

A Work Project presented as part of the requirements for the Award of a Master's Degree
in Management from the Nova School of Business and Economics.

TOWARDS A/B TESTING IN GUIDING A DEEP-TECH START-UP'S
CONTENT MARKETING STRATEGY:
A PRACTICAL APPLICATION OF THE LEAN START-UP METHODOLOGY

[A GO-TO-MARKET STRATEGY TO DISRUPT
THE EUROPEAN CLOUD COMPUTING MARKET]

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Title: Towards A/B Testing in Guiding a Deep-Tech Start-Up's Content Marketing Strategy: A Practical Application of the Lean Start-up Methodology

Abstract: This thesis explores the suitability of A/B testing to guide a deep-tech start-up's content marketing strategy, thereby serving as a practical application of the lean start-up methodology. It investigates different content formats' efficacy in achieving GTM-related objectives such as fostering customer orientation, authenticity, representation, and education. The research demonstrates that A/B testing can be extended beyond traditional use cases – albeit with limitations – to provide actionable insights for optimizing one's content marketing strategy. Results indicate that leveraging founders' personal brands and educating customers through blog posts can significantly enhance and thereby set up a deep-tech start-up's GTM strategy for future success.

Keywords: A/B Testing, Content Marketing Strategy, Deep-Tech, Start-Up

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List of Abbreviations

BP	CEMS Business Project
WP	Nova SBE Work Project
GTM	Go-to-market
B2B	Business-to-business
B2C	Business-to-consumer
VC	Venture Capital
e.g.	for example
et al.	and others
c.f.	compare

1. BP Introduction

This opening section includes an introduction to the BP industry, client, and challenge, including the approach the student team followed to successfully facilitate the latter. The BP was conducted at Stockholm School of Economics for Swedish early-stage cloud computing start-up Molnett Sweden AB from February 6th to May 21st, 2024.

1.1. BP Industry

The BP is set in the public cloud industry. In a public cloud, IT services are provided by a third-party and are shared among multiple customers, while a private cloud is defined as a dedicated cloud environment exclusively used and controlled by a single organization (Goyal 2014). In accordance, public cloud providers aim to lift their customers from the burden of operating and maintaining their own, on-premises IT infrastructure by offering the opportunity to provision ('rent') IT services over the internet ('the cloud'), on demand, in real-time, on a pay-as-you-go basis (Caroll, Van Der Merwe, and Kotzé 2011). These IT services include compute, data storage, managed databases, networking, analytics, etc. Such IT service delivery model can provide customers a range of benefits such as increased scalability, availability, cost-effectiveness, reliability, and security of their IT infrastructure and respective products built on top, such as web-based software applications of all sorts (Talukder, Zimmerman, and Prahalad 2010; Elmonem, Nasr, and Geith 2016; Caroll et al. 2011).

1.2. BP Client

The most well-known and worldwide leading public clouds are Microsoft Azure, Google Cloud Platform, and Amazon Web Services (Gartner 2023). Besides these so-called hyper-scalers, niche players and regional providers are carving out their dedicated spaces in a continuously growing cloud market (Statista 2023) by offering specialized cloud services, e.g., by catering to specific industries, regions, or use cases. This is also true for BP client Molnett Sweden AB – positioning itself as a new public cloud provider for the cybersecurity era – as its vision is to

serve clients that operate in highly regulated industries with sensitive data and thereby have a special need for cloud infrastructure that is exceptionally reliable, secure, and compliant with European and Swedish data regulations. Furthermore, the BP client can be characterized as an early-stage deep-tech start-up and at the time of this writing, there exists almost no traction, no external funding, and only a rudimentary MVP of its cloud platform. An additional challenge the BP client faces and must overcome is its ‘liability of newness’, a term coined by Stinchcombe (1965) referring to the challenges and higher failure rates start-ups face due to their lack of strategic relationships and legitimacy compared to more established entities in the market (Kuckertz 2015; Abatecola, Cafferata, and Poggesi 2012). Such notion is especially prevalent for deep-tech start-ups as they face the challenge of significant market education and adoption efforts which can be more time-consuming and resource intensive due to their product’s oftentimes more complex and intangible nature (Chorev and Anderson 2006; Carayannopoulos 2009), thereby likely deepening and / or lengthening a deep-tech start-up’s valley of death (Romme, Bell, and Frericks 2023).

1.3. BP Challenge

The given task was to develop a holistic GTM strategy enabling the BP client to carve out a dedicated niche in the European public cloud market, starting from Sweden. The task itself was two-fold as the first sub-task was to identify and rank attractive target segments based on the BP client’s (intended) key capabilities and USP. The second sub-task was to then develop an actionable GTM strategy for the target segments agreed upon by conducting a deep dive into these to first-hand derive information about their pain points and needs and how the BP client – given its current situation – can best and most effectively cater to these. Connected to that, a second, more implicit aim of the BP was to test the BP client’s business case hypothesis stating that there is an inherent need in the Swedish market for a public cloud provider that can unite the performance of the hyper-scalers with Sweden’s strict compliance and data protection

requirements by developing a cloud platform that can be scaled horizontally across industries as customer pain points and needs are mostly industry-agnostic.

A dual approach of primary and secondary research was used to successfully facilitate the BP. For the BP's first of three phases – gaining an initial product and market understanding – mainly secondary research was utilized such as market analysis tools and resources to gain an initial understanding of the public cloud market size and composition, white papers to better understand the cloud's value proposition, or news aggregates and government publications to ensure that the student team was up to date with the most recent regulations, trends, and developments. In the second phase – diving deep into the market and industry – these third-party resources were complemented by in-depth conversations with the BP client's founders to better understand their product vision, aspirations, and capabilities. Based on the generated insights, a decision was made together with the BP client in a dedicated workshop to focus on three dedicated customer segments, mainly SaaS firms operating in the EdTech, HealthTech, and GovTech sectors, as these were the industries that were most attractive and for which the student team saw the biggest potential for the BP client to add value. At this point, already some initial hypotheses of what pain points these segments might exhibit were garnered through desktop research, but the student team saw an additional need to further dive deep into these segments to uncover their true pain points to enrich and complement the desktop research. In line with Ries' (2011) lean start-up methodology, these hypotheses were then tested in 40+ interviews with potential customers. Combining the more granular insights from the customer interviews with the broader, more strategic insights from both desktop research and additional interviews with horizontal players such as trade associations, accelerators, and investors allowed the student team to create a robust foundation to inform and recommend an effective GTM strategy. This dual approach ensured that the proposed GTM strategy was not only responsive and attractive to specific and potentially isolated target customer needs but also kept

the bigger picture in mind and is aligned with the broader market trends and dynamics. In the third and final phase – putting together the pieces to create one holistic GTM strategy – the research findings were condensed and translated into actionable business recommendations in a presentation deck. In addition, these insights were used to draft an external-facing sales deck to convey the BP client’s value proposition in a customer-centric way to resonate well with both future potential VC investors and customers, and furthermore can act as internal guidance for future product development. Moreover, a list of realistic sales leads was provided. A second major – but rather indirect – outcome of the BP was the student team’s ability to successfully validate the BP client’s initial business hypothesis, thereby leading to a full circle moment.

