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ELECTRONIC ENGINEERING

THESIS

“UX/UI and SEO analysis and optimisation  
of a B2B website”

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## **Abstract**

The current study describes the process of exploration and analysis of the state of the user experience (UX) of an international business-to-business marketing website, as well as issues relating to the user interface (UI), which includes images, buttons, texts, and layouts. UX has taken centre stage in the design and maintenance of modern business websites, with an understanding that effective UX directly affects customer conversion.

The topic of search engine optimisation (SEO) is also addressed, in studying the organic placement and dynamics of a website in search engines. SEO is imperative in maintaining a website's relevance, and by extension the relevance of the brand attached to it, and recognising which aspects of SEO are effective can be more important than a page's content. The study demonstrates that following recommended best practices for SEO does improve a site's discoverability, but that the process is a lengthy one requiring continual monitoring and adjustments.

Finally, optimisation actions are proposed and implemented in the fields of UX/UI and SEO on key pages of a B2B website, with the aim of testing the efficacy of the process and exploring alternatives. A comparative analysis of the results obtained from the optimisation actions is presented, confirming that web optimisation is a constant process of re-evaluating the site's performance against its users as well as keeping up with the changing demands of search engines to ensure discoverability against targeted keywords.

# « Ανάλυση και βελτιστοποίηση του UX/UI και SEO σε εταιρικό ιστοτόπο»

Σοφία Αναστασίου

## Περίληψη

Η παρούσα μελέτη πραγματεύεται τη διαδικασία διερεύνησης και ανάλυσης της εμπειρίας χρήστη UX σε μια ιστοσελίδα επιχειρηματικού μάρκετινγκ B2B, καθώς και ζητήματα που σχετίζονται με τη διεπαφή χρήστη (UI), η οποία περιλαμβάνει εικόνες, κουμπιά, κείμενα και διατάξεις. Το UX έχει πάρει κεντρικό ρόλο στον σχεδιασμό και τη συντήρηση σύγχρονων επιχειρηματικών ιστοσελίδων αφού η αποτελεσματική εμπειρία χρήστη επηρεάζει άμεσα τη μετατροπή πελατών.

Επίσης, εξετάζεται το θέμα της βελτιστοποίησης μηχανών αναζήτησης (SEO), μελετώντας την οργανική κατάταξη και τη δυναμική μιας ιστοσελίδας στις μηχανές αναζήτησης. Η SEO είναι απαραίτητη για τη διατήρηση της σχετικότητας μιας ιστοσελίδας και, κατ' επέκταση, της σχετικότητας της επωνυμίας που συνδέεται με αυτήν. Η αναγνώριση των αποτελεσματικών στοιχείων της SEO μπορεί να είναι πιο σημαντική ακόμα και από το περιεχόμενο μιας σελίδας. Η μελέτη καταδεικνύει ότι η τήρηση των βέλτιστων πρακτικών για τη SEO βελτιώνει την ευρεσιμότητα μιας ιστοσελίδας. Παρόλα αυτά η διαδικασία είναι χρονοβόρα και απαιτεί συνεχή παρακολούθηση και προσαρμογές.

Τέλος, στη παρούσα εργασία προτείνονται και υλοποιούνται ενέργειες βελτιστοποίησης στους τομείς UX/UI και SEO σε βασικές σελίδες μιας ιστοσελίδας B2B, με στόχο τη δοκιμή της αποτελεσματικότητας της διαδικασίας και την εξερεύνηση εναλλακτικών λύσεων. Παρουσιάζεται μια συγκριτική ανάλυση των αποτελεσμάτων που προέκυψαν από τις ενέργειες βελτιστοποίησης, επιβεβαιώνοντας ότι η βελτιστοποίηση ιστοσελίδων είναι μια συνεχής διαδικασία επανεκτίμησης της απόδοσης της ιστοσελίδας απέναντι στους χρήστες της, καθώς και της προσαρμογής στις μεταβαλλόμενες απαιτήσεις των μηχανών αναζήτησης για να εξασφαλιστεί η ευρεσιμότητα έναντι στοχευμένων λέξεων-κλειδιών.

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## Abbreviations

AI	Artificial Intelligence
B2B	Business to Business
B2C	Business to Consumer
CPaaS	Communication Platform as a Service
CSS	Cascading Style Sheets
CDN	Content Delivery Network
CTA	Call to Action
CTR	Click-Through Rate
CLS	Cumulative Layout Shift
CX	Customer Experience
DOM	Document Object Model
FAQ	Frequently Asked Question
GUI	Graphic User Interface
HCI	Human Computer Interaction
HE	Heuristic Evaluation
HTML	Hypertext Markup Language
INP	Interaction to Next Paint
LCP	Largest Contentful Paint
PC	Personal Computer
SaaS	Software as a Service
SERP	Search Engine Results Page
SEO	Search Engine Optimisation
SSL	Secure Sockets Layer
TBT	Total Blocking Time
UI	User Interface
URL	Uniform Resource Identifier
UX	User Experience
WWW	World Wide Web
W3C	World Wide Web Consortium

# Chapter 1: Introduction

## 1.1 Introduction

User experience (UX) has become ubiquitous in the digital world: it is taken for granted that modern websites will provide a smooth and intuitive journey for the visitor. At the same time, the field of search engine optimisation (SEO) has proven itself to be an inextricable part of the online commerce model. It is therefore incumbent upon businesses to pay sufficient attention to each of these areas, both in launching and maintaining their websites, to remain relevant and competitive. The following case study will examine the example of one business-to-business (B2B) website's optimisation process, and consider the roles of UX, SEO, and data analysis.

## 1.2 Project aims

For a business website to be successful, it relies first on being visible and findable, and then on providing an enjoyable and memorable experience to users once they arrive. In this sense, the seemingly disparate fields of UX and SEO can be seen as complimentary: good SEO brings visitors through the door, and good UX ensures that they enjoy a pleasant and memorable 'stay'. By examining these two practices together, the aim of this project is to develop a more holistic image of a user's interaction with the business: one which considers the discovery phase of the journey as well as the on-page experience. The present study intends to explore these two in concert, in the context of a website's ongoing optimisation process.

## 1.3 Analysis of content

This paper will firstly examine the history of human-computer interfaces, alongside the evolution of the internet and SEO. It will then explore the natures of UX/UI and SEO in more detail, the importance of a data-led approach to the process, and what the website optimisation cycle may look like. There will follow an introduction to the SaaS company being studied, to the context in which the company operates, and to the tools which will be used to collect data. This will all lead into the study itself: an analysis of the optimisation process of a B2B website following a rebranding prompted by a corporate acquisition. Finally, the results of the study will be discussed, and final recommendations made.

## 1.4 Case study outline

The focus of this study is the marketing website of an international B2B technology company, and a yearlong process of overhauling it to better meet the needs of an ever-evolving competitive market. The occasion for this refresh was the company's rebranding following an acquisition, which provided an opportunity to observe the process of site optimisation, determine whether it was successful according to its own goals, and to identify the key takeaways.

## **Chapter 2: Literature Review**

### **2.1 Introduction**

For as long as computers have existed as a commercial concern, efforts have been made to improve their accessibility to the average consumer. What we call human-computer interaction (HCI) is the study of how regular users practically employ cutting edge computing technology in their daily lives. It is from these efforts that the inter-related fields of User Experience (UX) and User Interface (UI) were born.

At the same time, computers, particularly following the dawn of the internet, have proven to be an invaluable tool for commerce, and as such businesses worldwide have moved to embrace this technology for their own purposes. However, the markets and modes of transaction offered by these technologies of connectivity and interactivity are only as useful as an organisation's capacity to attract potential clients to their virtual front door, and it is for this reason that behind-the-scenes Search Engine Optimisation (SEO) is as crucial to online business as a public-facing web presence.

