mindset and values. Lundmark *et al*. (2020) see the rethinking of tourism as a re-politicizing process, necessary to achieve actual sustainable development. Saarinen (2020) further elaborates on this political view by pointing out how the actual implementation of SDGs with respect to tourism requires "stronger governance and politics guiding the industry" (p. 145). By contrast, Gibbons (2020) approaches degrowth by focusing on outside factors such as the impact of policies, authorities, and economic markets, arguing that the root of the failure to implement sustainability is that the values, beliefs, paradigms, and worldviews of tourism practitioners remain largely unaddressed.

This leads to a third, ethical branch of the discussion on degrowth, the focus of which is social and environmental well-being. To achieve sustainability, tourism has to be rethought in a way that prioritizes the needs of local communities over those of tourists or tourism agencies (Fletcher *et al*., 2019; Higgins-Desbiolles *et al*., 2019). Mathisen *et al*. (2022) stress that responsible behavior is a matter of the "soul" (p. 2), or the values and beliefs of tourism stakeholders; the authors discuss how sustainable behavior entails personal attachment to a place and a community and is hence driven by "inner sustainability" (p. 2; see also Wen *et al*., 2021) instead of an outer reaction to guidelines and political requirements. This approach focuses on the inclusion and well-being of everyone in local communities rather than on providing services for visitors and absorbing financial gains from tourism (Latouche, 2007; Mihalic, 2020). Huijbens (2021) furthers this holistic approach, where mankind is part of the "web of life" (p. 122) and emphasizes the importance of transitioning actions and focus to *earthly* matters. Thereby he describes earthly tourism as a form of tourism that is sensitive to the needs and restrictions of nature and local communities. Fundamentally, degrowth moves the focus onto the "real needs of humans in a finite natural system" (Muler Gonzalez and Gali Espelt, 2021). Various authors have observed how smaller tourism businesses are generally more interested in environmental and social issues than growth-oriented actors (Sørensen and Grindsted, 2021). Margaryan *et al*. (2020) have found hints that these so-called lifestyle entrepreneurs have discovered what this right size of growth could look like for their own businesses. By simply trying to contribute positively to their local communities, such entrepreneurs

often apply ethical values that align with the degrowth paradigm discussed above, without being aware that they are part of this new movement toward rethinking tourism.

So far, little is known about the role of small businesses, whose values often seem to align with degrowth principles and may potentially act as "agents of degrowth." The following section focuses on tourism lifestyle entrepreneurs and their possible role in this development, including their value to local communities. The paper then moves on to present the Icelandic case study.

Tourism lifestyle entrepreneurs

Business intentions beyond economic growth. Historically, entrepreneurship is associated in the classic Schumpeterian approach with the pursuit of economic growth (Schumpeter, 1999; Fu *et al*., 2019), as well as the ability to take risks (Dias and Azambuja, 2022). "Business oriented" (Dias and Azambuja, 2022) or "growth oriented" (Fu *et al*., 2019) entrepreneurs demonstrate a high level of business acumen, often fostered through innovation and creativity, and they measure their success by business growth.

The tourism sector, which consists largely of small and medium-sized enterprises, attracts many entrepreneurs (Bredvold and Skålén, 2016; Peters *et al*., 2009). However, their motivation to start tourism ventures often stems from lifestyle aspirations rather than thought-out business intentions (Bredvold and Skålén, 2016). In many cases, their engagement in the tourism industry may occur because of a series of coincidences in their lives (Andersson Cederholm and Hultman, 2010). Dias *et al*. (2022) observed the key role of independence for lifestyle entrepreneurs, including being their own boss and the freedom to be creative in a self-chosen job.

While some researchers consider such lifestyle entrepreneurs as driving forces for tourism development, others blame them for hampering the industry through a lack of business and management skills (Ateljevic and Doorne, 2000; Margaryan *et al*., 2020; Peters *et al*., 2009; Skokic and Morrison, 2011). Despite this criticism, Margaryan *et al*. (2020) emphasize that lifestyle entrepreneurship is not a downscaled imitation of "real entrepreneurship." Rather, lifestyle entrepreneurs differ in the way they approach life and their businesses, with their attitude toward business growth being the most crucial. The personal values identified for tourism lifestyle entrepreneurs, such as closeness to nature, friends, and family, often mismatch with economic growth intentions (Sørensen and Grindsted, 2021). Lifestyle entrepreneurs tend to constrain growth as soon as it negatively influences their quality of life or professional independence (Peters *et al*., 2009; Skokic and Morrison, 2011). This requires, however, that they demonstrate a level of financial security that comfortably enables them to make a decent living (Reijonen and Komppula, 2007) and find a balance between economic and non-economic goals (Dias and Azambuja, 2022; Sörensson *et al*., 2019). The ethical focus of such lifestyle entrepreneurs manifests in the importance they ascribe to the local community that they and their business are part of. Linking to this focus on community well-being, the following sub-section investigates the connections between tourism lifestyle entrepreneurs and their local communities.

The value of the local community. Integration into the local community plays a key role in both the acceptance and establishment of a tourism lifestyle entrepreneur's business (Dias and Azambuja, 2022). "Being locally embedded" into a community in an entrepreneurial context means becoming part of the community and creating a "sense of belonging" (Wen *et al*., 2021) comparable to a relationship-like alliance. Wen *et al*. (2021) criticize how many studies often look at tourism businesses in isolation, or outside the social setting in which they are embedded, disregarding the potential positive effect of embeddedness on sustainable tourism development (Dias and Azambuja, 2022). Besides acting according to internal ethical guidelines, the focus on community well-being at both an individual and an organizational level can potentially counteract the growth-fetishism driven by capitalism. Through its social focus, a small entrepreneurial venture can encourage positive change and foster well-being within the local community (Aquino, 2022).

Kibler *et al*. (2015) argue that the level of a business' attachment to and dependency on a place directly influences its degree of sustainable entrepreneurial behavior. This may vary between

entrepreneurs, often relating to the extent to which their business depends on local, natural, and social resources. Some entrepreneurs may easily lead their businesses without the benefits of being embedded in the local environment, while others depend heavily on these resources.

This interrelationship may be a prime reason why various academics have observed a direct link between a rural entrepreneur's local embeddedness and their contribution to sustainable business practices (Akgün *et al*., 2010; Kibler *et al*., 2015; Wen *et al*., 2021). Bosworth and Farrell (2011) stress how efforts by authorities "should build on this rather than trying to introduce something new" (p. 19). Even though knowledge about concrete entrepreneurial activities that successfully foster tourism sustainability is scarce, the literature assigns tourism lifestyle entrepreneurs a central role in the sustainability paradigm.

In the following section I will link the discussion on tourism degrowth and the potential role of tourism lifestyle entrepreneurs in this rethinking process to the case of Iceland.

Iceland case study: background. Tourism has often been seen as an economic "savior for [. . .] peripheral areas" (Kauppila *et al*., 2009, p. 425), disregarding the often negative impacts of tourism on both nature and local communities. Various researchers have noted the urgent need to shift growth-oriented tourism toward a more holistic and sustainable development agenda that takes both ecological and social factors into account (Hall *et al*., 2020; Higgins-Desbiolles *et al*., 2019; Saarinen, 2020; Seyfi *et al*., 2022). In the case of Iceland, tourism has undergone rapid growth during the past two decades. The following section presents this case, focusing on the key discussion about current tourism development and happenings.

Iceland: ambiguity of continuous tourism growth and sustainability policies

After the eruption of Eyjafjallajökull in 2010, Iceland received unprecedented international media attention and as a result developed into a popular tourist destination. Tourism has increased drastically over the past two decades, reaching a per-capita ratio of six tourists to one inhabitant (Ferðamálastofa, 2021). In the year before the COVID-19 pandemic, the international airport Keflavík registered 1,995,972 international visitors (Ferðamálastofa, 2019a). After the significant decline of international arrivals during the pandemic, the tourism industry in Iceland has more than recovered to reach about 1.6 million visitors in 2022. At the time of writing, the Icelandic Tourist Board indicated a 87.9% year-on-year increase for first three months of 2023 (Ferðamálastofa, 2022, 2023). As is typical for Nordic tourism destinations, the majority of Iceland's visitors come because of its natural attractions. Most visit Reykjavík, which serves as the main gateway into Iceland (Jóhannesson and Welling, 2020), with 75% of all overnight stays registered there in 2019 (Ferðamálastofa, 2019b). The spillover effect of the stream of visitors to the capital mainly affects the close surroundings and the South Coast region, which attracts 81% of the tourists with its popular nature attractions such as the famous Geysir hot spring (Ferðamálastofa, 2019a). By contrast, only 16% visited the remote Westfjords, and 38% the east of Iceland. This strong concentration of visitors in a small part of Iceland during the summer months has provoked discussions about crowding and over-tourism (Sæþórsdóttir *et al*., 2020b; Wendt *et al*., 2022). Over-tourism implies that the number of visitors to a destination negatively impacts the locals and their quality of life, and can cause harm to the natural surroundings (Sæþórsdóttir *et al*., 2020a). A media analysis by Sæþórsdóttir *et al*. (2020a) shows how international commentators increasingly point out Iceland as a "poster child for over-tourism" (, p. 11) and feature Iceland in "no-go" lists (p. 2) as a result of crowding at the main tourist attractions, where natural attractions visibly suffer from damage.

Despite these negative influences, which also affect the visitor experience, the discussion about whether or not Iceland's carrying capacity has been exceeded is delicate and ambiguous. Over-tourism, as it is pictured by the media, affects the spatially and temporally congested tourism destinations along the south coast and the capital area, but the less-frequented destinations in the more remote east and west of the country are often left out of the larger picture (Sæþórsdóttir *et al*., 2020b).

Tourism in Iceland is managed by the Ministry of Culture and Business Affairs and is operated by several officials under the auspices of the ministry. Due to the interconnectivity of the sector, a national "Tourism Task Force" was established in 2015 to improve coordination and collaboration between the ministry and various other government administrations, municipalities, tourism support systems, and interested parties involved in tourism. It operated until 2020. The starting point for future development is the *Icelandic Tourism Strategy for 2021–2030* (Ferðamálastofa, 2021), which serves as the basis for an action plan currently being drafted (Stjórnarráð Íslands, 2023). Its general goal is to enable sustainable tourism by engaging in community development and balancing economic gain with environmental utilization. Specifically, the goals stated in this plan call for "profitability above tourist numbers" (p. 4), achieved through "responsible tourism which makes use of technology, innovation, and product development" (p. 3).

As with many other Nordic destinations, the majority of tourism businesses in Iceland are micro-scale, small, or medium-sized businesses (Atladóttir *et al*., 2023). The developers of these forms of enterprise are often referred to as lifestyle entrepreneurs. In the following section, I discuss the methodology used in this paper, before exploring the main values ascribed to tourism lifestyle entrepreneurs and presenting the case study on their role in Iceland.

Methodology

This paper follows a qualitative approach. A total of 33 tourism entrepreneurs and two representatives from tourism authorities were interviewed in semi-structured research conversations. The interviewees were sampled using the snowball method and interviewed from July 2020 to September 2022. All interviews were recorded, transcribed, and analyzed based on the techniques of grounded theory (Strauss and Corbin, 1994), with themes identified through rounds of open and axial coding using the coding program MAXQDA. The interview duration was about 60–90 min and was partly conducted online due to the COVID-19 pandemic.

The interviews were structured into four main parts: Part I considered their business background, networks, marketing, and relevant advertising channels; Part II discussed rurality, and related issues such as the pros and cons of being a rural tourism entrepreneur; Part III focused on understanding of innovation and digitalization in the tourism business; and Part IV dealt with perceptions of Icelandic tourism development. The data used and processed in the framework of this paper were retrieved from parts I, II, and IV. The themes identified in this data set reflect the viewpoints of the entrepreneurs regarding Icelandic tourism development.

The main themes are: skepticism toward ongoing growth in Icelandic tourism; negative influence of over-tourism on locals; perceived lack of interest and disconnection from official tourism authorities; responsibility for community well-being.

Most of the interviewees or their partners had family roots in the areas in which they operated their businesses, and a few were newcomers to their areas. All of them were micro-scale, small, or medium-sized rural tourism businesses with varying business intentions ranging from scalable growth to lifestyle-related values. In relation to the characteristics outlined above, I classified the majority of the interviewees as tourism lifestyle entrepreneurs, since most interviewees entered the tourism industry due to the wish to live a certain lifestyle in a particular rural area of Iceland. The descriptions of how many of them started to build up their businesses tended toward "learning by doing" instead of a well-thought-through strategy, which matches with the characteristics ascribed to tourism lifestyle entrepreneurship. It is, however, based on subjective characteristics that other authors might interpret differently. I acknowledge the challenge of talking about tourism lifestyle entrepreneurs as a uniform group. I see tourism lifestyle entrepreneurs as professionals who are deeply rooted in their local community and display characteristics and values that align with the principles of degrowth (Demiroglu and Turhan, 2020; Lundmark *et al*., 2020). However, I acknowledge that there are various types of businesses classified as tourism lifestyle entrepreneurs in existing literature that may not necessarily embody these values. Table 1 gives

Table 1	Geographic distribution of the interviewees	
Region		*Total number*
South		11
East		7
North		6
Westfjords		3
West		5
Reykjanes		1
Source(s): Table by the author		

an overview of the geographic distribution of the interviewees. As mentioned in the description about Icelandic tourism above, the South is one of the most popular travel areas, whereas in contrast to that, especially the Westfjords and East face short summer seasons and remoteness. Hence these geographical differences impact the challenges these entrepreneurs face in the particular areas. In addition to the entrepreneurs interviewed, two further interviews with ministry representatives were conducted.

Analysis

In this section, I link the previous conceptual discussion to the case of Iceland, with a focus on exploring the role of tourism lifestyle entrepreneurs in rethinking current tourism practices and ensuring greater sustainability. I also investigate how business intentions beyond economic growth can contribute to fostering sustainable tourism development.

Growth-agenda in current tourism development

The conversations with the Icelandic tourism entrepreneurs reflect the ongoing discussion of the growth agenda in global tourism development. Despite valuing the role of tourism as an important economic pillar, many of the entrepreneurs voiced concern about touristic land use and over-tourism in some parts of Iceland. Most of them deprecated the recently rapid growth of tourism in Iceland, arguing it significantly contrasts with the various official sustainability goals such as "profitability above numbers" (p. 5) or "balance between conservation and utilization" (p. 8) envisioned by the Icelandic tourism authorities.

> It's been kind of Wild West in that way that we always have been. The tourists were coming, coming, coming, and we were building hotels, hotels, hotels.
> *Hotel owner, East Iceland*

A restaurant owner criticized the fact that a majority of the companies involved in Icelandic tourism are driven by the pursuit of economic revenue and exploitation. He observed how their aim of maximizing profit and reducing costs outweighs the industry's push for local value creation.

> Maybe my answer is really negative, but I think way too many companies have been doing this for the wrong reason. And that is only to make money, not to create something interesting.
> *Restaurant owner, South Iceland*

This criticism about people entering the tourism industry for "the wrong reason" arose again when some of the entrepreneurs pointed to the role that tourism had as an economic savior after the global financial crisis in 2008. Many businesses became involved in tourism for the purposes of financial recovery, marking the starting point of the exponential increase in visitors, they said.

Participants also emphasized that Iceland was "not ready" (*hotel owner, West Iceland*) when tourism demand started to grow, and some pointed out that Iceland has "no history in hospitality"

(tourism entrepreneur, West Iceland). Although a few of the entrepreneurs described Icelandic tourism as "blossoming" or "sophisticated," most felt that the industry had gotten "out of hand" and had developed "unsustainabl(y)," like "a gold rush." This heavy criticism of tourism development and the growth-oriented motivation of their industry peers, hints at a world view and values beyond the sole pursuit of profit that most of the tourism entrepreneurs interviewed seemed to have in common.

Negative influence of over-tourism on locals

In line with the characteristics ascribed to tourism lifestyle entrepreneurs above, most of them proudly referred to the beauty and calm of Icelandic nature, expressing a sense of enthusiasm and pride for the area—an area, as some of them complain, that is being increasingly overused by a rising and uncontrolled stream of visitors. This frustration shows, for example, in the criticism directed at the Icelandic tourism industry's tendency to reactively satisfy the growth in demand. One interviewee referred to the increase in hotel construction in the capital area as follows:

> Iceland has always been an expensive country. Iceland can never be anything else but an expensive country. So we should sell ourselves as expensive, and we should not take all this demand; we should be sold out during some parts of the year. Then we will actually get the money for the service that we need to get if we don't accept all.
> *Hotel owner, East Iceland*

In contrast with the aspiration of Iceland's tourism authorities to ensure a "positive impact on local communities and enhanced quality of life" (p. 6), many of the interviewees pointed out a reduced experience in nature for both tourists and locals, mainly due to overcrowding at tourist attractions at certain times of the year. A tour operator in the west of Iceland mentioned with regret how their company cut a once-regular and favorite picnic stop at Kirkjufell from their horseback riding tours. The stop was a scenic mountain with waterfalls that had become increasingly popular, especially among photographers and due to social media.

> That is a bit sad, if I think about it, because we have always been at this lovely place that nobody else was really interested in. And now everybody is interested in it, but we don't go there anymore. (Laughs).
> *Tour operator, West Iceland*

Many referred to the uneven tourism distribution, with attractions within a short drive from the capital city often overfrequented while remote areas struggle with the effects of seasonality. The entrepreneurs criticized Icelandic marketing and the way authorities manage the tourism industry, explaining the uneven distribution of tourism across the country as being due to a lack of controlled marketing or a holistic tourism strategy.

> The brochures were still showing Gullfoss, Geysir, and Blue Lagoon—public brochures made by the Tourist Board! People who visit Iceland get the feeling that that is the only thing there. I just don't understand why the authorities didn't do anything about it.
> *Tour operator I, Westfjords*

Perceived lack of interest and disconnection from official tourism authorities. Entrepreneurs' feelings toward tourism authorities were ambiguous. Many of them were "not really thinking too much about that" or felt that "authorities as such haven't done so much" while local players had. Some felt they were working toward the same goal in terms of greater sustainability and felt understood and supported by governmental grants and initiatives, referring mostly to support received from their local authorities. By contrast, a few voiced concerns about local and national tourism authorities, stating that "they don't understand; they are not thinking about business" (*Tour operator II, Westfjords*) and that the tourism strategy has "kind of not been followed or not been done in a really good way" *(Tour operator I, Westfjords).*

When talking to the representatives of the tourism authorities about this lack of clear communication, they explained that any fuzziness around the goals of the tourism strategy is partly due to the ongoing reorganization process in the central administration in Iceland following the COVID-19 pandemic. They referred to the official tourism vision as a first rough guideline that indicates Iceland's goals in significantly fostering tourism sustainability.