2. WP Introduction

In this section, the initial connection between BP and WP is made, outlining how the latter is embedded into the lean start-up methodology developed collaboratively by Ries (2011), Blank (2003) and Blank and Dorf (2012). Furthermore, the research problem the WP will address is introduced, elaborating on the study’s general purpose, study objectives, and research questions. The section is concluded with a brief outlook on how the overall WP report is structured.

2.1. Connection between BP and WP

A GTM strategy can involve many different business activities (Ashkenas 2016; Kuester, Konya-Baumbach, and Schuhmacher 2018; Teece et al. 2022), so it shouldn’t come as a surprise that the BP’s recommended GTM strategy – due to a number of limitations – was not intended to cover all of these holistically but rather focused on those that provided the biggest value-add for the BP client given its current situation and needs. However, the then deprioritized GTM activities – which were not included in the final BP deliverables per se – such as a complementing pricing or content marketing strategy proved to be promising topics to further extend the scope of the BP through an additional WP, an offer the BP client warmly welcomed.

A theme already highly present throughout the BP was the thorough application of Ries' (2011) lean start-up methodology, which will be continued in this WP:

2.2. Embeddedness of WP into the Lean Start-up Methodology

The key idea proposed by Ries (2011) why so many start-ups fail is that the latter don't starve, but rather drown, meaning that because there's so much a start-up *can* do, this makes it much more difficult to determine what a start-up actually *should* do. He thereby suggests that one major challenge is to focus both a start-up's energy and resources in the right place, at the right time, in the right amount. Consequently, this notion applies not only to key business activities such as company building (Weiland and Knizhnik 2022; Blank and Eckhardt 2023), product development and product-market-fit (Yoo, Huang, and Arifoğlu 2021; Leatherbee and Katila 2020), sales enablement (Blank and Eckhardt 2023; Bortolini et al. 2018), or other GTM-related activities, but also to a start-up's marketing efforts. Therefore, scientifically testing and recommending a suitable content marketing strategy is a promising opportunity to apply 'validated learning', which is the central concept in Ries' (2011) lean start-up methodology (Weiland and Knizhnik 2022; Silva et al. 2020). In short, validated learning emphasizes the importance of fast organizational learning through empirical data to make better informed decisions in the context of extreme uncertainty (Shepherd and Gruber 2020; Nirwan and Dhewanto 2015), a common environment for start-ups that also applies to the BP client. More specifically, Ries (2011) defines validated learning as a process through which one learns by trying out an initial hypothesis and then empirically testing it to validate the (potentially causal) effect of specific actions towards achieving a desired outcome (Bortolini et al. 2018). So, it's not just about gaining anecdotal evidence, but rather getting hard, empirical data that can prove whether an underlying assumption is correct or not. This systematic approach is vastly different of how content marketing is currently done at the BP client, as it mostly relies on a mix of gut feeling and trial and error to see what type of digital marketing content sticks with its audience

without a proper structure or process behind. Consequently, the application of validated learning is especially valuable in this regard as it prevents the resource-constrained BP client from spending valuable time, money, and efforts by uncovering what content marketing formats are truly value-adding for its (potential) customers to then adapt its marketing strategy accordingly, thereby turning assumptions into knowledge, risks into calculated risks, and reliance on gut feeling and trial and error into a series of informed, data-driven decisions (Lizarelli et al. 2021; Shepherd and Gruber 2020). To achieve validated learning in business practice, Ries (2011) proposes different methods, one of which is A/B testing.

2.3. Problem Statement

2.3.1. Study Purpose and Objectives

The study's general purpose is two-fold: On the one hand, it aims to extend the traditional view of A/B testing – beyond today's common use cases as outlined in section 3.1. and 3.2. – by trying to prove its suitability in guiding a B2B deep-tech start-up's content marketing strategy. As such, this study serves as a practical application of Ries' (2011) lean start-up methodology, complementing the existing but sparse body of academic literature investigating the practical implementation and suitability of this concept (c.f., Bortolini et al. 2018; Silva et al. 2020; Link 2016; Yordanova 2018; Lizarelli et al. 2021; Nirwan and Dhewanto 2015; Harms 2015; Leatherbee and Katila 2020; Scheuenstuhl, Bican, and Brem 2020; De Cock, Bruneel, and Bobelyn 2020). On the other hand, more specifically, the study will assess the efficacy of various types of digital content marketing formats with regards to GTM-related objectives in the case of the BP client. Consequently, the study will explicitly add value to the BP client by extending the scope of the BP towards the field of content marketing, providing an additional impact through supplementary scientific research and actionable recommendations in this field.

2.3.2. Research Questions

Based on the study's two-fold purpose, the following research questions are defined:

- RQ1:* Can the usage of A/B testing be extended beyond today's common use cases to optimize a B2B deep-tech start-up's content marketing strategy?
- RQ2:* Can the creation and sharing of relevant content marketing formats support a B2B deep-tech start-up in successfully going to market?
- RQ3:* What content marketing formats are most effective in the case of the BP client with regards to its GTM-related objectives?

2.4. Report Structure and Outline

Next, the theoretical background to the problem area and the research design is presented. Furthermore, the report will elaborate on the scientific methodology, research steps, and potential threats to validity, which will be concluded by a short presentation of the results. To summarize, the final conclusions, theoretical implications, and practical recommendations are presented, including a brief elaboration on the study's novelty.

3. Theoretical Background

In the following, a short literature review of both content marketing in B2B deep-tech start-ups and A/B testing as such is presented. It was conducted via a backward and forward snowballing method, in which – starting from a core set of academic publications – further relevant literature was identified both by examining the core paper's references for additional relevant works and reviewing academic publications that have cited the latter.