To better understand the modern applications and interconnectedness of these phenomena, it is instructive to begin by looking at the history of HCI. The importance and ever-changing natures of UX and UI will then be explored, including issues with accessibility and best practices and tools used. We will then consider the current state of online Business to Business (B2B) marketing, and how it differs from Business to Consumer (B2C). Finally, the role of SEO will be looked at, particularly the implications of how designing for automated search engines impacts the otherwise human-centred nature of UX optimisation.

### **2.2 The evolution of HCI**

When IBM launched the IBM System/360 computing family in 1964, they did so with the innovative idea of removing the necessity for end users to rewrite all their programs when they upgraded their systems, which until this point had been the norm. IBM wanted to change the way their computers were seen, from industrial hardware equipment to a streamlined platform. This was the start of an industry-wide move from a product-led approach, where users were almost told what to do with their computers, towards one that recognised the importance of software as a driver of hardware sales. This is an early example of recognising the experience of the users behind the software as a contributing factor in the development process: what we now call UX [1], [2].

IBM saw the need to make their business more sustainable, and they saw their solution in the separation of hardware from software. Until this point, IBM's primary customers had been governmental agencies: with the System/360 they were building a business model where software could be transferred between machines, making computers more versatile for use in other fields [1]. Businesses could buy the hardware they wanted at the time and upgrade it whenever they needed to, without having to worry about rewriting all their existing programs, potentially saving time, money, and manpower. This move by IBM was a critical waypoint towards mass adoption of computers by business [2], [3]. IBM's "\$5 billion gamble" paid off [4]. The computer market had reportedly generated combined profits of around \$7 billion in 1968, which represented a remarkable 36% year-on-year growth rate compared to the 1960 figure of \$600 million [5].

During the next few years many manufacturers worldwide contributed to the rapid growth and diversification of the computing market making computers smaller, faster, and cheaper. The development of the microprocessor helped make production cheaper and progress in screen technology

helped make computers more accessible. The use of screens changed the way humans interacted with computers, it moved from punched card input and printer outputs to on-line terminals and text command language [6]. The faster type of interaction and improvement of UX through screens, made computers more desirable, which led to the accelerated adoption by businesses, as computers were finally becoming usable and affordable [7].

It's not though until 1975 that computers enter the home with the first computer created for personal use, or what is commonly called a personal computer (PC), 'Altair' by Micro Instrumentation and Telemetry Systems (MITS). They decided to target electronics hobbyists with a simple product that didn't initially have a keyboard or display which would imply that the audience might not have find it easy to use, however the hobbyist community embraced the product very quickly buying 2,000 units in the first week. The quick embrace of the PC by hobbyists, indicated to competitors that there was a new market for the taking. Competitors started building and selling PCs, mainly targeting hobbyists, and by 1981 PC sales were in the millions [8]. In 1984, Apple announced the Macintosh, a computer which featured an integrated display and a software with a graphical user interface (GUI), which can be seen as an attempt to specifically target the mass market [9]. Users who might not have been familiar with command-line would be able to easier interact with this new type of computer. Their infamous ad during the Super Bowl was a prime example of how big computer companies started to shift their focus from business-only and hobbyists to consumers. The Macintosh also popularised the desktop idea of the GUI. The metaphor was envisioned to make the GUI more user-friendly and has since become a standard for GUI [10]. The rapid adoption the Macintosh PC saw in the home computer market, reflects the similar impact the System/360 had in business models.

The simplification of HCI made computing more accessible to the average user and helped bring the PC into the home, reaching new demographics beyond business and hobbyists, such as families and students. The needs of this new type of users necessitated further developments in software for personal use, such as word processors, games, and educational programs. The establishment of computers in the home benefited businesses, as their employees became more computer-literate. The uptake of user-friendly computers in the home, led to more standardised interfaces across applications which helped reduce the amount of computer training time required in the workplace, leading to increases in workforce productivity [6], [7].

The year 1990 marked a pivotal moment in computing history, when Tim Berners-Lee's vision of linked information systems became operational at CERN, showcasing his idea of the 'WorldWideWeb' as he formatted it, as well as the software client he designed to access these systems [11]. In 1991, he released his WWW project globally, but it was initially used primarily by scientists and academics [12]. It wasn't until 1993, with the launch of the easily installed text browser Mosaic, that the web truly opened to the public [13]. This new wave of diverse users, who were not necessarily as tech-savvy as their academic predecessors, brought fresh use cases and perspectives catalysing the evolution and expansion of web technology [14].

In the first years of the internet, there was minimal recognition of the end-user experience. UX and UI were not terms that had yet been applied to the industry, nor was there a popular idea of 'web design' per se: web pages were written in simple HyperText Markup Language (HTML) using the system default font (typically Times New Roman) and generally consisted of nothing but wall-to-wall text. While the internet continued to expand, website owners tried to create graphical elements to use on their pages to create a distinct visual identity. The lack of browser support and standardization fragmented the user experience across different platforms and machines, these attempts are evidence of the early

## Chapter 3:

stages of web design [15]. The many compatibility issues between websites and browsers were recognised by the leading professionals which lead to a pivotal moment in the history of HCI and UX, the foundation of the World Wide Web Consortium (W3C). W3C started a significant effort to develop protocols, standards, and accessibility guidelines to ensure the web ‘works for everyone’ [16]. This push towards standardisation over the last 30 years has continually shaped web UX and UI, ensuring the web is accessible to as large an audience as possible [17].

As the number of people online was growing, so did the concerns around data privacy. Even though online businesses existed, there was no protocol for secure online transactions: business websites were primarily informational, or if they were selling products, customers would typically mail a cheque to a postal address listed on their website. The introduction of the Secure Sockets Layer (SSL) protocol in 1995 was a game-changer for web security. SSL certificates became a marker of trust for users and enabled secure transactions online, which was essential for the growth of online businesses (e-commerce); web addresses that have acquired SSL certification start with https instead of http [18]. The same year saw Amazon and eBay launch their websites, and quickly proved the viability of this new system of e-commerce. In more recent years, Google has made HTTPS a factor in its ranking methods, emphasising the importance of security in UX and SEO [19].

The volume of online traffic pushed computer scientists and web programmers to bring in new ways to design, develop and optimise websites. Until W3C recommended Cascading Style Sheets (CSS) in 1996, the styling of web pages was done using HTML elements and attributes, which was very limited in scope and led to a lot of repetitive code which slowed page load time [20]. Through the years, the use of stylesheets dramatically influenced UX and UI design and development. Early on, the adoption of CSS was slow due to the lack of browser support [20], however, when it was used it facilitated the separation of content and design making website maintenance easier for developers. It also created consistency in style across multiple pages creating a more cohesive user experience, and lastly improved a site’s load time by reducing the HTML files’ size, which was very valuable in the dial-up days of the internet [21].

As the world became ever more digitally interconnected, HCI moved from a screen-based practice to a browser-based one. Previously people would buy software from a retailer, install, and use it, and then decide if it’s easy to use: a sequence called by Nielsen ‘payment first, user-experience second’. E-commerce was the opposite: potential customers navigated the site, and if they found it interesting and easy to use, they might proceed to buy from the company, flipping the previous sequence to ‘user-experience first, payment second’ [22]. Businesses thus increased their focus on UX, as it was potentially a gateway to revenue. As the number of websites grew, there was an increasing focus on user-centred design, which emphasised designing with the end-user’s needs and behaviours in mind: as such, a lot of now-established best practices such as navigation, information architecture and web UI/UX were just beginning to be developed [22], [23].