At the time the interviews were conducted, the ministerial representatives stated that concrete implementation plans would be forthcoming and would follow similar lines to the Tourism Task Force in place from 2015 to 2020. Individuals, large companies, and authorities would be asked to contribute to and co-create a strategic plan. At the time of writing this article, these future development plans had become more concrete and explicit steering committees and rough time projections for tourism development had been outlined in the action plan (Stjórnarráð Íslands, 2023).

When asked about the main players in tourism in Iceland, the ministerial representatives mentioned harbors, airlines, Airbnb, hotel chains, tourism authorities, and social media influencers. Smaller tourism businesses and entrepreneurs were not directly considered to be major players but rather actors who would automatically contribute to the sustainable tourism development envisioned by doing business in the countryside and fostering living and working conditions there:

> If you are a small business somewhere in the countryside, I can imagine you don't really have time for those kinds of things. You have many hats. But in a way, of course, they are working—if we say informally—as a part of this sustainable tourism development. Just by working in the countryside with the locals [. . .]. So they are supporting the social dimension automatically.
> *Representative, tourism authorities*

Entrepreneurs' responsibility for community-well-being

The ministry representatives see small tourism entrepreneurs as actors who contribute informally to sustainable tourism development, but on their own initiative. In interviews, entrepreneurs confirmed this personal "inner" approach toward sustainable behavior, which showed when they were asked about their values, role, and position in their local communities. Many stressed how their lifestyle as a rural tourism entrepreneur enables them to be close to family and friends. The majority had family roots in the places they lived and operated in, often over several generations.

Furthermore, almost all of the entrepreneurs interviewed pointed to the local community, neighbors, and friends as an essential pillar in both their private and business life. They referred especially to the benefits of having a close and accessible local network when they need help or simply the company of friendly people. Local connections clearly play a key role for entrepreneurs, though few of them referred to this as "networking" or "collaboration."

When identifying what concrete value their businesses brought to the local community, there were two different types of answers. The first group see their contribution in terms of their services. For example, caterers referred to providing important social meeting places or venues for events, which they emphasized were rare in remote places with little service infrastructure. Some also mentioned their role as employers in scarcely populated areas. Apart from adding tangible value to the local community, some in the first group also mentioned value creation in terms of enhancing local identity. For example, two entrepreneurs in Vík í Mýrdal, a small village in South Iceland, emphasized that their businesses had contributed to the town's attractiveness as a tourist destination. During the tourism growth of the previous decade, Vík í Mýrdal had turned into a gas-station-stop kind of service center. The high volume of tourists had further negatively impacted locals' perceptions of the quality of life in their village. Apart from the value their businesses provide for visitors in terms of regaining the appeal of the town for both tourists and locals, the participants from Vík stressed their essential role in adding to the local identity and empowering the locals to be proud of what their small town has to offer tourists.

> Vík is a drive-through town for Icelanders. They don't see any reasons to stop here. And what we have done is make people pull over and say: "What is this town?"

Coffeehouse owner, South Iceland.

The second group see their value as extending beyond their actual business activity by explicitly trying to create value for their local communities, for example by hosting parties, providing infrastructure for leisure activities, or financially supporting individuals in need. Here, the emphasis is on local well-being. This dominant goal of fostering community well-being instead of a sole focus on increasing profit is a cornerstone of the degrowth paradigm. The following quotation from a restaurant owner demonstrates a high level of ethical behavior and responsibility toward the local community:

> A lot of things don't pay off that we do, but it is nice for the community. I throw a party because I know it will make the community happier. But I don't make money from this party. But we are responsible for the community; we are part of the community. This would not happen if it were not our hometown and if we were not a vital business for the town.
> *Restaurant owner, East Iceland*

In the following section, I examine the empirical data from Iceland through the lens of the degrowth paradigm. My aim is to identify the role of tourism lifestyle entrepreneurs in the process of rethinking tourism, dwelling in particular on the findings of the conceptual discussion and how they manifest in the case of Iceland. The goal is to gain an understanding of what kind of explicit actions can foster degrowth and why.

Discussion

This paper explores the viewpoints of tourism lifestyle entrepreneurs and their role in tourism development, particularly noting where policy and academic discussions on fostering tourism sustainability do not match with the ongoing growth agenda in the industry.

Figure 1 illustrates the debate on alternative forms of tourism development, as discussed above in the literature review and reflected in the Icelandic case study. The desire is for an alternative and rethought form of tourism that embraces degrowth and sustainability. These discussions are represented by a symbolic black box: concepts of degrowth and how to rethink tourism are clearly worded and discussed as potential solutions to counteract exploitation and over-tourism; the uncertain factor is the outcome or the implementation of this black box. Here lies the actual ambiguity. As Figure 1 shows, the outcome is twofold and can be divided into actions driven either by growth or by degrowth. The Icelandic case study reflects this ambiguity, with a growth agenda manifest in a policy-driven increase in tourism, in contrast with the actions of tourism lifestyle entrepreneurs, who follow the degrowth paradigm in their focus on community well-being.

Various researchers see the degrowth paradigm as presenting a solution to tourism development, suggesting a change of focus from a growth-based and hence visitor-centered perspective to one

| **Figure 1** | Mismatch of political and academic discussion and the happenings in the tourism industry |

Source(s): Figure by author
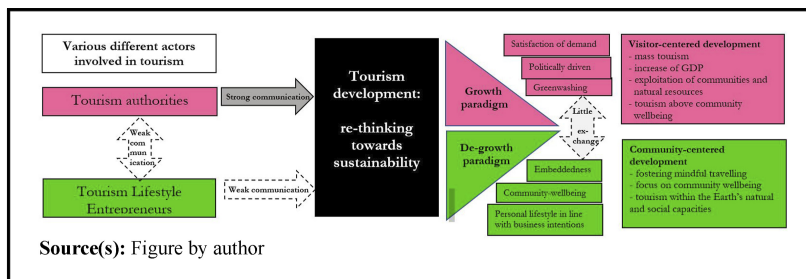
that focuses on the well-being of local communities (Latouche, 2007). The interviews with Icelandic tourism lifestyle entrepreneurs suggest that their worldview and values might contribute to finding the "right measure" of growth in this respect (Hall, 2009). In their responses, most of their growth intentions were locally scaled, which supports my earlier observations that tourism lifestyle entrepreneurs embrace growth only until they reach a certain level of security that ensures their desired lifestyle (Reijonen and Komppula, 2007; Schilar and Keskitalo, 2018; Komppula, 2013). Hence, growth plays a key role up to a certain point, after which there is room for ideological values. This finding is crucial with regard to tourism lifestyle entrepreneurs' views on current tourism development in Iceland. Many felt they had embraced growth until it exceeded a threshold and then mismatched with their ideological values, at which point they felt it had turned into over-tourism. In the case of the tourism provider from West Iceland, this perceived mass tourism resulted in them avoiding tourist attractions that had once been highlights of their tours, mainly due to the high number of visitors.

One of the entrepreneur's questions, "Why can't Iceland be sold out?" shows how "growth fetishism" (Higgins-Desbiolles et al., 2019; Viken, 2016) has played a major role in Icelandic tourism development. This is manifest in how the market reacts to and constantly attempts to satisfy touristic demand, such as with the construction of hotels in the capital area and the expansion of the Keflavík international airport, which has enabled a more-than 300% increase in international arrivals since 2011 (Ferðamálastofa, 2021). This focus on satisfying increasing demand, and hence economic growth, is illustrated through the pink boxes in Figure 1.

However, the goals stated in the official Icelandic vision statement for future tourism create the impression of a degrowth strategy. Goals such as "profitability above tourist numbers" (Ferðamálastofa, 2021, p. 4) or "balance [...] in infrastructure development" (p. 8) are ambiguous and do not match with actual developments in the Icelandic tourism industry, as also discussed by Sæþórsdóttir et al. (2020a, b) in terms of over-tourism. The interviews with both entrepreneurs and representatives of tourism authorities demonstrate how both stakeholder groups seem to strive for sustainable tourism development, yet the exact opposite seems to occur on the ground. This dichotomy is analogous to the process of greenwashing, where the communicated goals diverge from what happens in reality.

Throughout our discussions about tourism sustainability, the interviewees rarely used terms such as "sustainable" or "value creation." Instead of conceptual descriptions, they typically described the importance of their friends and families and practical actions, underscoring their support for their communities. I observed a special care for the surrounding nature and local people, which I illustrate in Figure 1 with the green boxes. This form of attachment (Wen et al., 2021) supports what Mathisen et al. (2022) refer to as "inner sustainability," which stems from personal caring for particular places and communities. Caring for nature and interacting with and including locals, as well as improving their standards of living, result in a successful authentic tourism business that benefits both locals and tourists benefit, embodying the core aspirations of degrowth (Fletcher et al., 2019; Lundmark et al., 2020).

Driven by an internal motivation to contribute to their communities, tourism lifestyle entrepreneurs desire to add value to the experiences of both locals and visitors. This desire is shown in various examples, such as the restaurant owner in a remote fishing village who hosted parties for the local community without directly benefiting from it financially, demonstrating an acknowledgment of social responsibility; or the entrepreneur in Vík í Mýrdal, who proudly pointed out the contribution of her coffee shop to the village's identity: economic growth was far less important to her than her business' contribution to upgrading the village's image from a mere service center to a place characterized by community spirit. Contributing to social well-being instead of solely enhancing economic growth could be interpreted as a practical manifestation of "right-sizing" as discussed by Hall (2009). This focus on contributing to community well-being plays a vital role in the ethical approach toward the degrowth paradigm.

Whether consciously or not, the majority of the tourism lifestyle entrepreneurs interviewed embrace and act according to the official vision statement. However, a few of them felt strongly about the lack of understanding and transparency from relevant authorities. The relationship between tourism lifestyle entrepreneurs and authorities appears passive, with both entities coexisting but having minimal interaction. Even though small businesses have been invited to contribute in the past (e.g. within the framework of the Tourism Task Force in 2015), the findings of this study raise questions about the role tourism authorities ascribe to lifestyle entrepreneurs in holistically rethinking Icelandic tourism. Believing that they would "contribute to sustainability anyways," as mentioned by one representative, implies that tourism authorities may not fully acknowledge the potential contribution of tourism lifestyle entrepreneurs to the sector.

Tourism is a multifaceted industry consisting of various actors. Conceptualizing tourism lifestyle entrepreneurs as mere small businesses with little turnover may result in authorities missing an opportunity to learn and benefit from these entrepreneurs' values and experiences as practical examples of applied tourism degrowth.

Conclusion

This paper tackles the ambiguity inherent in tourism development in Iceland, where the reality on the ground does not match the political agenda or discussions about how to make tourism more sustainable. By focusing on tourism lifestyle entrepreneurs, the dominant group of providers within the industry, this paper exposes how some of their actions seem to be in line with concepts of degrowth and community well-being as tools to positively change the tourism industry. This study showcases how these entrepreneurs act according to the degrowth paradigm and exhibit the kind of behavior that academics and policymakers are trying to foster. Instead of acting according to theoretical concepts and guidelines, however, this paper shows how the sample group's sole focus is on their practical actions and the thought of making a positive contribution to their local communities.

This form of contribution to community well-being, within the limitation of the own tourism business, could be seen as an example of what the "right size" (Hall, 2009) looks like in practice. The sample group of Icelandic tourism lifestyle entrepreneurs have applied forms of degrowth without being embedded in a larger degrowth strategy, their positive actions stemming from initiatives to contribute to local community well-being. Hence approaching tourism degrowth from an ethical point of view, actually instigates change in a very small scale.

This paper therefore makes several noteworthy contributions to the discussion about how values beyond growth foster tourism sustainability. Further research is needed to investigate how the value created by tourism lifestyle entrepreneurs can be scaled up and accessed by decision makers.

The findings in this study are subject to several limitations. The examples discussed in this paper are locally limited and cannot be generalized due to the small size of the interviewed sample group. The scalability of individual entrepreneurs' impact is limited due to their small size (Peters et al., 2009). Nevertheless, their actions implement positive change in their direct surrounding and create locally limited "bubbles" of sustainability within the particular local communities they are part of. In light of the large number of tourism lifestyle entrepreneurs in the industry, it would be valuable to further research how their business practices relate to tourism sustainability on a larger scale. Hence this paper is a call for action and recommends a tourism strategy that includes the "actors on the ground," the small businesses who actually shape the tourism landscape in Iceland.

The actions and values applied by these tourism lifestyle entrepreneurs demonstrate how degrowth can be manifest on a small scale: growth is only embraced up to a certain limit, so it does not exceed social and environmental capacities; from that point on, community well-being plays the key role. From a broader perspective and viewing the tourism industry as a whole, this study demonstrates the importance of shedding more light on ethical issues and values beyond growth

in both academic and political discussions. Addressing tourism lifestyle entrepreneurs as smaller-scale actors of tourism degrowth could be a meaningful starting point for holistically rethinking tourism. I suggest that the insights provided in this paper should be used to encourage tourism decision makers to collaborate with these lifestyle entrepreneurs to promote a degrowth agenda holistically.

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Publication 2: The Value of Digital Innovation for Tourism Lifestyle Entrepreneurs in Rural Iceland

The Value of Digital Innovation for Tourism Entrepreneurs in Rural Iceland

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The aim of this paper is to explore digital innovation and entrepreneurial dynamics in rural areas in Iceland. More specifically, the main objective is to describe the current significance digital innovation has for rural tourism entrepreneurs in Iceland. The goal of this study is hence to investigate if and how digital innovation becomes meaningful for rural tourism entrepreneurs in Iceland. Apart from answering the question of 'what is going on on the ground,' the aim is to describe the level of involvement of rural businesses and entrepreneurs in innovation, digital application and technology. Despite the global political discussion about smart tourism and the necessity of digital innovation in the tourism industry, the study revealed that innovation and digitalisation are not necessarily interrelated in the understanding of the rural Icelandic tourism entrepreneurs. The research is an exploratory study and is based on qualitative methodology. Information has been gathered through 34 semistructured interviews with tourism entrepreneurs and members of their support system in rural Iceland. The research provides knowledge about the status and the value of digital innovation for rural tourism entrepreneurs in Iceland. The study furthermore contributes to gaining understanding about the missing link between policy and practice and thus adds both practical and scientific value to the body of literature.

Keywords: lifestyle entrepreneurship, Iceland, smart tourism, digital innovation, rural entrepreneurship

Introduction

This article explores the dynamics of digital innovation among rural tourism entrepreneurs based on a case study in Iceland. We are particularly interested in how rural tourism entrepreneurs understand and work with digital innovation and perceive its value, and their experiences of support mechanisms intended to boost innovation. Applied digitalisation is currently a highly discussed topic in policy and business in Icelandic and international contexts (Hjalager, 2014; Stjórnarráð Íslands, 2018; Williams et al., 2020; Zavratnik et al., 2018; Falter et al., 2022). In the tourism industry, digitalisation typically manifests as 'smart tourism.' However, despite an open-mindedness towards digitalisation, tourism practitioners frequently remain sceptical about adopting smart approaches in practice (Liburd et al., 2017). Tourism's economic role has rapidly increased globally over the past cou-

ple of decades,[1] and innovation and entrepreneurship have received increased attention in tourism research. Moreover, the COVID-19 pandemic has highlighted the need for innovation in the tourism industry (Tiwari et al., 2021). In light of this, it is concerning that the literature on rural innovation reveals a gap between rural and urban areas concerning the application of (digital) innovation (Mayer et al., 2016). In Iceland, most tourism businesses are small or microsized (SMIES), many of which can be categorised as lifestyle businesses. Such businesses are not limited to rural areas, potentially affecting innovation in the sector. Lifestyle entrepreneurs have been criticised for showing restraint towards technological progress and a lack of interest in profit maximisation (Ioannides & Petersen 2003; Peters et al., 2009).

Our objective is to explore the value of digital innovation for rural tourism entrepreneurs in Iceland and identify how they understand and apply innovation in practice. We focus on the value of innovation from the perspectives of entrepreneurs with different operations and business goals and the challenges they face when engaging in innovation. This paper begins with a brief overview of innovation research in tourism and subsequently explores how tourism operators perceive digitalisation in the tourism industry. This study demonstrates that smart tourism's value differs significantly within the Icelandic tourism industry. The findings indicate black-and-white thinking regarding digital applications in tourism. Business-oriented entrepreneurs are likely to perceive digital applications as valuable, while those more aligned with their business' lifestyle values tend to reject them due to concerns about 'robotising' their interactions with tourists. This paper identifies a communication gap between support systems and the tourism industry, which hinders innovation in rural tourism. We conclude this paper by making recommendations for further research.

Literature Review

Innovation in the Context of Tourism

Although innovation is frequently discussed in current tourism entrepreneur literature (Hansen et al.,

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[1] https://www.unwto.org/why-tourism

2019; Jaafar et al., 2015; Romão, 2020; Sørensen & Hjalager, 2020; Tuomi et al., 2020; Williams et al., 2020; Zach et al., 2020), it is often considered 'too fuzzy a concept to be measured and accounted for' (OECD, 2018, p. 1). The classic Schumpeterian approach (Schumpeter, 1999) describes innovation, in the sense of idea and value creation, as the quintessence of entrepreneurial activity. Within this approach, technological change and productivity growth are closely connected (Ruttan, 1959). The OECD defines innovation as more than developing ideas and creating prototypes and inventions (OECD, 2018) and identifies implementation, knowledge, novelty, and value creation (p. 48) as four essential dimensions of innovation. As the OECD observes, global government initiatives have called for innovation to boost economies and strengthen communities. Due to tourism's continued growth and potential economic value, innovation in this sector has become the focus of public administrations globally (Hjalager et al., 2018; Rodriguez et al., 2014). Furthermore, in the case of Iceland, innovation is seen as an essential driver of regional development, not least in the context of tourism. Recent efforts by public authorities to establish support systems for innovative development in tourism have highlighted this political interest (Stjórnarráð Íslands, 2018).