3.1. B2B Content Marketing in (Deep-Tech) Start-Ups

A widely accepted definition of digital content marketing is the one of Hollebeek and Macky (2019), who define the latter as the production and sharing of relevant, helpful, and brand-related content to one's current or potential customers on digital channels. Engaging in content marketing represents an increasingly important and growing vehicle for B2B firms to develop and foster brand engagement and interaction (Ashley and Tuten 2015), relationships (Yaghtin, Safarzadeh, and Zand 2020), and customer loyalty (Wang et al. 2017), which can lead to more

engaged audiences at reduced marketing cost (Pulizzi and Piper 2023) and a firm's enhanced online visibility (Mansour and Barandas 2017). Furthermore, other key objectives of B2B content marketing include fostering brand awareness and reinforcement, lead conversion and nurturing, customer upsell (Rose and Pulizzi 2011), and positioning the selling firm as a thought leader (Gagnon 2015). Compared to 'traditional', promotionally based advertising that is mainly designed to foster short-term sales and to encourage customers of the specific advantages of one's products / services (Yaghtin et al. 2020), content marketing rather aims for "increasing (potential) customers' appreciation [of a firm's brand, products, or services] by adding value to their lives" (Hollebeek and Macky 2019, 28), e.g., by publishing educational content (Järvinen and Taiminen 2016). Thus, engaging in content marketing requires a change in business culture from 'selling' to 'helping' (Holliman and Rowley 2014), thereby turning promoters into publishers of product information that is more factual in nature and more directed at helping the potential customer solve a specific problem (Gagnon 2015). Furthermore, Gagnon (2015) proposes that such status of being a thought leader can help firms achieve a distinct advantage and leadership position in the buyer's mind. Overall, Hollebeek and Macky (2019, 28) summarize that "while content marketing (like advertising) intends to boost consumer brand perceptions and ultimately sales, it (unlike advertising) does so by developing consumer engagement, attitudes, trust, and relationships, which are intended to cultivate sales *indirectly* and in the long run". To do so, content marketing can take on various formats such as blog posts, social media and website content, podcasts, eBooks, (technical) white papers, webinars, case studies, e-mails, customer success stories, etc.

In recent years, content marketing has enjoyed a sharp rise in popularity and adoption especially in (deep-)tech start-ups, as these often face particular challenges associated with marketing their products / services due to their often complex, intangible, or unfamiliar nature (Chorev and Anderson 2006). Moreover, they frequently encounter scepticism and resistance from potential

customers who might be reluctant to adopt their new and untested technologies, so engaging in effective content marketing strategies can help deep-tech start-ups build trust, credibility, and overcome these adoption barriers. However, particularly early-stage tech start-ups and their (technical) founders oftentimes lack experience in marketing (Mansour and Barandas 2017; Bresciani and Eppler 2010) or may neglect the latter to focus on areas deemed to be more important, such as developing (a better) product or improving product-market fit (MacInnis and Heslop 1990; Rizvanović et al. 2023), a sentiment which also applies to the BP client. Furthermore, Pulizzi and Handley (2014) found that even if deep-tech start-ups do engage in content marketing, they seldomly have a structured and documented strategy to do so, a notion which can be attested to the BP client as well.

A specific type of content format this study aims to further investigate is the approach of leveraging a start-up founder's personal brand for content marketing purposes, as "especially in early-stage tech start-ups, [a potential customer] is not buying a fully fleshed out product, but rather the founder's vision of it" (Geller, interview by author, May 8th, 2024), a sentiment similar to early stage investing (Bernstein, Korteweg, and Laws 2017; ElMassah et al. 2019). Moreover, it is believed that a founder's personal brand can be a crucial tool to gain market traction, as their expertise, thought leadership, or personal story can be leveraged to create compelling content that can differentiate a start-up in the marketplace by building trust and enhancing its visibility (Rode and Vallaster 2005). This view is also supported by Fetscherin (2015) who concludes that start-up founders – similar to CEOs in more established firms – can leverage their personal brand to attract attention and establish credibility and trust with not only potential customers, but also with investors or partners. In a similar vein, Hamby, Brinberg, and Daniloski (2019) and Witt and Rode (2005) propose that start-ups can benefit by sharing both their founder's underlying stories, goals, and motives behind their brand's foundation to engage potential customers and build positive brand perceptions and authenticity.

3.2. A/B Testing

A widely adopted method to implement validated learning in business practice is A/B testing, as it is generally regarded as the best and easiest scientific design to establish a causal relationship between a change and its influence on user-observable behaviour (Kohavi et al. 2008). To do so, two different variants are created, which are typically characterized as:

1. *Control* (Version A), the default option and currently existing variant
2. *Treatment* (Version B), the new, (optimized) variant that needs to be tested

Users are then randomly split between these two versions in a persistent manner, meaning that in an ideal state, the same user is exposed to the same variant in multiple visits (Kohavi, Tang, and Xu 2020). These days, A/B tests are used heavily especially at internet-based tech enterprises such as the ‘FAANG’ companies, as these run tens of thousands of A/B tests every year, sometimes involving millions of users (Kohavi et al. 2020). The abundance of third-party A/B testing software further underscores how widely adopted this method has become in today’s business world. Furthermore, the ease of use of running an A/B test also allows for a broad application across various channels. Use cases range from testing changes to the UI, relevance algorithms (search, ads, personalization, recommendations, etc.), or marketing messaging to latency and performance monitoring, and human behaviour analysis, all across multiple channels such as web, desktop, mobile, or e-mail (Kohavi et al. 2020).

As previously stated, the practice of running A/B tests is especially common in larger-scale enterprise tech companies, but besides that, A/B testing in recent years has also seen an increased adoption in the start-up sector, for the same reasons. A large share of such can likely be attributed to Ries’ (2011) popular lean start-up methodology and the fact that A/B tests are explicitly recommended in the latter as one scalable method to implement validated learning in one’s organization. This notion is also mirrored by Schuit, Baldassarre, and Bocken (2017), who proclaim A/B testing to be an “easily accessible [tool for start-ups] to execute experiments

in a fast paced and iterative manner” (Schuit et al. 2017, 370) that is crucial in both developing and strengthening a start-up’s overall value proposition and business model, while Zaheer et al. (2019) add that the systematic and strategic usage of A/B testing can help a start-up gain traction – and thereby overcome the valley of death – faster. Furthermore, prioritizing quick testing and learning based on user feedback through methods such as A/B testing – especially in one’s product development – can help start-ups in better mitigating risks connected to the introduction of new products and technologies (Teberga and Oliva 2018). As a result, A/B testing is especially widespread in software development start-ups due to their iterative development cycles (c.f., Melegati et al. 2019; Klotins et al. 2012; Gutbrod, Münch, and Tichy 2017). But also in start-up marketing, A/B testing is seen these days both by scholars and practitioners alike as a promising tool to drastically reduce the time and cost of experimentation and thereby overall time-to-market (Lee and Kim 2024), as compared to more traditional marketing methods such as interviews, focus groups, or questionnaires, A/B testing can enable feedback at scale, in parallel, in real-time, and at relatively low cost (Koning, Hasan, and Chatterji 2022). Other, Conway and Hemphill (2019) also highlight A/B testing as a crucial enabler of ‘growth hacking’, which they define as a data-informed and -driven marketing approach that leverages digital marketing tools to get a start-up off the ground faster. The reason why A/B testing is especially beneficial in this case is because it allows “to quickly and cheaply test a marketing idea, use data to analyse the outcomes, and to iterate, optimise, implement, or change” (Conway and Hemphill 2019, 174). Reading through all this appraisal, one might conclude that A/B testing these days is considered to be the gold standard for validated learning, especially in the resource-constrained start-up world. However, A/B testing is not merely seen as such invariable saviour as multiple scholars counterargue that the more a start-up spends its time on experimentation to explore and fine-tune (parts of) its processes the more likely the risk that by

doing so, it will at some point lose momentum, get outpaced, or imitated by its competitors (Agrawal, Gans, and Stern 2021; Contigiani 2023; Yordanova 2021).

