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Challenges Developing a Digital Marketing Roadmap for a MedTech startup in Ireland.

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Abstract

The background to the study, Ireland is the second-largest MedTech export in the EU (Ardill, 2019) and is the largest exporter of Medtech products in Europe; annual exports total reports at €10.2 billion, but there is also a 90% failure rate in Irish startups in the first five years. The global pandemic has highlighted the need to have a digital presence to enter the market.

The primary objective of this study was initially to create a digital marketing roadmap for MedTech startups in Ireland. However, after reviewing existing literature, theories, and in-depth interviews, the researcher identified the many challenges a startup faces before reaching the digital marketing stage. The researcher sought to explore this further and pivoted to research the challenges of developing a digital roadmap for MedTech startups in Ireland. The researcher will outline any applicable research gaps and provide recommendations on digital marketing channels that could be used as part of this digital roadmap.

Research Method: The primary data was gathered through six interview case studies, a survey and desk-based research; grounded theory was used to form the topic questions to analyse and deconstruct the collected data. The interview sample size was taken from four MedTech companies, one FinTech company and a digital marketing industry expert. The survey sample size was taken from forty-five start-up companies within the MedTech sector.

The key findings were that Ireland is viewed as an ideal incubator for MedTech startups globally. However, many challenges were identified, such as funding, seed investment, regulatory policies, marketing knowledge, attracting and maintaining talent. There was evidence of support at early and high-performance stages but a significant gap between these milestones to succeed as a MedTech startup. There was a significant disparity between the literature and the findings from the interviews, so recommendations were made to conduct further observation and investigation.

Key Words: Digital marketing, MedTech startup Ireland, Funding

Declaration

National College of Ireland

Research Students Declaration Form

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Chapter 1: Introduction

1.1 Background

The Irish MedTech sector has over 450 businesses, with 60% Irish owned, and is globally in the top five Medtech hubs (Ibec. i.e., 2021). Ardill (2019) stated: “These startups design and develop solutions for unmet clinical needs. Ultimately, these MedTech startups save lives!”. There have been investments of €316 million in 2020 (Hughes, 2019). MedTech growth forecast is set to €640.9bn by 2023 globally (Enterprise.gov.ie. 2021). To put this in perspective, the overall failure rate of Irish startups is around 80% in the first five years (Percival, 2010). Ireland has over 32,000 people employed in the MedTech sector (Med In Ireland, 2021).

Ireland is the second-largest MedTech export in the EU (Ardill, 2019) and is the largest exporter of Medtech products across the EU; total reports at €10.2 billion annually. Ireland is ranked first for employable graduates and the second-largest exporter of MedTech products in the EU (IDA, 2021). While the lower corporate taxes make Ireland an ideal business climate for startups, it ranks 12th in a list of countries with the worst access to venture capital (Kennedy, 2019).

The statistics show that while Ireland ranked highly globally and in the EU in terms of the regulations and providing a supportive ecosystem, there is still a very high failure rate. The MedTech startups are developing solutions to save lives, and preventative measures need to be taken to reduce the level of failure. Chaffey and Ellis-Chadwick (2016) noted that while most companies have a digital marketing engagement, less than 49% have a clearly defined digital marketing strategy.

The TechIreland report 2020 (Earley, 2020) noted a drop in funding, while Ibec (2019) report noted that early-stage or pre-revenue companies reported cash flow concerns. Figure 1. below demonstrates the long history of the development of the Irish MedTech environment, and, at a glance, it is imposing, with the likes of Google in 2002 and Johnson & Johnson in 2021. Ireland is proud of the MedTech environment, and it has been evolving since 1847, but the current trends are showing a dip in funding levels and early seed investment and a rise in failure rates.

Figure 1. Why Ireland for MedTech Timeline

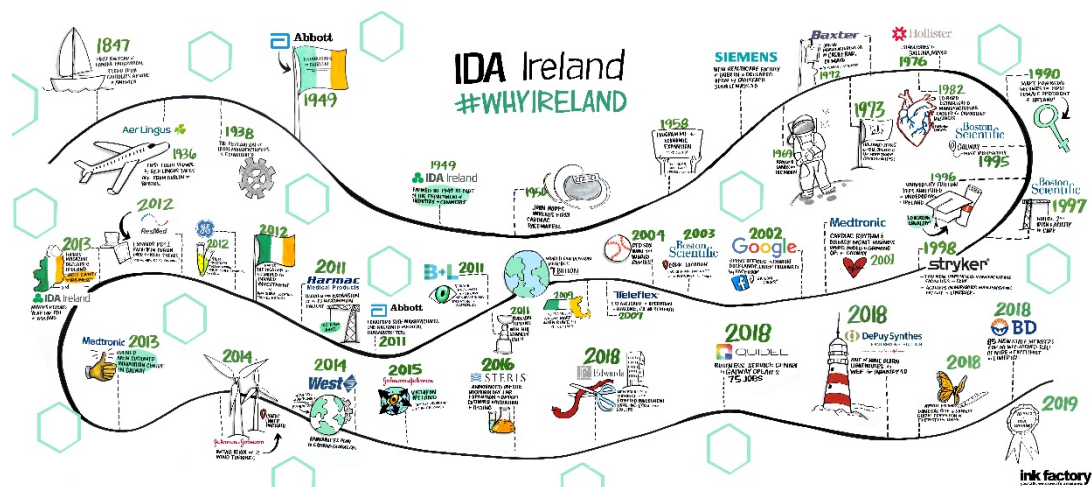


Image Source (IDA . i.e. 2020)

1.2 Core Concepts

The core concepts for this study are:

- MedTech startups
- Irish startup environment challenges
- Digital marketing channels and investment in marketing

1.3 Justification for Research

Doran, McCarthy and O'Connor (2018) stated a gap in Irish research; while there has been much research regarding startups, there was a lack of understanding specifically around failures due to financial issues as financial specifics were not shared in articles. Existing literature lacks specific details regarding reasons for the success or failure of a startup.

Common challenges faced by startups in developed and developing worlds are financial stability, lack of industry knowledge, and attracting and retaining talent (Gupta *et al.*, 2020). Zwillling (2013) stated that existing research mainly focused on the “first valley of death” phase rather than how startups can be commercially successful. Xu and Du (2012) noted that companies failing were through a lack of market research and understanding.

The research hopes to investigate the literature surrounding startups and challenges, focusing on the MedTech sector, developing a digital strategy to combat failure rates. Ireland is one of the top five MedTech hubs globally. Making it a vital industry for the Irish economy and, as such, an industry worth researching.

1.4 Research Problem, Questions and Objectives

The overall aim of this study is to explore Challenges in Developing a Digital Marketing Roadmap for a MedTech startup in Ireland, using digital marketing to reduce the risk of failure in new startups, align missions and goals to have a strong brand and presence, attract investors and the right talent, which are significant issues for new startups.

Questions

- What are the most prominent reasons for the failure of startups?
- What marketing channels are most suitable for startups?
- Best practice in digital marketing
- Do companies value and invest in marketing?
- Gaps in research

Objectives

RO1 Understand challenges a startup encounters in the early stages

RO2 MedTech startup regulations in Ireland

RO3 Evaluate digital channels against industry leaders and examine if companies invest in marketing

The primary research is conducted qualitatively, using semi-structured interviews conducted over Zoom with senior management of MedTech startups.

1.5 Structure of the Thesis

This thesis will commence with an introductory chapter to set out the background for the study, the motivation, and the objectives. Chapter two sets out the literature review, introducing the main concepts for MedTech startups in Ireland and digital marketing channels. The methodology section will set out the research context and justify the approach and methods used alongside core concepts for data collection and analysis, including questions and interview question creation.

The methodology will be analysis findings in the third chapter, where the author breaks down the key findings from the semi-structured interviews and the survey. Then in the discussions section, the study's practical implications and limitations are discussed. In the final chapter, the conclusion summarises key findings and sets out future recommendations.

1.6 Value of this Research

The research will add value as little literature exists on why MedTech startups fail or the specific use of digital marketing to help launch MedTech to the market. Irish MedTech sector is growing steadily with a 4.5% growth in 2019; this is attracting new investment opportunities in Ireland as well as developing life-changing tech (Ibec . i.e., 2019)

The next chapter will critically examine the relevant literature to the objectives of this study.

Chapter 2: Literature Review

2.0 Introduction

Here, the researcher critically examines MedTech startups in Ireland and why they fail and examines digital marketing channels, using up-to-date, relevant literature. In reviewing the current literature, the researcher will identify gaps and where the study will help fill the gap and form the eventual research objectives and questions.

2.1 MedTech Startups Ireland

Forbes (Sanyal, 2021) defines a startup as a young company developing unique products and services to bring to market to make it irresistible and irreplaceable in the hearts and minds of consumers—generally rooted in innovation, focusing on filling an existing need for services or products. Others define a startup as a company that has been in place for ten years or less (Laari-Salmela, Mainela and Puhakka, 2017). Due to their innovation and the nature of a startup, they are often called disruptors, defined as something that brings a different proposition to the market (Christensen, 2016). Ardell (2021) defined a MedTech startup as “These startups design and develop solutions for unmet clinical needs. Ultimately, these Medtech startups save lives!”

Irish MedTech companies collaborate to support one another, and in the last 50 years, the number of companies has gone from 50 to over 450 (Med In Ireland, 2021). The Irish MedTech sector is home to 9 of the world's leading companies; of that number, 60% are homegrown, and there has been an investment of €316 million this year. Ireland is the most significant employer per capita in the EU, with 38,000 people employed in the sector. It is estimated that MedTech sales will reach over €520bn worldwide sales by 2021, representing growth from 2017 – 2021 of €168.6 billion (Ibec. i.e., 2019)

The MedTech industry in the EU employs 730,000 professionals, across 32,000 MedTech companies, with small to medium enterprises making up over 95% of this figure, with 7.4% of GDP spend on medical technology (Burke-Kennedy, 2020). Ireland is the centre of excellence for MedTech companies, ranked first for levels of employable graduates, and the second-largest exporter of MedTech products in the EU (IDA, 2021). There was a 37% rise in the numbers of startup registrations in Ireland in quarter three of 2020; companies registered between July and September were 5,482. Ireland is home to eighteen of the world's top 25 medical manufacturers (Burke-Kennedy, 2020).

Ireland has an established ecosystem where a MedTech startup can strive and grow, with key ingredients readily available to pharma and tech companies. IBEC is putting Ireland on the map as the go-to country for connected health and innovation as a strategic location; the MedTech market exported MedTech worth over €3bn in 2006, which has grown to €12.6bn by 2016 (Hughes, 2021)- check the Hughes references. Ireland's policies in terms of intervention are considered best practice internationally, particularly in regulation innovation and high-potential startup encouragement (OECD, 2019). Critically though, even with the supports and funding mentioned, there is still a high level of failure of startups in Ireland; an article in the Irish Examiner stated that 80% of Irish enterprises fail in the first five years (Percival, 2010). We will look at this further in the next chapter, examining barriers to success in startups.