As the amount of online content started to grow rapidly, the necessity for tools to find and index this information was born [24]. The birth of search engines saw new technology being developed that used crawlers or bots that searched across the WWW for new websites to index to the website’s database [25]. Search engines’ appearance in the early 90s were lists of websites manually curated and ordered by the personal preference of the engine’s owner, rather than any algorithmic methodology [15]. When google.com launched in 1998, it reflected a significant departure from the prevalent design trends of the time. The popular search engines like Yahoo! and AltaVista were increasingly cluttered with content, offering a lot more than search on their homepage, whereas Google’s page was a white page with their

logo and a search bar. While minimalist, Google placed UX and UI at the front and centre of their website, creating a page where users would get what they wanted as quickly and simply as possible. Google very quickly gained traction from the public and became the leading search engine, surpassing Yahoo! in 2002 [26], [27].

Prior to Google's launch, search engine rankings for websites were predominantly determined by the content present on the pages, domain names, and basic page structures, such as use of breadcrumb navigation. Google introduced the PageRank algorithm, which also ranked pages based on their popularity among other pages, emphasising the importance of backlinks. Even today, backlinking remains a considering factor in a website's positioning in the search engine results page (SERP). Businesses eager to rank highly on Google's SERP endeavoured to acquire as many backlinks as possible from other sites to improve their chances. This practice could be seen as one of the earliest indications of SEO evolving specifically to cater to Google's algorithm [25], [27].

With the launch of the first iPhone in June 2007, Apple catalysed a mobile revolution that accelerated the proliferation of mobile internet usage, fundamentally altering how users interact with computers and the internet [28]. Smartphones quickly became ubiquitous across demographics, and touchscreen interfaces changed how humans interact with, or expect to interact with, digital devices. Accessibility took on new dimensions, encompassing not only user-friendliness but also connectivity, speed, and ubiquity. The widespread adoption of smartphones across diverse populations compelled designers to address a wider range of user needs and capabilities [29]. In 2016, mobile internet usage surpassed desktop for the first time indicating a significance shift in user behaviour and the importance of mobile-friendly design. Consequently, responsive, and mobile-first design for websites gained even greater importance [30].

Google has continually updated its algorithm since its inception, with the stated intention of improving UX with every modification and serving the most relevant and valuable results for each search query [25]. The search algorithm remains a closely guarded secret within Google [31], though many have attempted to decode which factors it prioritises to refine their SEO strategies [32]. Nowadays, Google considers a far broader array of factors than when it first started, aspiring to present the most relevant and useful results, taking into account meaning, relevance, quality, usability, and context [33]. The algorithm has evolved beyond the initial emphasis on keywords and backlinking to include a site's overall reputation, metadata, accessibility, loading time, adhering to coding best practices, the user's location, and the overall user experience [34]. Companies have often expressed frustration over the frequent fluctuations in rankings caused by the numerous updates to the search algorithm, making SEO more complex than ever before [35].

Google has been the number one search engine for over 20 years, with a market share of over 90% for almost ten years [36]. This dominance adds considerable pressure to business to employ the full Google portfolio in the hope of improving their Google search ranking and achieving a better position on the SERP. The critical role of Google in online discoverability has made it challenging for businesses to rank highly in search without adhering to Google's recommended best practices for their pages [32].

As the search algorithm is scoring sites in elements like on-page experience and accessibility, SEO is starting to influence other aspects of webpage optimisation like UX and UI. Core Web Vitals, another of Google's products plays an important role in understanding page experience and looks at the technical aspects of UX such as loading time, interactivity, and visual stability [37]. The interconnection of UX, UI and SEO has led many experts to question if businesses are optimising their sites primarily for users or for Google's web crawler, with the concern that that the pursuit of favourable algorithmic evaluation

could overshadow the goal of providing an optimal human user experience [32]. Moreover, with the recent heightened focus on the role of artificial intelligence (AI) into search algorithms raises new questions about the future of website optimisation, as it may further complicate the balance between catering to sophisticated machine learning (ML) systems and meeting the genuine needs of human users [38].

## **2.3 UX and UI: The web perspective.**

### **2.3.1 What is UX/UI and how they are different.**

User experience is a field of study which explores how different types of people perceive a product, system, or service, how they engage with it, and how they respond to it [39]. The term UX derived from HCI, yet it has been adopted more widely to measure any human-design interaction [40]. For example, in the field of canned fizzy drinks, user experience might focus on or how they open the can, or the taste of the drink; whereas in the field of car design, user experience would cover how the driver operates the radio, or maybe how they open the gas cap.

User Interface design is a practice that focuses on how a product looks and how easy it is to use; it is a lot more visual and heavily influenced by design theory and style [41]. In contrast to UX, the UI term is mostly used in the computing sciences and refers to software interfaces, and how they are designed based on design principles to make a product as simple and easy-to-use as possible for the user [42].

UX and UI often are grouped together, but they are different principles: UX examines the total user interaction with a product or service including the accuracy, ease of use, and value to the user, where UI concentrates on what the user sees: in a way UI is the cosmetics of the UX [43]. Using the previous example of a fizzy drink, UI is the design on the can and UX is the person's exposure to the drink experience, from picking it up from the supermarket shelf, to drinking it and how they feel afterward [43].

In this scope of this project, UX and UI will be best understood looked at through the prism of web design. The UX term has been widely embraced by researchers and practitioners in the HCI field, but even within this community the principle can be elusive and can be interpreted with multiple meanings in different environments [44]. For this reason, UX should always be examined through the conceptual lens of a specific practice to ensure clarity [45]. In the area of web design, UX studies the anticipated and actual behaviour of webpage visitors [46]. This includes who uses the website, how they land on it, how they navigate it, how they read the information on it, and how they interact with it. Web UX should provide a comprehensive view of a visitor's experience including usability, task completion and emotional reactions [47].

Meanwhile, UI in the web-specific context refers to a website's design system and layout templates. UI designers strive to create aesthetically pleasing web pages that are enjoyable for users to explore, without getting in the way of the user's intentions. UI designers focus on the visual touchpoints of the UX. This includes the look & feel, interactivity and usability of a website [43]. The look and feel examines imagery, colours, fonts, and layouts as well as the desired impression these aspects should leave to the user. For example, a webpage could evoke mistrust to a user if an image is distorted, as it looks like it's put together in an unprofessional manner. Interactivity covers the different ways a user is expected to engage with a page, such as buttons, forms, surveys, videos, or any other elements that require an action from the user. Usability is one of the most important aspects of a user's experience, as it examines how

easy a website is to use [48]. UI designers intend for all elements of the website’s design, to work as expected by the users and that minimal thinking is required to find what they are looking for. While UI draws on actual user behaviour in determining the norms of website design, UI design can be instrumental in shaping those same behaviours: for example, the widespread adoption of the hamburger menu (two or three lines at the top of the page) on mobile websites which users in 2024 almost natively understand opens a website’s main menu. This is an example of Jakob’s law of UX, interpreted by Yablonski as “users will transfer expectations they have built around one familiar product to another that appears similar” [49], [50].

The phrase UI design is often interchanged with web design: however, web design is a broader term that includes both UX *and* UI. UX designers think strategically: they collect and analyse data, identify problems, and try to establish a desired user journey, where UI designers think creatively: they find solutions to the UX problems, while maintaining the website’s overall appearance [44]. UX and UI go hand in hand in web optimisation and often grouped together using the ‘UX/UI’ abbreviation as it’s intended to showcase that both contribute to the process, as this paper will do going forward.