4. Methodology

This section outlines the methodology utilized for relating the conceptual research problem to practical empirical research. It states why a particular research design was chosen and furthermore refers to the techniques used to collect and analyse the data, which will be broken down into four stages representative of the overall methodical approach.

4.1. Stage One: General Research Design

The main motivation to engage in empirical research is to answer one's research questions (Ghuri, Grønhaug, and Strange 2020). Therefore, it is important to strategically decide on a suitable research design that effectively produces the wanted information to test one's research questions, while at the same time achieving such within certain time or budgetary constraints (Ghuri et al. 2020). For this WP, a causal research design was chosen to isolate the causes and assess if and to what extent these result in actual effects to identify what content marketing formats are most effective in the BP client's industry with regards to certain GTM-related objectives. The research challenge therefore is to design a study that allows to scientifically uncover and access such information, which will be achieved through the usage of the 'classic' experiment. To do so, subjects are randomly allocated to one of the three following conditions. Strictly speaking, thereby the conducted experiment could also be regarded as an A/B/C test. A visualization of all three conditions including their links is provided in Appendix A.

1. *Control group (Version A)*: Shows the BP client's website landing page as it is at the start of the WP, without any content marketing formats presented.
2. *Treatment 1 (Version B)*: *Ceteris paribus*, shows the BP client's website landing page but a preview series of three technical blog posts is added prominently after the website's

header. Every blog post's preview is accessible through a 'learn more' button which navigates to a sub-page consisting of the full article.

3. *Treatment 2 (Version C)*: *Ceteris paribus*, shows the BP client's website landing page but a short biography of each of the three founders – including their professional achievements, values, vision, mission, and motivations to found the start-up – is added prominently directly after the website's header. This treatment therefore acts as a special type of content format by leveraging a founder's personal brand.

4.2. Stage Two: Granular Experiment Design

The experiment itself is divided into two sections: First, subjects are randomly allocated to one of the three conditions and are presented correspondingly with either website version A, B, or C. Second, after going through and interacting with the presented content marketing formats at their own pace, subjects are then tasked to rate twenty statements connected to the presented content on a numerical scale from 0 (not applicable at all) to 10 (highly applicable), which are the same for every subject regardless of the treatment. To visualize, a depiction of the survey flow is presented in Appendix B.

4.2.1. A/B Testing Environment

Scholars propose that the overall usage of A/B testing increases over a start-up's life cycle (Klotins et al. 2021) due to the fact that such data-heavy method requires a significant amount of website traffic or interactions which may not be available to a start-up during its early stages (Olsson and Bosch 2023). This notion unfortunately also applied to the BP client, so consequently, the A/B test could not be conducted in the BP client's 'natural' website environment but had to be moved into an artificial survey setting. Qualtrics was chosen as survey provider as it offered a technical advancement crucial to the experiment which was the possibility to embed an iFrame into the survey mask. To circumvent the aforementioned challenge and preserve an A/B test's essence, the Qualtrics survey mask had to resemble the BP

client's actual website environment as close as possible to best simulate an authentic website experience. To do so, the BP client's website was coded into Qualtrics through an inline frame (iFrame), which is a HTML element that can be used to embed third-party content into Qualtrics via a content window. To sum up, through this peculiar experimental setup, the following benefits were achieved: First, an efficient workaround was created to overcome the challenge of transferring the A/B test into an artificial survey setting without losing its essence. Second, the BP client's website environment is simulated as best as possible as an iFrame allows for natural website interactions within Qualtrics as compared to, e.g., a screenshot of the BP client's website or a link to redirect, subjects can interact freely with the content displayed in the iFrame as if they would navigate on a regular website.

4.2.2. Operationalization

The next step was to determine how the theoretical concept(s) under scrutiny should be measured (operationalized) in the experiment (Ghauri et al. 2020), with the challenge at hand to translate actionable business metrics into scientific metrics appropriate for experimentation. As previously outlined, the main theoretical concept this study will investigate is different content marketing format's efficacies in supporting a deep-tech start-up's GTM objectives. However, such variable may not be possible to translate directly into an experimental context as several questions arise: How does one test for efficacy? What are GTM-related objectives that content marketing formats should foster, especially in a deep-tech environment?

To achieve such operationalization, this study leveraged the CARE-Framework proposed by Kuester et al. (2018), designed to help tech start-ups efficiently and effectively allocate their limited resources within their GTM strategies when launching so-called 'e-innovations'. Kuester et al. (2018, 65) describe e-innovations as "internet-enabled service innovations associated with high levels of uncertainty for potential customers, particularly when [they] are launched by start-ups", a sentiment also applicable to cloud computing. The framework itself

is built on four pillars: Customers, Authenticity, Representation, and Education. Kuester et al. (2018) argue that by fostering these four pillars, start-ups can significantly enhance the success of their GTM strategies while at the same time managing their limited resources effectively.

To test for these four pillars respectively in the study, after subjects underwent the treatment, they were tasked to indicate their perception on twenty statements connected to the just presented content marketing format on a scale from 0 (not applicable at all) to 10 (highly applicable) Those twenty statements were in turn divided into four sub-categories – each consisting of five statements – that fed directly into one of the four CARE-Framework pillars: For the first pillar– Customers – the statements presented in the survey closely evolved around establishing an image of customer orientation, as such emphasis is proposed by Kuester et al. (2018) to have a positive influence on the adoption of a tech start-up’s products / services. Consequently, all five statements in this sub-category are connected to such notion of customer orientation, with two exemplary statements being “In its work, Molnett exhibits a strong culture of customer orientation” and “I perceive Molnett as a trusted partner that works side-by-side with customers rather than being a ‘pure service provider’”. The second sub-category of statements is then connected to the second pillar – Authenticity – which proposes that the latter is particularly important for new and yet unknown tech start-ups as it can help build favourable initial trust perceptions (Kuester et al. 2018). This sentiment is also mirrored in the survey’s second sub-category, with two exemplary statements being “The presented information makes Molnett authentic” and “Through the information presented I was able to build favourable initial trust in Molnett and its offerings”. For the third pillar – Representation – Kuester et al. (2018) emphasize that to successfully gain a foothold in a market, a start-up should take great care in making its often technical and intangible products / services more tangible for potential customers. This goal again is mirrored in the survey’s third sub-category, with statements such as e.g., “The presented information made Molnett's core product more tangible for me” and