2.1.1 Startup Barriers – Fundings

Startups can fail for many reasons, including internal, external factors. Future success can rely heavily on the way the company learns and recovers from its setbacks. Internal factors can include motivation, and demographics while external factors are market stability, economic growth, and competitors (Nikolić *et al.*, 2019); a willingness to learn the industry is also a vital attribute for startup entrepreneurs (Gupta *et al.*, 2020). There is a practice in the entrepreneurship ecosystem in Ireland to bet on the winner, which means that only high performers will be considered and eligible for support (Cooney, 2017). Wreckler (2020) stated that Irish tech funding was set to exceed €1bn, there has been a notable fall in first-time funding rounds, and more needs to be done to encourage investment in startups.

Critically, the Organisation for Economic Co-operation and Development (OECD) and Enterprise Ireland show there are many forms of funding available; the Development Capital Fund €225M, Innovation Fund Ireland €125 M, Enterprise Ireland Seed and Venture Capital Scheme €175 M, and five mentoring sessions for startups. Ireland is ranked 2nd in Europe as a hub for MedTech companies, potentially accessing five hundred million in Disruptive Technology Funds (Hughes, 2019).

The TechIreland report 2020 noted a drop in funding, and while levels were still €545m, they were lower than anticipated; the article also noted that early startups find it difficult to raise funding (Earley, 2020). While the lower corporate taxes make Ireland an ideal business climate for startups, it ranks worst in the top 12 in terms of access to venture capital (Kennedy, 2019). A recent report by the OECD stated that while Ireland has a solid set of resources for entrepreneurship, there is a danger of some small to medium enterprises falling between local enterprise and Enterprise Ireland, which mainly focuses on firms demonstrating export potential (OECD, 2019). So, while there are supports at local enterprise stages, a company must demonstrate high potential and/or a desire to export.

Critically, the researcher has identified that there is a limited amount of academic research on how the MedTech startups can commercialise products successfully; a lot of the research focuses purely on the “first valley of death”, which is the phase in which startups fail due to lack of financial funding (Zwilling, 2013). Statistics show that 90% of ventures fail to attract sufficient funding to succeed. Gupta *et al.* (2020) stated that common challenges faced by startups are the lack of financial stability, market and business knowledge, and human capital retention. Xu and Du (2012) noted that only a small number of businesses are successful on their first attempt as one of the leading causes of failure is lack of market research. Eggers and Song (2015) measure success as learning outcomes gained as a result of previous failures

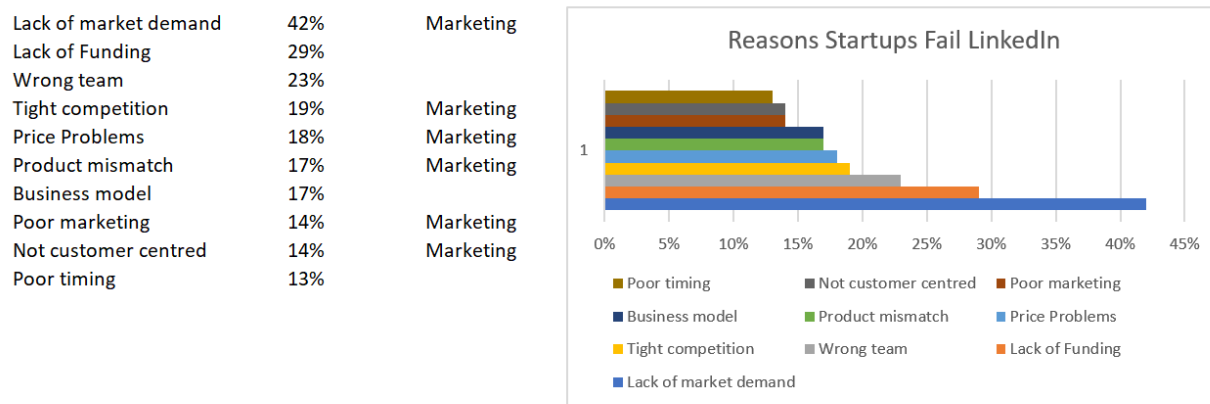
Much research has been conducted on the success of businesses globally, but there is a gap in startups’ research in Ireland (Doran *et al.*, 2018). There has been a substantial omission of revenues and revenue destruction in the literature about startups; this leaves a gap for future study. Another gap identified was the lack of alignment between startup strategies and company missions/development plans; this is one theme addressed within this paper.

A company must align its business strategy with the digital marketing strategy; it has clear objectives aligned with its development goals (Chaffey and Ellis-Chadwick, 2016). In particular, the alignment of strategies in a startup is critical to its success, as a misalignment of both could potentially lead to inefficacy and inefficiency (Centobelli, Cerchione and Esposito, 2017). Critically, Harrigan, Ramsey and Ibbotson (2009) put forward that integrating communication channels aligned with management strategy is an effective way for startups to retain employees.

According to Yohn (2019), with 70% failure rates among startups, one of the primary reasons they failed was not meeting the customers’ needs and not listening or no market need. Another reason was the misalignment of the team between partners, rollouts and vision. When the company is not customer-centric or do not value or care about the customer, they will not succeed. A clear strategy at the early stages of product development is vital; the product or service should have been born out of a ready-made market. As such, all areas of the startup should be built around a customer-centric mindset

As evidenced by Table 1 regarding the top ten reasons a startup fails, six are closely linked to marketing. A strong marketing strategy can anticipate demand which was the leading cause of failure, attract funding for the second highest cause, address pricing, product and competitiveness, and timing, and bring the correct staff on board that aligns with the culture. In short, marketing is a crucial facet to preventing failure, and the researcher will look at digital marketing to create a roadmap for startups to combat the high failure rates.

Figure 2. Top 10 Reasons Why Startups Fail, 2021



Source: Adapted from (Palmieri, 2020)

2.2 Startup Barriers – Regulatory

Kramer et al. (, cited in Heiß, G. 2018) identified that MedTech is a mix of different highly regulated markets. These regulations differ hugely from country to country, and there is a lack of harmonisation for international standards legal provision. This has led to a significant increase in certification investment as these are needed to enter the markets. Research conducted by Chatterji (cited in Heiß, G. 2018) emphasised that economic success is driven by regulatory knowledge more than product or technology. A delay in certification can often delay marketing strategies and time to market, adding additional costs. Small advantages can contribute to greater efficacies for a MedTech start-up, shorter timelines to approval, and profitable product and marketable (Jambulingam, 2018).

In Ireland, medical devices are regulated by the Health Products Regulatory Authority (HPRA), formally known as the Irish Medicines Board (HPRA, 2021). There is a transition underway to EU Medical Device Regulation (2020) and In-vitro Diagnostics Regulation (2022); this has the potential to cause certification delays and the need for many companies to be recertified; this will come into effect in 2023 (Enterprise.gov.ie. 2021). The medical device regulations being overhauled currently is to give greater legal clarity, improve safety, and create a fair market; this will come into effect in May 2023, which will also result in a waiting period of 18 months complete assessments as they will be done on a national and EU level (Mason Hayes and Curran, 2021).

A company must also adopt a quality management system, one of the most popular being ISO 13485 certification; this certification is only valid for five years before the company must again show compliance through an external audit (Regdesk, 2019). Achieving regulatory compliance is expensive; a review by the Health Products Regulatory Authority fees guide (HPRA, 2021) demonstrated the cost for a medical device startup - if they were to have a manufacturing facility based in Ireland and other locations, they could pay up to €61,200 annually. While many classes and tiers will define the cost, additional fees include Type I €5,500 annually up to Type II 7,500 (HPRA, 2021). The certificates and letters of the free sale cost €255 and €25 for each additional letter. Clinical investigations and studies also need to be completed to achieve regulatory compliance, and cost €4,300, with additional resubmission and modification fees.

From a critical perspective, while information can be garnered regarding the cost of specific regulations, the researchers noted a lack of guidance as to specific levels required as per MedTech device or the timelines. An area that could be explored in further research to understand the process better, as a roadmap on regulations would benefit startups.

2.2 Digital Marketing

As one of the fundamental themes of this thesis is digital marketing, and as such, it is vital to define what this means. Singh (2017) stated that digital marketing is practised through platforms such as e-mail, apps, websites and electronic devices. Digital marketing has been described in the simplest

terms as: “Achieving marketing objectives through applying digital technologies and media” (Chaffey and Chadwick-Ellis, 2016, p.57). Taken Smith (2012) elaborated that it was a way to promote products or services across digital channels. Thani Jambulingam (2018) study showed that high-performance marketing in a MedTech could leverage customer insights, achieve strategic focus, and help commercialise and offer the potential to gain a significant share of the market.

The importance of digital marketing is further recognised in Ireland as a viable solution for startups, as evidenced by the OECD (2019), they have committed to increasing funding to startups to support the digitalisation of the business and address low digital skills to help increase uptake of digital technologies (OECD, 2019). MedTech devices are also known for an innovative product that is a differentiated product marketing that can offer a competitive advantage by identifying a target product profile (Jambulingam, 2018). Marketing can shape the core value of a company. When a strategy is created early in the process can help map out not just marketing but also strategic planning of clinical trials and commercial insights (Jambulingam, 2018).

Levitt (cited in Harvard Business Review Press, 2013, p.24-47) states that “marketing is the process of attracting the customer”; similarly, Kotler (2011, p. 132-135) stated that marketing is a “social and management process through which individuals and groups obtain what they need and desire through the creation and exchange of products and values.” According to Chaffey and Patron (2012), digital marketing can support existing customers while attracting new ones. It offers a high level of customer relationship management by using marketing automation.

Miller (2012) positions that using internet marketing gives the company a competitive advantage by enhancing the customer experience and building relationships with a relatively low budget compared to traditional marketing. Therefore, in the modern age of the internet of things (IoT), businesses stay current by having a digital presence. In particular, as a new startup with limited funds and a need to build a brand as rapidly as possible, digital marketing offers the opportunity to create an online presence and build a brand cheaply and directly with the customers.

While it can be argued that traditional marketing and digital marketing offer opportunities to help a company be profitable, both have advantages and disadvantages. A comparative research study by Salehi *et al.* (2012) demonstrated that digital marketing was far more cost-effective and offered faster, more direct channels to reach customers; accessibility allowed the company to form real-time connections. Digital marketing is the ideal tool to target a specific market or demographic directly. Traditional marketing focuses more on messaging to many, in the hopes that someone within the target group will be called to action; in contrast, digital marketing can measure its traffic flow and click-throughs, which in turn means that a more targeted message will go to the target audience, saving time and money. It allows the company transparency on what is and what is not working.

In the most recent findings on digital marketing, there is a noted fragmentation in the discipline due to the internet's complexity (Busca and Bertrandias, 2020). The internet is a constantly evolving force since its inception in 1991; the advancements made are jaw-dropping, and the potential for further upgrades is limitless. Therefore, comprehensive knowledge of it as a tool is advantageous to companies and startups in particular. Consumers spend more time than ever on the internet.