Tourism is not an easily defined sector and is affected by sectors that are not linked to it at first appearance (Hjalager, 2015). For example, EU transnational corporations, such as infrastructure provision, and the principles of consumer protection, are also linked to tourism and shape the sector subliminally. Hence tourism innovation is often a combination or variation of existing innovative services rather than a 'breakthrough innovation' (Zach, 2016, p. 273). Innovation outside the tourism sector affects tourism, and, to some extent, tourism innovation is a response or consequence of external changes (Hjalager, 2015). As in other sectors, tourism innovation is considered essential for responding to fast-changing global competition (Sørensen & Hjalager, 2020). Businesses need strategies fostering innovative behaviour that eventually leads to business improvement to maintain a competitive advantage in the global tourism market

(Hansen et al., 2019; Ottenbacher, 2007). Perceived service innovation can positively impact customer experience (Teng & Chen, 2021). In this regard, Hjalager (2015) argues that the role of innovation is increasing in successfully operating tourism businesses.

This article focuses on digital innovation in the context of rural tourism entrepreneurship. The changing trend towards increased application of digitalisation in the service industry has started to affect and change dynamics in tourism and hospitality services (Tuomi et al., 2021). The goal is to support the business' efficiency by increasing customer service and cutting costs through automated processes. Examples include automated check-ins, room service and luggage storage or artificial intelligence-supported learning (Tuomi et al., 2020).

Although the COVID-19 pandemic has increased the attraction of the countryside (French, 2022), there are few examples addressing such digital pilot approaches in rural areas. Nevertheless, rural areas are confronted with the consequences of ongoing change and the transition towards a more technology-driven development. Innovation is imperative for rural areas' resilience and ability to adapt to change to counteract rural-urban migration and promote an attractive living and working environment (French, 2022). The successful implementation of rural innovation depends on the actors involved, a network that French (2022) refers to as an 'innovation ecosystem' (p. 4), and political support (Mann & Miller, 2022). According to Mann and Miller (2022), academia's overarching focus on urban innovation creates a false image of rural areas having little innovation potential. However, due to the lack of access to resources, infrastructure and networks compared to urban areas, rural innovation occurs on different levels and is rarely directly comparable to urban innovation (Mann & Miller, 2022).

Hjalager et al. (2018) relate the discussion of rural innovation to tourism, pointing out that it has a certain ambiguity. The typical rural tourist seeks authentic and back-to-basics experiences (Hjalager et al., 2018). However, rural tourism must simultaneously meet global tourism expectations and provide a certain standard of comfort and modernisation to remain attractive to future customers. Such expectations can

place rural tourist entrepreneurs in a paradoxical position when deciding whether to become innovatively active.

Innovation Obstacles and Lifestyle Entrepreneurship

Rosalina et al. (2021) differentiate between internal and external challenges to entrepreneurial innovation. Political issues and dependence on government support are examples of external innovation hindrances (Rosalina et al. 2021). Cooperation between the state and private businesses is frequently regarded as fundamental for effective response to competition in the fastgrowing tourism sector (Rodríguez et al., 2014). Innovation policies and support systems aim to reduce entry barriers and effectively implement tourism innovation. However, Rodríguez et al. (2014) criticise public institutions' tendency to implement innovation strategies *for* actors in the tourism industry instead of collaborating *with* them. Top-down approaches without incorporating the private sector have failed to fulfil companies' needs when implementing innovation.

Rural tourism entrepreneurs also face internal challenges that can negatively influence innovation, such as their tendency to be 'late bloomers' when adopting and implementing innovation (Rodríguez et al., 2014). In light of digital innovation's increasing role in tourism (Işık et al., 2019; Hjalager, 2015), this restraint can affect their level of business improvement and market advantage. The COVID-19 pandemic provided an opportunity to respond to the global trend of increasing digitalisation (Sigala, 2021). The hesitant and late adoption of digital innovation in the tourism sector is rooted in further internal innovation hindrances. Possible reasons include lack of time and financing, insufficient knowledge and a fear of risk and change (Rodríguez et al., 2014; Rosalina et al., 2021).

Another common feature of the tourism industry is hesitation to collaborate with other tourism firms due to rivalry and fear of competition (Rodríguez et al., 2014). Tourism companies' reluctance to collaborate and share knowledge at the government and private sector levels impedes innovative development internally and externally (Işık et al., 2019). Zach (2016) emphasises the benefits of collaboration, especially for SMIES. Compared to larger tourism companies, these

businesses have limited innovation possibilities due to their small size, financial framework and workforce (Zach, 2016). An understanding of innovation is essential for its implementation and enhancing business performance (Martínez-Román et al., 2015).

However, limited knowledge, lack of collaboration and failure to adopt new technologies are said to be typical characteristics of lifestyle entrepreneurship. Entrepreneurship is commonly defined as 'the pursuit of opportunity beyond resources controlled' (Eisenmann, 2013), often concerning the willingness to take risks (Gunnarsdóttir & Jóhannesson, 2016) and the underlying rationale of economic gain and business growth (Peters et al., 2009). Entrepreneurs are considered to have a key role in innovation and the development of technology and smart processes (Williams et al., 2020).

Unlike conventional entrepreneurs, lifestyle entrepreneurs' business goals are not necessarily growth-oriented and are often driven by various motivations (Peters et al., 2009; Jóhannesson, 2012; Ateljevic & Doorne, 2000). According to Hjalager et al. (2018), the rural tourism industry attracts lifestyle entrepreneurs who pursue the idea of turning a hobby into a career instead of profit maximisation (Hjalager et al., 2018; Peters et al., 2009). They have been criticised for 'primarily following a dream, often with no experience, training or expertise in these areas' (Peters et al., 2009, p. 6). Further criticism has been voiced regarding lifestyle entrepreneurs' aversion to applying new technologies and their lack of management skills and interest in collaborating and networking (Peters et al., 2009; Gunnarsdóttir & Jóhannesson, 2016). Conversely, lifestyle entrepreneurs are said to foster the development of innovative (niche) products and their distribution in the wider industry (Ateljevic & Doorne, 2000).

Dias et al. (2022) argue that lifestyle entrepreneurship in the rural context is an essential driver of innovation. They maintain that lifestyle entrepreneurs' embeddedness in communities increases knowledge and network formation on a local scale. The authors also observe that entrepreneurs' attachment to surrounding nature positively affects innovative value creation (Dias et al., 2022).

Digitalisation and Smart Tourism in Rural Areas

The discussion concerning digital innovation and tourism frequently manifests as smart tourism in the current body of tourism innovation literature and is increasingly gaining global government attention (Hjalager et al., 2018; Rodríguez et al., 2014; Zavratnik et al., 2018). The level of digitalisation in the tourism industry has increased due to extensive technological development (Tuomi et al., 2020). In digital innovation, a distinction is frequently made between smart tourism and e-tourism (Kazandzhieva & Santana, 2019). E-tourism focuses on providing digital connections and is typically used in e-marketing and online booking systems. It is the foundation of smart tourism (Gretzel, Sigala et al., 2015). In contrast, smart tourism has a broad scope of involved technologies, is based on ICTS (Jovicic, 2019; Roopchund, 2020) and is described as 'technical, data-driven, system-oriented and service-dominant' (Liburd et al., 2017, p. 4). It is a meaning-enriched and context-driven application of technology (Gretzel, Reino et al., 2015). The link to virtual reality, artificial intelligence (AI) (Del Chiappa & Baggio, 2015) and social media indicates that tourism innovation is user-driven and responds to the needs of 'smart tourists.' These 'travellers 2.0' (Magasic & Gretzel, 2020, p. 5) demonstrate changed tourism behaviour following digitalisation. This new form of traveller is also referred to as a 'digital native,' emphasising the omnipresence of emerging technologies in daily applications (Skaletsky et al., 2017). Practical examples include the application of AI, online streaming, the use of apps and mobile marketing, for example, cloud-based training programmes for the hospitality sector (Roopchund, 2020). Specifically, smart tourism replaces conventional information channels, such as tourist guidebooks, with smartphones and other digital devices (Mieli & Zillinger, 2020).

However, Ren et al. (2018) argue that smart tourism remains an indistinct and weakly defined concept from the perspective of tourism actors (Gretzel, Sigala et al., 2015). Therefore, despite an open-mindedness towards digitalisation, tourism practitioners often remain sceptical about how to adopt smart approaches in practice (Liburd et al., 2017). Ren et al. (2018) stress

that it is important to 'not see smart tourism as driven exclusively by technological developments and data' (p. 135) but as an amalgamation of digital and social attributes. They see smart tourism as a combination of skills and resources that neither focuses solely on technology and big data nor exclusively on social approaches. Zach et al. (2020) point out that the decision to adopt a new strategy, such as smart tourism, 'happens between becoming aware and forming an understanding of the innovation' (p. 3). Hence, the ability to see value in smart tourism requires a basic understanding of what it implies. The lack of concrete ideas about how to apply smart tourism in practice could lead to the digital exclusion of those unwilling or incapable of making use of technological changes underpinning smart tourism. In the near future, tourism companies will likely require more IT and digital application knowledge (OECD, 2022).

Smart development is more challenging in rural than urban areas (Zach et al., 2020). One reason is that rural areas often lag behind regarding the infrastructure necessary to use or develop digital solutions (Mayer et al., 2016). Moreover, rural areas are associated with high transportation costs, low levels of innovation and fewer creative minds (Gibson, 2010). Another reason is the differences in access to digital applications among individuals. Varying levels of digital involvement produce social division, intensifying the so-called digital divide (Gunkel, 2003). The less peoples' knowledge and involvement in technological development, the less attracted they are to the idea of applying digitalisation. Hence, rural areas often face a downward spiral since information is increasingly provided through digital channels. Those who lack access to technology become even more disadvantaged (Rooksby et al., 2002) and wary of technology, as manifested in technophobia, a feeling of anxiety towards digitalisation and technology (Tussyadiah et al., 2020).

Case Study: Digital Innovation In The Icelandic Tourism Industry
Tourism in Iceland, Organisational Structure and Support for Innovation
In past decades, Iceland has become a popular tourist destination. Tourism has become one of Iceland's most

significant economic pillars, with 2,013,190 arrivals at the international airport in Keflavík in 2019 (Ferðamálastofa, 2020b). Before the COVID-19 pandemic, tourism's share of foreign exchange earnings was 42% (Ferðamálastofa, 2018) among the highest in OECD countries.[2] The country's landscape and natural attractions are the main incentives for travelling to Iceland. The Ministry of Culture and Business Affairs (Department of Tourism) is in charge of the development and execution of Icelandic tourism policy and of coordinating various tourism collaboration partners, including the Icelandic Tourist Board. Iceland is divided into seven regions, each with its own DMO supported by public authorities.[3] The DMOS are in charge of marketing their regions as tourism destinations, and they collaborate with municipalities and member companies in tourism development. The Tourism Strategy 2021–2030 (Ferðamálastofa, 2021) was developed under the auspices of the Ministry. It demonstrates an ongoing emphasis on tourism as a tool for developing rural areas. In summary, the tourism strategy aims to achieve a 'profitable and competitive tourism industry in harmony with the country and its people' (p. 3). Its focus is on enhancing the visitor experience and the quality of life for locals. Its purpose is to increase sustainability and effectiveness regarding the 'community,' 'economy' and 'environment.' The strategy emphasises responsible tourism by applying technological and innovative approaches (p. 5). Tourism also features in the Icelandic Strategic Regional Development (Stjórnarráð Íslands, 2018, p. 16) plan, which aims to 'boost tourism services in rural areas.' Regarding implementing the measures described in the plan, public authorities in Iceland collaborate with various private initiatives that carry out training programmes for tourism businesses to increase access to innovation and digital development. The tourism sector's organisational structure largely consists of SMIES, often characterised by lifestyle entrepreneurs, with a few large companies. Despite increased digital activity in the Icelandic tourism industry, the level of digital applications is relatively low. Many SMIES lack a con-

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[2] https://data.oecd.org/industry/tourism-gdp.htm
[3] https://www.visiticeland.com/the-regions/

crete social media strategy and the motivation to undertake further education in digital marketing (Ferðamálastofa, 2020a).

Methodology

This study is based on qualitative fieldwork undertaken by the first author. In total, 34 tourism entrepreneurs were interviewed, of which 17 were tour or activity operators, nine were accommodation establishment operators, and eight were catering business operators. The interviewees' ages ranged from 30 to 70 years. Most of the businesses were SMIES and family-run. Although most of them were open all year round, their peak operation period was the summer. The number of employees varied between seasons, from no additional employees in winter months to 40 employees in the high season.

A snowball technique was used to select interviewees throughout Iceland from July 2020 until March 2021. Snowball sampling, also called network chain referral (Lawrence Neuman, 2014), refers to the metaphor of a snowball that gains volume when rolled in the snow. The snowball sampling technique begins by approaching one or a few people and increases the number of contacts based on these initial interactions (Lawrence Neuman, 2014). Since Iceland does not have a formal list of rural tourism innovation network members, snowball sampling allowed us to gradually widen our network and approach actors in this informal network. Most of the interviews were conducted along the South Coast (12), followed by East Iceland (7), North Iceland (6), West Iceland (5), the Westfjords (3) and Reykjanes (1). The interviews were recorded, transcribed and analysed using grounded theory (Strauss & Corbin, 1994), and themes were identified through open and axial coding rounds.

Although the entrepreneurs interviewed in this study were all SMIES, their business aims varied significantly. The vast majority were classified as lifestyle entrepreneurs. The rest had more economic and global perspectives on the tourism sector; hence, they could be classified as growth and business-oriented entrepreneurs, whose business goal is economic growth and scalability. The identified key themes were, firstly, how the interviewees understand and apply innovation in their businesses, focusing on innovation during the COVID-19 pandemic, including perceived innovation hindrances. Secondly, the analysis focused on digital innovation, how the interviewees apply it and, notably, how they perceive smart tourism.

Analysis

Definition of Innovation

In tourism, the innovation process is described as complex, resulting in additional difficulties for SMIES (Dias et al., 2022; Zach, 2016). As previously discussed, innovation has become a buzzword in the global tourism sector (Hjalager, 2010). To gain understanding, it is essential to obtain insights into how innovation manifests in practice. We attempted to elicit interviewees' understanding of how they apply innovation by asking them to illustrate or describe innovation. We observed that although many of the entrepreneurs initially associated innovation with 'something new' or 'unique,' most of them perceived it as 'doing existing things in a new way.' Hence, most of the interviewees saw innovation as an improvement or 'twist' on existing products or processes instead of initiating something 'ground-breaking.'

For many of the interviewees, innovation means to actually *do* something and bring the idea-finding process further towards implementation. Identifying oneself with the implemented innovation ('with heart and soul') was a frequently mentioned aspect. Two entrepreneurs argued that innovation occurs 'out of need;' great ideas are more likely to happen under pressure. In six of the cases, the term 'innovation' was unclear and required further explanation or translation into Icelandic.

Innovation in Practice

Despite the interviewees' overall agreement in defining innovation, the above definitions remain theoretical. Contrary to the literature's emphasis on the key role of technology in innovation processes, only three entrepreneurs associated innovation with something digital. When asked what innovation means in practice and how it manifests for them, most of the entrepreneurs referred to their business as a whole rather than identifying specific examples. They often

saw their innovation manifesting as a business idea that was new to the area or executed in a way that had never been tried before. Gastronomy entrepreneurs, in particular, defined their innovation as using natural materials and converting them into products that do not yet exist in that form. Another connection to innovation was made through education, notably 'raising awareness for sustainability in local food' and Icelandic history:

> Cause [sic] we are doing something new on a very old foundation. So we are taking something that wasn't really known. Because the Icelanders that come to us, they are always like, 'Oh, I didn't know you had caves here.' [Tourism Entrepreneur, South Iceland]

Only a few entrepreneurs gave examples of their innovation in practice that matched their previous description of innovation. A restaurant owner in North Iceland described innovation as something 'which was maybe behind, and you take it and put it in a new dress.' In practice, she 'dressed up' traditional rural Icelandic food and served it as original meals in her restaurant. She aimed to reveal old Icelandic traditions and combine them with contemporary tourism requirements.

Innovation During the COVID-19 Pandemic

The field study was conducted from the summer of 2020 until the spring of 2022, when the tourism industry was significantly impacted by the COVID-19 pandemic. In Iceland, tourism decreased by 75.8% compared to the previous year (Ferðamálastofa, 2021). Many tourism companies suffered financial losses despite government support.[4] The most frequent business response was to reduce services to a minimum. All operational businesses shifted their focus to the Icelandic market due to global travel restrictions, implying a redefining of their marketing strategies. Several interviewees stated that although they did not take specific action to cope with the sudden effects of the pandemic, they used the time to rethink their business

philosophy. They explained that due to their small business size, the daily workload required all their time, resources and workforce during COVID-free years. Hence, restructuring the business had largely been placed on hold:

> And we started to realise how nice it is to not constantly be stressed. That was a very important experience for us, which eventually led us to starting [sic] to restructure our business model. [Lifestyle entrepreneur; tour operator, North Iceland]

Several of the interviewed tourism entrepreneurs adapted their services so that they could continue to operate their businesses despite social gathering restrictions and reduced numbers of tourists. They reused their business resources in a different context. For example, a tour operator in South Iceland temporarily offered car cleaning services using the equipment they used to clean their tourist trucks:

> It was a brilliant idea because what could we do? I mean, we did not have any travellers. Because we had everything there. The best products and equipment and all of the machines. [Tour operator, South Iceland]

Using existing resources was also a crucial coping strategy adopted by restaurant owners who supplied packed raw materials typically used in their business. Apart from the abovementioned restructuring of (online) marketing strategies, only one entrepreneur mentioned a digital coping strategy. He restructured his restaurant and offered an online takeaway service.