“The information addressed made it easier for me to understand how Molnett creates value for its customers”. Lastly, the fourth pillar– Education – proposes that to foster trust and adoption, start-ups should also engage in educating their potential customers about their products / services (Kuester et al. 2018). This goal is aimed at in the survey’s last sub-category, with exemplary statements such as “The content inspires me to learn more about the topic” and “The content addresses problems or questions that are relevant to me / my organization”. To sum up, the statements presented in the survey’s second part aim at gaining a thorough understanding of which content version performs best in terms of efficacy across the four pillars of the CARE-Framework, thereby offering guidance to the BP client how the marketing content can be adapted to set up the overall GTM strategy for a higher success rate. An overview of all respective questions for each of the CARE-Framework’s pillars is provided in Appendix C.

4.2.3. Overall Evaluation Criterion (OEC)

Judging from the number of statements in the survey, one currently must examine twenty mean averages to compare across the three different versions, which is highly impractical. A suitable solution is to combine these metrics into an ‘Overall Evaluation Criterion’ (OEC) (Kohavi et al. 2020), a practice especially common in A/B testing. Such practice on bundling various metrics into just one is also echoed by Croll and Yoskovitz (2013) and McChesney, Covey, and Huling (2016), who suggest to focus on just ‘One Metric that Matters’ or one ‘Wildly Important Goal’ respectively if the researcher runs into aforementioned situation of having collected multiple key metrics. For the OEC to be valid, it must be measurable in the short term – the experiment’s duration – yet believed to causally drive long-term strategic objectives (Kohavi et al. 2020). In A/B testing practice, many firms collect multiple metrics within one experiment and to summarize these into an OEC, have a mental model for the trade-offs they’re willing to accept between those (Kohavi et al. 2020). Connected to the WP and the CARE-Framework’s pillars, this suggests that the BP client might be willing to sacrifice some perception of customer

orientation (Pillar 1) if in turn the marketing content boosts its authenticity (Pillar 2). If such mental model exists, Roy (2001) and Kohavi et al. (2020) propose the OEC as a weighted combination of such trade-offs is the most desirable solution. To do so, together with the BP client a weight was assigned to each of the CARE-Framework's four pillars to establish a mental trade-off model representative for the public cloud industry with customers = 0.15, authenticity = 0.2, representation = 0.4, and education = 0.25. The resulting formula to calculate each version's OEC can be found in Appendix D. To calculate an OEC's respective standard deviation needed to perform a t Test, first, the pooled variance was calculated for each pillar of the CARE-Framework, and then multiplied by the respective pillar's weight. These four pooled variances were then summed up to get an OEC's overall variance. See Appendix E for an overview of all the version's OEC's and their respective standard deviations. All related calculations were performed in Python can be found in Appendix F. Through this procedure, one now has reduced the number of mean average values to compare from twenty to just one.

4.2.4. Hypotheses and Predictions

To statistically assess the difference in the OEC between versions A, B, and C, the following hypotheses were developed:

Experiment 1: To test the OEC between Versions A and B with Student's t Test:

Null Hypothesis: There is *no* statistically significant difference in the OEC between Versions A and B.

Alternative Hypothesis: There is a statistically significant difference in the OEC between Versions A and B.

Based on the previous literature review and the associated benefits content marketing in the form of leveraging a founder's personal brand can provide, it is predicted that Version B will outperform Version A.

Experiment 2: To test the OEC of between Versions A and C with Student's t Test:

Null Hypothesis: There is *no* statistically significant difference in the OEC between Versions A and C.

Alternative Hypothesis: There is a statistically significant difference in the OEC between Versions A and C.

Based on the previous literature review and the associated benefits educating potential customers through blog posts can provide, it is predicted that also Version C will outperform Version A.

Experiment 3: To test the OEC of between Versions B and C with Student's t Test:

Null Hypothesis: There is *no* statistically significant difference in the OEC between Versions B and C.

Alternative Hypothesis: There is a statistically significant difference in the OEC between Versions B and C.

Because the differences in content formats in Versions B and C might be too small, it is predicted that no version will outperform the other.

4.3. Stage Three: Data Collection

For the experiment, the decision was made to utilize exclusively primary data through aforementioned survey, a decision that came with a number of advantages, disadvantages, and further considerations: The first and main advantage of utilizing solely primary data is one's ability to collect data with the exact objectives of the study in mind, thereby allowing to generate data that overlaps exactly with the underlying theoretical concepts (Ghauri et al. 2020). Connected to the WP, this meant that the statements presented in section two of the survey could be tied closely to the underlying CARE-Framework by Kuester et al. (2018), thereby ensuring a higher-quality operationalization. The second advantage is that one can choose exactly who to approach for the required data, and how many units of observation are to be surveyed (Ghauri et al. 2020). In the case of the WP, this meant that for the experiment to have predictive power,

the survey respondents would need to closely resemble the BP client's ideal target customers which are mainly SaaS firms operating in the EdTech, HealthTech, or GovTech sector and either have already deployed (some of) their workloads on a public cloud or are planning to do so in the near future. The fact that – compared to other WP's – the survey's target respondents are not B2C, but rather B2B customers proved to be a significant challenge – as one could not rely on his / her student network for data collection – and called for rather unusual ways of collecting data: E.g., to first-hand gather suitable B2B respondents, a full two-day trip to the LearnTec trade fair in Karlsruhe, Germany, was facilitated from June 4th to 5th, 2024. LearnTec prides itself with being Europe's #1 trade fair in digital learning with 400+ attending companies (LearnTec 2024), and after studying beforehand the list of exhibitors, 120+ EdTech SaaS firms were identified that would likely match the experiment's target sample. Equipped with two devices and a QR code linking to the survey, over the course of two full days, 75+ survey responses were collected from representatives of leading European EdTech SaaS firms by roaming the fair's three exhibition halls. A fact worth highlighting in this regard is that all incurred costs were fully covered by the BP client.