Jackson and Ahuja (2016) highlighted in their research the need for businesses to use internet platforms and personal devices as consumers are more connected than ever and are conducting more transactions online. Ponder (2019) recognised that over 2.46 billion social media users are online and that 45% of the startups in his research claimed that digital and social media played a significant role in company sustainability and growth.

Busca and Bertrandias (2020) also noted that digital is at the core of value creation's success by intertwining social and commercial relationships, offline and online interactions. Digital offers the opportunity for a company to interact directly with their customer in a meaningful way; having a seamless transition across all touchpoints will enhance the customer experience, ensuring that it offers the highest customer service. According to Singh (2017), digital marketing allows information to be accessible and up to date, thus allowing the customer to seek out a specific company and gain details of locations and services that they may require.

In order to increase traffic and stimulate customers' activities across platforms to grow a company's presence, a review of both online and offline tools should be undertaken to determine the most effective mix (Chaffey and Ellis-Chadwick, 2016). Digital marketing offers small to medium businesses and startups the opportunity to afford the advertising level that was once only available to more prominent companies due to budgetary limitations.

2.2.1 Digital Marketing Channels

Having identified digital marketing as an effective tool for startups, a review of the channels were undertaken. There are many tools that digital marketers use to promote brands to customers, such as e-mails, blogs, social media, advertisements, websites offering uninterrupted enhancements across personal devices being laptops, smartphones, tablets and smartwatches, to name a few (Kotler and Armstrong, 2004). Customers are hyperconnected; partly due to the rise in wearable technologies, it has never been easier for customers to engage with a brand or service directly. It is a digital era, and companies have altered their strategies to take a more digital approach.

A coordinated digital marketing strategy is only as successful as the tools used. The digital strategy must align with the business strategy and goals. The company must set out a list of specific goals and objectives in a business development plan; this will be the basis of the framework (Chaffey and Ellis-Chadwick, 2016). Customers want real-time marketing and digital tools that capture analysis and monitor platforms constantly offer opportunities to outperform competitors (Omale, 2020).

2.2.2 Social Media Marketing

Social networks dominate the World Wide Web; according to Statista (2021), there was 49% penetration globally, with over 4.2 bn users worldwide, with Facebook the most popular site. Western Europe is reporting 79% penetration, and the average time spent on social media daily is 145 mins. There has been exponential growth in customers using social media platforms to engage with their favourite brands, join brand communities, becoming brand ambassadors (Tsimonis, Dimitriadis and Omar, 2019).

The interactive nature of social media platforms lets companies build and maintain meaningful relationships with their customers; they often reach out to the company directly due to social media posts. A study carried out by Hubspot (2021) noted that in 2021 eight in ten companies will invest in social media marketing. Hudson *et al.* (2016) and Labrecque (2014) identify social media as one of the most potent media for building relationships and building brand awareness and engagement, leading to increased purchasing. When the customer connects to the brand's social media, it allows the company to send personalised messaging and news relevant to the person directly and drive them to their website to complete a purchase. Having connected with the brand, the customer is more likely to post, comment, and share brand posts and messages directly with their followers (Hudson *et al.*, 2016).

The research from Tsimonis *et al.* (2019) showed that the gain from social media marketing was convenient and time-saving. Engaging with the brand community and pages allowed their messaging to be viewed across various platforms simultaneously. The social media brand communities offer a convenient way for communities to get brand information in a localised area and enhance user experience. Social media allows a company to share content between different areas, from internal to external and consumers. It also facilitates a connection between various digital platforms making the customer journey simpler to navigate. There are further benefits to social media's immediate nature, allowing customer insights to be gained organically, invaluable during development and service improvement phases (Habibi *et al.*, 2015).

Social media is free, or at premium levels inexpensive, to generate online content, fast and cost-effective (Iankova *et al.*, 2019). Social media is an appropriate channel in marketing across the entire customer lifecycle, from creating awareness to acquisition (Mangold and Faulds, 2009); customers become co-creators and active process participants. In this way, customers can influence brand messaging, service, or product developments, allowing the company to capitalise on this information and gain a competitive advantage.

2.3 Content Marketing (Inbound Marketing)

The average customer is exposed to around 5,000 advertisements daily (Hubspot, 2021). Traditional marketing communications involving large-scale campaigns, intensive advertising, and massive scale e-mail campaigns are now outdated. Content marketing is often referred to as inbound marketing. The company pulls in the customer by sharing or creating online content, blogs, vlogs, videos, and social media posts that are not necessarily an advertisement but are used to stimulate interest for a brand or service indirectly. Rowley (2008) quantified content marketing as a medium concerned with conveying messages to a customer to influence their behaviour. In contrast, Patrutiu-Baltes (2016) states that the golden rule of content marketing is 80% focused on teaching and consumer information, 20% on sales growth.

There are many forms of content management; in the case of a MedTech startup, for example, a medical testing service, offering advice on blogs and vlogs are a great way to get engagement and offer a call to action for the customer to go on to buy the product or service. With 3 in 4 marketers stating that they were currently running content marketing campaigns, it automates messaging at crucial times and increases revenue (Hubspot, 2021).

2.3.1 Website

Dwivedi and Nath (2020) define a website as the cornerstone of any digital marketing strategy, the so-called electronic face of the company. Having a well-established website, giving consumers good content and information, draws more traffic to the site, using search words to increase rankings on the search engine results page (SERP). You get one chance to introduce yourself to the world, so a great first impression is vital; proper attention should be paid to the site's layout, design, colours, look, and feel. Along with SERP, search engine optimisation (SEO) helps companies reach and convert customers in a digital age. SEO works most effectively when choosing correct keywords, linking the searches with website content.

The onset of the global pandemic and consumer shift to shopping on websites rather than in-store has brought a whole new generation of online shoppers that may never have made the shift. Websites are seen as the number one channel in digital marketing, with 91% of companies surveyed having a website and 64% looking to upgrade in 2021 (Hubspot, 2021). The website plays a vital role in directing users towards more digital content that aligns with their needs and requirements (Rowley, 2008).

2.3.2 Blogging

Increasingly consumers are turning to peer-to-peer communications when making a purchasing decision. In turn, this has led to the growth of influencer marketing and, as such, an increase in firms investing in this as a facet of their marketing campaigns (Hughes, Swaminathan and Brooks, 2019). Sponsored blogging combines paid and earned media (Lovett and Staelin, 2016); bloggers are paid in kind to promote a product or brand.

The benefits of blogging are that it can be launched across multiple platforms simultaneously; it also allows people to interact with the blog, ask questions, start a conversation, like and share content. The two goals of a blogging platform are to increase brand awareness with a call to action to buy the brand. The blogger must be viewed as a credible source; and, when seen as authentic, more likely to be considered competent and generate sales (Hubspot, 2021).

2.3.3 E-mail Marketing

E-mail marketing is a form of direct marketing that conveys information or knowledge directly to an individual; it is highly targeted and sent directly to the intended recipient. The fundamental aim of marketing is getting the right message to the right person at the right time, and if the message can come across as personalised rather than generic, it is more likely to convert to a sale. According to Zhang, Kumar and Cosguner (2017), the cost of sending e-mails to a customer is meagre. E-mail marketing is also faster to prepare and instantaneous as it goes directly to the customer's inbox.

It is necessary to use e-mail marketing to reach potential customers digitally, understand target markets, and correct messaging (Ellis-Chadwick and Doherty, 2012). Patrutiu-Baltes (2016) hailed e-mail marketing as a very effective way to promote a business to prospective customers and current customers; it is one of the most accessible and effective forms of communication.

2.3.4 Search Engine Optimisation

Matta, Gupta and Agarwal (2020) stated that search engine optimisation (SEO) is a way of manipulating a website's prominence in paid or unpaid search results on a search engine. The search engine includes Google, Yahoo, Bing and Firefox, a few more prominent ones. According to Taiminen and Karjaluoto (2015), startups commonly use SEO as a very low-cost solution. SEO offers the opportunity for the websites to use keywords that will lead the consumer directly to the company page, putting it at the top of the search lists.

A successful SEO campaign is achieved by creating meaningful and exciting content. SEO is about creating a tailored experience for users and allowing meaningful interactions. 75% of respondents in the Hubspot survey felt that their statistics in SEO were highly effective, and 83% stating that they were confident that their website through SEO was helping achieve marketing goals (Hubspot, 2021).

2.4 Research Gaps as Emerging from the Literature Review

The key finding of the literature was that there are many challenges a startup faces on its journey to market. The gaps in the literature were identified as the reasons startups fail, clarity around the highly complicated regulatory compliance to go to market and digital strategies for MedTech startups.

These gaps in the literature present the researcher's opportunity to investigate this area further, and empirical research will be conducted to shed light on the matter. This study will attempt to look at case studies in order to gain more information. The next chapter will be to outline the research objectives and questions.

Chapter 3: Research Question

3.1 Introduction

The researcher sought to explore the digital roadmap as a cost-effective means for a MedTech startup in Ireland. However, after reviewing the literature, a common theme was a high level of failure rates for startups in Ireland, precisely due to a lack of market knowledge and the need for a strategy to help navigate the complicated regulatory, digital marketplace. The researcher recognised the need for a digital strategy to combat challenges encountered by MedTech startups. Thani Jambulingam (2018) stated that a strong marketing strategy could help commercialise and offer the potential to gain a significant share of the market. Consequently, the original question has changed to encompass the findings from the secondary research; the main research question explores:

Challenges to creating a Digital Roadmap for MedTech startups in Ireland

3.2 Clarifying Research Question & Aim

Having broken down the process, the researcher identified a need for further refinement to reflect better the aim (developing a digital roadmap for a MedTech startup) as it was too broad. In order to refine it further, figure 8 was used to access and come up with several straightforward questions:

1. What are the most prominent reasons for the failure of startups?
2. What are the most suitable marketing channels for startups?
3. Is digital marketing the most viable solution for a startup due to low cost and rapid engagement results?

4. Best practice in digital marketing
5. Do companies value and invest in marketing?

3.3 Research Objectives

In order to answer the research question, sub-objectives were formulated following the review of the literature. An understanding of the MedTech industry in Ireland and the barriers encountered was gained, and a review of the digital marketing channels used in the roadmap.

3.3.1 Research Objective One

Is Ireland a viable incubator for MedTech startups, and are there adequate supports and funding?

In the last 50 years, the number of MedTech companies has gone from 50 to over 350 and is a growing industry fueled with funding from Enterprise Ireland as a unique enabler (Med In Ireland, 2021). Ireland is 2nd in Europe, making Ireland a hub for MedTech companies, potentially accessing five hundred million in Disruptive Technology Funds (Hughes, 2019). The first research objective will explore the Irish MedTech sector, exploring the supports and organisations within the Irish market. Is the Irish market a viable market for startups?

3.3.2 Research Objective Two

What are the most prominent reasons for the failure of startups?

Eggers and Song (2015) would measure success as learning outcomes gained from previous failures. Objective two will explore the causes of startup failures to help determine patterns or offer marketing-based solutions. Are there any MedTech specific challenges that would not affect a non-MedTech company? A significant gap in the research was identified in the literature as to why startups fail. As a result, the researcher hopes to gain deeper insights in their in-depth interviews. According to Yohn (2019), there is a 70% failure rate among startups in Ireland, and one of the primary reasons they failed was not meeting the customers' needs and not listening or no market need.