It’s important to understand the various overarching purposes that UX/UI serve during the creation or optimisation of a website. To that end, examining a proven methodology such as Garrett’s elements of UX [51] will be useful. During the web optimisation process, UX/UI examines the holistic perspective on a user’s interaction with the website including usability, functionality, and content. To help convey that UX/UI designers are part of the full process, Garrett, created the five planes of UX and set the framework that should be considered when designing web experiences [52], [53]. In Figure 1 the five planes are: surface, skeleton, structure, scope, and strategy.

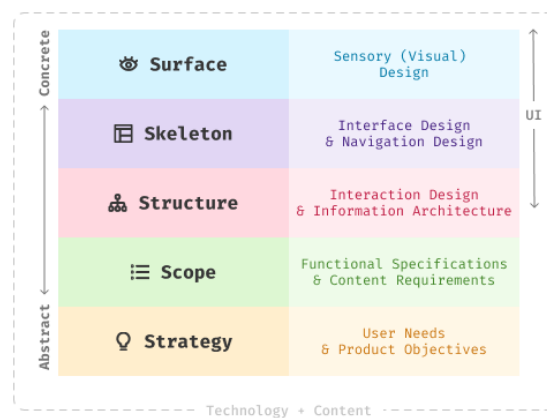


Figure 1 Garrett’s five planes of UX (edited)

Garret explains that the elements stack, from the conceptual to the tangible, and even though each is defined in his approach, he recognises that practically they don’t necessarily have clear borders and each lead into the next, so strategy leads to scope, scope leads to structure and so on. The functions at the bottom of the stack are more conceptual and explore more abstract themes such as the user needs, and the website’s objectives, where the functions at top are more tangible and look at concrete ideas like the visual design such images and colours. The stack has two additional factors that shape the final UX: content and technology [53]. Content needs to be as impactful as the rest of the UX is, users don’t visit websites with the intention to evaluate a website’s usability, they are looking for content. Bad content will affect a visitor’s experience and their opinion of the brand, where good content contributes to a

valuable experience [54]. Technology is ever-evolving, and it heavily influences how users experience the web, a pattern that is seen throughout the history of HCI [45], [55].

### 2.3.2 The importance of UX/UI optimisation for businesses

The modern software sales model relies on potential customers trying free, ‘lite’, or sandbox versions of the software before committing to spending money, a practice also known as freemium [56]. If a user’s interaction with the product is not valuable to them, they would hesitate to purchase a license or continue with the sales process. This is an example of the importance of good user experience in the modern sales funnel. Similarly, most e-commerce websites will have direct competitors offering similar buying options, making it more difficult for them to stand out in a crowded market. On top of this, visitors who don’t feel empowered to explore and find the information they’re seeking on those websites, will navigate away without making any purchases and with a negative opinion of the brand [22]. In both cases, the role of the UX/UI designer is to create an understandable and enjoyable user journey that is so intuitive that it places the product ahead of the market and leaves a positive impression on potential customers [57]. It can then be seen that UX and UI are vital catalysts in the progression of a user, from prospective to converted customer [53]

UX researchers and designers also use analytics tools to investigate and offer insights on behaviour of actual website visitors, such as: the order in which they read information, what attracts their attention, where they click, how far they’re scrolling, how long they stay on a page. They also compare their findings with industry benchmarking and overall web standards. UX designers also propose opportunities for optimisations in the UI or code of a page to improve its performance and facilitate visitors’ purchasing decisions [58], [59].

### 2.3.3 UX/UI optimisation.

To better understand how optimisation works in the UX/UI space, Figure 1 represents the feed of information from one stage to the next. After the UX data is collected and analysed, actionable recommendation tasks are proposed by the research team for consideration by UI designers and web developers. Sometime after the completion of the optimisation task further data is collected to reflect on the effectiveness of the optimisation [57], [60].

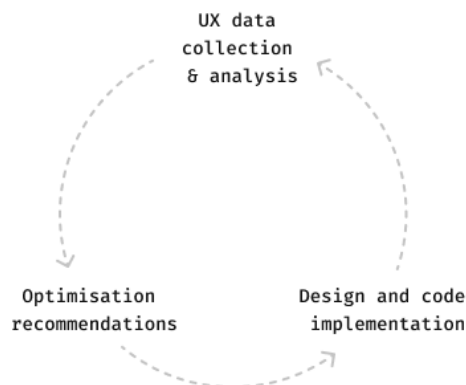


Figure 2 The UX/UI optimisation process.

As represented in Figure 2, optimisation is a continuous cycle: even if an optimisation works for a while, there are several contributing factors that might change a visitor's experience such as changes in technology, trends, and type of users [15], [61], [62].

### 2.3.3.1 Web UX/UI optimisation process

In the practical process of optimising a website, the clear steps of the process must first be outlined. Tomlin [63] outlines a very practical approach to the optimisation process which will be employed here, while the influence of Garrett's work on the five elements of UX can be seen in works by Kremer et al., Kiruthika et al., and Zheng and Liu [64], [47]. Tomlin has broken the UX/UI optimisation process down to four steps: defining personas, conducting behavioural UX data analysis, conducting UX and usability testing, and finally, analysing results and making optimisations based on that analysis [65]. Tomlin's steps correspond well with Garrett's five elements of UX [53], therefore it seems appropriate to consider them together. Garrett established the basis on which the steps would be implemented, and, in his analysis, personas are part of the *strategy phase* of UX design. In the scope of optimising an existing live website, there is the assumption that personas are already defined and are not part of the optimisation process: however, since this is an assumption, websites who haven't defined their target groups of users should consider incorporating Tomlin's first optimisation step into their process.

The three adapted steps that are derived by combining the optimisation cycle and Tomlin's optimisation steps are: collection of behavioural and usability testing data, conducting data analysis, and making recommendations, and implementation of proposed optimisations. According to the cycle, more data should be collecting post implementation to analyse the impact of the process [60].

#### 2.3.3.1.1 Step 1: Collection of behavioural and usability testing data.

During the UX research step of the optimisation process, various data is gathered to understand the who, why, what, and how of the website's use [46]. Their purpose is to find the most valuable data to present the real audience of the website to stakeholders and explain their expectations and behaviours. Similarly, when planning a website and the desired experience for its visitors, these areas of data are considers as also outlined in Garrett's UX stack [51], [53].

The methods for collecting these metrics are many, but it's important to understand the main two categories UX data is divided in: quantitative data, and qualitative data. Quantitative data is numerical and answer the questions of who, what and part of how, where qualitative data is more descriptive and looks on the why and part of the how [66]. There have been arguments about what type of data is more valuable: measurable data and seeing real numbers can be very compelling for decision making in the design process, while qualitative data is valuable as it captures the user's underlying motivations [60], [67]. For the successful optimisation of web UX/UI, teams should take a holistic approach in the data processing and try and include both quantitate and qualitative data to gain more contextual depth [63], [66].

Behavioural UX data looks at the usability aspect of a user's experience and examines how effective, satisfying, and efficient a website is and is typically quantitative as it only looks into the actions and not the reasons behind them [68], [65]. Examining the usability of a website is also useful in benchmarking against competitors and web standards [67]. UX/UI designers and researchers use multiple analytics

### Chapter 3:

tools to collect multiple types of behavioural data such as acquisition, conversion, engagement, and technical. When combined, the different types of data can signpost to UX/UI designers the amount and type of interactions that are taking place on a page [65].

As the categories of behavioural data is better investigated, and for the purposes of this project, the naming conventions that will be used, will be in reference to Google Analytics (GA) name sets.