The required total sample size to statistically test Experiments 1, 2, and 3 was determined a priori by a G*Power analysis consisting of the following input parameters: Test family = t Tests, statistical test = means (difference between two independent means; two groups), tails = two, effect size $d = 0.6$, α error probability = 0.05, power ($1-\beta$ error probability) = 0.8, with an allocation ratio = 1. Given these input parameters, G*Power computed the required sample size to be 90 per experiment or at least 45 per version. To achieve such required sample sizes, once the respective survey was made publicly available on Tuesday, May 28th, 2024, at appr. 11 am CEST, it was shared privately both through personal contacts and direct outreaches, as well as publicly in professional social networks such as LinkedIn. The data collection stage was ended after two weeks on Tuesday, 11th of June 2024, at appr. 12 am CEST. In total, the survey

received 196 responses. The third advantage of utilizing exclusively primary data is that the data will be collected directly by the researcher who is aware of the study objectives and possible nuances of interpretation and should thus be able to collect more accurate responses and therefore have a greater confidence in the final results (Ghauri et al. 2020). This advantage came in handy especially at LearnTec, as one was able to rule out potential survey respondents based on short personal talks beforehand, thereby exposing some of the shortlisted firms as not being as a good fit for the survey as hoped during the pre-screening process.

The two main disadvantages of deciding on utilizing solely primary data are the facts that first, the process of data collection is often slow and / or expensive, which can be a major issue if either a timely analysis is required or one has only a limited budget, while the second drawback is that it may be difficult to obtain suitable access or build a dataset of significant size. The WP suffered from both of these disadvantages which may explain the rather small usable sample size of 142 survey responses.

With the aforementioned experiment design and respective questions operationalized from the CARE-Framework by Kuester et al. (2018), the survey aimed to collect (numerical) data on the following primary data types (Ghauri et al. 2020): First, to collect data on a subject's attitudes and opinions, in this case, referring to both the BP client per se and its product offering as such data may reveal future usage of and attitude towards the latter. An exemplary statement from the survey to collect such sentiment was "Through the information presented I was able to build favourable initial trust in Molnett and its offerings". Second, to collect data on intentions, in this case, referring to a respondent's future actions such as their intention to share the presented marketing content within their organization. This was collected in the survey by asking e.g., "I am likely to share this content with others". Third, to collect data on the subject's awareness and knowledge, referring to what a respondent already knew about particular cloud products. Collecting such data is crucial to investigate what factors motivate potential customers to buy

cloud products or to decide for a specific public cloud provider. An exemplary statement in the survey designed specifically to collect such data was “Compared to other cloud providers, Molnett has a distinctive personal image”. Fourth and final, to collect data on attributes, in this case, referring to a respondent’s socioeconomic data such as their profession: To filter for the desired target sample, a disclaimer was to the survey asking participants to indicate their profession. Here, once a respondent stated that they were not part of the desired target group, their data was cleansed from the data set to enhance the study’s external validity and predictive power. An overview of the collected data is presented in Appendix G.

4.4. Stage Four: Data Analysis

After the data collection stage, the data was cleansed from both incomplete and duplicate responses, as well as from responses from those subjects that self-identified themselves in the survey to *not* be part of the experiment’s target group. These measurements reduced the available data set from 196 to 142 responses with the following distribution: Control group = 48 answers, Treatment 1 = 49 answers, Treatment 2 = 45 answers.

To statistically compare the efficacy of the three different conditions, a two-tailed t Test was utilized assuming that the experiment’s observations are normally distributed, and the sampling distributions variances are not known but believed to be similar. To do so, in A/B testing, a two-tailed test is preferred, as one does usually not know a priori whether the difference in efficacy will be in favour of one version or the other (Kohavi et al. 2020). The respective calculations for the statistical testing were conducted in Python, with the full code available for inspection in Appendix F.

4.5. Threats to Validity

One potential threat that could harm the WP’s ability to deliver valuable insights for the BP client is the risk of including the ‘wrong’ subjects in the sample, that is, subjects that are not deemed as the experiment’s target group. This can result in the sample not being representative

for the experiment's intended population and can introduce bias, which likely leads to inaccurate conclusions and potentially misleading recommendations to the BP client. To prevent and minimize this threat, a screening section was added to the survey as outlined in sections 4.3. and 4.4.

Another potential threat is that compared to 'real-world' A/B tests, the experiment conducted did not make use of persistent testing as outlined in section 3.2., but instead, subjects were exposed to the treatment only once. As a result, the study results will likely reflect only the short-term effects of the treatment and long-term effects will not be measured, thereby reducing the study's external validity as the findings may not generalize well to real-world scenarios where users interact with the treatment multiple times. Consequently, the study likely misses out on understanding how such repeated exposure will influence user behaviour in the long run. Furthermore, the study did not control for any moderating variables such as a subject's position within their company that could possibly influence their survey behaviour, as different positions may answer the survey differently. E.g., a person with a specialist background in IT might find the ideas, concepts, and products presented in the different content marketing formats way less innovative, novel, or exciting than a person from a non-technical background. This can lead to issues such as missing out on understanding how different job roles might moderate the effect of a treatment. Furthermore, if certain job positions are overrepresented / underrepresented in the survey, the results may be biased and not accurately reflect the views of the BP client's entire target group. Here, one potential mitigation strategy could be to segment the sample by job position and thereby incorporate this moderating variable into the data analysis.

Another threat to validity is the fact that the experiment very likely suffers from an overrepresentation of one target group within its sample that is, respondents from EdTech SaaS firms. As mentioned in section 1.3., the BP client's main target customers are SaaS firms operating either in the EdTech, HealthTech, or GovTech sector, with no particular focus, so

these industries should be represented evenly in the sample. However, it is possible that due to the visit to LearnTec to boost survey responses, the experiment's sample likely suffers from a slight overrepresentation of EdTech respondents which again can introduce bias and potentially skew the findings more towards this target group's specific preferences, opinions, or behaviours, thus leading to inaccurate conclusions and compromising the study's generalizability. For future experiments, a countermeasure to mitigate such threat could be the introduction of quota sampling to ensure that the survey sample includes a sufficient and evenly distributed number of respondents from each of the BP client's target segments.

5. Results

The data analysis revealed that with regards to Experiment 1 and 2, in both cases, the null hypothesis was successfully rejected (Experiment 1: $p = 0.0002 < 0.05$; Experiment 2: $p = 0.0015 < 0.05$), signalling that there exists a significant difference in the OEC between both the control group (Version A) and the two treatments (Version B and C), respectively. In both cases, the difference was in favour of the treatment, meaning that compared to the control group, both treatments showed a higher efficacy with regards to the proposed GTM-related objectives by Kuester et al. (2018). These results were in line with the WP's predictions. For Experiment 3, the test failed to reject the null hypothesis ($p = 0.5321 > 0.05$), indicating that no significant difference exists in the OEC – and thereby efficacy – between the two treatments (Versions B and C), which confirms the study's prediction as the difference between the two content marketing formats is likely too small to be significantly different. However, as to be further detailed in section 6.2., a common mistake is to assume that just because the two OEC's are not significantly different, there is no treatment effect between Versions B and C. An overview of the results can be found in Appendix H.