3.3.3 Research Objective Three

Digital marketing channels use: Do companies invest in and value marketing?

The final objective is to look at and understand the motivation to embrace digital marketing, testing the theory that a digital roadmap is an essential tool in the success of a go-to-market strategy in launching a startup in terms of cost-effectiveness and speed to connect on a meaningful level with customers. Harrigan *et al.* (2009) put forward that integrating communication channels aligned with management strategy is an effective way for startups to retain employees. The OECD (2019) is looking to increase funding to startups to support the digitalisation of the business and address low digital skills to help increase the uptake of digital technologies.

3.4 Conclusion

Comparing the theory and practice, the discoveries from the literature and the findings in the current MedTech marketplace will give the researcher a deeper understanding of the barriers facing startups in the Irish market and the benefits of a digital roadmap.

The research methodology is set out in the subsequent chapter, looking at the methods used and why the selected method.

Chapter 4: Methodology

4.1 Introduction

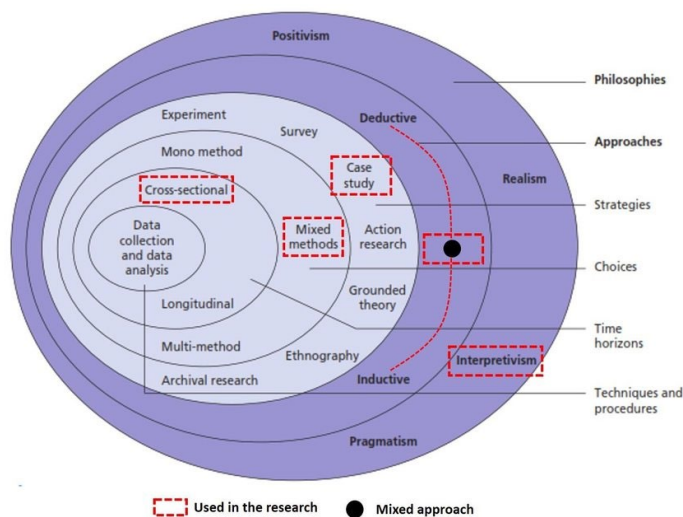
This chapter will look at the process, theoretical and applied, by which this research methodology was formulated, allowing the researcher to avoid personal bias by exploring different methods. The method used and formulation of questions was derived mainly from an inductive and deductive approach.

The research approach is a process to increase knowledge systematically (Saunders, Lewis and Thornhill, 2007). A research framework helps collect organised information and helps to examine a specific problem, offering a solution to the problem presented. It should highlight the main steps

that a researcher should consider in order to answer research questions effectively. The use of techniques and methodology to design and plan to conduct a case study and qualitative research.

This chapter will include the research onion model shown below in figure 2 (Saunders *et al.*, 2007) as applied to this research and include the study's breakdown, research design methodology, data collection, and data review.

Figure 3. Research Onion by Saunders *et al.* (2007)



4.1.1 Formulating and Clarifying the Research Aim

In coming up with a topic for the research proposal, several techniques were used to select and rule out topics to find an area of interest for the researcher. Raidmond (cited in Saunders *et al.*, 2007) stated that using reason and creative techniques will ensure that the topic has been planned and evaluated. The techniques in question are represented in figure 3 (Saunders *et al.*, 2007), from which we have two potential outcomes:

- i. A few topic ideas will be generated
- ii. Panic, as nothing of interest or suitable, evolves (Jankowicz, 2005).

4.3 Formulating the Research Questions

In order to develop a robust research aim, the researcher asked questions based on available secondary data to aid in narrowing down to the most suitable research topic listed below:

- Am I familiar with the area and literature?
- Areas that need further exploration
- Important research questions in marketing
- Could my research help identify and fill a gap and lead to a greater understanding?
- Is the target industry interested?
- Had existing research been completed?
- Is this a current topic right now?
- Can my research be put to use in my field?

In conclusion, the process in which the objectives were formulated is presented below; methods used and the style of how the questions were derived using a combination of deductive and inductive reasoning which will be discussed further in the strategies and research philosophies section to follow.

4.4 Research Philosophy and Approach

When tackling the best approach for research, the researcher read theories about epistemology and methodology to gain a greater understanding. The term epistemology is derived from a Greek word *epistēmê*, meaning knowledge; in simplest terms, it is the philosophy of knowledge. The methodology takes a more specific view of the methods used to deeply understand the subject (Trochim, 2020).

4.4.1 Research Philosophy

According to Saunders *et al.* (2007), there are two main types of researchers, type A and type B:

- A. A researcher who is comfortable with the collection and analysis of facts

B. The feelings researcher who is more concerned with the attitudes and feelings of people

In order to determine the appropriate philosophy for this study, a closer look was taken at positivism, interpretivism and realism, which are not mutually exclusive views.

Positivism

Positivism as a broad social scientific view, one in which knowledge is grounded in experimental data and observations; the researcher takes the stance of a natural scientist. Remenyi *et al.* (cited in Saunders *et al.*, 2007) also highlighted that a person's research philosophy imbues the positivism principles as they work with observable social reality and produce an end product with law-like generalisations that a natural scientist would produce.

Interpretivism

Epistemology is advocating that a researcher understands the differences in humans and their roles as social actors. An interpretivist understands that humans are complex and intricate and experience and understand objective realities in very different ways as to how they live and interact with the world (Thompson, 2015) — as such, emphasising the differences in research among people instead of objects (Saunders *et al.*, 2007). Therefore, it is vital to interpretivist epistemology that research adopts an empathetic stance to be successful. In this research, this approach was taken into account when conducting the interview process to gain more significant insights empathetic.

Realism

Another position of epistemological research, one that relates to scientific enquiry, is realism. Essentially, what our essence shows us to be reality is the truth; objects can exist outside of the human mind; this approach also assumes a scientific approach (Saunders *et al.*, 2007).

The researcher has chosen to take the interpretivist philosophical perspective for two reasons:

- a. Neither pragmatism nor positivism fit the path the research is taking, and within the timeframe, while working full time, there are limits to time and resources
- b. Also, positivism works better when taking a quantitative approach, and in reading the theory of the methods, a greater understanding was gained of the complexity of new content generation (Saunders *et al.*, 2007).

4.4.2 Research Approach

The overall research approach will come down to the level of clarity at the beginning of the project and, in turn, determine if the most appropriate research approach is to be inductive or deductive (Saunders *et al.*, 2007). Bryman and Bell (2011) and Saunders *et al.* (2007), quantitative research takes a deductive approach. Then the research is used to test the theory, and qualitative research takes an inductive approach where the theory is generated from research.

Given time restraints and the pandemic, the researcher used inductive research; issues with sample sizes were anticipated; inductive can be used with a smaller sample. At the same time, it needs various data sources to highlight the various phenomena and be more likely to work with qualitative data (Saunders *et al.*, 2007).

Inductive reasoning starts with a specific observation, into generalisations and broader theories. The observations are then measured and evaluated; from inductive reasoning, patterns or regularities can emerge that formulate a hypothesis that is then a formed theory. In its nature, it is more open-ended and exploratory, particularly at the beginning.

In conclusion, while both approaches are practical and could have been used in the study, the inductive approach was more suited based on the nature of the study. At this stage, it is essential

to note that while the study leans to an inductive approach, a combination of both was a component in deriving the original aim and hypothesis.

4.5 Research Design & Method

Research methodology also known as the ways and activities performed by a researcher to complete the conceptual framework of the research problem. As mentioned earlier, the research onion was created by Saunders (Saunders *et al.*, 2007) and used to develop the methodology. There are three further sections to be explored - research strategy, methodological choice and the time horizon. In deciding on the methodology, the choice between quantitative and qualitative was made early on; for this study, qualitative was the most appropriate method as one of the aims was to gain insights from the expert participants in the interviews and surveys, which would not have been achieved in a quantitative study.

The formulation of the research questions (Appendices I) are broken down by areas of interest -

- Understanding MedTech start-ups
- Why the Irish market?
- Marketing channels and digital marketing investment

A pilot interview was conducted with a CTO and friend of the researcher to gauge the effectiveness of questions. This was done face-to-face, but this also changed the format and flow of the questions as they were found not to address what the researcher was looking to explore. A second interview was conducted over Zoom due to the poor skill of the researcher's shorthand note-taking.

4.5.1 Qualitative Research Method

One of the overarching uses of the qualitative method is to improve the hypothesis and ideas and go deeper into the problem. Unlike quantitative, qualitative is unstructured, and that will bring richer data. According to Bryman and Bell (2007), qualitative “emphasises words rather than quantification of data.”, but Saunders (et al. 2009) would argue that “research questions rarely fall neatly into only one philosophical domain”. Due to the nature of this study, the qualitative approach was chosen, with the understanding as per Saunders, it may not be the most straightforward approach.

A qualitative approach was taken for the thesis project as it offers the opportunity for the researcher to learn from the opinions and suggestions of the market experts. Further reasons are outlined below:

- It offers the ability to interpret meaning and relationships between participants
- It is measured with words rather than numbers
- A wide variety of data collection techniques and procedures can be analysed

4.5.2 Limitations of Qualitative Research

Findings may be generalised when applied to a specific context, the data collection and coding are time-consuming, and the researcher may be prone to personal biases.

While there are limitations to qualitative research, it still lends itself perfectly to gaining a deeper insight into the subject. The ability to gain a greater understanding by talking to an individual from the startup sector will offer invaluable information not always found in articles. The qualitative methodology offered a dynamic approach and allowed the researcher to get more profound answers and ask follow-up questions. Marketing as a subject is more focused on meaning creation where quantitative is mainly numerically based.

4.5.3 Interviews for Case Studies

Saunders *et al.* (2007) state that there are many different types of interviews; the chosen interview must correlate closely with the purpose and overall direction of the research objectives and problem. Through interviews with a cross-case study context, qualitative research was used to generate and capture ideas to develop concepts based on grounded theory collected by choosing a mono method.

An interview is a conversation between two or more people asking specific questions on a chosen subject (Saunders *et al.*, 2007). According to Bryman and Bell (2011), two of the most prevalent interviews are structured and semi-structured; for this thesis, the researcher conducted a semi-structured interview.

The case study method is one of the most profound studies considering social and organisational studies (Gehman *et al.*, 2018). They can be used to explore dynamic industries such as the MedTech sector in Ireland. The case study allows the investigator to capture novel findings observed in the data; it gives the research a snapshot in time (Eisenhardt, 1989).

“Multiple cases are more compelling” and offer “more robust” information than a single case study; Hollweck (2015) stated that between 4 to 10 case studies were an appropriate number to offer compelling support. The sample were chosen as the CEO/Director/CFO are the decision-makers; they are usually on board from day one; they will have insight into marketing needs and strategy and marketing plans and directions.