Innovation Obstacles: The Gap Between Policy and Practice

Most of the interviewees stated that they would like to increase their innovation level within their business. Lack of time and financial resources were the most frequently named hindrances, as highlighted in the following quote:

> Maybe when you are in a rural setting, you are fighting a much harder life within your com-

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[4] https://www.government.is/government/covid-19

pany. You are the manager, the marketing manager, the sales manager; you are the chef, you probably have 100 jobs, so this [increasing innovation] is something you always leave for later. [Hotel owner, East Iceland]

This statement reveals that apart from the time aspect, the rural setting further complicates innovation development. In rural areas, tourism is more seasonal, which is a challenge when hiring staff. Seasonal staff turnover forces businesses to allocate resources to teaching and training employees instead of focusing on expansion. Hence, developing innovative ideas is placed on hold to ensure day-to-day business operations. Furthermore, the 'countryside mindset' was a frequently named innovation hindrance. The entrepreneurs differentiated between individuals and local governments hampering innovative actions. Regarding individual actions, one entrepreneur pointed out a particular area's unused tourism potential and criticised the lack of private initiatives for developing it:

> It is so funny because there are a lot of people here that are talking about this kind of stuff: 'Yeah, we need to find something to do and do something.' But nobody is doing that. Maybe it is because everybody thinks people should do it for them [laughs] and not themselves. [Tourism entrepreneur, West Iceland]

Several entrepreneurs highlighted the difficulties rural companies encounter when accessing venture capital. They argued that in remote areas, banks demand a long-term business plan and securities to ensure repayments. Due to the short tourism season, many applicants cannot provide this; thus, they are not granted a loan. However, the current Icelandic Regional Development Plan refers to rural equalisation regarding several measurements (Stjórnarráð Íslands, 2018). According to one interviewee, this development is either too slow or non-existent:

> Rural areas. They are not really on their focus plan. It's very fancy to say, 'we want to strengthen the rural areas.' You get a lot of votes,

and people are very positive and blah, blah, blah, but they are not showing it by doing anything. [Lifestyle tourism entrepreneur, East Iceland]

The local grant system was also criticised. According to one interviewee classed as a growth-oriented entrepreneur, non-scalable and non-innovative projects with a low impact on the region's economic development predominantly receive local government support. The following quote emphasises criticism of this lack of understanding of innovation on the part of authorities:

> I think with the governmental programmes, when they are talking about innovation, they are thinking about creating jobs for one. But real innovation is when you have something that really scales. [Growth-oriented tourism entrepreneur, South Iceland]

Further criticism towards the (local) government was voiced, especially by entrepreneurs in the most remote areas, the Westfjords and East Iceland, because they do not feel seen and supported by local and national governments. Two business operators from West Iceland criticised the lack of practical relevance in government educational programmes and funding for SMIES. They considered government support to be too little and irrelevant. They also argued that mentors and lecturers lack the practical experience and insights into the reality of the tourism industry required to teach educational programmes. These entrepreneurs criticised the missing link between policy and practice that hampers successful collaboration benefitting both sides. They argued that tourism businesses and the government work separately with little exchange:

> The system is so broken. The companies and the system, they are not talking together. This is just like there is not an understanding between these two groups, [of] what we are doing. [Tourism Entrepreneur, West Fjords]

Entrepreneurs in the west and east of Iceland predominantly highlighted this perceived disconnection

from policy. However, several other entrepreneurs from these regions had a very positive attitude towards the government, as did entrepreneurs in the north and south. According to one entrepreneur, government support follows the 'principle of demand and supply.' Due to the lower entrepreneurial activity in rural areas compared to the 'innovation centre Reykjavík,' fewer requests are submitted to local governments. Hence the likelihood of obtaining support increases. The fact that companies and individuals are 'more unique and better known' (Entrepreneur, West Iceland) in smaller local communities improves this likelihood.

The Digital and Tourism: Smart Tourism

As demonstrated above, the current body of digital tourism literature and tourism development leans towards fostering digital innovation and smart tourism strategies. In this case study, we observed that the interviewed entrepreneurs held different opinions regarding the value of digitising and automating processes in the tourism sector. Several entrepreneurs associated smart tourism with digital marketing and online booking, an area in which all the interviewees demonstrated high levels of expertise. In contrast, some interviewees did not perceive any usefulness in smart tourism in the sense of automated processes onsite and pointed out that they could not imagine applying it in their own businesses. They associated smart tourism features with urban areas, where travelling is faster and more anonymous. They argued that automated processes such as self-check-ins fit 'the younger generation' and considered themselves digitally 'old-fashioned.' These entrepreneurs feel that personal communication with guests is an essential requirement of Icelandic tourism. Hence, they related automation processes with a loss in personal services and, thus, a decline in the offered experience:

> But I find it quite sad; humans are lacking so much interaction because of technical advances. Covid has also highlighted the loneliness of being in a virtual world. [Lifestyle gastronomy entrepreneur, South Iceland]

These entrepreneurs also fear 'missing touch with the real world.' Two entrepreneurs voiced concerns that smart applications could attract mass tourism and careless travellers. An entrepreneur from South Iceland argued that her sole-trader business does not fulfil the requirements for digital applications, and extra demand through online systems would exceed her capacities.

In contrast, the entrepreneurs classed as growth-oriented saw great value in smart tourism and argued that digital features improve service and *save* capacities. This group is divided into those who find smart tourism development meaningful in *general* and those who find it relevant only in *specific* application areas. Instead of fearing a loss of personal service through digital applications, several entrepreneurs see an opportunity to use smart tourism to improve it. They anticipate that outsourcing time-consuming processes will allow them to focus on communicating with tourists, which positively contributes to improving their service and, hence, their product:

> I don't want you to stand behind the desk and sell tickets; I want you to go on the outside. I want you to greet the [guests]. And then I want you to lead them to the ticket machine. Eventually, we will only have automatic ticket machines and will only have greeters. [Growth-oriented entrepreneur, South Iceland]

These entrepreneurs see smart tourism as 'the future' of Icelandic and global tourism and expect 'easier business.' Several of them criticised the slow digital development in the Icelandic tourism sector and anxiously referred to the lack of digital awareness among their colleagues. They criticised the 'dinosaur' mindset of those unwilling to apply digital innovation and pointed out the lack of openness towards new trends in Icelandic tourism, such as innovative paying systems. According to one growth-oriented interviewee, tourism innovation in Iceland is predominantly driven by large companies due to a lack of understanding in the smies community:

> They don't understand the reason, and if I want to help them to do digital innovation, they want

me to do Facebook ads. That's their innovation. [Growth-oriented entrepreneur, South Iceland]

Despite an expressed openness towards smart tourism, most of the entrepreneurs do not consider smart tourism features a fit for their business. A hotel owner in East Iceland, who is very open towards digitalisation per se, observed that guests visiting remote rural Iceland are looking for personal contact:

> I like that for natural landmarks, it is good to have these gates where you can just pay and come in. Or for the toilets and stuff like that. But my feeling is you are not coming to the end of the world where we live, like people who live in cities. This is surreal, that peaceful town. I think that would be strange. [East Iceland]

Most of those entrepreneurs who do not consider digital innovation a fit for their businesses see the future in a combination of traditional and digital measures. Whether they find digitalisation useful, all the interviewees share the common goal of increasing personal service and experience. Thus they see aspects of smart tourism as a method of simplifying processes, saving staff or providing touchless payment systems through technological support without 'robotising' their business. For example, one hotel owner in East Iceland supplies her rooms with iPads providing an integrated booking system for the hotel's and region's services. At the same time, she employs additional staff at the service desk exclusively for personal customer contact:

> Of course, it costs something, but I really think it is worth it because this is one way of doing things more simple [sic] for my staff and also doing something good for the environment. But we have to be careful because I don't want to have a place where I don't see the people. The technology, it's both positive and negative. [Hotel owner, East Iceland]

Discussion and Conclusion

Lack of time and financial resources are the main obstacles hindering small Icelandic tourism entrepreneurs from educating themselves about digital marketing strategies (Ferðamálastofa, 2020a). Our above observations support this finding: smies are too occupied with their daily work to study digital applications and decipher innovative projects. The enforced break during the covid-19 pandemic gave them room to rethink their strategies and business models and develop new approaches. This lack of time raises the question of whether lifestyle entrepreneurs can increase their level of innovation on a larger scale. The interviewees also observed that financial restrictions indicate a gap between tourism reality and policy. Large funding applications require significant time and labour commitments. It is evident that the interviewees, who are already running businesses, cannot meet grant requirements requiring the time-consuming instigation of ground-breaking projects.

For the interviewees, applied innovation manifests in various novelties or variations in their businesses. However, these innovations tend to serve their specific business and demonstrate little capacity for growth. Due to increased competition in the Icelandic tourism industry in previous years, innovation has become imperative for survival in the market, raising the question of how tourism companies will cope in the future. If they strive for non-scalable, local innovation while global development aims for high-scalable, international innovation, further research is needed to investigate what this implies in practice. If lifestyle entrepreneurship reaches its limits in a future dominated by digitalisation and automation, creative destruction could result as entrepreneurs who do not jump on the bandwagon disappear from the market.

The financial aspect of the innovation dynamic seems to reproduce the rural divide. Entrepreneurs in areas with short seasons and a modest flow of tourists highlighted the difficult conditions for obtaining loans. Banks are more likely to support tourism projects close to the capital area because the steady flow of tourists guarantees the ability to make repayments. The lack of support in rural areas also hinders tourism innovation. Again, tourism entrepreneurs face a vicious circle, and the dynamics of innovation come to a halt: the lack of financial resources supporting tourism innovation leads to a lack of innovative

projects. Hence a lack of investment results in a lack of innovation.

At this point, rural innovation is facing a double-edged sword. On the one hand, policy aims to foster rural tourism by boosting innovation (Stjórnar-ráð Íslands, 2018). The considerable political interest in tourism is largely due to its contribution to the GDP. On the other hand, several entrepreneurs state that the grants are difficult to obtain and too small to implement innovative and creative change. Further criticism of the mismatch between education provision and tourism business needs indicates another gap in demand and supply between tourism entrepreneurs and the support system. As previously discussed (Rodríguez et al., 2014), including tourism actors in policy formulation and implementation is essential for achieving desirable outcomes. The interviewed SMIEs perceived a lack of broad involvement in the tourism policy framework. Tourism plans, strategies and education appear to be developed *for* tourism entrepreneurs rather than *with* them using a top-down approach in collaboration with a few strong, large companies.

Furthermore, this study demonstrates that the rural tourism sector does not consist of a uniform group but various businesses with different goals. We see the need for more straight-forward and open conversation between tourism businesses and policymakers to overcome this mismatch and establish more customised bottom-up approaches. Therefore, acknowledgement from the tourism support system that the Icelandic tourism sector is not uniform is an essential precondition. The sector consists of various forms of entrepreneurs with different business goals, ranging from growth-oriented to lifestyle entrepreneurship, and while most appear to be interested in innovation, its meaning and value for their businesses differ. Hence, a vibrant innovation ecosystem in rural Iceland requires a support system that considers these companies' individual characteristics, strengths and weaknesses.

Uncertainty regarding the implications of smart tourism was a recurring theme throughout the research, influencing its perceived value for the interviewees. Since most of them were tour operators, caterers or accommodation owners, they could not completely digitise their core services. We often received the impression that smart tourism and automation were directly associated with the image of heavy industry. Most of the interviewees appeared to think in black-and-white terms, either for or against smart tourism. Since smart tourism seemed to symbolise industrialised robotic technology, some automatically associated it with decreased personal communication with customers. Only a minority, predominantly growth-oriented entrepreneurs, saw smart tourism features as an opportunity to minimise necessary daily tasks and focus on personal interactions with tourists. They largely referred to smart tourism features as staff- and time-saving tasks such as automated ticket sales or audio guides. Despite scepticism and restraint towards automated processes, digital marketing tools are crucial for most of the interviewees. Since tourism operators are highly proficient in digital marketing, although most are somewhat reserved concerning smart tourism strategies, we would categorise the scale of digital applications in Icelandic tourism as e-tourism (Kazandzhieva & Santana, 2019). While e-tourism uses digital channels to provide information, smart tourism implies experiencing co-creation through technology. Only two of the interviewees, whose businesses are based on co-creation and digital interaction with tourists, matched the classification of smart tourism providers. For the rest, the value of digital innovation lies more in advertising and information provision. As soon as the guests arrive, they focus on personal interactions.

Regardless of the interviewees' business intentions, they all pursued the common goal of increasing personal customer service and positive experiences for tourists. As discussed in the literature review, the global digitalisation trend will lead to a changed and more digitised tourism demand in the near future. As smart applications gradually replace tourism leaflets, the future of tourism will require a higher level of automation and digital possibilities. Since many of the interviewees do not see a match between digitalisation and remote Icelandic nature, we wonder how Icelandic tourism businesses will react when tourists' expectations change in the near future. Global tourism devel-

opment is bipolar, with an enhanced requirement for convenient travel and a high level of new technologies, on the one hand, and a growing demand for authentic rural and back-to-basics experiences, on the other. Further research is needed to investigate the extent of these future changes and their potential impact on the rural tourism industry in Iceland and elsewhere.

As previously stated, tourism entrepreneurs who strongly favoured smart tourism development voiced heavy criticism, and in some cases even annoyance, because they perceived digital development in the Icelandic tourism industry as too slow. They especially criticised their industry peers' indignation at increasing their digital applications. Like Rooksby et al. (2002), they observed a link between low levels of digital competence and understanding and the decreasing likelihood of becoming digitally active and blamed individuals' 'fear of the unknown.' We found these arguments very similar to the common criticism of lifestyle entrepreneurship: hindering economic growth.

Nevertheless, lifestyle entrepreneurs can also significantly impact rural innovation development. Notwithstanding the wariness towards digital applications in their businesses, we did not receive the impression that the interviewees were against applying digital features. Several entrepreneurs who felt less technology-aware often outsourced digital marketing, leaving analytical work to experts. We identified significant conformity between their operational management, location and guests' (largely nature lovers seeking outdoor activities and peace) requirements. The main concern of tourism operators who did not see digital applications as meaningful was their fear of losing what they described as the authentic tourist experience. Concerns that smart tourists could miss being fully present in the moment have also been addressed in academia in the context of smart tourism development (Gretzel, Reino et al., 2015).

Listening and responding to customer feedback can provide a successful resource for increasing business success (Hjalager, 2014). The importance of understanding customers became evident when exploring the first research question about how innovation is understood and applied. In contrast to the above-stated emphasis on digital innovation in policy docu-

ments and literature, technology did not have a significant bearing on the meaning of 'being innovative' for the interviewees. For lifestyle entrepreneurs, in particular, innovation meant adding new value in terms of new for the area, the situation or the people involved. Hence, despite remaining restrained about applying digital innovation in their businesses, the interviewed lifestyle entrepreneurs indicated significant interest in and awareness of tourism innovation.

The aim of this paper was to explore the value of digital innovation for rural tourism entrepreneurs in Iceland and identify how they understand and apply innovation in practice. The study offers some important insights into the role of digital innovation in rural tourism. It demonstrates how a lack of clear communication between tourism actors and authorities can hinder innovative development of the industry. A limitation of this study is that the sample group is relatively small. To investigate the dynamics of digital innovation in Icelandic tourism on a bigger scale, further research is needed. As previously mentioned, the tourism industry in Iceland is not uniform and consists of a variety of different actors. It would be interesting to gather a bigger sample group of each type and hence get deeper insights into the dynamics of each type.

Acknowledgments

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Publication 3: Hacking Hekla: Exploring the Dynamics of Digital Innovation in Rural Areas

ORIGINAL ARTICLE

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Hacking Hekla: Exploring the dynamics of digital innovation in rural areas

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Abstract

This article explores innovation initiatives in rural communities in Iceland conveyed through the implementation and perceived outcomes of the hackathon Hacking Hekla. Digitalisation is often proposed as a new, all-purpose tool for regional development that responds to rural challenges innovatively. However, the digital role is often less clear when examining finer development practices. Hackathons are frequently applied to achieve instant economic and societal change. Through the example of Hacking Hekla, we research the challenges and outcomes of creative interventions and critically explore the value of innovation and digitalisation in the context of rural development in Iceland. Based on action research, we use the hackathon as a tool for knowledge generation and intervention in regional policy discourse with the intention to foster applied digital innovation. Data were collected using qualitative semi-structured interviews. The study demonstrates a gap between regional policies emphasising digital innovation and innovation practices on the ground and argues that fostering digital innovation in rural communities is a complex process that could demonstrate effects only in the long term.

INTRODUCTION

This article explores entrepreneurship and innovation processes in rural communities in Iceland based on a case study of a rural hackathon, Hacking Hekla, intended to encourage digital innovation in rural Iceland and conceived by the lead author in 2020. The main objective of this article is to critically explore the meaning and value of innovation, digitalisation and entrepreneurship as they unfold in the context of rural development in Iceland. We describe the planning, execution and outcomes of the Hacking Hekla hackathon from the perspective of its supporters and organisers with an emphasis on how digitalisation and innovation become meaningful and valuable for entrepreneurs. Using action research as a methodology, the hackathon thereby functions as an intervention that enables us to explore the dynamics and networks of digital innovation and regional development.

Digitalisation is often proposed as a tool that responds to the challenges of rurality in an innovative way and has become a buzzword in academia and policy-making (Sept, 2020; Wolf & Strohschen, 2018). However, several researchers argue that the concept of digitalisation is abstract, mutable and vague (Bloomberg, 2018; Schumacher et al., 2016; Wolf & Strohschen, 2018). Moreover, when addressing digital development and innovation practices, the role and interplay of the digital with innovation and entrepreneurship often become less clear (Ren & Jóhannesson et al., 2017). The article aims to improve understanding of the challenges and opportunities for digital innovation in enhancing rural development.

First, we provide an overview of the current discussion on innovation and digitalisation regarding regional development. We follow this synopsis with a brief review of the relevant literature, highlighting ongoing debates on the requirements for innovative tools in regional development. Next, we present key sustainable rural tourism development and digital innovation topics recently emphasised in Icelandic regional policy. The methodology section introduces the rural hackathon case study and describes the action research approach employed in the study. In the subsequent analysis of Hacking Hekla, we address the meaning and values attached to the participation in the hackathon by exploring the motivations of involved actors and demonstrate a gap in digital innovation and regional development. Literature on regional development and innovation describes digital innovation such as hackathons as tools that instigate ground-breaking change. The intervention of Hacking Hekla, however, reveals that implementing a rural hackathon does not lead to a burst of innovation but rather subtle repercussions and humble outcomes. This gap further manifests in a missing link between the policy discourse and innovation practices. We conclude by considering how such modest outcomes underscore the slow, ongoing and improvised process of valuable innovation and its implication for regional policy.