**Acquisition or traffic data** measures where visitors are coming from on a page. For example, a user could have searched for a term and clicked on the SERP (organic search), or someone else found a link on another website (referral) [65]. Understanding where the users find a page helps marketing teams identify if their acquisition methods are working and can lead to changes in the spending on paid media or paid search, concentrating on SEO to increase organic search or try to get more backlinks from other websites [69].

**Engagement data** is helpful for understanding how much attention a user pays on a website proven by the way they move on a page. Peterson and Carrabis [68] support that engagement is made up by several components that each measure a different aspect of a visitor's engagement, such as: click depth, duration, interaction and more [70]. These types of engagement behavioural data can be collected using popular analytics tools, such as bounce rate and engagement rate (measures the percentage of users exit or stay respectively on a page after 10 secs), click heatmaps (measures where users click), scroll heatmaps (measures how deep users scroll), and average session duration (measures the average time user stays on a page) [71].

**Conversion or key events data** helps UX/UI teams understand if, how and when the users are engaging with the expected elements on the page, and if they are progressing successfully through the sales funnel [72]. Key events measure the important actions on a page as set by the website owner, and the conversion meaning depends on the website's purposes and business goals, for example it can be someone clicking on a link, or downloading an asset, someone filling a form, or adding something on their basket [65], [73].

**Technical data** is useful for measuring the types of technology that visitors use to access a website and highlight limitations on a page such as loading times, that might hinder their visit [65]. Collecting technical data on user metrics includes finding out the most common browsers, devices, and screen resolution, which during the optimisation process helps focus the attention on the right mediums i.e. desktop over mobile. Collecting a page's technical data includes measuring the loading time and performance signals (Core Web Vitals) which affect the page speed which consequently affects the user's experience and engagement on a page [74]. It is known that users who encounter slow pages, are likely to abandon the website and look for alternative faster vendors [75]. Technical data is most valuable when combined with the rest of the behavioural data can facilitate the assessment of the quality of the experience [65].

UX and usability testing gathers data that examines the why behind a user's behaviour: this type of data is qualitative, and when combined with the quantitative behavioural data it enables teams to make better informed optimisations on a website [65]. The two most common testing methods for usability testing are real-user experience testing, and expert review or Heuristic Evaluation (HE) [76]. Real-user testing uses moderated or unmoderated methods to collect feedback from website visitors, some examples of collecting such data are via surveys, eye tracking, A/B testing and focus groups [65]. HE is faster approach to usability testing as it's done internally within an organisation, and the chosen group of reviewers examines a page against recognised usability principles [76].

### **2.3.3.1.2 Step 2: Conducting data analysis and making recommendations.**

As seen in the first step, there are multiple ways and types of data a researcher can collect during the optimisation process of a website: however, it's imperative that the type of data collected is relevant to the specific project and website type [65]. When the appropriate behavioural and usability testing data is analysed together, it can give a 360° view of a visitor's experience and later help define the optimisation tasks. Examined on their own, one set of data can be interpreted in multiple ways for example, a high bounce rate practically means that users are leaving the website in less than ten seconds, but that could be due to multiple reasons, such as a page being too slow to load so users choose to leave, the search term they used not matching the content of the page, not liking the content, not liking the design, encountering an error, or others [77], [78]. Hasan et al. [77] identified that a high bounce rate metric could only help identify that there is a usability issue with was page, but couldn't pinpoint what the issue was [79]. When they combined their findings with the HE, they managed to identify fourteen problems on one site including incorrect page design and broken images. The example demonstrates that adding context to measurable data enriches the observations and makes the process more reliable [66]. Another takeaway from Hasan et al.'s example is that when gathering and analysing quantitative data, the findings and patterns observed can pivot the qualitative data collection [65]. The identification of usability problems through the analysis of the available data should lead to actionable tasks for UI designers and Web developers to implement.

### **2.3.3.1.3 Step 3: Implementation of proposed optimisations**

The implementation phase of the optimisation is working within the top three planes from Garrett's UX stack and optimising a website's UI and coding to improve the interactions, content, interface, navigation, and visuals of a website [53]. These of course, should be altered in correlation to the website's identified issues, and not all of them need to be addressed every time an optimisation takes place [65].

To make good UI decisions, designers rely on design principles and guidelines on grid, layout, typography hierarchy, and colour psychology, while keeping in mind the desired brand experience by the company [42], [44], [53]. When the UI design of a website is successful, it goes unnoticed by the users, and delivers useful, credible, desirable, and valuable content [80], [81].

Looking at the optimisation process for a live website, a lot of the considerations for the development framework have already been decided and implemented during the original scope of the website: however, the analysis of UX data can often suggest opportunities for improving or updating such frameworks to achieve better online experiences or adhere to updated standards [53], [44]. In addition, new UI designs for new features might require extra development work that wasn't part of the initial scope.

A big consideration of the implementation step is accessibility, as it enables disabled users to access and navigate websites effectively, thus improving the UX [44]. On the surface, accessibility examines the colours and contrast used on a page, but accessibility goes beyond the UI and affects the development of a page. When the four principles of accessibility as defined by W3C (perceivable, operable, understandable, and robust) are translated to accessible code, a website uses proper markups, attributes,

identification, titles and more [81], [82]. A proper framework enables users with visual, cognitive, auditory, or motor disabilities to interact with a website successfully [82].

#### **2.3.4 UX/UI in B2B VS B2C**

A Business-to-Consumer (B2C) website sells products or services directly to individuals. Most e-commerce websites fit in that category as the user base is a lot bigger, for example amazon.com is a B2C website [83]. As per its definition, a B2C website sells products or services for personal use: while it may try to entice many users, it only addresses one at a time by appealing to their emotions and preferences [83]. B2C websites usually have greater traffic than B2B, and their users are more likely to make impulse decisions. UX on retail websites focus more on smooth checkout processes and personalisation [84].

A Business-to-Business (B2B) website facilitates transactions or interactions between businesses. Examples of such websites are wholesale suppliers makro.com and business software provider salesforce.com [83]. B2B websites differ from B2C primarily in their target audience, as purchasers will typically address multiple stakeholders before the buying decision is made [85]. The process from identifying the problem within the organisation, to agreeing in investing money to a solution is lengthy because it has several steps and involves multiple people [86]. Often the person who identifies the problem is not the same with the one that makes the purchasing decision, or the person that will ultimately use the acquired 'solution' [87]. B2B websites therefore need to be multifaceted, with a view to communicate effectively to the many types of business users [83].

Laubheimer [85] identifies five UX differentiators between B2B and B2C websites: content that supports long-purchase decisions, clear integration, compatibility and regulatory information, content that addresses both end-users and decision makers, representative pricing even for complex cases, and addressing all relevant verticals appropriately [87]. These differentiators should be considered alongside the general web usability practices, since B2B website visitors bring their buying behaviour from their non-business world [88].

For many B2B companies the main objective of their website is to capture information and generate sale leads: this critical role makes it a very important tool in marketing [86]. Hence the UX/UI optimisation of a B2B website is important as it creates better brand experiences, and improves trust and credibility for visitors [88], [84].

## **2.4 SEO**

Most business buyers begin their purchasing journey by searching for relevant information online, making high rankings in the SERP important for discoverability of businesses by potential customers [86]. The click-through rate (CTR), representing the ratio of people that click through to a website of the total number that viewed the link, that ranks on the first place on the SERP is 31.96%, a number that drops as the ranking position lowers and falls below 10% for only the third position (8.44%) and below 1% on the nineteenth position (0.97%) which is still on the second page of the results [89]. The CTRs demonstrate that the higher a website shows up in the SERP the more traffic it will get, and further, that if a page doesn't rank in the first couple of pages of the search results, it will get hardly any visitors from organic search [24], [90].