The study was conducted across MedTech startups in Ireland; various new medical devices are brought to market yearly in the Irish market. Consumers are looking to a digital marketing expert for insight into the current market and best practices. There are various levels and stages of the

technologies' startups; there is a notable increase in disruptive technologies resulting from the digitalisation of products and services. There is also an expectation of a digital product offering due to the increase in healthcare costs and requirements brought on by the pandemic to have a take-home option, test, and offer medical services. Chronic health detection and disease management solutions are most requested due to being housebound and cocooning.

4.5.3 Surveys

The survey was created from a time perspective as startups are notoriously busy. In addition to the above reasons, a survey can test the information obtained in the existing literature and look at the implementation (Saunders *et al.*, 2007). According to Brannick and Roche (1997), the sample size depends on the availability of a suitable sampling frame - in simple terms, the ability to get access to a list of population forms of ready participants. In this project, a sample size of 45 individuals was contacted personally on LinkedIn.

Sample size and selection - As with the interviews and case studies, the CEO/CFO and Directors of startups were contacted via LinkedIn and email and offered the opportunity to fill out the survey or to take part in an interview over Zoom. The survey was sent out through LinkedIn to 45 MedTech and Tech startups, explaining the research and a QR code and a link to fill in the 5-minute questionnaire.

4.5 Data Collection

The researcher conducted the interviews on Zoom via video call due to current government COVID-19 restrictions; only one in-person interview took place in a park during the initial pilot interview. Zoom was used in other instances to have a more personal presence and build rapport and recorded to transcribe to give the interviewee full attention during the interview. The interviews were allocated 45 minutes on Zoom to understand that it would take 25 to 30 minutes to complete. They were recorded on Zoom with the participant's permission; this also offered the

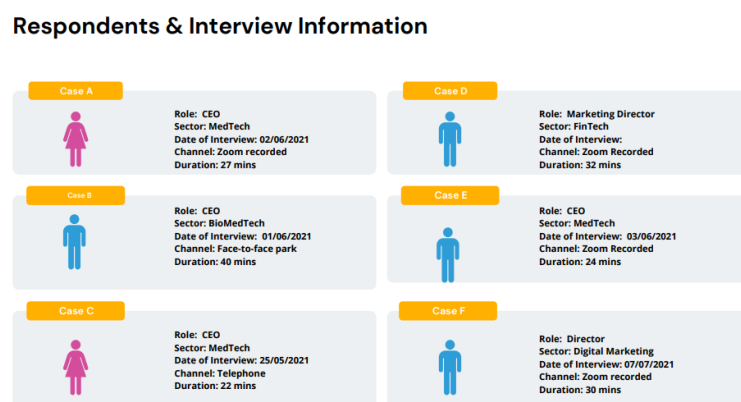
researcher the opportunity to code a live transcription and allowed the researcher to go back to the videos for reference of clarification at a later date. All participants were aware that the interviews would only be used for thesis reasons and offered the chance to be confidential.

The format was non-standardised, semi-structured to allow the interview to flow, with open-ended questions and a minimum of closed-ended one-line answers (Saunders *et al.*, 2007). According to Saunders *et al.* (2007), a semi-structured interview provides the researcher with the opportunity to probe the answers given and dig a little deeper and lead to further discussion that was not on the question sheet.

4.6 Interview Participation

The research is based on the sample of 6 participants noted in figure 4 who were contacted through LinkedIn, startups, and a digital marketing expert. The participants are all at CEO, CFO and Director level, and a marketing manager, whose companies are at various stages of the startup process, chosen for their notoriety across startup journals, Enterprise Ireland, and newspaper articles. Saunders *et al.* (2007) suggest that the choice of respondents is optimal when researching to get a high level of accuracy in more rigorous results.

Figure 4. Respondents & Interviewee Information



The interviewees' names are retracted as they will be anonymous, and the researcher has kept all the data collected with the respondents' consent as per GDPR guidelines. While 45 minutes was allocated for each interview, the average time of the interviews was 33 minutes.

4.7 Data Analysis Methods

Once data was collected from the research, analysed it by decomposing it to explain and break down the elements; this is known as data analysis (Saunders *et al.*, 2007). A critical part of qualitative study is the data analysis; the analysis should be “based on logic and creativity” (Yin, 2003, p.49). At the same time, Quinlan (2011) stated that qualitative is more straightforward than quantitative data when analysing data. Qualitative data needs more concentration as there are no set formulas. Therefore, the researcher must take a more analytical approach to obtain a high-quality analysis (Yin, 2003).

Qualitative coding is sorting data into segments concerning a general idea, category or theme; data involves breaking down and fragmenting it into different parts, more significantly into clear parts, when coding it inductively. It is done to make it easier to search for similarities, as well as anomalies and differences. A code represents a specific element within the data considered relevant and/or interesting to the researcher.

Inductive coding approach – at its principle ((it aims to prevent the grounded theory and existing concepts from showdown the researcher from identifying and or developing new theories))-needs rephrasing. In this form of coding, the researcher is encouraged to immerse themselves into the data and identify clear themes (Braun and Clarke, 2006). This method effectively organises data that clearly describes and is easily recognisable in terms of themes. One of the reasons thematic was chosen was its flexibility.

During this phase, the researcher identified and highlighted similar or repetitive themes within the transcribed data. Once the data has been coded and themes identified, a data set acts to answer research questions. Braun and Clarke (2006) stated that a theme is an element to which a judgement can be formed about a phenomenon. The researcher read through the entire data set to begin coding to help shape and identify patterns, taking notes.

The final phase of thematic analysis coding is looked at in the next chapter, reporting the findings and analysis. Some themes have been discounted as they were not relevant; the themes must be coherent and cohesive in their flow.

4.8 Ethical, Validity and Reliability

Regarding ethical issues, the researcher must consider what harm could occur in planning the research. The respondents need to be protected and respected, behave according to ethical standards, and consider at all stages how and if the research could negatively affect the participants. They also have a responsibility as students of the college to protect the institute's name and reputation. There are various codes of ethics, and it is essential to review the college's guidelines and adhere firmly to the principles to protect the research and college.

The validity of the research is often measured by course credibility, both internal and external sources. In order to ensure the trustworthiness and credibility of the research, this can be achieved by using multiple sources. The interview questions were tested on a startup CTO who has completed several masters and PhDs; he was chosen to ensure validity and relevance.

Reliability ensures that the findings are concise, honest, and valuable for further research. However, on review, the findings may highlight issues and the time and skills and other factors.

4.08 Limitations to Research

There were several limitations in the research data collection; the first challenge was the pandemic; it was impossible to organise a face-to-face interview offering a limited scope due to the lack of ability to build rapport. The college library and facilities were closed as per government guidelines, so there was no access to physical books.

A second limitation was time as a part-time student with a full-time job. There was a finite amount of time to conduct the study. The response rates were lower than expected, which affect the survey sample size. Ideally, 50 survey respondents would have offered a better sample size. While the pandemic limited the availability of persons of interest to interview, the interview sample size would have remained the same; as is noted, six is considered a good sample size (Yin, 2003).

Thirdly, a qualitative approach can be open to personal bias by the researcher. The researcher was mindful of this throughout the process, but this was still considered a limitation.

4.09 Conclusion

The chapter objective was to offer a rationale for the methodology used in the study. The researcher took an inductive methodological approach taking an interpretivist view. A qualitative approach was used due to the nature of the study and the in-depth interview approach taken by the researcher, who wanted to gain insights that could not be derived from the literature from industry professionals. The reasons for the sample size, thematic approach and qualitative approach are outlined within the chapter. Ethical considerations are discussed alongside limitations.

The next chapter will outline the findings and analysis broken down as per the research objectives set out in this chapter.

Chapter 5 – Analysis and Findings

5.1 Introduction

This chapter will review the findings of the interviews. The data was broken down using the six stages of the thematic analysis summarised under the set-out research objectives. *1.) Is Ireland a viable incubator for MedTech startups with adequate support and funding? 2.) What are the barriers startups face and the reasons for the failure of startups? 3.) Digital marketing channels use: Do companies invest in and value marketing?* The outcomes of the interviews were presented using quotes verbatim. As mentioned in the methodology, the case studies will be anonymous and presented by Case studies A to F for anonymity.

5.2 Is Ireland a Viable Incubator for MedTech Startups, and Are There Adequate Supports and Funding?

The first research object was to investigate the Irish MedTech sector, looking at trends, growth, and development, examining supports on offer to help startups grow and succeed. Key findings were that the respondents agreed that while Ireland was good for initial supports, there was a gap between the level of support in the in-between phase if you were neither early stages or high performance.

The following themes were identified from the survey and the interviews –

5.2.1 Theme 1: Limited Funding

The first theme that arose under the first research objective was limited access to funding. The survey and the interview reflected that while Ireland had support and infrastructure for new startups, there was limited funding and gaps they could be doing better. As you can see by the below survey figure 5, there were no excellent responses, with the respondents being between fair and reasonable.

Figure 5. Question 20 from the survey -

20. How would you rate start-up supports in Ireland?

[More Details](#)

Excellent	0
Very good	2
Good	3
Fair	3
Poor	0



The respondents stated that while there is support, there are gaps, and more could be done. Respondent B stated, “*Enterprise Ireland gives you a certain amount, and then you have to go to above Enterprise Ireland, there are gaps in levels of support*”; Respondent D outlined that “*you nearly have to be a high-performance startup*” and explained that a lower-level startup could gain support more efficiently; however, once a startup needs to go up to the next level, it is more challenging to get the support needed. However, both respondents also said that the initial investment could be hard to come by as well. Respondent E echoes this by stating that “*Early seed investment is quite hard to come by, especially in Ireland, that is probably the biggest hurdle we will encounter.*” They explained that while it is much harder in Ireland to obtain the initial investment, there is some support through public investment like Enterprise Ireland, where there is good support during the early stages of a company.

Respondent A highlighted that “*investments can be tricky in the MedTech space*” and put it down to “*duration to market*”. As Respondent E alluded to earlier, seed investment was hard to come by, which is the initial capital to help a company succeed. If they take longer to get to market, then that is a more significant period when they are not revenue-generating. This particular challenge is sector-specific due to regulatory compliance that they need to go through that perhaps another startup would not be required to meet.

5.2.3 Theme 2: Size of Ireland

The second theme that emerged under the first research objective was that Ireland was limited due to size, and multiple companies are going for the same supports and expertise, which are limited.

Respondent A noted, *“Ireland is a small place, and you know, there is a finite number of investors”, “everyone is competing for the same”*. While respondent A also states that *“Ireland kind of punches above its weight in terms of any other country”*, acknowledging that Ireland is doing its best given its limited size and access to experts. Respondent C echoes this sentiment, noting, *“I think the challenge with Ireland is also the benefit of Ireland”*. Having a limited number of industry experts in areas means that you and your competitors are vying for the ear of the same person *“knowing that any one person you speak to is only two or three degrees of separation away from a competitor.”*

Respondent A noted that a benefit of Ireland is its size: *“I just feel like you can get in front of people very easily in Ireland”* - due to the proximity of people in Ireland, it is often easier to get in front of key people. In contrast, in a larger country such as the UK, this might not be possible. While respondent D also noted Ireland's many strengths in startups, *“strengths there in terms of the entrepreneurial lists, good ecosystem, especially in life sciences, MedTech.”* Ireland currently has a population size of 4.9 million while the UK has 66.6 million; as such, the community and MedTech industry are smaller, and connections could be made more quickly.