Exploring the Dynamics of Digital Innovation in Rural Areas

Regional development: Towards creativity

Rural areas often lag behind when it comes to the infrastructure required for digital solutions. Current research on rural digital innovation tend to focus on the 'fourth agricultural revolution'

(Barrett & Rose, 2022), agro-food systems (Rotz et al., 2019), tools for responsible and efficient digital farming (Charatsari et al., 2022; Espig et al., 2022; Søraa & Vik, 2021) and the underlying political and policy debates. Thereby, only a few studies put emphasis on co-creation and network effects (see Lioutas & Charatsari, 2022). Especially research on fostering digital innovation and creativity beyond agricultural issues (Roberts & Townsend, 2016) is scarce. Hence, it has been criticised that rural areas are seldom considered attractive for entrepreneurs or creative hotspots (Mayer et al., 2016; Shapiro, 1999). According to Gibson (2010), creative processes require face-to-face interaction, highlighting the significance of innovative meeting places for like-minded people (Leadbeater & Oakley, 1999) to facilitate knowledge exchange and accumulation that support entrepreneurship and innovation. Scholars have argued that cluster building and innovative networks strengthen a region's capacity to attract creative actors (Feld, 2012; Huijbens et al., 2014). The argument is that digital innovation requires a creative space that fosters the interaction of various actors within clusters and facilitates the exchange of experiences, knowledge and competence for developing a successful entrepreneurial scene (Fuglsang & Eide, 2012). Networking and cluster building play an essential role in current European rural development programs (European Commission, 2014–2020). The European Cohesion Policy has two significant funding instruments for strengthening rural and regional development: the European Region Development Fund (ERDF) and European Agricultural Fund for Rural Development. Both emphasise digitalisation to a considerable extent. Digitalisation has played a leading role in the global discussion on rural and urban development as a tool for improving living and working conditions (Wolf & Strohschen, 2018). The significance of digitalisation in international policy is also evident in the Organisation for Economic Co-operation and Development's (OECD) rural development strategy. In its report *Rural Well-Being: Geography of Opportunities*, the OECD discusses the European digitalisation policy and outlines the importance of digitalisation for sustainable development. The report emphasises the potential of digitalisation for overcoming the disadvantages of remoteness in rural regions by reducing distances and increasing location independency. A practical example of how this is being translated into practice in rural and regional policy initiatives in the Nordic countries is the alliance of the Norwegian Ministry of Local Government and Modernisation and the Nordic Council of Ministers, where Iceland is a part of. In order to overcome rural drawbacks in terms of digitalisation they set themselves as a common goal the strengthening of the 'competitiveness of our enterprises through digitalisation (Randall et al., 2020, p. 6).

Digital divide and smartification

The challenge remains to successfully translate policy discourse, theoretical insights and concepts into practice (Dubois & Sielker, 2022). Digitalisation is undergoing a value shift in terms of European policy as a regional development tool to address demographic and climate change, low income in remote areas, limited services, broadband restrictions or the effects of the corona virus disease 2019 (COVID-19) pandemic (Cambra-Fierro & Pérez, 2022; Panciszko, 2021). The importance of making use of ICT and *smart* digital approaches to respond to the specific needs and expectations of rural communities has also increased in prominence recently (Anastasiou et al., 2021; Hanninger et al., 2021; Mohanty et al., 2020). Smartification implies the improvement of quality of life through the usage of information and communication technologies (Chourabi et al., 2012). Unlike the development of digital innovation in urban areas, in terms of the smart city concept, approaches of applied smartification in rural areas are scarce.

Cambra-Fierro and Pérez (2022) point out how the requirements for a higher life quality by residents in rural areas differ significantly from their urban counterparts. This gap in

digital development between urban and rural areas is referred to as 'digital divide' in the current body of literature (Lyhreatis et al., 2021). It implies a gap of digital knowhow and application evoked by unequal conditions between urban and rural areas (Morris et al., 2022; Philip & Williams, 2019; Rooksby et al., 2002) and ranges from an infrastructural gap such as poor broadband connections to social gaps (Cowie et al., 2020; Palmer-Abbs et al., 2021; Rooksby et al., 2002). Social components play an essential role in fostering digital applications (Roth et al., 2013) as smartification goes beyond the bare application of ICT and digitalisation. It requires the interconnection between technology and people (Burnes & Choi, 2015, meaning that the digital divide often stems from a lack of access and digital competences that can only be overcome when digitalisation adds identifiable value to peoples' lives; Rocksby et al., 2002). Therefore, digital innovation must be meaningful to residents in rural areas if it is to as underlined in a case study by Kenny and Regan (2021) of the willingness by Irish farmers to engage with apps to simplify and monitor farming and administration processes. They illustrated how essential a positive validation of technology is in order to apply it. In order to overcome these barriers and find ways to foster digital rural innovation, the first step was acknowledging and addressing the farmers' lack of trust in digital applications and their perceived insufficient gain of digital engagement (Kenny & Regan, 2021).

The policy trend of aiming to foster rural smartification is also manifested in Iceland, where digitalisation in sustainable development is outlined as a key role in Iceland's regional development policy (Stjórnarráð Íslands, 2018). The following section explores this focus on digital technologies and creative network formation.

Regional development in Iceland: Digital technologies and creative network formation

The Icelandic Strategic Regional Development Plan (Byggðaáætlun fyrir Ísland) provides basic conditions for planning methods and consists of precise objectives, geospatial planning and general guidelines for regional development. Its primary objective is to create opportunities and improve living and working conditions in all sectors of society, focusing on sustainable development nationwide. The policy discourse in Iceland has an increasing focus on smartification. The policy issued for the period 2018–2024 stresses the need for research and development into digital solutions for rural areas (Stjórnarráð Íslands, 2018). It aims to increase business capacity, enhance digital technologies and foster industrial innovation in sparsely populated and remote regions, specifically within small companies.

In the context of this article, the Icelandic Strategic Regional Development Plan aims to establish 'collaboration with marketing agencies, regional consultancy services, and lifelong learning centres throughout the country to reach as many parties as possible' (Stjórnarráð Íslands, 2018, p. 16). This objective is similar to innovative networking concerns such as the establishment of so-called Digital Innovation Hubs described in the European Cohesion Policy (European Commission, 2014–2020). These hubs are considered a digital entry point for rural creativity, providing access to technological knowledge, support and experiments with digital innovation. Nevertheless, regarding the abovementioned regional development goals, it remains unclear what concrete projects will support the implementation of the regional development plans. Furthermore, concrete project directly addressing smartification of rural areas in Iceland are scarce. To intervene in innovative regional development and obtain first-hand and practical insights into the dynamics of rural entrepreneurship, we focus on the rural hackathon, Hacking Hekla, conceived by the lead author. Initially intended to foster digital development in rural Iceland, the case of Hacking Hekla shows that smartification is a complicated and non-straight forward process.

Hacking Hekla methodology and case-study description

Hacking Hekla is an exploratory intervention in the implementation of regional policy. It attempts to link different actors in rural Iceland by building a platform to respond to the challenges of rurality and create tools to overcome rural and digital gaps identified in literature and policy, addressing the previously discussed policy goals in practice. Following the hackathon's interventionist ambitions, we adopted an action research methodology, in which we invested ourselves in the research with the explicit aim of instigating change (Cunningham, 1995; Dickens & Watkins, 1999; Hjemdahl & Aas, 2017; Kumar, 2014; Lune & Berg, 2017; McTaggart, 1991; Thiollent, 2011). In this case, the lead author founded, organised and hosted Hacking Hekla.

According to Cunningham (1995), an essential precondition of action research is identifying a problem. In the Hacking Hekla case, the first aim is to explore ideas and insights into possible regional development applications. The second aim is to gain academic and practical insights into the dynamics, values and meanings of innovation, digitalisation and entrepreneurship through collaborative research (Ren et al., 2017). The project's third and final aim is to foster networks through hackathon participation.

This method of conducting research as part of a development process draws inspiration from and responds to the current rethinking of research methods. For example, Ivanova et al. (2020) criticise the restrained objectivity of traditional research approaches in tourism studies and highlight their limitations. They argue that retention and cautious rapprochement in research leads to 'partial and limited' knowledge (p. 5) and see creativity and active involvement in research as a 'new [way] of bridging the gap between research and practice collaborations' (p. 5). The collaborative Hacking Hekla study adopts this idea while building on the well-established tradition of action research. By co-designing the hackathon and actively participating in it, we approached the research questions from two aspects: an academic, descriptive perspective and a practical, disruptive and interventionist standpoint. Hence, we actively and explicitly participated in co-creating tourism knowledge (Ren et al., 2017).

Hackathons as network-forming events

The term *hackathon* is derived from a combination of the words *hack* and *marathon*, in which hacking is understood as a way of exploring, investigating and experimenting (Briscoe, 2014), and marathon alludes to a longer period of work. In the usual sense of the word, a hackathon essentially refers to an event focusing on software development (Briscoe, 2014). A typical hackathon is an invention marathon in which inventors, entrepreneurs and creative individuals collectively program intensely over a short period, usually 24 h. Hackathons offer founders, students and entrepreneurs a platform to work on a business idea, start-up or product from conception. The result can be an application, a website or any other digital creation (Briscoe, 2014; Soltani et al., 2014; Pogačar & Žižek, 2016).

Although discussions about digitalisation have increased exponentially in recent years, research into digital innovation practices remains scant. According to the current literature, network building is essential to trigger innovative thinking and entrepreneurship (Bathelt et al., 2004; Feld, 2012; Fuglsang & Eide, 2012). Hacking Hekla can be considered a suitable vehicle for such a purpose and investigating how hackathons, as network-forming events, enhance digitalisation and innovation.

Hacking Hekla

The concept of Hacking Hekla was the creation of a rural hackathon in South Iceland. Hacking Hekla is named after Mount Hekla, one of the three most active volcanoes in Iceland, located in the South of Iceland. This name was chosen for its symbolic reference to unpredictable and powerful energy and eruptions. The goal of Hacking Hekla Suðurland was to foster innovative and digital solution-based thinking and address problems regarding living and working conditions in South Iceland. More concretely, the participants were asked to develop digital solutions for strengthening local food production and marketing, increasing the awareness for nature, tackling the challenge of rural mobility and transportation and fostering rural tourism. This was partly devised in collaboration with Nordic Food in Tourism, a project implemented on behalf of the Nordic Council of Ministers (https://nordicfoodintourism.is). At first, we focused on the digital aspect encouraging the participants to make use of new technologies and digital innovation and yet being inclusive and open towards non-digital approaches. Our goal was to foster the development of apps, webpages, software or various forms of virtual reality and artificial intelligence suitable to grapple with identified challenges in South Iceland. In the further course of the event, we realised that there was little response from the participants towards the development of digital solutions and decided to shift the focus of Hacking Hekla for the follow-up events (further discussed below). From there on, we promoted Hacking Hekla as a non-traditional hackathon that does not exclusively address technology-interested stakeholders and software development. The COVID-19 pandemic reached Iceland during the planning phase in spring 2020. Therefore, we hosted Hacking Hekla Suðurland as a 3-day online event. The intention was to run Hacking Hekla on-site in Hvolsvöllur, a small town about 1.5 h away from the capital Reykjavík. The most eastern town of South Iceland (Höfn) is 4.5 h's drive from Hvolsvöllur. Converting the hackathon to an online event saved participants substantial traveling time, often lacking among small entrepreneurs. However, the digital format also created challenges, discussed later in this article. Regarding the demographic arrangement of the 21 hackathon participants, 67% were originally from Iceland. Most (56%) of the participants resided in Reykjavík, while 33% lived in South Iceland.

In addition to the hackathon activities, in which the lead author took part as a participant–observer, the research is based on material collected as part of planning, organising and hosting the hackathon. This material includes observations, documents and policies, a survey and interviews with the mentors, keynote speakers and judges involved in Hacking Hekla. We conducted qualitative, semi-structured interviews with 17 of these Hacking Hekla mentors, keynote speakers, and judges several weeks after completing the project. We also invited the 21 Hacking Hekla participants to take part in a post-project survey, to which around half responded (48%). In Section 2, we analyse this material to explore the outcomes of the hackathon as an example of a digital rural development event in practice.

ANALYSIS

Developing entrepreneurship and innovation in practice: Barriers and ways forward

We established Hacking Hekla with the long-term goal was to provide entrepreneurs in rural Iceland with a platform to meet, exchange ideas and information and thus enhance digital innovation

and rural entrepreneurship. The most significant obstacle to implementing Hacking Hekla was communicating it to the local community and stimulating interest.

To our knowledge, Hacking Hekla is the first rural hackathon in South Iceland. Regional actors were unfamiliar with the concept of the hackathon and its potential benefits. Consequently, gaining interest and subsequent involvement was not straightforward. To establish a rural hackathon in the local community, we approached local companies for support and to help communicate about the event. We invited local food and tourism businesses to discuss their opinions regarding the challenges of running a business in South Iceland and the changes they would like to see. We explained the concept and procedure of the planned hackathon and that this event would be used to specifically tackle these challenges and develop individual solutions for them. We saw an important benefit in including the local businesses in the fact that we would offer them a platform to share their own and 'real problems' they are facing. We expected a high identification with the Hacking Hekla project through getting the feeling of being actively involved from the very beginning. We furthermore approached various rural and urban high schools and institutions, requesting support in spreading the news about the event and promoting it to their students and encourage them to participate. However, interest remained limited. Businesses did not appear to perceive Hacking Hekla as a relevant opportunity. The interest of schools was restrained and would have required more follow-up effort and would have required more than we were capable of at the time. A lack of financial support also delayed the implementation of Hacking Hekla. Several applications for funds to support rural development in the project area were rejected.

The breakthrough in the project development process happened when the first author got in touch with the Icelandic innovation scene. Especially players from the Icelandic Tourism Cluster, the Icelandic Tourist Board and individual entrepreneurs who are involved in various way in innovative regional development projects saw great value in the Hacking Hekla concept. Through their various networks, Hacking Hekla got magnified by multiplier effect and Hacking Hekla Suðurland was finally carried out in collaboration with Samtök Sunnlenskra Sveitafélaga (SASS), the Regional Municipality Association of South Iceland. Later in the course of the project, Hacking Hekla received funding from the Ministry of Industries and Innovation and the Entrepreneurial Fund of Íslandsbanki (an Icelandic bank; Frumkvöðlasjóður Íslandsbanka) to provide follow-up events in other rural locations in Iceland.

Through this enhanced network consisting of rural entrepreneurs, the Icelandic innovation support system, universities and initiatives such as student councils, the Icelandic Tourism Cluster and Icelandic Start-ups, we gained support and involvement including mentors and keynote speakers as well as channels to share information about the event. Reaching out to different actors in the national innovation scene and gaining access to entrepreneurial networks to support the event enabled us to approach South Icelandic businesses again, and this time with more success. The key learning we drew from that project development process was the importance of networking. As soon as we could refer to well-established names and institutions, the event was taken more seriously by prospective participants.

Even though the event was open for everybody, we aimed at participants between 18 and 40 years living in or having strong interest in South Iceland. Apart from the word-of-mouth effects, we ran a targeted Facebook campaign, which lead to a few registrations. We furthermore hosted a Hacking Hekla pub quiz event in a hostel a couple of weeks prior to the first COVID-19 lockdown, which resulted in a few further signups to the event. As surveys after the event have shown, a big part of our participants took notice of the Hacking Hekla event due to the advertisement of the University of Iceland's email distribution to all students. Hacking Hekla Suðurland was attended by 20 keynote speakers, mentors and judges, who supported the participants and their project

development through counselling sessions. In the following, we will describe the main value, challenges and outcomes as perceived by this group.

Perceived value of the Hacking Hekla hackathon

The group of keynote speakers, mentors and judges consisted of highly qualified entrepreneurs from the Icelandic innovation and start-up scene. Their professional background ranged from private entrepreneurs and business owners to staff members of regional development institutions and public officials. The panel of judges, which evaluated the participants' pitched projects after 48 h project development, consisted of the project manager of Nordic Food in Tourism, a member of SASS, the Regional Municipality Association of South Iceland and a representative of a local branch of Íslandsbanki. Considering the difficulties in initiating the project, it is interesting to explore how this group perceived the value and outcomes of Hacking Hekla.

In the following, we are going to explore the perceived values and outcomes for attending the hackathon for the mentors, keynote speakers and judges through four key motivations of participation.

Motivation I: Obligation to the entrepreneurial scene

When we asked the keynote speakers, mentors and judges why they dedicated their time to participate in Hacking Hekla, most of them responded that it was something they simply did:

> Because it's a person-to-person [sic] to try to mentor and help people ask questions and be in the creative.... I don't know anything that is more fun than that, solving problems and… And engage people, and bring people to bring the best out of – and I do it internationally. I do it so many times a year. (Reykjavík-based entrepreneur who grew up in South Iceland)

The inclination to support other entrepreneurs, as a matter of course, seems to be expected in the entrepreneurial scene. The entrepreneurial scene consists of institutions and private entrepreneurs and is vaguely structured and hard to define and resembles an organic cluster of like-minded people (some have also referred to it as an ecosystem) rather than an organised, bounded group. Most of the actors seemed to know about each other. The desire to raise awareness about their organisation was mentioned by only one institution, suggesting a minor role in expressed motivation. One entrepreneur described this evident willingness to support others as a 'pay-it-forward kind of a deal':

> I mean, entrepreneurs are a special breed of people. And I am one of them, so I love it. So yeah, pretty much everyone in the ecosystem here knows that if my help is needed, then they will get it. (Reykjavík-based entrepreneur who grew up in South Iceland)

The lead author also experienced this sense of support when approaching the scene with their project. Despite being an unknown newcomer, the Hacking Hekla project received significant interest from the early stages. This interest could be attributed to increased activity in innovation

by individual entrepreneurs and central authorities in Iceland in recent years. In addition, as previously demonstrated, many actors consider assistance a natural part of belonging to the 'special breed'. Increased networking and involvement in events such as Hacking Hekla, accelerator programs or innovation courses could have led to a sense of camaraderie and loyalty in this circle.