Furthermore, with 252,000 new websites created every day, search engines evolve their practices often to serve the best possible results to users [91], [92]. The increased volume of competition in online search, as well as the continuous changes in search algorithms, has made SEO a demanding dynamic process for website owners [86], [92]. Critics argue that Google's dominance in the search engine market has transformed SEO into a practice primarily focused on deciphering Google's algorithm changes, with the aim of improving a webpage's position in the SERPs [93], [32].

SEO encompasses various subjects, each contributing to the overall objective of improving a website's visibility and ranking on the SERP [92]. When Google was launched, it differentiated itself in the search engine market by considering both on-page and off-page factors to rank pages: a principle that is still true today, though the on-page and off-page elements look considerably different now [94], [95]. On-page optimisation includes everything that is edited on the page itself, such as the content, keywords, on page user experience and technical aspects, where off-page optimisation includes the contributing factors that are not within the website itself but affect its reputation, such as backlinks [96]. To optimise a page for Google search, specialists should examine both on-page and off-page elements that help improve a website's visibility and reputation and ultimately attain a better score on the ranking algorithm [97].

#### **2.4.1 Off-Page SEO**

Off-page optimisation refers to creating external strategies with the purpose of bringing value to internal content. Some of the off-page optimisation aspects are harder to influence because they heavily rely on other sites' backlinks, something that is not always controlled by the website's owners, nonetheless it can be reviewed and influenced to a point [96]. The goal of off-page SEO is to enhance the perception of a website's credibility and authority among both search engines and users [98]. The biggest areas of interest in off-page optimisation are link building, domain authority and social media marketing [99].

##### **2.4.1.1 Link building**

Links from other pages have always been a part of Google's ranking algorithm, something that was initially exploited by webmasters who resorted to buying links and exchanging links with other websites to increase their inbound links, a practice known as black hat SEO [33], [92]. In 2012, the Penguin update in Google's PageRank algorithm was an attempt to clean up this type of link-building strategy emphasising that the quality of backlinks is equally important to the quantity [92].

A link building strategy is crucial for SEO and entails long-term management of inbound links which Ziakis et.al [90] validated with their study [25], [99], [92]. Their study concluded that the number of backlinks to a website was the most important factor affecting a website's position on the search result pages [92]. Moreover, Backinko's study showed that the first result in Google's SERP has an average of 3.8 more backlinks than the pages on positions two to ten emphasising the importance of backlinks and their contribution to positioning [100]. Therefore marketers who want to improve their website's place on the SERP should develop a long-term link building strategy that aims to acquire a greater number of reliable and relevant links from other websites that themselves are authoritative and reputable as Kumar & Paul proposed "not all links are of equal value" [25], [97], [92]. There are many tactics that SEO professionals can use to increase their inbound links such as guest posts, profile backlinks, broken link building, content syndication and more [98].

### 2.4.1.2 Domain authority

Domain authority is a metric developed by Moz, a SaaS company that works in the SEO space, that predicts how well a website will rank on SERPs [101]. Moz scores pages on a logarithmic scale from one to 100, using their own developed algorithm which considers multiple factors including quantity and quality of inbound links [99]. An established domain that has been around a long time is considered more trustworthy, has higher domain authority, and ranks higher in the SERP [90]. Even though domain authority is not a metric that Google uses in their ranking algorithm, it remains a critical tool used by SEO professionals to assess the potential search performance of a webpage against its competitors [101], [102].

Social media has become part of people's daily lives and for some it's their sole source of information, making a social media presence necessary for businesses who want to increase their website traffic and engage their audience [92], [90], [25], [99]. Google's search algorithm uses social signals to capture engagement from social media users with shared content from a website: when a user publicly shares a link to a webpage and people like, comment, and repost it, Google acknowledges it as it builds up the website's reputation and consequently improves its position on the SERP [103], [25]. To conclude, the off-page SEO of a page should include social media support including bookmarks, social signals, and social creators, a practice that is validated by Google in both their SEO documentation and their 'Google for Creators' guides [92], [104], [105].

## 2.4.2 On-Page SEO

On-page optimisation concerns the careful and precise choices made on a page to achieve higher rankings in search results [31]. On-page optimisation is imperative for any SEO strategy, and includes three overarching areas of interest: content, user experience, and technical [97].

### 2.4.2.1 Content

In the words of Bill Gates, 'Content is King', a phrase often used by SEO experts, but arguably only true when accompanied by good SEO strategy [106], [107]. Content optimisation for search examines the quality and origin of the content as well as the use of keywords in the titles and text [25], [92]. High-quality content can help enhance the brand message, educate visitors, and influence purchasing decisions. Creating valuable content is a vital part of SEO because content that truly benefits the website's audience delivers better user experience, creates opportunities for quality backlinks, and drives traffic [25], [54], [107].

According to White [105], every content piece besides being of great value to the website's audience should also be strategically aligned with certain keywords [107]. Keywords are foundational to SEO efforts: they represent the set of words or phrases, referred to as 'keywords' in search terminology, that a page aims to rank for in search results [108]. Moreover, part of Google's ranking algorithm updates caters specifically to finding more sophisticated ways of reviewing the use of keywords on pages and detect keyword stuffing [96]. According to Luh et al., the targeted keywords should be present in the HTML code of a page such as the title tag, meta description, the h1 HTML attribute, main body of the page as well as the in the URL [31].

#### **Keywords in <h1>:**

A literature review by Ziakis et.al revealed that keyword presence in the h1, h2, and h3 HTML tags of a page was the most important ranking factor for on-page SEO. Keywords in h1, h2 and h3 tags enable

crawlers that search a page to extract the desired information by quickly accessing these tags, making them an ideal strategy for SEO [92], [97].

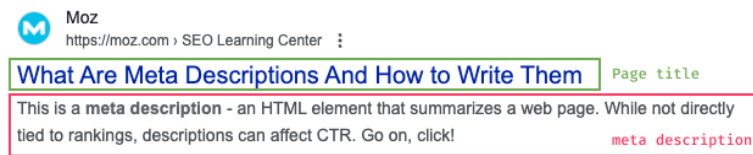


Figure 3 Page listed on search results on google.com.

### **Keywords in title and meta description:**

Targeted keywords should also be present in the title and meta description tags, as these two tags contain the text that appears in the search result just below the link and define the content and summary of the page [31]. Their prominent place on the SERP, as shown in Figure 3, makes them important for SEO and highlights the need for correct use of language that is understandable by real people [108].

### **Keywords in the URL:**

The use of important keywords in the URL aids crawlers in indexing and tracing the page, as well as indicating to potential users what they can expect from visiting it [92], [109]. Luh et al. in their study found the importance of keywords in the URL is decreasing, something that was also confirmed by John Mueller from Google, who described them as a “very, very lightweight ranking factor” [31], [109].

### **Keywords in the body:**

Keywords in the main body, also known as keyword density, refers to the number of times the targeted keyword appears in the text compared to the rest of the text [92]. The suggested keyword density is 5-8%, meaning that for every 100 words on a page five to eight should be targeted keywords [108], [92]. However, according to Google, keyword density is no longer a ranking factor in their algorithm, and webmasters should instead try to include relevant keywords in a natural and useful way within their content [109]. Well-written, natural, and contextual language offers more value to users. Lastly, the placement of the most important keyword in the top part of the page, specifically in the first 100 to 150 words, was found to be useful as it indicates to visitors that the page is relevant to the information they searched [109], [108].