There was an overarching sentiment that Ireland is doing the best it can in terms of resources. There were two sides to each limitation summed up well by respondent C: *“I think the challenge with Ireland is also the benefit of Ireland”*. While the size of Ireland was not mentioned as a factor in the literature as something that held it back, it is good to note for further research into this subject.

5.3 What Are the Most Prominent Reasons for the Failure of Startups?

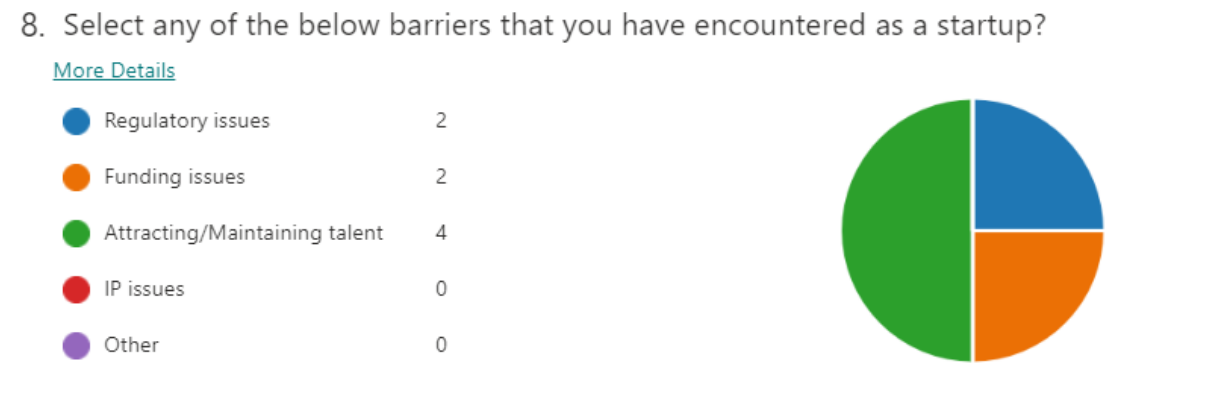
The second research objective was to investigate the barriers that startups have encountered as possible causes why startups fail. The following themes were observed below via the survey and in-depth interviews.

5.3.1 Theme 1 - Attracting and Maintaining Talent

The first theme identified under this objective from the survey and interviews was the difficulty and importance of attracting and maintaining talent.

As the survey illustrated in figure 6, 50% of surveyed people felt that their most significant issue was maintaining and attracting talent. Respondent F mentioned there might be “capable professionals, but they may not be the right fit for your organisation”. So even though you may hire a qualified person, they may not be the right person for your company or align with what you are trying to achieve. Respondent C noted the “intense competition with other companies” and the competitive nature of hiring. Ireland has a large balance pool getting the correct person for the role; as startup funds may be lacking, they may not always be as competitive as they would like to be in terms of remuneration packages.

Figure 6. Question 8 Survey



Respondent F highlighted the need for your staff to align with the mission and goal of your company: *“The workers you are hiring might be talented, capable professionals, but they may not be the right fit for your organisation.”* Respondent B echoed the importance of staff aligning with the company goals and direction it wants to take, not to waste resources and time; otherwise, *“you are not going to be getting the amount of traction that you need to build the brand”*. Respondent B addressed that it is a business, not a charity. As such, people, if they are not working out, need to be released: *“you will have to learn to let people go if they are not pulling their weight. it is a business, not a charity.”* Staff turnover at a startup company can be pretty high due to trial and error, this can also be attributed to the lack of brand and mission within the company at the beginning which is the core of the company, and when its brand is strong it attracts similarly valued people.

Respondent A identified the need for a strong, established team at the beginning to gain investment. *“I think if you are looking to raise money from investors, a number of them look at your status”*, having a diverse and robust team will make the company more attractive to investors. However, they all note that different skills in other areas were important to have; Respondent A mentions: *“I think that it is really important not to just go with people who are the same, like another marketing, you know, digital marketing expert”*, this will also save on time and energy as not everyone can be an expert in all areas. Trying to wear multiple hats takes away from the critical skills of the person; a job that might take an expert 5 minutes could take another person half a day.

5.3.2 Theme 3: Regulations

The third theme to emerge was that the MedTech and Tech startup market was highly regulated. There was a view across the respondents that it was time-consuming and expensive but with no transparent process or best practice in terms of timelines to apply or upgrade the regulations.

Respondent A states that regulation is a significant challenge “*regulatory perspective but also from a roadmap*” not just from the point of view of understanding the regulation process but also at what key points the regulations need to be applied for. Also, highlighting the high costs of medical regulations “*by definition adds about 30%,*” explaining that it might be up to 20% of overall seed investment on the regulations compliance alone. This is then echoed by respondent E: “*It is heavily regulated*” but also bringing up the point that a MedTech startup cannot launch into a market without this regulatory compliance ” *So we have to gather a lot of clinical evidence in order to get our certification for entering the commercial stage.*” This means a huge initial layout of funds before the product can even make it to the market, generating revenue. Respondent B, noting that regulation needs to play a vital role in budget planning to ensure sufficient funds “*We need to be able to explore how to have much money left aside for all the regulatory things.*” This reinforces that regulatory costs must be considered from the start and thought of throughout the process.

The respondents agreed on a lack of knowledge in timelines and best practices in terms of what level to go for; this was brought up by Respondent C: “So trying to understand where is the best place and time to incorporate medical regulation, and to what level into the business is quite a challenge”. The point was further developed, noting the benefits of a roadmap, by respondent F. To have a roadmap guide startup along their path is also mentioned by respondent C, wanting to “understand where on the roadmap, certain elements of medical regulation should be”. Respondent E also mentioned that regulation is ever-changing and evolving - “*regulatory things that pop up, that you need to go through to get to a product certified to be accepted into specific markets.*” When planning, it is crucial to take into consideration possible new or upcoming regulations and the possible costs and implications they will have for the brand or product.

5.4 Digital marketing channels use: Do companies invest in and value marketing?

The final research objective was an exploration into investment in digital marketing channels and marketing. The following themes were identified:

5.4.1 Theme 1: Multiple Platforms and a Fluid Approach

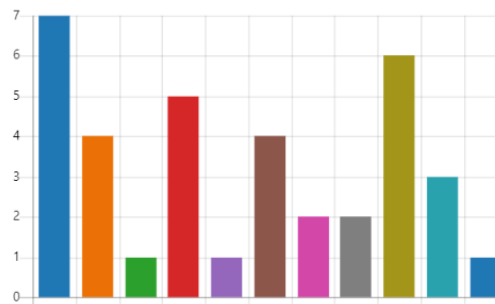
The first theme that emerged under research objective three was that utilising multiple platforms would be the preferred approach but would be reviewed and updated; taking a constantly changing approach was preferred. As demonstrated by the survey results below in figure 7, there is a wide range of use across multiple platforms; while there were clear winners, most companies took a mixed approach. Out of the respondents surveyed, over 50% of startups were using several platforms.

Figure 7. Survey question 18

18. Which of the below digital marketing channels do you currently use, or intend to use in the future?

[More Details](#)

● LinkedIn	7
● Facebook	4
● WhatsApp	1
● Instagram	5
● Snapchat	1
● Twitter	4
● Tic Tock	2
● Blogging	2
● Emails	6
● Whitepapers	3
● Other	1



The respondents echoed the sentiments of the survey. As demonstrated by Respondent A, their strategy will “not be set in stone” as such. The ever-changing nature of digital marketing and marketing in general needs to be kept at the forefront of every campaign they will conduct. They stated it would be “*tested and change that be testing every single month.*” That they would also be mindful of new platforms “*because mothers are getting the information, there's new as you know, new platforms being established all the time*”.

In taking the tested approach to measuring success while keeping abreast of the sources her customers would look to, Respondent A offers a more secure way to spend marketing budgets wisely. Respondent A noted the ever-changing popularity across platforms and reiterated the need to test: *“Facebook is probably the number one. However, you know, the age demographic is changing.”* Understanding that digital and people preferences constantly change, Respondent A stated: *“it is something we need to continually test”*. Respondent B, also explaining that they would use multiple resources offered by digital marketing to build their brand, said: *“we are big on digital marketing, utilising all the resources that we can to get kind of a global brand out there.”*

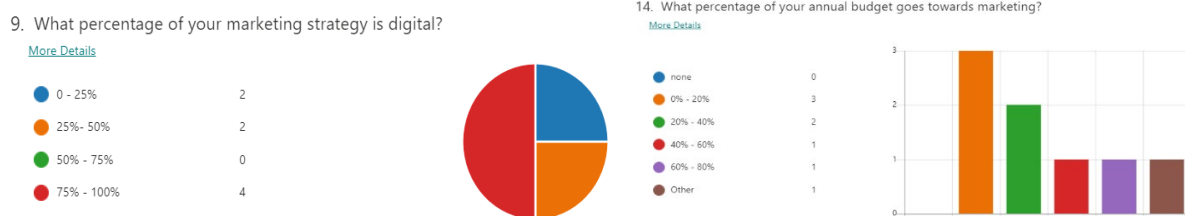
Respondent D pointed out that marketing needs to be part of the strategy from the beginning: *“I think the best approach is if marketing is in on the ground at the very start”* to align with the product and the customer needs for optimal gains, explaining *“it gets close to the product, understands its product, it understands, then the customers and what the customers want, and then it can marry the two together.”* In a symbiotic relationship, respondent D identified the importance of giving the customer what they want and giving the startup a strong foundation from the start.

Respondent D understands that a company needs to focus their approach and target the customers where they go: *“It depends where your personas are hanging out, what channels they're on, where you're going to, like fish where the fish are.”* Finding the correct channels and platforms is crucial. This can come by monitoring and listening to customers, understanding them by engaging with them and monitoring trends and success across platforms and channels.

5.4.2 Theme 2: Investment in Digital Marketing

Under the third research objective, the second theme was the uptake and investment in digital marketing as the sole if not majority investment in marketing spends. There was a common theme that digital marketing was a channel utilised and invested in throughout the research as the company grows. The questions here were two-pronged, one about overall budget spend on marketing and the second about the digital marketing budget percentage. As demonstrated below in figure 8, more than 50% of the companies surveyed would be investing 75% plus in digital marketing as part of their marketing budgets, with 70% of the respondents spending 0 – 40% of their annual budget on marketing.

Figure. 8 Survey Question 9



Respondent B stated that: *“I would say would be probably a third of the overall budget on marketing”*. In contrast, respondent F stated that 40% of the overall budget would be aligned with the survey result. According to our industry expert respondent D: *“I would say between 10% and 20%”* would be a good standard of spend across the industry.