Motivation II: Heart of the countryside

A further decisive aspect of participating in Hacking Hekla was the event's focus on the Icelandic countryside:

> Because it doesn't happen often that events like this are moved from the centre, which is Reykjavík, to the people in the rural areas. So, even though it was a webinar, it was still focused on a different area that has a special focus on an area that is not the Reykjavík area.… Usually, it's the rural people or the people from the countryside that are going. (Entrepreneur living and working in North Iceland)

As previously discussed, hackathons are becoming popular, particularly in urban areas. Conversely, rural areas have not been included in this hacking movement to the same extent, in Iceland or internationally. Approximately 11 hackathons were carried out in Iceland in 2019–2020 focusing on different fields. Of these 11 hackathons, only one (besides Hacking Hekla Suðurland) included rural Iceland. Therefore, as expressed in the above quote, hackathons or entrepreneurial events with a rural focus remain rare in Iceland. Mentors with personal connections in the Icelandic countryside emphasised the necessity of developing initiatives such as hackathons in rural areas. This connects to a perceived stigma regarding rural areas as expressed in the following statement:

> And I know it from my own experience; being a person from a rural area… I hate it when people are saying, 'Oh, why are people living there? Why don't they just come to [Reykjavík]?' (Representative and board member of the Entrepreneurial Fund of Íslandsbanki)

Rural areas are not seen as places to be or the locations of creative processes. During a conversation with one mentor, it became evident that participation in Hacking Hekla was connected to a personal desire to reach the development goals addressed in the Icelandic Strategic Regional Development Plan. One of the leading development goals in the Icelandic Strategic Regional Development Plan 2018–2024 is the 'sustainable development of rural communities throughout the country' (Stjórnarráð Íslands, 2018, p. 3).

> I love to live in [the countryside]. And I would love for my family to be here… to have the opportunity to come back home, and to have a nice job here that pays well, then we need to have more specialised jobs here. (Entrepreneur living and working in North Iceland)

This compassion for rurality was evident among interviewees with roots in the Icelandic countryside. The desire to increase rural innovation rests predominantly upon the personal wish to

improve living and working conditions for the participants. Conversely, non-rural interviewees approached rural innovation with less emotion.

Motivation III: Joining forces and building trust

Aside from the emotional connotations of rurality, interhuman aspects played an essential role in the decision to support Hacking Hekla. The following comment by an individual working in the entrepreneurial support system in Iceland demonstrates that a good idea alone is insufficient; it requires social fit, passion and the capacity to communicate project visions clearly:

> I knew that you were a strong team. And that is so important. You have to have people that are dedicated to the subject and have this ambition and drive, to make something good and great…. And I thought joining forces with you guys. That could absolutely be the best that we could do. (Reykjavík-based entrepreneur working in the entrepreneurial support system)

One question is whether the significance of trust in the project team alluded to in this statement could lead Hacking Hekla to concrete successful outcomes in the future. Hacking Hekla's rural focus was a good fit for its primary funders. The hackathon was partly financed by SASS, the association of municipalities in South Iceland. It also received a large grant from the Entrepreneurial Fund of Íslandsbanki bank. When we asked the bank why they decided to sponsor Hacking Hekla, a representative stated that Hacking Hekla's focus on rural areas significantly influenced the decision process. While having their largest market share in the capital area, only a few applications to the Entrepreneurial Fund were received from entrepreneurs from rural areas. Hacking Hekla thus fitted an agenda and responded to a demand by the fund, the bank's motto, *hreyfiafl til góðra verka* (a moving force for good), and its aim to support sustainable development in both rural and urban areas:

> We do have a higher market share in the Reykjavík area, but we as a bank have a great social responsibility, and we talk about social responsibility, and we talk about *hreyfiafl til góðra verka* and that we want to move Iceland in the world in the right directions. So that is why we really need to look into entrepreneurship. We do have the Entrepreneurial Fund of Íslandsbanki [translated by the authors], and we are using that. (Representative and board member of the Entrepreneurial Fund of Íslandsbanki)

The hackathon also fitted the South Icelandic Regional Development Plan, (Sóknaráætlun Suðurlands) carried out under the auspices of SASS. In recent years, enhancing innovation and digitalisation have been a highly discussed issue in regional development policy, nationwide and in South Iceland specifically. Therefore, Hacking Hekla fitted a perceived demand for a concrete project on digital innovation.

Motivation IV: Self-gain

Mentors working or conducting business in South Iceland voiced hope that Hacking Hekla would help them expand their networks. A mentor running a tourism business in South Iceland referred

to her expectations and hopes for reaching out to locals and strengthening their network in the area:

> It would have given me a lot of value if I would strengthen my network in this area. Cause [sic] that is one of the issues that we struggle a lot with in running tourism companies in the south. It is difficult to kind of make these connections with the farmers and the kind of the backland. (Entrepreneur and tourism business owner in South Iceland)

This entrepreneur was motivated to participate in Hacking Hekla by a need to expand their business network. However, the hackathon proved unable to fulfil this need or deepen this entrepreneur's business relationships in South Iceland due to the absence of suitable connections. According to this entrepreneur, the 'locals, even though they were not farmers … the people living in Hvolsvöllur' that they would have liked to connect to, were not present at Hacking Hekla Suðurland.

Together apart: Networking at online events

According to several mentors, the low local networking effect could have been because Hacking Hekla Suðurland was carried out online. On the one hand, several mentors argued that the online event provided access to a wider range of individuals. An on-site event in South Iceland would have incurred travel and accommodation costs for mentors and participants. Hence, an online platform facilitated participation without committing an entire weekend. On the other hand, several participants voiced concerns about an online event. Approximately half of the Hacking Hekla mentors, keynote speakers and judges highlighted the difficulties of networking in online events. Some argued that virtual meet-ups could not replace physical networking:

> Nobody has cracked that code. All online events struggle with the same fucking thing. But we can't actually sit together on [sic] a table and smile and be human. (Entrepreneur based in rural Iceland, working on innovative and social projects)

The perceived value of Hacking Hekla for enhancing and boosting innovation

The low number of participants from South Iceland in the hackathon prompted the question of why there was such restrained local interest. In conversation, many Hacking Hekla mentors, keynote speakers and judges highlighted a divide between the entrepreneurial rural support system and those working at the ground level:

> We struggled a bit with that mindset of the core group that would be farmers or growers. So, it was a bit weird that we didn't, I don't know if I am saying this if it is not true, but I felt, we were having a lot of outsiders… and very few kind of people within the circle. (Entrepreneur and tourism business owner in South Iceland)

The event did not appear to attract those within the circle, resulting in a creative network with perceived outsiders and the challenging mindset of local farmers. This inability to engage local

participants is reflected in the following statement:

> And when I heard [first] about Hacking Hekla, I was like 'okay you are not going to get the locals at least'. (Reykjavík-based entrepreneur who grew up in South Iceland)

According to one mentor, the debate among hackathon participants sometimes lacked regional focus despite ongoing keen and lively discussion. They argued that most participants had no connection to South Iceland and that significant insider insights and knowledge about the area were lacking in the concept and project development processes. This insight expressed by mentors, keynote speakers and judges suggests that opinions about innovation and digitalisation in South Iceland are divided between them and us.

> I think we, in general, not you guys, but we as this digital entrepreneur industry, we are still working with, or against the stigma that is connected, that has to do with everything that has to do with innovation, entrepreneurship, even though these are the words that draw us in, but I think these are also the words that keep them out. (Entrepreneur working in the Icelandic tourism support system)

This entrepreneur highlights the role of innovation and entrepreneurship as attractants and repellents and touches upon the stigma attached to them. This notion links to and reinforces the vision presented in the interviews of a bifurcated situation. On one side, is a creative network of mentors, judges, and keynote speakers (and potentially interesting but absent locals). On the other, are farmers and growers who do not see (or are not considered open to) the value of digital innovation or innovative interventions, such as hackathons.

In terms of this 'digital entrepreneurial industry', we also observed restrained responses from our participants. Despite the original goal of Hacking Hekla Suðurland to foster rural innovation through digital approaches, only one out of 11 pitched projects—an interactive webpage for restaurants and consumers to decrease food waste—could be classified as digital. The majority of ideas and projects developed in Hacking Hekla focused on innovation in terms of raising awareness of local food, distributing local value through even creation and alternative and more sustainable ways for local food production. The winning idea 'Ómangó' was a project that artificially produced mango puree by extracting mango cells with the goal to decrease the proven high carbon footprint of mangos being imported to Iceland.

The absence of local residents significantly concerned mentors, keynote speakers, judges and those wishing to expand their networks. According to several respondents, the lack of interest and participation in events such as Hacking Hekla derives from the traditional Icelandic culture and mindset:

> I was born and raised in that area. And I think it's a cultural thing. It's about people, they are afraid, I don't have the English, it's like *spéhræðsla* [fear of mockery] in Icelandic like they are afraid of showing off or showing what they are doing. (Reykjavík-based entrepreneur who grew up in South Iceland)

According to one mentor from South Iceland, rural Icelandic people are typically described as *small kings* who prefer the do-it-all-yourself approach to collaboration and networking. Another mentor continues this thought, highlighting the lack of networking and innovation in the tourism

and agricultural sector in South Iceland:

> There is a lot going on there, but it hasn't really been put in context as 'we are a group of people that are doing innovation in food or tourism'. I think that tourism and farming and all that, they need to kind of step up at the game. And I think they just don't know how to, and Icelanders are quite shy. (Business owner in South Iceland)

This view outlines the situation as one populated by an innovative group of entrepreneurs (the scene) perceiving themselves as struggling with a reserved rural community characterised by a non-collaborative approach, which is perhaps not translated or immediately identified as 'doing innovation in food and tourism'. Interestingly, despite expressing an interest in and feeling motivated by compassion for the countryside and the desire to break down barriers in rural communities, the entrepreneurs also reinforced the stereotypical image of rural areas as places where nothing happens.

Misconception of hackathons

The perception of (rural) development occurring slowly was recognised by most of the mentors, keynote speakers and judges. One keynote speaker highlighted this view, stating that projects such as Hacking Hekla resemble 'a marathon, not a sprint'. In contrast, short-term effects are scarce and difficult to measure. Mentors suggested that although participation in Hacking Hekla Suðurland was limited, the event probably influenced individual perceptions and reduced barriers to participating in such creative events:

> So I think we would probably really [be] kidding ourselves if we thought that we had really transformed the south of Iceland with this one event. It is more about what could this grow into? (Entrepreneur and expert in boosting innovation in rural Iceland)

This statement suggests that Hacking Hekla Suðurland triggered a discussion instead of creating an immediate and tangible impact. According to a SASS consultant, the main challenge to long-term success is to 'keep the discussion alive, and remind [the community]'. One keynote speaker confirmed this sentiment and stated that the journey of innovation is 'disappointingly slow' and requires patience and stamina:

> I am pretty sure you will have to go through two to three events through 2–3 years before it actually starts showing effect. But that's the thing with change; it doesn't happen overnight. It happens within a long time frame and even generations. It's terribly disappointing, but unfortunately, that's our game. (Entrepreneur based in rural Iceland, working on innovative and social projects)

The Íslandsbanki representative expanded on this idea, criticising the tendency for infrastructural projects, and those proposing immediate impacts, to be more likely to receive government support. They commented that the Icelandic grant and funding system still tends to fund 'the hard stuff', referring to infrastructural projects such as tunnel or road construction, rather than '[an] area [that] is doing special things'. Two hackathon mentors within and outside Iceland supported

this statement, arguing that the effects of hackathons are often misunderstood at political and institutional levels. One mentor criticised the way politicians tended to focus on the end products rather than the creative process of hackathons:

> First misconception [about hackathons] is that there is something valuable that is being created. Very seldom there is something valuable created in hackathons. It is about empowering people and giving them a chance to create. (Reykjavík-based entrepreneur who grew up in South Iceland)

One keynote speaker confirmed the ongoing 'capitalisation of hackathons', considering a short-sighted political mindset the reason for this situation:

> Because they don't see in the short term how it will be paid back. And we have no models that fit into a long-time-frame event. Only power plants fit into that frame…. So when we come in and say, 'Yeah, this will actually take effect in 10 or 15 years', they don't wanna hear it cause [sic] it's so long. (Entrepreneur based in rural Iceland, working on innovative and social projects)

DISCUSSION

This study aimed to explore and describe the dynamics of rural innovation through the Hacking Hekla hackathon from the perspective of its supporters and organisers. We focused on the value, challenges and outcomes of Hacking Hekla for digital innovation in Icelandic rural development. The study revealed that the involvement and participation of the mentors, keynote speakers and judges involved were driven by different values. Interestingly, this group raised highly emotional reasons for their support of Hacking Hekla, rooted in personal backgrounds and relations to the Icelandic countryside. Several mentors, keynote speakers and judges mentioned a personal caring obligation to the entrepreneurial scene, a desire to contribute to the local community and an ambition to build networks for future business. Other, more formal values were primarily mentioned by those representing institutions or companies, such as Hacking Hekla, fitting the profile and agendas of private or public funding agencies.

A bit more challenging to track is the perceived value of Hacking Hekla to the local entrepreneurs, the intended target group of the hackathon. Most of the mentors, keynote speakers and judges noted that Hacking Hekla did not attract sufficient interest from local entrepreneurs. They cited several possible reasons, such as the mentality in the region concerning entrepreneurship and what some termed the 'Icelandic mindset', referring to a lack of willingness to collaborate. They argued that the lack of presence and participation derives from a lack of understanding about hackathons and innovation and inadequate communication about the potential benefits and outcomes. The fact that Hacking Hekla did not solely focus on digital innovation, and thus had a wider thematic scope than other hackathons, did not affect local interest or participation in the event. We explicitly stated in the marketing campaign that no specific knowledge was required to participate in the hackathon. However, mentors, keynote speakers and judges perceived an association between hackathons and hipsters and nerdy city computer specialists, fostering a division between 'them', locals living in a farming community, and 'us', the urban, tech-savvy entrepreneur community, reflecting, to an extent, a rural–urban divide in digital development

(Gibson, 2010). Conversely, despite the abovementioned compassion and concern for South Iceland expressed by the mentors, keynote speakers and judges, we identified a further distinction between a lively urban entrepreneurial scene and a reluctant rural community, reinforcing stereotypical perceptions. Much literature has been published regarding hackathon procedures (Briscoe, 2014; De Götzen et al., 2020; Nandi & Mandernach, 2016). The participant groups presented in this study primarily refer to hackathons as innovative tools used in universities or student associations (Nandi & Mandernach, 2016). Therefore, it could be assumed that the lack of local participation is connected to an inability to identify with the target group or, as one entrepreneur commented, the stigma associated with the concepts of entrepreneurship and innovation. However, this hypothesis requires further investigation.

According to mentors, keynote speakers and judges, low participation rates among South Icelandic locals impeded Hacking Hekla's potential for the regional anchoring of innovation and development and underlined the challenges of intervening in regional development. It raises concerns about implementing regional policy objectives in rural areas and demonstrates that despite the potential usefulness of digital solutions, creating outcomes and having an impact do not transpire from technology. It also entails the participation and anchoring of actors in digital practices (Ren et al., 2018). Given the weak links identified between the hackathon event and local entrepreneurs, this could prove challenging. It also raises questions about inclusion and exclusion in regional development and bridging the apparent gap between policy and practice. In this study, we endeavoured to engage residents using targeted social media campaigns, direct contact with local companies, and collaboration with SASS. Despite this wide reaching out, the intervention of Hacking Hekla did not enrol many local residents. It remains unclear if a different hackathon design, target group, hackathon theme or wording and language in the marketing campaign would have had a positive impact in that regard. The distinction made by the mentors, keynote speakers and judges between 'us' and 'them' and their invoking of traditional stereotypes of rural culture and mindsets further leave the question open if hackathons are the right tool for fostering rural innovation at all. The mentors, keynote speakers and judges lamented that the lack of participation among local actors hindered intergeographic discussions and networking, reducing the event's value. We did, however, not get any insight into how and if these discussions would have benefited the locals of South Iceland.

The value of Hacking Hekla on a political level differs from the personal, ideological and emotional values mentioned by the keynote speakers, mentors and judges and is more focused on concrete outcomes in terms of (digital) innovative projects and products. This is somewhat counteracting the objective presented in the Icelandic Regional Development Plan, which emphasises the role of 'lifelong learning centres' in increasing the 'digital lead in rural areas' (Stjórnarráð Íslands, 2018, p. 16). The original idea of Hacking Hekla Suðurland was indeed to create digital solutions for local rural challenges such as food, tourism and nature. As discussed above, the response of our participants towards the development of digital responses was however very low. According to our mentors, keynote speakers and judges, the public innovation support system considers immediate proof of the societal and economic benefits of events such as Hacking Hekla more critical than the creative process. In terms of outcome, the original effort to enhance digitalisation in rural South Iceland through Hacking Hekla can thus be said to have failed from a political point of view as it did only to a very limited extent contribute to fostering digital innovation. The mentors, keynote speakers and judges stressed however that fostering innovation in rural areas is a long-term process. The co-creation of value most often happens gradually. From this perspective, the primary outcome and contribution of Hacking Hekla are that it promotes the

idea that hackathons provide a valuable learning experience and as such introduces an alternative mode of innovation to participants.

One of the reasons for the restrained interest in developing digital applications could be a digital divide. It is possible that there is a lack of access and competence in South Iceland that hampered the participants to think about digital applications in a meaningful way. As mentioned above, a division emerged between those identifying as members of a more general, nationwide entrepreneurial scene (judges, speakers, and mentors) and residents as the intended participants. While the former seemed to ascribe value and meaning to the hackathon more readily, they also perceived the concept of digital innovation and hackathons as more distant to local (potential) entrepreneurs. This is however something that needs to be explored through further research. Despite the restrained interest in applying digital approaches, Hacking Hekla Suðurland was still functional as an incubator for rural innovation and a momentum to instigate change. At the time of writing this article, three further Hacking Hekla events in other rural areas in Iceland have been successfully carried out in collaboration with the particular regional development associations and private entrepreneurial initiatives. This ongoing nationwide interest after our pilot project supports the view that while Hacking Hekla might not instigate change in digital innovation, it provides a valuable space for creativity in rural areas. Hence, we conclude that Hacking Hekla adds value to rural innovation processes by providing a platform for creative collaboration.