6. Conclusions

This section will systematically state the study's conclusions for each of the three proposed research questions – thereby elaborating both on the theoretical and managerial implications – and will end with a short outlook on the study's novelty and potential areas of future research.

6.1. Theoretical Implications

With regards to *RQ1*, the study has successfully shown that it is possible to apply the method of A/B testing beyond today's common use cases such as outlined in sections 3.1. and 3.2. towards the case of content marketing- and GTM strategies in (deep-tech) start-ups. Thereby, it acts as a practical application of Ries' (2011) lean start-up methodology. However, one must acknowledge that the process of operationalizing business objectives related to content- and GTM strategies that tend to be 'fluffier' – such as creating favourable trust perceptions and attitudes, or fostering awareness, visibility, authenticity and innovativeness – are difficult to operationalize and measure in a practical context, especially in resource-constrained start-ups. It is therefore recommended that instead, A/B testing should mainly be leveraged in situations in which the experiment's objectives are more straight-forward to measure and compare across the test's variants, such as e.g., average order values, click-through rates, or conversion rates. Concerning *RQ2*, it has been shown that engaging in the creation and sharing of relevant content as a form of marketing strategy can strongly support a B2B deep-tech start-up in going to market by having a strong positive influence on fostering the four pillars of Kuester et al.'s (2018) CARE-Framework crucial to set up a (deep-tech) start-up's GTM strategy for future success.

6.2. Practical Implications

Judging from the study's findings, the main managerial recommendation to the BP client is simple and straight-forward: With regards to supporting its GTM aspirations and objectives, it is highly recommended to the BP client to engage in the creation and sharing of marketing content, regardless of its format. As for *RQ3*, when it comes to guidance on what specific

content marketing format is the most effective in the BP client's specific case, it is recommended that it should deploy a mix of both with a bigger focus on building up and leveraging its founder's personal brands, as Version B in Experiment 3 has – although not statistically significant – outperformed Version C across three of the four CARE-Framework's pillars, that are, customers, authenticity, and representation. This distribution makes sense as for the framework's fourth pillar – education – the founder's personal branding approach was outperformed by Version C, as the main purpose of a blog post in content marketing is to educate. Therefore, to foster all the framework's pillars holistically, it is recommended that the BP client should also engage in creating blog posts to educate its (potential) customers on e.g., its products, services, or overall value proposition, but should still prioritize leveraging its founder's personal brands over publishing educational content. To summarize, this study thereby offers valuable and actionable insights to the BP client by uncovering the types of content marketing formats that are most effective in the BP client's specific case to best position its overall GTM strategy for future success.

6.3. Areas for Future Research

This study deployed a novel experiment design by utilizing an A/B test to scientifically test different content marketing formats on their efficacy in fostering specific GTM-related business objectives that were operationalized from Kuester et al.'s (2018) CARE-Framework. However, it will remain a challenge for future marketing research to operationalize well a GTM strategy's key marketing objectives into scientific and measurable metrics suitable for experimentation as marketing goals such as authenticity, trust, or attitude are sort of 'fluffy' and – compared to other metrics such as click-through rates, conversion rates, or average order values – are therefore rather difficult to measure and collect. As this study deployed a novel way to do so by leveraging the CARE-Framework of Kuester et al. (2018), further research is needed to confirm that such operationalization is valid and can persevere in the future.

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8. Appendix

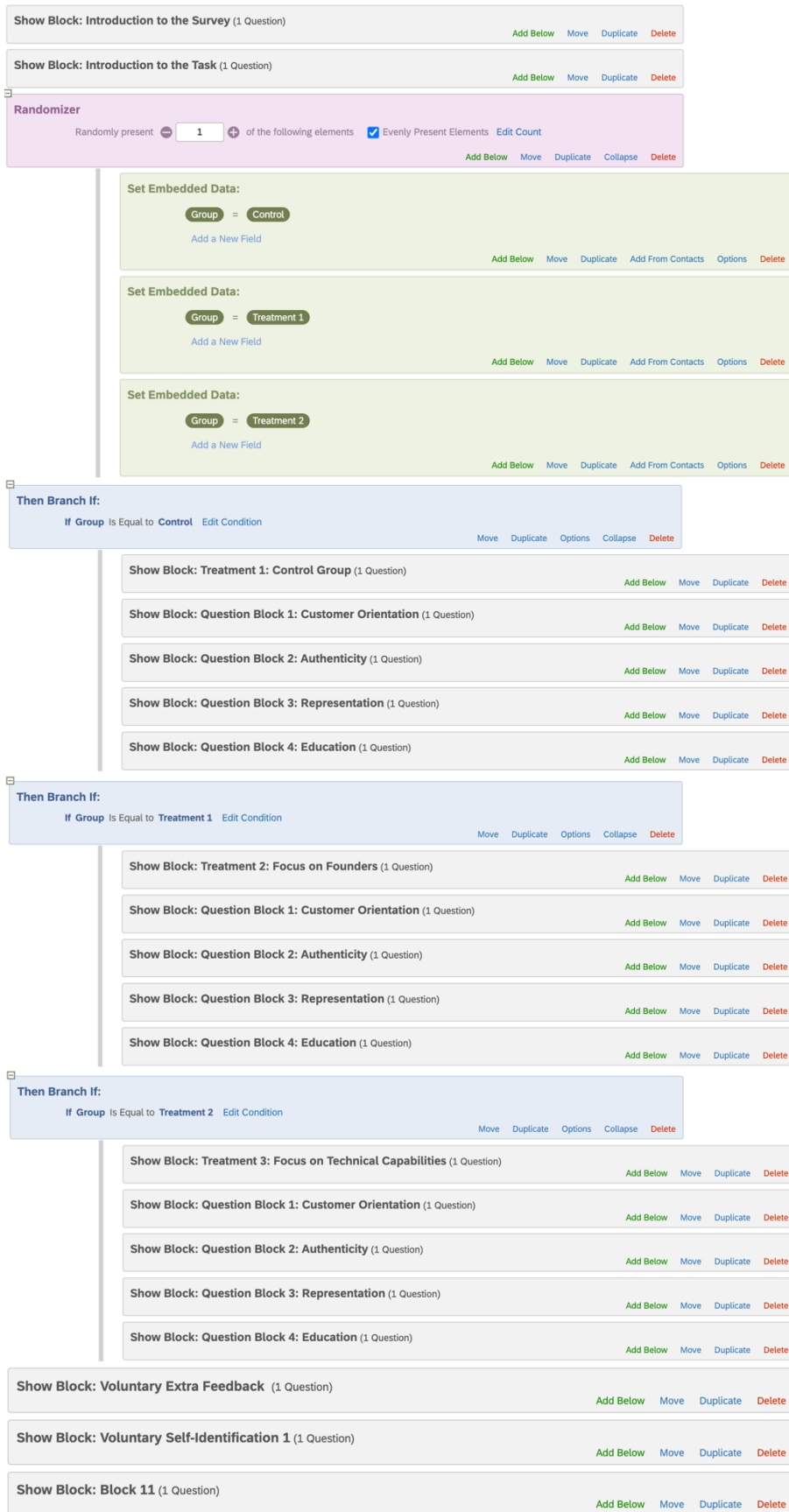
Appendix A: Visualization of Experiment Conditions

Please find the links to the different website versions utilized for the control group and

Treatments 1 and 2 below:

1. Control group (Version A): Access website [here](#).
2. Treatment 1 (Version B): Access website [here](#).
3. Treatment 2 (Version B): Access website [here](#).