### **Non-text content:**

A big part of content is images and videos that enhance and support the body copy on a page: however all page elements need to be in HTML to be understood by search engines and indexed correctly [25], [92]. Moreover, images are also not understood by text readers used by visually impaired visitors, and to that extent it's beneficial to SEO and accessibility that all images have alt tags defined and videos have transcripts [102], [99], [92]. Lastly, images contribute to the page's loading time, so their optimisation to minimise their file size is recommended, in the interest of decreasing potential bounce rates due to slow loading times [25], [102].

### **Bounce rate:**

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Another indicator of the quality of content in SEO is bounce rate, which shows how many visitors are finding the page useful and relevant to their search term [92]. Google listens to the bounce rate as a negative ranking factor, assuming that a high bounce rate indicates that users are not satisfied with the information provided [99]. Even though Google has not confirmed that bounce rate is a ranking factor, experts suggest that a good bounce rate is considered around 40% or lower, and it indicates that the content is engaging and useful [110].

To conclude, content plays an important role in SEO, and when used correctly keywords are its lifeblood [96]. The most important placement of keywords on the page are in the title tag, meta description and the h1 tag and sub-headers tags, and other suggested placements of keywords include the first paragraph of the body copy and URL. However, there's evidence to suggest that they are less important in optimisation for search engines, and more valuable to website users [109], [31]. Additionally, good quality content that is structured with appropriate headers and accompanied by optimised visuals contributes to engaged users, and helps pages rank higher on the SERP [54].

### **2.4.2.2 Page experience.**

Page experience in SEO includes key elements of a visitor's experience on a page that directly impact the page's position on the SERP [111], [19]. The set of factors that Google considers important for UX and SEO is called page experience. Page experience examines not just the quality of the content, but also how users interact with a page and whether the interaction is smooth and enjoyable [25]. There's no single page experience signal that Google uses for ranking, but the documentation suggests that for a page to be optimised for search it should have good Core Web Vitals, a collection of metrics that Google released to help website owners measure real-world user experience on a page and includes loading performance, interactivity, and visual stability [112]. During the optimisation process, teams should incorporate the Core Web Vital metrics with the existing UX ranking factors to ensure SEO requirements are met while keeping usability and accessibility central [19], [111]. The set of UX elements that influence page experience alongside Core Web Vitals as identified by Katave et al. are mobile friendliness, HTTPS, and interstitial use [113].

#### **Core Web Vitals:**

Google announced the metrics in 2020 helping webmasters to identify opportunities to improve UX on their website, and according to Semrush, the better a page performs on the Core Web Vitals metrics, the better the experience it provides [19], [37]. Google's Core Web Vitals include Largest Contentful Paint (LCP), Cumulative Layout Shift (CLS), and Interaction to Next Paint (INP), with each of them examining a different aspect of the UX in accordance with page speed. Google evaluates Core Web Vitals using a color-coded system similar to traffic lights, where 'green' signifies 'good', 'amber' denotes 'needs improvement', and 'red' reflects 'poor performance' [112], [114].

LCP measures the loading performance according to the largest element on the page and how long it takes to load [112], [37]. Google suggests that pages should strive for 2.5 seconds or less and the time is calculated using only the largest block-level element on the user's viewport, for example an image or a text block [115], [116]. Understanding how quickly a text section or an image becomes visible is important as it measures accurately when a page is practically usable by visitors, giving a real insight into the UX [114].

CLS measures visual stability, which means how much the page layout moves unexpectedly as it loads [112], [37]. The suggested score by Google is 0.1 or less and it's calculated by only looking at the content above the fold: a good score means the layout is stable [117]. Unexpected movement of the page content can cause users to lose their place on the page or even click the wrong thing which can contribute to a frustrating UX, which in its turn will lead to visitors abandoning the site [19].

INP measures a page's responsiveness, interpreted as how fast a page updates with new visuals when a user interacts with it: for example, when a user adds an item to their basket on a website, INP would measure how quickly the basket icon would update to show that an item has been added [112], [37]. Google measures INP in milliseconds (ms) and considers a page's responsiveness good when its INP is 200ms or less [112]. INP was incorporated in Core Web Vitals in March 2024, replacing the previous metric of First Input Delay (FID) which also measures responsiveness with the difference that it only reviews the user's first interaction [118], [114].

The core web vital metrics go beyond page speed and examine how long it takes for elements on the page to be ready to use for visitors, giving a useful insight to the UX [19]. SEO teams that improve their site's score can expect, besides improving search rankings, reduced bounce rates, improved engagement, and potentially higher conversions [37].

#### **HTTPS:**

As seen, security in the e-commerce space enhances trust between websites and users and protects user's privacy [18]. Ziakis et al. observed that the SSL certificate was one of the most crucial factors for page rank and one of the few that haven't changed during the many algorithm updates [92]. The page experience report in Google's Search Console, in addition to the Core Web Vitals, includes only one additional check, which is the HTTPS status of a URL, highlighting the necessity for SSL certificates even more [119].

#### **Mobile friendliness:**

In 2020, Google announced that they will indexing websites mobile-first, emphasising the need for websites to be user-friendly to mobile users [120]. As the usage of mobile devices continues to rise, the importance of maintaining a responsive website has become critical [102]. Mobile friendliness is part of Google's assessment implying that websites with poor mobile experience will not rank on the SERP [99].

#### **Interstitial use:**

Avoiding intrusive interstitials and dialogs also known as pop-ups is part of the page experience ranking factors [19]. Kaley during usability testing found that users who came across multiple pop-ups abandoned the site, expressed frustration, and left with a negative connotation of the brand, which showcases that the interrupting nature of pop-ups leads to bad UX [121]. Additionally, intrusive interstitials and dialogs obstruct Google's ability to understand the content on a page, resulting in poor search performance [122].

To sum up, Google's has integrated page experience in its ranking algorithm, making UX part of the SEO process, something that is emphasised even more with the integration of Core Web Vitals in several of Google's page auditing tools [113], [19]. SEO practitioners should evaluate and optimise their pages holistically, not only to rank on the SERP but also to offer intuitive and engaging experiences to their users [123].

### 2.4.2.3 Technical SEO

Technical SEO optimises a website for better search engine discovery, understanding, and indexing of content, while also improving UX factors such as site speed and mobile usability [124]. The reason it's called technical is because it often requires technical expertise such as web development, server configuration, and knowledge of SEO tools to implement [123].

The importance of technical SEO firstly lies with making pages discoverable by search engine crawlers, because no matter how useful the content, if Google can't access a page, it won't appear in the SERP [125]. Google's crawlers constantly search the web for pages to index, though some pages can only be discovered when Google follows a link from a known page [25]. For example, when a new blog is posted, websites add the link to the blog page to their main blog listing page, this way next time Google crawls the blog listing page it can see the new link to the new blog post. Hence clear site architecture ensures that crawlers can access all the pages and there are no orphan pages (pages with no internal links pointing to them) [124].

#### Sitemaps:

An XML sitemap is crucial for the SEO optimisation of a website, as it informs search engines about updates to the website, relative importance of each page, and how often the site is updated among other data [92]. Sitemaps that are not defined correctly may lead to the lack of indexing of important pages of the website [99].

#### Robots.txt:

At the same time, website owners can choose *not* to list some of their pages on the SERP if they offer no value, for example a thank you page. This can be achieved by either using the 'noindex' tag in the head section or by submitting a robots.txt file to Google which instructs which URLs it shouldn't crawl [124], [25]. In practice, robot.txt files serve several purposes: they prevent duplication of content, they prevent certain parts of the website from public view, they detail the location of the sitemap, and they prevent search engines from indexing specific parts of the site [99].