CONCLUSION

The goal of this article was to explore the dynamics of rural entrepreneurship and digital innovation in rural Iceland. The study identified a gap between policy discourse and practice and highlighted the challenges of digital innovation in rural Iceland as well as bringing forth the perceived value of hackathons for boosting innovation. Digitalisation has become a buzzword in regional development circles, and digital approaches are often expected to lead to bursts of innovation. When Hacking Hekla was advertised as the first hackathon in rural South Iceland, the slogan *Hacking Hekla: Creative eruptions* was used to reflect expectations about its creative capabilities. However, this article's analysis indicates that Hacking Hekla's impact was subtle. The innovative process of Hacking Hekla may still be likened to volcanic activity despite it did not result in a full-blown eruption in the form of ground-breaking change and with a long-term effect and the active involvement and participation of local residents. Similar to an earthquake, innovative interventions are ongoing processes that build gradually and are discernible through increased activity and can be experienced as tremors or subtle shifts in the way things are done. Most of the activity is modest and occurs in the background, and some of them never reach the surface as in our case, the application of digital innovation in Hacking Hekla Suðurland. The conversations with the involved mentors, keynote speakers and judges revealed that the event outcomes and developed projects played a minor role in their views of the value created. This observation shifts the understanding of Hacking Hekla from a solution-finding competition and innovation accelerator to a more modest event serving as a platform for sharing interests and concerns and exploring solutions.

A limiting factor in this study is the focus on only one case in South Iceland. The overall feeling from the other three hackathons is that they are seen as valuable input in an ongoing effort to enhance innovation in rural areas. So far, these events and potential effects on rural innovation have not been analysed in depth.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ETHICS STATEMENT

Data concerning Hacking Hekla's keynote speakers, mentors and judges were treated according to the University of Iceland's ethical guidelines. The interviewees were informed about the scientific processing of the data and offered anonymity. Participants provided declarations of consent either verbally or in writing.

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Publication 4: Exploring The Dynamics of Digital Applications in Icelandic Tourism: Insights from Stakeholders

Exploring the Dynamics of Digital Applications in Icelandic Tourism: Insights from Stakeholders

ABSTRACT

Digitalization in tourism increasingly influences entrepreneurial activities and plays a key role in fostering sustainability. A specific example of digital innovation in tourism is the growing significance of digital applications (apps), which have been proven to enhance communication with tourists. This trend aligns with the UN's Sustainable Development Goal 9, which targets resilient and sustainable industry, innovation, and infrastructure. The current chapter focuses on the value that representatives of the tourism support system attribute to digital innovation. Potential obstacles that could impede the successful implementation of entrepreneurial endeavours of digital solutions in the Icelandic tourism industry are discussed, and three examples of digital innovation in Iceland are examined: an entrepreneurial app, a digital platform initiated by destination marketing organizations, and the development of an Iceland-specific app that could foster tourism sustainability by providing targeted information to manage the flow of visitors to popular attractions. These three examples demonstrate how the success of digital solutions depends on gathering significant market awareness and creating a large user pool. Due to their focus often being limited to a specific locale, these applications frequently fail to achieve sufficient user downloads to cover the development costs, scale up, add value, and become effective tools for tourism development in Iceland. This chapter reveals that while the tourism support system recognizes the value of digital solutions, the widespread implementation of successful tourism apps at the national level is lacking. The reasons for this phenomenon and potential effects on entrepreneurial endeavours are discussed.

Keywords: Tourism apps, digital innovation, tourism entrepreneurship, Iceland, smart tourism

INTRODUCTION

Digitalization has become a vital tool for regional and tourism development agendas worldwide (Mohanty et al., 2020; Ren et al., 2018). The increased application of digital solutions aligns with a change in travellers' behaviours and expectations (Opute et al., 2020) towards more comfort and convenience, which are often fostered through digitalization. For example, artificial intelligence (AI), augmented reality (AR), and service robots (Fusté-Forné et al., 2021; Tuomi et al., 2021) enable the provision of a contactless service and 24/7 access to information and customer service. Responding to challenges with digital solutions aligns with the UN's Sustainable Development Goal (SDG) 9, which targets resilient and sustainable industry, innovation, and infrastructure. With regard to tourism development, this goal calls for innovative solutions, with an increased focus on new technologies and digitalization.

A common manifestation of digital innovation in tourism is smart phone applications (apps; Birenboim et al., 2023). Encouraged by improved and less expensive access to the internet, smartphones have become an omnipresent part of daily life and can be used, for example, for contactless payment, communication, recreational planning, online shopping, or ordering a meal at a restaurant. Birenboim et al. (2023) emphasize that smartphones have become an 'indispensable part of international travel' (p. 1), as they are an effective tool for customer communication and the promotion of destinations (Alghizzawi et al., 2023; Dorcic et al., 2019; Gretzel et al., 2015; Huettermann et al., 2019) through the provision of real-time data. This type of customer communication can influence visitors' decision-making processes considerably and should therefore be used as a tool to foster tourism sustainability, for example by controlling and managing the visits to vulnerable nature attractions by providing targeted information through an app. Such innovative solutions are often initiated by entrepreneurs (Williams et al., 2020).

Global apps have been found to be more efficient than local apps (Birenboim et al., 2023). A common challenge is the integration of new tools into existing applications, as potential users are often unwilling to download separate apps, resulting in a user pool that is too small to generate value (Huettermann et al., 2019).

Randall et al. (2019) highlight the role of governmental leadership, pointing out the imperative of acknowledging that digital solutions do not automatically foster sustainability

but require specific governance guidance to instigate positive change. In particular, the role of collaborations at the local, business, and non-governmental levels.

Making use of digital solutions in tourism development is being discussed at the governmental level in Iceland. The Icelandic Regional Development Plan 2022–2036 supports digitalization and encourages Icelandic companies to apply digital solutions to foster growing and resilient business environments (Stjórnarráð Íslands, 2022). In light of the near-exponential increase in international arrivals in Iceland in the last decade, Icelandic tourism stakeholders have recognized the need to restructure tourism holistically and view it through the lens of regeneration and sustainability (Ferðamálastofa, 2020). Digital innovation is a means to foster this development, for example, by counteracting the degradation of nature caused by mass tourism and the resulting negative consequences for local communities. Indeed, due to the concentration of tourism in Iceland's capital area and South Coast (Ferðamálastofa, 2023), Iceland is increasingly portrayed as a victim of overtourism in international and social media (Sæþórsdóttir et al., 2020).

Although research on tourism entrepreneurship and the application of digital innovation is scarce, some authors have started to explore the dynamics and value rural tourism entrepreneurs ascribe to digital innovation in their businesses (Falter et al., 2023). Obstacles impeding tourism entrepreneurs' ability to apply digital innovation have been identified, ranging from a lack of technological know-how to a perceived lack of support from tourism authorities. To gain a better understanding of the entrepreneurial and digital landscape of Icelandic tourism, this chapter explores how representatives of the support system approach and foster the application of digital innovation in Icelandic tourism. The following research questions are addressed: *How do representatives of the Icelandic tourism support system assess the value and status of applied digital innovation as a tool for fostering sustainable tourism development in Iceland? What hampers the successful implementation of entrepreneurial endeavours for digital solutions in the Icelandic tourism industry?* Currently, best practice examples of applied digital innovation in Icelandic tourism are scarce. Therefore, I only discuss and analyse the examples provided by the interviewed representatives of the tourism support system.

The chapter begins with a literature review on digital innovation in tourism with a particular focus on smartphone apps, which is one of the most common ways smart tourism manifests in practice and has great potential to foster tourism sustainability. From there, lifestyle entrepreneurship and the various obstacles preventing these actors from contributing to successful digital solutions in the tourism industry are discussed. Next, I introduce the

study area of Iceland, present my findings, and identify potential obstacles impeding the application and development of digital solutions in Icelandic tourism before concluding the chapter.

LITERATURE REVIEW

Digital Innovation in Tourism

Globally, the focus of tourism is shifting towards fostering digital innovation (Hjalager, 2015; Tuomi et al., 2020), as shown by the increase in smart tourism developments (Gretzel, 2018; Williams et al., 2020). This shift has already instigated a change in the dynamics of the tourism and hospitality industries (Tuomi et al., 2021), which can be seen, for example, in the automation of front-desk services (Gretzel et al., 2019) and which influences customer behaviours and expectations (Opute et al., 2020).

In a changing market landscape in which tourists are commonly digitally connected, the tourism industry must improve standards of service and comfort to improve customer experience and remain competitive (Dorcic et al., 2019). Tourism attractions and destinations that offer smart applications, such as AR, on-site can positively influence potential travellers' decision-making processes (Kuo et al., 2019). It is vital for tourism providers to become visible to these 'travellers 2.0' (Magasic & Gretzel, 2020, p. 5). Tourism increasingly includes contactless service and 24/7 access to information, bookings, and real-time forecasts, leading to the new target group being referred to as 'digital natives', highlighting the key role of digitalization in future travel patterns (Skaletsky et al., 2017).

Discussions of digitalization are closely linked to the debate on sustainable tourism development. In particular, the focus of this chapter is on SDG 9, which targets infrastructure, sustainable industrialization, and innovation. Singh and Ru (2023) link the aim of SDG 9 to the application of AI and the development of sustainable digitalization in tourism, emphasizing the imperative of enhancing mobile broadband subscriptions and gaining insights regarding internet penetration.

In the discourse on digital innovation as a potential tool for fostering tourism sustainability, various researchers have identified apps as an essential component of smart tourism development (Birenboim et al., 2023; Dorcic et al., 2019). The use of smartphone apps has gained importance in terms of visitor experience, travel planning, visitor management, and communication with guests (Alghizzawi et al., 2023). In addition, mobile apps can be useful in responding to environmental issues caused by a lack of visitor management. Natural attractions, in particular, suffer from high numbers of visitors, which

often occurs seasonally. In a case study on the Swiss–German border, Huettermann et al. (2019) demonstrate how mobile applications can be successfully used to guide and manage visitors. By providing real-time data on vacancies, parking options, and current traffic situations, AI-powered apps have the potential to considerably impact visitors' decision-making processes (Huettermann et al., 2019; Tuomi et al., 2020). Through data analysis, AI can save time and contribute to more targeted and personalized customer communication (Tussyadiah et al., 2021). This enhances the customer experience and can increase the likelihood of reaching and persuading customers to purchase advertised services (Alt, 2021). Furthermore, mobile apps have the potential to contribute to tourism safety by providing real-time information in dangerous situations, such as natural disasters (Dorcic et al., 2019).

Gathering travellers' information for analysis has been criticized in terms of data protection and privacy rights (Dorcic et al., 2019); however, a detailed examination of the issue is beyond the scope of this study. Huettermann et al. (2019) suggest that digital tools will be indispensable to future visitor management processes and stressed the importance of integrating new tools into existing applications. They pointed out that potential users are often unwilling to download separate apps, resulting in a user pool that is insufficient to generate value on a large scale. This aligns with Birenboim et al. (2023), who found global apps to be more efficient than local apps and thus suggest that local DMOs collaborate with global tourism app developers to benefit from their large user pools and give their apps more impact. Similarly, Cearra et al. (2021) discuss the challenge of 'atomization' (p. 1), which is when similar innovative solutions coexist regardless of each other.

The Value of Digital Innovation for Tourism Entrepreneurs

Innovation – instigating change and inventing new solutions – is closely linked to entrepreneurship. Several studies have discussed the potential for rural tourism lifestyle entrepreneurs to respond to challenges with creative solutions (Ateljevic & Doorne, 2000; Dias et al., 2020; Dias et al., 2022; Peters et al., 2009). The majority of Nordic tourism entrepreneurs, including those in Iceland, can be classified as lifestyle entrepreneurs (Atladóttir et al., 2023). Little is known about the role, contribution, and potential of these entrepreneurs in tourism development processes in Iceland, especially with regard to the application of digital innovation. Only recently has research explored the dynamics and value rural tourism entrepreneurs in Iceland attribute to the application of digital innovation in their businesses. Falter and Jóhannesson (2023) demonstrate how the motivation to digitally innovate varies widely among lifestyle entrepreneurs and is dependent on the values each entrepreneur attributes to their business. For example, lifestyle entrepreneurs often associate

digitalization with automation, heavy industry, and a lack of personal interaction, whereas more growth-oriented entrepreneurs tend to focus on the positive aspects of digital innovation (Falter & Jóhannesson, 2023).

Entrepreneurs are pivotal in driving innovation and smart processes (Williams et al., 2020); however, a number of obstacles hinder them from applying innovation and digital solutions. Apart from logistical reasons, such as a paucity of time and financial resources, a lack of knowledge about how to be innovative and a fear of taking risks often prevent entrepreneurs from becoming more involved in digital innovation processes (Rodríguez et al., 2014; Rosalina et al., 2021). Furthermore, Rodríguez et al. (2014) posit that public institutions tend to design tourism innovation strategies without including tourism businesses in the process. Falter and Johannesson (2023), who observed this tendency in Iceland, discuss how insufficient communication among tourism authorities and entrepreneurs hinders entrepreneurial endeavours, particularly with regard to the application of digital innovation. Therefore, the following section briefly discusses the role of the governing authorities in creating an environment that fosters the development of digitally innovative initiatives.

National Strategy to Foster Digital Innovation in Tourism

Feld (2012) refers to a gap between the government – including central authorities, the state, and local governmental institutions – and entrepreneurs, in which authorities often lack an understanding of the foundation needed for entrepreneurial endeavours to flourish. In a study about Nordic policies regarding digitalization, Randall and Berlina (2019) indicate the imperative to acknowledge that digital solutions do not automatically foster sustainability; governance guidance is needed to instigate positive change. They suggest 'multi-level governance arrangements, including vertical and horizontal dimensions, as well as cross-sectoral collaboration' (p. 16), highlighting the key role governmental initiatives play in fostering a variety of collaborations, from the political level to the inclusion of businesses. Similarly, Obaji and Olugu (2014) see the government as being responsible for laying the groundwork for entrepreneurial activities. Strong collaboration between several stakeholders is also discussed by Goebel et al. (2020), who claim that local communities are often not included in decision-making processes related to tourism development in their own areas, leading them to miss out on opportunities to present their ideas and shape development according to their needs. Mazzucato (2018) argues that the government should actively promote networking and sees the government's role as that of a provider of basic necessities, while private businesses are the main drivers of creativity and digitally innovative

development. In the following section, the Icelandic tourism landscape is described in more detail, and current happenings related to digital innovation are illuminated.

Study Area: The Tourism Landscape in Iceland

Tourism in Iceland falls under the responsibility of the Ministry of Culture and Business Affairs (Department of Tourism), which controls the development and execution of Icelandic tourism policy and the coordination of collaborative partners, such as the Icelandic Tourist Board (*Ferðamálastofa*) and Business Iceland (*Íslandsstofa*). The former, an independent authority under the umbrella of the minister in charge of monitoring and promoting Icelandic tourism as an economic pillar, focuses on the societal aspects and the care of the natural environment with regard to tourism. Meanwhile, Business Iceland is a public–private organization that oversees exports and investment in tourism as well as marketing communications, campaigns, and the official tourist webpage.

At the time of data gathering, Icelandic tourism was undergoing internal structural changes caused by the 2021 governmental elections and the effects of the COVID-19 pandemic. The Icelandic Tourist Board has also undergone changes at the managerial level. Hence, in the interviews, discussions on Icelandic tourism development at an institutional level were affected by what one of the interviewees described as an 'atmosphere of re-orientation'.

After the eruption of Eyjafjallajökull in 2010, Iceland received considerable international media attention, which resulted in it becoming a popular tourist destination (Benediktsson et al., 2011). Tourism became the main economic pillar in the country, with 2.3 million international visitors in 2018 – a ratio of almost seven tourists to every one inhabitant. The majority of tourists go to Iceland because of its natural attractions, with most visiting the capital area and the South Coast (Huijbens & Jóhannesson, 2020). Due to overcrowding, especially at the most frequented tourist sites, negative experiences have occurred, bringing overtourism to the fore of discussions on tourism in Iceland (Sæþórsdóttir et al., 2020b; Wendt et al., 2022). This has been picked up by international media, resulting in the country being portrayed as a victim of mass tourism (Sæþórsdóttir et al., 2020a).

Due to the influx of tourists, discussions on sustainable tourism development and visitor guidance have also emerged. The official vision for tourism development aims for Iceland to be 'leading in sustainable tourism development by 2030' (Ferðamálastofa, 2020, p.1). The application of digital tools is considered a possible tool to contribute to this goal. The Icelandic Regional Development Plan 2022–2036 envisions fostering digitalization in various areas (Stjórnarráð Íslands, 2022). A specific goal is to encourage Icelandic companies

to apply digital solutions to stimulate a growing and resilient business environment. In addition, fostering a 'green and smart Iceland' (Stjórnarráð Íslands, 2022, p. 19) in relation to digital solutions for public services, innovation policies, or municipality policies is envisioned, including a digital innovation portal for entrepreneurs that will provide materials and information to promote local and regional innovation.

There are seven marketing offices in Iceland that manage tourism in different areas. Some of these offices are under the auspices of particular DMOs, while others are independent entities. The areas they promote vary widely, from rather remote tourism destinations to oft-frequented areas (Huijbens et al., 2024).

Until 2021, the Icelandic Tourist Board had a digital manager who was in charge of digital education initiatives for tourism businesses and gathering data for mapping the current state of digital competencies (Ferðamálastofa, 2020a). Despite the digital plans implied by the official tourism vision, examples of applied technological innovation in Icelandic tourism are scarce, and at the time of the writing of this chapter, the position of digital manager had not been filled. Recent tourism education project initiatives have a strong focus on including small tourism businesses throughout the county. TOURBIT[1], for example, is an international programme with the aim of empowering tourism entrepreneurs with various digital tools for their businesses, which indicates a growing interest in involving small businesses and tourism entrepreneurs. In their study of digitalization policies in Iceland, Randall and Berlina (2019) observed a lack of collaboration and concrete strategy in the case of digitalization in Reykjavík; however, the study did not focus on tourism development and was limited to the capital area.

Research Methods

This study followed a mixed methods approach, meaning that both quantitative and qualitative data were gathered. For an overview of the existing tourism apps in Iceland, desk research was conducted through a Google Play Store search. To explore the perceived status of applied digital innovation in the Icelandic tourism sector, semi-structured interviews with eight tourism representatives were conducted. The goal of these interviews was to obtain insights into the views of a range of actors who support the tourism industry in Iceland. Table 1 outlines the interview participants and the techniques used for sample identification.

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[1] https://www.icelandtourism.is/tourbit/

Table 1

Interviewee Type Sampling

Interviewee type	Referred to in the text	Number of interviewees	Sampling technique
Institutional Level	Institutional Interviewees **II-I** **II-II**	2	Purpose-sample technique. The two main institutions, Íslandsstofa and Ferdamálastofa, were contacted.
Business Level	Business Interviewees **BI-I** **BI-II**	2	Snowball technique through the author's network.
Local Level	Local Interviewees **LI-I** **LI-II** Destination Management Organisation Interviewees **DMO-I** **DMO-II**	4	Purpose-sample technique. Emails were sent.