Appendix B: Depiction of Qualtrics Survey Flow:



Overview of Survey Statements and Respective CARE-Framework Pillars:

Survey Statement:	CARE-Framework Pillar:
1.1. The content demonstrates that Molnett has a deep understanding of the subject matter.	Customer Orientation
1.2. In its work, Molnett exhibits a strong culture of customer orientation.	Customer Orientation
1.3. What differentiates Molnett from other public cloud providers is its more personal approach.	Customer Orientation
1.4. I perceive Molnett as a trusted partner that works side-by-side with customers rather than being a “pure service provider”.	Customer Orientation
1.5. I am confident that Molnett can deliver on its promises made.	Customer Orientation
2.1. The presented information makes Molnett authentic.	Authenticity
2.2. Compared to other cloud providers, Molnett has a distinctive personal image.	Authenticity
2.3. Through the information presented I was able to build favourable initial trust in Molnett and its offerings.	Authenticity
2.4. I now better understand Molnett's origins, mission, and vision.	Authenticity
2.5. The content increases my interest in Molnett's offerings.	Authenticity
3.1. I am likely to share this content with others.	Representation
3.2. The approach taken by Molnett is unique compared to others in the cloud business.	Representation
3.3. I would follow Molnett for more content.	Representation
3.4. The information addressed made it easier for me to understand how Molnett creates value for its customers.	Representation
3.5. The presented information made Molnett's core product more tangible for me.	Representation
4.1. The information provided is useful for my (organization's) needs or interests.	Education
4.2. The content addresses problems or questions that are relevant to me / my organization.	Education
4.3. Molnett presents ideas and solutions that are innovative.	Education
4.4. The content inspires me to learn more about the topic and Molnett itself.	Education
4.5. Molnett demonstrates strong and credible problem-solving capabilities in their field.	Education

Appendix D: Formula for OEC Calculations

$$OEC_{version\ x} = \sum_i^4 a_i * w_i$$

where:

i = ranges over all four pillars of the CARE-Framework

a = is the weighted average of all five statements within one survey question blog

w = is the weight attached to each pillar of the CARE-Framework

Appendix E: Overview of OECs

Version	OEC	OEC Standard Deviation
Control group (A)	4.54	1.98
Treatment 1 (B)	6.06	1.93
Treatment 2 (C)	5.82	1.78

Appendix F: Python Code

For this WP, Python was utilized to conduct both supporting calculations (e.g., the OEC and each OEC's standard deviation) and the statistical testing. To access, a Microsoft team was set up and three different versions of the Python code have been uploaded to choose from:

1. Code in HTML format (to open in Google Chrome)
2. Code in .py format (to open in any Python platform)
3. Code in .ipynb format (to open in a jupyter notebook)

Please access the Microsoft team through [this](#) link to download the preferred version of code.

Appendix G: Overview of Survey Results

Control group (Version A):

Survey Statement No.	Average Mean Answer	Variance	No. of Observations
1.1.	5.58	2.49	48
1.2.	4.35	3.48	48
1.3.	3.63	5.19	48
1.4.	4.48	3.25	48
1.5.	4.94	2.40	47
2.1.	4.44	3.54	48
2.2.	3.13	4.73	48
2.3.	4.79	1.53	47
2.4.	3.81	5.82	48
2.5.	4.90	4.09	48
3.1.	3.53	3.82	47
3.2.	3.85	3.96	47
3.3.	4.11	4.58	46
3.4.	4.26	3.42	47
3.5.	4.38	5.64	47
4.1.	6.83	4.06	47
4.2.	7.20	3.72	46
4.3.	4.43	2.80	47
4.4.	4.74	4.06	46
4.5.	4.67	3.43	48

Treatment 1 (Version B):

Survey Statement No.	Average Mean Answer	Variance	No. of Observations
1.1.	6.29	2.86	49
1.2.	6.69	2.54	49
1.3.	7.41	3.59	49
1.4.	6.47	3.84	49
1.5.	5.69	2.58	49
2.1.	7.48	3.54	48
2.2.	7.31	4.73	48
2.3.	6.35	1.53	48
2.4.	7.25	5.82	48
2.5.	6.15	4.09	48
3.1.	4.13	3.09	47
3.2.	4.83	2.76	48
3.3.	4.56	2.41	48
3.4.	6.71	5.12	48
3.5.	6.83	4.57	47
4.1.	6.67	5.47	48
4.2.	6.69	6.01	48
4.3.	5.38	2.86	48
4.4.	5.83	3.97	48
4.5.	5.92	3.41	48

Treatment 2 (Version C):

Survey Statement No.	Average Mean Answer	Variance	No. of Observations
1.1.	6.78	3.00	46
1.2.	5.31	3.06	45
1.3.	4.00	4.44	45
1.4.	5.29	3.27	45
1.5.	5.98	2.56	45
2.1.	5.31	3.64	45
2.2.	3.56	3.94	45
2.3.	6.09	3.15	45
2.4.	5.49	2.92	45
2.5.	6.11	2.99	45
3.1.	5.47	2.53	43
3.2.	4.86	2.91	43
3.3.	5.60	4.24	43
3.4.	6.43	3.29	44
3.5.	6.32	3.08	44
4.1.	7.20	3.80	44
4.2.	7.91	2.22	44
4.3.	5.86	3.12	44
4.4.	5.93	2.70	44
4.5.	5.91	2.81	44

Appendix H: Overview of performed Statistical Tests

Experiment No.	Test Type	Versions Tested	T-Statistic	P-Value	Result
1	Student's t Test	Control group (A) Treatment 1 (B)	-3.83	0.0002	Null Hypothesis Rejected
2	Student's t Test	Control group (A) Treatment 2 (C)	-3.28	0.0015	Null Hypothesis Rejected
3	Student's t Test	Treatment 1 (B) Treatment 2 (C)	0.63	0.53	Null Hypothesis Not Rejected