The respondents disagreed about the split between digital and traditional marketing, with some going all in and others taking a more conservative approach. When asked about the marketing budget split that would be digital, respondent B said: *“All of our marketing budgets is on digital”*, as they solely use digital to promote their brand. While respondent A stated: *“So for us, it's going to be, I'd say, 80%”*. Respondent D takes a more measured approach: *“Our marketing strategy will be about 50/50, digital, and maybe increasing.”* Frequently, companies see a mix between traditional and digital as a safer approach but have not considered the cost of such approaches and the extra level of complexity.

Not all respondents were able to judge their spending in terms of marketing. Respondent E stated: *“we would have bootstrapped very much the amount of spend we spent on initial marketing, and logos and branding and stuff like that”*. Respondent E would seem to view marketing as an additional cost that would only be considered once the other startup elements were in place, which is often the case. Respondent C echoes this in terms of their investment in marketing would depend on available funds to apply to it: *“And, you know, I suppose funding as well, like, How much money do we have to spend on marketing like?”*. Startups can only spend what they have and must ensure a return on investment to justify the spend.

5.5 Miscellaneous Findings

Through the research, other minor themes were identified that the researcher felt they were prevalent to note - 1.) Building Brand; 2.) Market Strategy.

5.5.1 Building Brand

Respondents understood the importance of building the brand for a startup. Respondent F highlighted the need to resonate with the customer: *“We’re hoping that the branding strategy by understanding the core customer”* discovers more about them and then *“use that to inform our marketing strategy”*. While respondent F highlighted misaligned brands: *“So staff issues can be if the people doing your marketing don't get what you're doing or understand”*; you could hire the wrong staff and lead to a failure in building on creating a brand *“then you're not going to be getting the amount of traction that you need to build the brand”*. This was a great point to make; if a company does not know who they are, they cannot hire staff that will align with what they want to achieve.

Respondent D advocated for consistency in building a brand: *“So it's more important that they're consistent with the brand all along”* and understanding what a brand should stand for and align with the company mission. By building a brand, it will inform logos and such as the company then has a sense of who and what they are *“and then if the logo changes, it should be in line with what the brand stands for.”*

5.5.2 Marketing Strategy

The final theme to emerge under the miscellaneous section was a marketing strategy. The respondents identified the need to have a thought-out marketing strategy before launch to offer the customer what they want. Respondent D: *“so our marketing strategy is focused essentially on influencing potential customers further down the road.”* Building a solid customer base will help retain customers, and when they are ready to go to market, there will be a client base already in place. Moreover, respondent C, aligning with respondent D, highlighted making the customer the core component in building strategy.

While respondent C stated that although they did not have a marketing strategy as of the year, they were looking to build their brand by investing in *“a branding strategy. We are hoping that the branding strategy by understanding the core customer”*. Branding is a core part of a marketing strategy in terms of it identifying target segments in marketing and messaging as to who and what the brand is, which will, in turn, be the core of the marketing strategy.

Finally, Respondent F has captured all points: *“not everyone can do everything, and it is best to invest in solid team and strategy at the start. Aligning your missions and goals will help you stay on a clear path and give clear branding and help you stick to it.”*

Key findings in the miscellaneous section, having a marketing strategy and building brands, were necessary for understanding the customer. While wearing many hats and being willing to hire experts in each area, a clear strategy that will define the brand should be stuck to throughout the process to grow and develop.

5.6 Summary of findings

This chapter is a thematic presentation of the researcher's main findings:

1.) Is Ireland a viable incubator for MedTech startups with adequate support and funding?

Limited Funding: While Ireland offered many supports and mentors to startups and is doing its best to help, there are gaps and disparities in the levels of support given at the different startup phases. There are finite funding levels available and many people applying for the same funds, making it very competitive. Supports were mainly offered at the seed and high-performance stages, which left a gap in the middle and pre-launch phases. This contradicts the literature the Ibec report (2019) stated that: Irish MedTech sector is home to 9 of the world's leading companies; of that number, 60% are homegrown, and there has been an investment of €316 million this year.

Size: Ireland's size can be seen as both a benefit and a hindrance; while it is easier to get in front of key people, these key people may also be talking to your competitors. Also, there is a limited pool of expert supports. Ireland has access to industry professionals and mentors; this could mean that the expert you seek advice from could also support your competition due to the country's size and proximity.

2.) What are barriers startups face and the reasons for the failure of startups?

Attracting and maintaining talent: While Ireland has a large pool of talented, qualified persons across many fields, hiring the correct person who understands and values your brand is essential to the company. The respondents noted that a strong team with a range of skills is essential for making a great startup attractive to investors. As mentioned by Respondent A, this is looked for by investors, so it should be considered from the beginning (Gupta *et al.*, 2020). Common challenges startups face in developed and developing worlds are financial stability, lack of industry knowledge, and attracting and retaining talent.

Regulatory compliance: To become regulatory compliant was an expensive and often time-consuming process. There was no clear roadmap or best practice guide as to when and what level of regulatory compliance was needed or should be sought. In many cases, a minimum level of regulation is required before accessing the market to make profits and grow. A strong level of understanding and constant monitoring of the market, existing and upcoming, must be kept at the forefront of the startup's minds and budgets.

3.) Digital marketing channels use: Do companies invest in and value marketing?

The utilisation of digital platforms: It is evident from the respondents' answers that there would be a strong focus on being educated about where the customers are and understanding the market and channels that best suit their target customers. This ensures no time wasted and correct message to the correct people; as mentioned, Facebook was the top platform two years ago, but this is ever-changing.

Investment in marketing and digital marketing: The key findings from this theme were that while there were varying spend levels or splits, all companies would invest in digital marketing and marketing in general. The levels of spend are often dictated by the level of funds available to assign to marketing. Marketing is often seen as nice to have, and the level of investment will directly correlate with funds.

The emerging themes from this study have attempted to offer some insightful considerations for startups and businesses as a whole. They will be discussed in much greater detail in the next chapter alongside the relevant data gained from the secondary research in the literature review chapter. The researcher identifies the need for further research into startups and digital channels. With the changing nature of business and the digital world, it will rapidly go out of date. Ponder (2019) recognised that over 2.46 billion social media users are online and that 45% of the startups in his research claimed that digital and social media played a significant role in the companies' sustainability and growth.

The next chapter is the discussion chapter, where the key findings will be discussed in more detail.

Chapter 6 – Discussion

6.1 Introduction

This chapter will explore the significance of the findings from the survey and interviews mentioned in Chapter five; the researcher will discuss how the answers will fit the existing literature previously mentioned in Chapter two. The significant findings will be presented based on the three objectives: **1.) Is Ireland a viable incubator for MedTech startups with adequate support and funding? 2.) What are the barriers that startups face and the reasons for the failure of startups? 3.) Digital marketing channels use: Do companies invest in and value marketing?** The end goal is to develop a digital road map for MedTech startups in Ireland.

6.2 Research objective 1: Is Ireland a Viable Incubator for MedTech Startups and Adequate Support and Funding?

The findings clearly show from the primary research that while Ireland is a viable incubator market for MedTech startups, there were limited supports and gaps in funding. This was further evidenced in the themes identified in the previous chapter and the literature review and discussed below.

6.2.1 Theme 1 - Limited Funding at Certain Startup Stages

Lack of funding was a significant theme that emerged from both the literature and the interviews. The research findings in the study concur with the views stated in the literature in that there are supports, but they are limited. Hughes (2019) noted that Ireland is an ideal incubator location for startups. Cooney (2017) highlighted a practice in Ireland's entrepreneurship ecosystem to bet on the winner, which means that only high performers will be considered and eligible for support, reiterating the disparity within the funding system. Zwilling (2013) talks about the "first valley of death", which is the phase in which startups fail due to lack of financial funding.

This was restated by respondent D: *“you have to go to Enterprise Ireland, which you nearly have to be a high-performance startup to, to get anywhere near that”*. This recognised that while you get funding as a startup, to get the next level of funding, you have to be in the high-performance category, but what about the startups that are beyond seen and before high-performance levels. The TechIreland report 2020 noted a drop in funding while levels were still €545m but were lower than anticipated; the article also noted that early startups find it difficult to raise funding (Earley, 2020). As per the TechIreland article, funding levels are dropping, and the early seed investment is harder to come by.

The significance of the findings is that Ireland needs to look at the funding levels available at each stage to understand it better. Respondent E highlighted this finding: *“Early seed investment is quite hard to come by, especially in Ireland’s that is probably the biggest hurdle we will encounter.”* Wreckler (2020) stated that Irish tech funding was set to exceed €1bn, there has been a notable fall in first-time funding rounds, and more needs to be done to encourage investment in startups. Respondent B also highlighted: *“making sure you have enough VC funding, gone through the VC process.”* It is an integral part of ensuring significant funding levels. The venture capital process is long and complicated, so the application must request sufficient amounts to get to the next level required. According to Kennedy (2019), Ireland has an ideal business climate for startups, although it ranks worst in the top 12 for venture capital access. Enterprise Ireland contradicts this again by stating that are many forms of funding available; the Development Capital Fund €225M, Innovation Fund Ireland €125 M, Enterprise Ireland Seed and Venture Capital Scheme €175 M (Ibec, 2020).

While the literature posits that Ireland is 2nd in Europe as a hub for MedTech companies, potentially accessing five hundred million in Disruptive Technology Funds. Huges (2019) highlights that while there are funds to access, there is a lack of knowledge of how to apply for the funds or the division of funds across all levels of a startup. As respondent B mentioned: *“there are gaps in support levels; there are limited amounts of support once you exhaust one avenue.”* While the research talks of high levels of support and mentions a system of backing the winners or high performers, this lends itself to further investigation into the levels available at each stage of the startup process.

6.2.2 Theme 2: Size of Ireland

The research gained from the in-depth interviews about the size of Ireland being a barrier was not reflected in the literature. Ireland is known globally as an excellent centre for MedTech due to its location geographically and the high availability of talent across all areas (Med In Ireland, 2021). The survey results reveal that “good” was the highest score achieved, with excellent being the best, in terms of the startups and how they felt the startup environment was in Ireland. While they were not critical, there was a recognition that Ireland was doing the best it could with limited supports.

However, the literature paints a different picture, stating that the Irish MedTech sector boasts over 450 businesses and is home to 9 of the world’s leading companies; of that number, 60% are homegrown (Hughes, 2020)-check the Hughes references. This article shows that Ireland is a crucial player in Europe in terms of MedTech companies. Critically this conflicts with most responses received - Respondent A noted: *“Ireland is a small place, and you know, there is a finite number of investors”* and *“everyone is competing for the same”*. Although Respondent A also noted: *“Ireland really kind of punches above its weight in terms of any other country”*. Given the statistics from the literature, that looks to be a fair statement, that although Ireland is small, the levels of employment and investment are still very high.

Critically, as there was no secondary research reflecting that the size of Ireland is an issue in terms of levels of support, it lends back to Doran *et al.* (2018), where they stated that while much research has been conducted on the success of businesses globally, there is a gap in startups' research in Ireland. This gap could be further investigated if this research were used as a foundation for exploring the subject matter.