The selection criteria were as follows: the institutional interviewees were representatives of the two main tourism institutions in Iceland. The business interviewees held consulting roles and were involved in local and national projects that foster digital innovation. They and the local interviewees were chosen via the snowball technique, with connections stemming from the author's professional network. The DMOs in Iceland that manage tourism were approached via email, and those who responded were interviewed.

The interviews were conducted both in person and online and lasted about 30 minutes each. The conversations ranged from general questions about the interviewees' perceptions of applied digitalization in tourism to digitalization as a potential tool for fostering sustainable tourism in Iceland; specific examples were referenced. Another topic was the perceived usefulness of existing tourism apps and whether and how a holistic Icelandic tourism app could contribute to fostering tourism sustainability. The interviews were recorded, transcribed, and analysed based on grounded theory techniques (Strauss et al., 1994), with themes identified through rounds of open and axial coding using the coding programme ATLAS.TI.

FINDINGS

In line with the literature review, the following themes were identified in the interviews: the interviewees' perceptions of the status of digital innovation in Icelandic tourism, the potential

of mobile applications and the challenges of upscaling, the application of digital innovation in relation to SDG 9, and what is required for tourism entrepreneurs to contribute to digital innovation and the role of governmental involvement in this regard.

The Status of Digital Innovation in Iceland

When asked about their perceptions of 'ongoing developments' in Icelandic tourism, the interviewees' answers varied widely. The business interviewees spoke rather critically about the current status of digitalization. The majority referred to a perceived tech deficit rooted in the lack of widespread knowledge about digital innovation and the small size of most tourism businesses, which leads to a scarcity of both time and financial resources. The participants believed that these businesses did not see investment in digital innovation as a priority, in relation to which BI-I emphasized the low level of education in Icelandic tourism.[2]

At the institutional level, the status of digitalization was perceived as 'a little bit behind' and still in 'the early stages' (II-II), with the large market leaders primarily having the financial capacities and skillsets to make use of digital developments. Finding ways to grant small and medium-sized companies access to both data and know-how to enable them to benefit from digital marketing strategies, for example through the surveillance of customers' bookings and search behaviours, was seen as an ongoing challenge (II-II). Such insights could help companies target their digital marketing more specifically and influence customers' decision-making in the pre-trip stage.

The local interviewees were, in general, more content with the status of digital development; however, their perceptions differed significantly between regions. DMO-I described the awareness and skillsets related to digital innovation within DMOs as varying, saying, 'Some of them are a bit better than others'. They indicated a gap and said that many DMOs 'haven't seen it so far as their task to step in' where digital development is concerned. According to these interviewees, DMOs do not yet see digital development as a priority when it comes to distributing their limited funding. In contrast, LI-I was content with the extent of digital development in Icelandic tourism and pointed out various ways they applied digital solutions, ranging from travel planning tools to AI-powered marketing content management systems.

DMO-II, who represented a less-frequented area of Iceland, saw the role of their local DMO and marketing office as supporting local companies in developing their digital skills, for example, through specialized training and courses. Local tourism businesses have requested seminars on basic digital marketing and social media competencies, and such

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[2] To my knowledge there is no formal overview of the educational background or level in the tourism sector

courses have been well received. Despite the high demand for such training, the DMO has yet to provide more extensive education in digital innovation, judging that this does not fit local business needs or interests.

Mobile Applications and Digital Projects in Iceland: The Challenge of Upscaling

As indicated by Birenboim et al. (2023), smartphone usage has become essential in the contemporary tourism industry, and smartphone apps play a key role in smart tourism development. However, when asked about best practice examples of an Icelandic tourism app that showcases digital innovation, the majority of the interviewees were unable to name a specific one. A search in the Google Play Store with the keywords 'Iceland Tourism' failed to reveal any official apps related to Icelandic tourism but did produce apps such as international booking platforms, a hostel travel app, and an app about weather and road conditions. Only two apps had more than 10,000 downloads, both of which were based on non-Icelandic app templates. In relation to this, BI-II stated the following:

> Yes, I mean, there are tourism apps. Many of them are just individually owned. They haven't thought funding through, they haven't thought marketing through. Some of them overlapped.
> *BI-II*

The Icelandic tourism app landscape is perceived as scattered, and existing apps are seen as lacking focus or are unknown (BI-I). The majority of tourism apps stem from entrepreneurial activities and are usually implemented by individuals, disconnected from the overall context, and not embedded into a wider strategy. This tendency of digital Icelandic initiatives to be 'one-man projects' that operate on a very small level is seen as hampering digital innovation on a larger scale (BI-II, DMO-I):

> Being spread out very thin is usually not very good. A lot of individuals working on tiny projects with tiny businesses will lead to a lot of tiny projects.
> *BI-II*

Criticism was voiced regarding how individual endeavours are usually not embedded into a larger strategy and are often conducted by people with little experience, leading to the risk of remaining undiscovered due to a lack of marketing skills. As a further possible reason for the scattered digital landscape and (according to the representatives) the slow development of digital innovation in the Icelandic tourism sector, one of the interviewees referred to the Icelandic 'do-it-yourself' mentality:

> Iceland basically loves to make all the mistakes others have made. They think it is always better to have something done and spend a lot of money on it than to have some Icelandic IT company.
> *DMO-II*

Upplifðu, a platform for planning trips and highlighting tourism destinations that was jointly initiated by DMOs of Iceland, was mentioned by three interviewees. Against expectations, this platform did not scale up and has not been extensively used by tourists at the time of data gathering. Some of the interviewees wondered if a better use for the funding spent on this project would have been a collaboration between existing projects rather than the creation of something new (BI-I, DMO-I). In contrast to this criticism, many representatives at the local level mentioned the Upplifðu project as a best case example of digitalization.

Entrepreneurial Digital Initiatives and Their Potential Contributions to SDG 9

Having focused on digital solutions instigated by tourism institutions, the following section sheds light on entrepreneurial digital solutions through the example of Wapp, a hiking app. Wapp, which was mentioned by two interviewees, is well known among Icelanders and has gained extensive media attention. It was designed by an Icelandic entrepreneur and uses GPS-activated pop-up facts about particular hiking areas throughout Iceland. The Google Play Store search showed Wapp only in the 'related search results'; thus, it was not obviously identifiable as an Icelandic tourism app. One of the interviewees posited that Wapp 'showcases how tourism apps can contribute to sustainability goals' (BI-II); however, it did not catch on as a scaled-up tool for tourism development.

> Wapp is not big; it is just a proof of concept. It is too big a task for one person to do it himself. […] A lot of things are possible, if you have a hiking app like that, and most of the routes are mapped, and some of them go through private land, some go right by sheep sheds, but during some seasons you might not want people to walk by. The good thing about an app is that you just close the route at that time. Or if it has been raining considerably, and the moss is peeling off, you will close the route as well. You can't do that with a guidebook; the route will be there for 20 years.
> *BI-II*

The business interviewees stressed the benefits of such an app, in terms of both visitor management and the protection of nature: sensitive routes can simply be marked as closed during some seasons of the year, and information can be adapted according to circumstances. Many interviewees highlighted the benefits of a digitalized form of visitor management in contrast to traditional booklets.

Most of the interviewees, especially the business interviewees and one DMO interviewee, saw great potential in a holistic Iceland-specific tourism app to address issues related to sustainable tourism development. The local-level interviewees showed interest in and recognized the benefits of an Iceland-specific tourism app, but they remained more neutral and were not overly enthusiastic about the idea. Their main concern was ensuring that each region could access and manage its own area independently (DMO-II).

The interviewees who saw value in such an app referred to the potential to improve targeted visitor guidance through real-time information on, for example, tourist density, parking situations, or weather conditions at tourist destinations. However, an Iceland-specific app has not yet been implemented. BI-I believed that the implementation of such an app failed due to practical complications: not only was the idea rejected by the larger tourism companies, but it also received little approval at a political level, and the question of ownership remained open. BI-I stated that they would take the lead in implementing an app 'if the ministry would assign [them] with the implementation through their service contracts' (II-II).

Other major challenges related to developing an app inter-institutionally include questions concerning data access, rights, and security. Business Iceland already possesses the relevant data for its official website, but it has not been used for reasons related to data protection (BI-I). The fact that official authorities are not allowed to profit and can only act as resellers has further impeded app development. For example, such an app could provide options for planning a journey to Iceland but not options for booking tours and activities.

National Strategy for Digital Innovation

When asked what would be needed to raise the level of digital innovation in Icelandic tourism, the business interviewees called for top-down initiatives as a starting point, arguing that 'the push doesn't come from the bottom-up' (BI-I). Some of the local interviewees, however, criticized the top-down communication of digital development plans that occurred in the past as having created a distorted picture of applied digital innovation. One interviewee smilingly remembered how it was introduced as a scenario 'in the near future, where there are no more people and robots will be changing the bed sheets' (DMO-II). Rather than seeing its potential as a tool that can save time and assume the more tedious tasks, the idea of an automated, inhuman future has led to a stance against digitalization within the tourism industry. This seems to be rooted not only in a lack of knowledge but also in a lack of trust:

> Because you need to introduce such things to people. This is like a government thing; you have to initiate it, follow up on it, and make sure it's used.
> *DMO-II*

The rapid tourism growth of the 2010s negatively influenced media reports about Iceland as a tourism destination, and the country has increasingly been used to showcase how adventure tourism can lead to overtourism. II-II saw a great opportunity in the post-COVID period to 'do things right'; they believed one of the main roles of the Icelandic Tourist Board was providing small businesses with tools, such as relevant data and the skills to use it

strategically in their marketing. II-II further referred to digitalization as a way to counteract seasonality and local signs of overtourism at Icelandic nature attractions.

> There were periods [in Icelandic tourism development], just like with horses, when nobody was holding the reins. And then COVID came. And now there is growth again, but I think there is a general consensus in the industry (…) We want to do this well!
> *II-II*

Discussion and Concluding Remarks

The goal of this chapter was to investigate how representatives of the Icelandic tourism support system perceive the value and status of applied digital innovation as a tool to foster sustainable tourism in Iceland. A further aim was to explore what may be preventing the successful implementation of digital solutions in the Icelandic tourism industry. Most of the interviewees saw a need for action with regard to fostering digital innovation. The business interviewees seemed to approach digital development in tourism with a clear view of the overall picture. They were critical of the low level of digital skillsets among tourism businesses, which often lack access to large datasets that can provide a marketing advantage. The variations in the different groups' perspectives on the current status of digital innovation were particularly obvious in discussions about Upplifðu. While some interviewees stressed the success of this platform, BI-I used it as a 'worst case example' and criticized its lack of collaboration and failure to make use of existing platforms. The tendency of Icelanders to do everything themselves instead of collaborating or consulting experts was also criticized by DMO-I. This 'do-it-yourself' mentality (Falter et al., 2022) and reluctance to collaborate could negatively influence digital development in Iceland, as can be seen in the current scattered digital landscape. A lack of knowledge about or acknowledgement of existing digital solutions often results in 'reinventing the wheel', and digital solutions are developed independently of one another. The interviews revealed that this has resulted in an insufficient user pool and an inability to upscale, both of which could be provided by platform solutions (Hein et al., 2018). Indeed, many digital endeavours have failed to be applied extensively; thus, they contribute little to holistic tourism development. The example of Wapp shows how high-potential entrepreneurial initiatives can contribute to sustainable tourism development. However, due to the lack of a national strategy, individuals and apps are at risk of not catching the attention of tourists. It is essential that decision-makers have an overview of the existing digital solutions instead of developing separate initiatives in different locations. The goal of the Icelandic Regional Development Plan 2022–2036 to create a digital innovation portal for entrepreneurs indicates a first step to bridge this gap. An official platform could

counteract the current scattered digital landscape, in which many similar solutions coexist. Furthermore, entrepreneurial initiatives could be used to solve challenges by providing specific targeted information.

As shown in the literature review, the limited national strategy is only one of many obstacles hindering the successful implementation of entrepreneurial endeavours related to digital tourism in Iceland. At the entrepreneurial and business levels, tourism actors do not always possess the required skillsets, financial resources, or time to become digitally innovative.

The potential of digital solutions, specifically mobile applications, to foster tourism sustainability in response to SDG 9 was mentioned in the discussions about an Iceland-specific tourism app. The business interviewees, in particular, saw the potential of an official app to manage issues related to mass tourism by providing targeted information and thereby contributing to an even distribution of tourism across Iceland. The root of the disagreement about data ownership and protection in an Iceland-specific app lies beyond the scope of this research.

Due to the wide range of perceptions among the various stakeholders regarding the current status of digital innovation, an essential next step for the successful implementation of digital solutions is to define the direction in which development should proceed. The Icelandic Regional Development Plan's vision for a 'green and smart Iceland' indicates that digital solutions are anticipated to contribute to fostering sustainability. Best practice examples of how this could manifest would increase understanding and lower the access barriers for entrepreneurs to contribute. This aligns with the recommendation of Randall and Berlina (2019) to increase multi-level collaborations fostering digital development. The call of some interviewees for a top-down 'push' for the digital development of the Icelandic tourism industry aligns with Mazzucato (2018), who emphasizes the government's role in establishing networks and collaborations, which create the groundwork for bottom-up empowerment and thus for entrepreneurial endeavours to thrive. For example, embedding Wapp within a larger strategy wherein issues regarding data rights and ownership are clarified could ensure that the impact of such an app is scaled up to be meaningful and contribute holistically to tourism sustainability.

A first step for fostering digital development in Icelandic tourism is a thorough mapping of the Icelandic tourism industry's digital landscape to gain an overview of the existing projects and solutions and decide whether certain initiatives can be combined. Funding could then be used to integrate entrepreneurial endeavours into this process. Calls for

entrepreneurial initiatives to address particular challenges can be made, which would establish a foundation upon which entrepreneurial endeavours could scale up and reach their full potential by being accessible to a larger user pool instead of fading away.

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APPENDICES

Appendix 1: Interview Guide Publication 1 and 2

Appendix 1: Interview Guide: Publication 1 and 2

A, General introduction

1. Can you tell a bit about your institution/business?

2. Where is your business situated?

3. What is the core idea behind your current business?
   How did you make it happen?
   Is it already like you have always wanted it to be?

4. Is there an "innovation landscape" in Iceland in your understand?
   How would it look like if you had to illustrate it?
   How would you draw it?
   (Map with actors, or just any picture that comes into your mind that describes that)

5. What was difficult when you started?
   Whom did you have contact to in the beginning? Which contacts were helpful for getting it started?
   Whom do you have contact to now?

6. Who is your scene? These "significant others" that helped you enabling your business?
   Can you draw a map of this?
   How does your scene and the landscape interconnect?

7. Who is the target group of your business? Where do you promote your business online?

B, Location and place and "what if"

8. Why are you (and your business) located where you are?
   What does it mean to you to be here? Can you give me an example?

9. What is challenging to be at this location?
   Can you give me an example?

10. Can you give me 3 significant words to describe what is good on your location, and another 3 words to describe what is bad?

11. Do you think these descriptive components you mentioned above, are they a general thing how things are between urban and rural in Iceland?

12. (If something in regard to 'digital' is mentioned there):
    Why do you think there is a difference in digital applications between the urban and the rural?

13. What would be different if you were located at any other place in Iceland?

14. Now think about your business as if it was located in Reykjavík.
    What would be good, what would be bad? 3 words each.

15. How (and if so) has all this changed since you have started your business?

16. What is the value of your business for the local community?

C, Talking about innovation

17. What is "innovation" in your understanding?
    Can you illustrate "innovation"? Just any picture (or word) that comes into your mind.
18. Can you give me one example how you or your business is really innovative.

19. How has your "innovative behaviour" changed within the last three years?
    Why has it changed?
    Did something trigger you?

20. Do you want to be more innovative?
    How, can you give me an example?

21. Is there anything that hinders or restricts you from implementing your innovation plans?

22. Do you think you can do that alone?
    Whom do you need to reach your goal to be more innovative??

23. How would the "best case scenario" for you look like?
    Where are we aiming at in a long-term sight?

D, Tourism

24. Can you describe the tourism Sector in whole Iceland with 3 sentences?

25. Can you describe the tourism sector in your area with 3 sentences?

26. How does the Icelandic tourism industry work to boost innovation?

27. How do you work to boost innovation in the Icelandic tourism industry?

28. Does the Icelandic tourism industry get support from (private) tourism companies in order to boost innovation?

29. What is your view, how do tourism companies in Iceland, and especially in your region, use ir work in digitally innovative ways?
Why (not)?
Examples.

Appendix 2: Interview Guide publication 3

Appendix 2: Interview Guide: Publication 3

1. **How did you like Hacking Hekla Sudurland?**
   1.1. What was good? (one example)
   1.2. What was bad? (one example)
2. **If you take part in another HH, what would you like to have more or less of?**

3. **When did you hear the first time of Hacking Hekla?**
   3.1. Before me or Svava approached you?

4. **Why did you agree to be with?**
   4.1. What about Hacking Hekla seemed to be attractive or interesting to you?
   4.2. What was decisive that you made that commitment of being with?

5. **Who do you think benefits from Hacking Hekla?**
   Why?

6. **What do you think is the effect of Hacking Hekla for South Iceland?**
   Did Hacking Hekla change anything?

Appendix 3: Interview Guide publication 4

Appendix 3: Interview Guide: Publication 4

1. **What is your impression: what is the status regarding digital innovation in Icelandic tourism?**

2. **How could the tourism industry make use of digital innovation?**

3. **Do you know any Icelandic tourism apps?**

4. **What is your opinion, how are apps used in Icelandic tourism? Are they used strategically? For whom are they useful?**

5. Follow up question:
What do you think of an Iceland tourism app?
Do you think it could be a tool to increase tourism sustainability?
How?

6. Often the initiatives for developing tourism apps are implemented by local individuals, local DMOs or entrepreneurs that raise some (limited) funding. In literature it has been criticized that such apps, often have limited downloads that do not scale up.
Do you think this is also the case in Iceland?
What do you think about that? Do you agree, if yes why, if not, why not?

7. **Who should be the one taking initiative for digital endeavors? How should that happen? Who would be needed?**

8. **What do you think are the reasons why it has not happened yet?**