6.3 Research objective 2: What are the Barriers that Startups Face and the Reasons for the Failure of Startups?

The second research objective was to ascertain barriers startups face that can prevent them from succeeding. It became clear from the primary research that regulation was a complicated and expensive process. Another significant barrier was the attraction and retention of good staff. These became more evident through the themes identified and discussed in further detail below:

6.3.1 Theme 1: Attracting and Maintaining Talent

The first theme identified under this objective from the survey and participants in the in-depth interviews was the difficulty and importance of attracting and maintaining talent. Ireland is known globally as an excellent centre for MedTech due to its location geographically and the high availability of talent across all areas (Med In Ireland, 2021). Respondent F acknowledged that while Ireland had a large pool of qualified candidates, they also needed to align with the organisation's goals. They were: *“capable professionals, but they may not be the right fit for your organisation”*. Respondent C noted: *“Intense competition with other companies”*. The secondary research revealed in a LinkedIn survey on the top ten reasons companies fail: the wrong team was number 3, with 23% of startups failing (Palmieri, 2020). The ability to attract and retain talent is particularly complex for startups with limited funds and an unknown reputation in business; talented individuals will look to more established and multinational companies as startups are seen as a riskier option due to high failure rates.

Yohn (2019) stated that another reason for the startups' failure was the team's misalignment between partners, rollouts and vision. As Respondent A mentioned above, having a solid core team with varying talent and skills is vital to success; failure to help meet customer needs is another reason startups fail. According to Yohn (2019), 70% of startups fail for this reason.

6.3.2 Theme 2: Regulations

The research findings in the study reflected what was noted in the secondary research in the literature reviewed; regulations constitute a significant step in particular for a MedTech startup. Medical technology is highly regulated currently (MedTech Europe, 2020). Respondent E mentioned that regulation is ever-changing and evolving: *“regulatory things that pop up, that you need to go through to get to a product certified to be accepted into specific markets.”* The medical devices regulations have changed as of May 2021, which means up to 18 months for assessments to be carried out as they are done nationally and by the EU (Mason Hayes and Curran, 2021). As demonstrated by the literature, the regulations are changeable. They can lead to longer lead-in times, which would take longer for the companies to get to market due to a lack of regulatory compliance.

As a result, startups must stay abreast of these upcoming changes and prepare both time and financially. Respondent B: *“We need to be able to explore how to have much money left aside for all the regulatory things.”* Brexit is a great example. Due to the UK no longer being part of the EU, this may impact the regulatory requirements for a MedTech to launch in the UK.

The high cost of regulatory compliance was a concern of most respondents and reflected in the literature as per the Health Products Regulatory Authority report (HPRA, 2021). The cost of regulation is very high for a medical device startup (HPRA, 2021). With an estimated cost of up to 61,200 annually, Respondent A noted that this *“by definition adds about 30%”*. With funding hard to come by, this is a considerable expense for startups.

The discussions with respondents and the literature reviewed emphasised no clear timelines for regulatory compliance levels to apply for at crucial times. Respondent C voicing that it was difficult to know best practice in terms of when to apply for the different levels of regulation, said: “So trying to understand where is the best place and time to incorporate medical regulation, And to what level into the business is quite a challenge”. The time it takes to process the registrations can be up to several months, depending on the class of the device and the higher the risk (Regdesk, 2019). Also, this certification is only valid for five years before the company must again show compliance through an external audit.

6.4 Research objective 3: Digital marketing channels use: Do companies invest in and value marketing?

The final objective of the research project was to look at the digital marketing channels use and the investment in marketing, in particular digital marketing. The following are the themes that emerged.

6.4.1 Theme 1: Multiple Platforms and a Fluid Approach

Literature states, "marketing is the process of attracting the customer" (Levitt, cited in Harvard Business Review Press, 2013), and Taken Smith (2012) elaborated that it was a way to promote products or services across digital channels. The finding in the literature shows that channels rather than a channel would help promote a brand. The survey revealed that most of the companies would use multiple platforms to get their message across. Respondent B noted: “we are big on digital marketing, utilising all the resources that we can to get kind of a global brand out there.” Salehi *et al.* (2012) demonstrated that using digital marketing was far more cost-effective, offering a faster, more direct channel to reach customers.

Jackson and Ahuja (2016) highlighted in their research the need for businesses to use internet platforms and personal devices as consumers are more connected than ever and are conducting

more transactions online. The literature reflects the sentiment that digital is cost-effective and faster, and more direct in the approach. As Respondent D noted: *"It depends where your personas are hanging out what channels they're on, where you're going to, like fish where the fish are."* Chaffey and Ellis-Chadwick (2016, p.57) described digital marketing as: "Achieving marketing objectives through applying digital technologies and media."

6.4.2 Theme 2: Investment in Digital Marketing

The second theme under research objective three was looking at investment in the overall marketing budget and then digital. As per the survey conducted, more than 50% of the companies surveyed would be investing 75% plus in digital marketing as part of their marketing budgets. While the startups interviewed are at pre-commercial stages, a clear strategy is critical in terms of marketing strategy. As Chaffey and Ellis-Chadwick (2016) stated, a company must set out a list of specific goals and objectives in a business development plan; this will be the basis of the framework.

Ponder (2019) recognised that over 2.46 billion social media users are online and that 45% of the startups in his research claimed that digital and social media played a significant role in the companies' sustainability and growth. Respondent B stated: *"All of our marketing budgets is on digital"* and that *"a third of the overall budget on marketing"*. Critically there is a gap in the literature as to the optimal amount of spend for digital marketing budget as it is particular to the startups and the funding available to them. At the same time, the literature does reflect that digital is an ideal avenue for startups due to the low cost and ability to build a brand. Social media is free or at premium levels, inexpensive; online content is fast and cost-effective (Iankova *et al.*, 2019).

One of the conclusive findings that emanate from the research was that investment and funding were crucial to success, as lack of it had knock-on effects on regulatory approvals, the ability to hire and attract talent, which is the significant findings from the interviews as to challenges faced. The literature and interview often contradict each other;

Enterprise Ireland stating that there were several forms of funding development Capital Fund €225M, Innovation Fund Ireland €125 M, Enterprise Ireland Seed and Venture Capital Scheme €175 M, and OECD noted that there is a danger of some small to medium enterprises falling between local enterprise and Enterprise Ireland. Ibec stated that the Irish MedTech sector is growing steadily with a 4.5% growth in 2019, attracting new investment opportunities in Ireland. The researcher will offer recommendations in the next chapter.

Chapter 6: Conclusion and Recommendations

6.1 Introduction

The researcher set out to better understand challenges in creating a digital road map for MedTech startups in Ireland. The objective was achieved using secondary research and primary research through in-depth interviews and a survey. Ireland is the second-largest MedTech exporter in the EU (Ardill, 2019) and is the largest exporter of Medtech products in Europe; annual exports total reports at €10.2 billion. This is a huge revenue generator for Ireland, and as such continued support for startups in ensuring future success is vital for the economy.

A comprehensive review of articles and up to date literature was concluded with key insights from the IDA (2021), OECD (2019), Kotler and Armstrong (2004), Busca and Bertrandias (2020), and Saunders *et al.* (2007), to name a few, as well as MedTech websites and Local Enterprise. These authors provided key insights into the MedTech environment in Ireland and the digital marketing strategy that formed this study.

6.2 Limitations

Limitations included a small sample size; while 45 companies were contacted initially, there were eight volunteers for interviews, but only six committed to making time, and only eight responded to the circulated survey. Covid-19 was a barrier in face-to-face interviews and the personal connection that can add to the depth of an interview. The recording could result in less honesty as the person is aware that they are being recorded. Also, people are more likely to commit and then not follow through.

There was a lack of access to crucial information about financial supports, specific levels of funding, and a clear consistent message across articles.

Time, working full time while studying meant that time was more limited than the researcher anticipated. That and turn around time for organising and facilitating interviews and thematic analysis would be something that would be better prepared for in further research.

6.3 Research Findings

The study's main objective was to discover the “Challenges developing a Digital Marketing Roadmap for a MedTech startup in Ireland.” The study found many challenges for MedTech startups in Ireland;

- Funding supports and access at all levels of startup phases
- Size and scope of Ireland
- MedTech Regulation

The key findings indicated that there were many advantages and supports in launching in Ireland. That Ireland is among the top countries both globally and in the EU for MedTech. However, there were gaps in the supports and levels of competitiveness due to the small size of Ireland.

The central theme that emerged from this study was the lack of clarity of available funding levels. The research often contradicted itself. This could be a matter of keeping up appearances by the government bodies, such as Enterprise Ireland, Local Enterprises, and Ibec, reporting great support and funding. At the same time, the respondents themselves stated the difficulties in obtaining it.

As well as that, Ireland is a highly regulated country, and it is costly to achieve regulatory compliance. The process was also confusing to many, with no clear roadmap as to the timelines of applications. The size of Ireland was also noted as limiting the amount of support and mentoring that can be provided.

Digital marketing was seen as a solution that was seen as beneficial for startups within the literature, but there is scope for further investigation. Also, it was often seen as a nice to have and would be utilised depending on funding available.

So in closing, funding was the main challenge; this has knock-on effects on getting to market, regulatory compliance and investing in digital marketing. This is something that needs to be at the forefront of every MedTech startup strategy planning.

6.4 Recommendations for Further Research

As mentioned, funding was the critical issue with the respondents, and across the literature, there were many conflicting views in terms of levels of funding on offer. Further research specifically on levels of funding and supports across all government bodies in Ireland. To gain insight across all stages of a startup's journey and engage with key stakeholders and the startups at ground levels to highlight existing gaps.

Another area worth future study was that having a digital marketing roadmap in place from the beginning would alleviate challenges identified for startups. This was eluded to in Thani Jambulingam (2018). This could be studied in more detail.

Finally, research into a Regulatory roadmap would be of great benefit. The study showed that the new implementation of the regulations that will take effect in 2023 offers a good window of time to conduct a study and offer recommendations. That there was an evident lack of understanding of this process.

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Appendices

One to one interview questionnaire

1. What is your position in the company?
2. What sector does your company fall into?
3. What stage of the Start-up process are you?
4. How long is the company been established?
5. How many employees do you currently have?
6. Who is the company's target market?
7. What if any challenges do you feel you encountered as a MedTech start-up that you think was specific to your industry?
8. What is your overall marketing strategy for your company?
9. What percentage do you see your company investing in digital market when you go to market?
10. How do you value digital in your organisation?
11. Have you had any have you had any negative experiences with marketing to date?
12. What percentage of your annual budget goes to or will go towards marketing?
13. Do you have a marketing person?
14. In the future do you see yourself having a digital marketing department or Marketing?
15. Since your company has started have you changed any of your branding or your logos
16. Are there any digital marketing channels that you would feel would not be appropriate for you to use to market your product?
17. How would you measure your company's marketing success or KPIs?
18. Do you feel Ireland is a good platform to launch start-ups?
19. Was your move to launch in Ireland a strategic one?
20. Is there any advice you would give a new start-up entering the market?