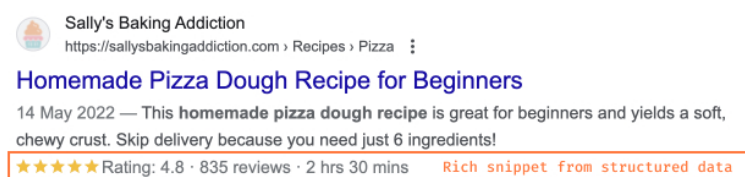


Figure 4 Rich snippet in SERP - google.com.

#### Schema markup:

Schema.org is an open-source community that was initiated by popular search engines in 2011 to promote standards for structured data (schemas) online [126]. Structured data provides information about a page and classifies its content, potentially enabling rich snippets on the search results and helping the page to stand out [124]. For example, a review schema could result in the rating appearing under the page description as shown in Figure 4.

#### Site speed:

One of the known factors in search algorithms is loading time: the higher the loading time, the lower the ranking of the page [92]. The process of loading a website starts as soon as the user requests a URL from the browser: if the server takes too long to respond, a user might potentially decide to leave causing a 'bounce', which as already examined affects rankings negatively [126]. A tool like Google's PageSpeed Insights examines the performance of the page and looks for opportunities for optimisation to improve its speed, which is useful during the optimisation process [122]. Where possible, a website's files (HTML, CSS, and JavaScript) should be minimised, and its images optimised, to improve its loading speed and enhance UX [102]. Another way to improve a page's loading time is by using caching techniques such as server-side caching, which keeps a cached copy of the page and serves it until the page is updated, and client-side caching which is a temporary version of the page in the user's browser, should they have visited the page previously.

## **2.5 Integrating SEO and UX/UI optimisation.**

The web has become an essential tool for people's daily lives and business websites serve as the primary point of interaction between organisations and potential customers [92]. However, having a business website alone is not enough in today's competitive online landscape. Businesses need to ensure their website is not only visible on search engine results but also provides a smooth and user-friendly experience [123]. SEO helps improve the SERP position and increase website traffic, and UX/UI design is crucial to retain visitors and ensures the goals of the website are met. Therefore, digital marketing professionals should focus on both aspects to guarantee successful integration [127].

Optimising a page for both SEO and UX contributes to a more holistic approach to website optimisation and creates a more effective website that satisfies users [123]. However, there are challenges to consider as SEO and UX contradict each other in some cases, as they potentially have different priorities mainly around content, keywords, and how they are presented on the page [125]. SEO heavily relies on the use of keywords and comprehensive content which could lead to text-heavy pages, but people online are not necessarily interested in long content, as shown by a study by Nielsen Norman Group finding that only 16% of users actually read the pages they came across [128]. This is an example of how, while UX and SEO may have competing priorities, a good optimisation process can bring them into alignment: clear and consistent page structure helps users navigate pages at the same time as aiding SEO crawlers in detecting keywords.

Google states that their algorithm always looks for content that is created with people first in mind and benefits users rather than looking to gain search engine rankings [129]. With that statement, Google emphasises that websites should be user-centric, and for the purpose of this project where conflict arises the prioritisation of tasks will take the UX/UI over SEO approach. The proposed optimisation cycle is edited as such in Figure 5 and changes Step 1 to: UX & SEO data collection and & analysis.

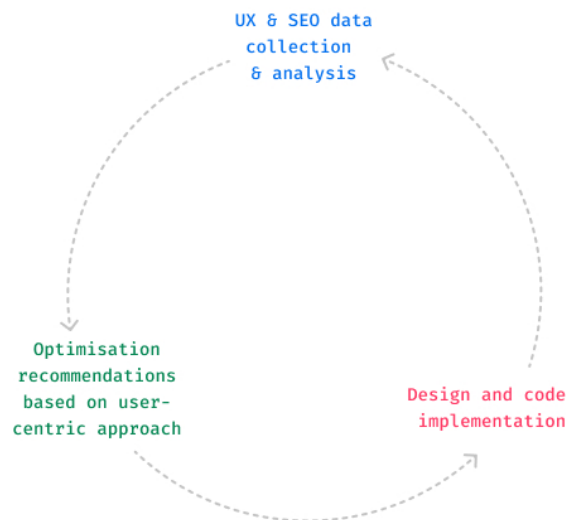


Figure 5 - UX/UI & SEO optimisation cycle.

## 2.6 Summary

In this section the history and evolution of HCI has been explored, and the roles of UX, UI and SEO in a B2B context have been examined. As new technologies have expanded the field of HCI, so HCI has impacted the direction in which technology has been developed: as increasingly user-friendly technologies have been produced, opening the market to new users, so those users have introduced new expectations and demands which have in turn driven the production of new technologies.

The internet, initially an invention purely for sharing information, rapidly became the world's biggest and most fought-for marketplace: but as the number of businesses online exploded, the battle for visibility became ever fiercer, leading to the development of SEO to attract and maintain audiences. As Google became the soaraway leader of the search engine field, the ability to divine their opaque demands became the difference between success and irrelevancy for many organisations, and created a new are of interest for marketers.

Attracting visitors to a website is only the beginning, however: keeping them there and encouraging repeat traffic requires that a site is pleasant to use, attractive, and easily accessible. Creating such sites is where the interconnected fields of UX and UI come in: HCI deployed to interest and engage potential customers, and to guide their conversion journey. 'Good' UX is a hotly debated topic, particularly as the needs of B2C sites differ from those of B2B, but the importance of developing and following a clear UX design process such as Garrett's is obvious.

So, it is clear that the website optimisation process is instrumental in ensuring that a business' web presence remains effective, usable, and discoverable over time. There now follows a case study examining how this optimising cycle can be implemented on specific pages on a B2B SaaS site, taking into particular consideration user engagement and SERP visibility.

## **Chapter 3: Case Study Methodology**

### **3.1 Introduction**

This chapter introduces the business central to the case study and sets the objectives for the methodology. Before exploring the methodology in detail, the suite of analytical tools to be utilised is outlined. An analysis of the business' audience and traffic sources follows, providing an understanding of the customer base and informing the parameters of the methodology. This step is essential to ensure that the approach is appropriately tailored to the specific characteristics and requirements of the business.

### **3.2 About the business**

This study will analyse the UX, UI, and SEO of the marketing website of imi.com. This study aims to analyse the current state of the imi website. The objective is to identify areas for improvement in UX, UI, and search engine positioning. Subsequently, optimisation measures will be implemented, and the impact of these efforts will be assessed. The data collection period spans from May 2022 to June 2023.

imi is a Cloud Communications Platform as a Service (CPaaS) provider. CPaaS is a cloud-based and programmable product, enabling businesses to broaden their client communications through a greater variety of digital messaging channels, without the need to re-engineer their backend systems or build new infrastructure. Digital messaging channels include common mediums such as SMS and email, as well as modern messaging apps like WhatsApp and Messenger, social media, video conferencing apps, and chatbots. Some everyday examples of CPaaS in action include receiving an SMS alert for extreme weather conditions, a personalised marketing email following a purchase, and engaging in a conversation with a chatbot on web chat that may be transferred to a live customer service agent [130].

A CPaaS business primarily targets other businesses, making it a business-to-business (B2B) company that falls within the Software as a Service (SaaS) category of the technology industry. The organisation has been trading globally for approximately 20 years, predominantly catering to large enterprises (client bases of over a million). The company's flagship product, Connect, is promoted as the comprehensive CPaaS solution, complemented by three additional applications: Engage, Campaign, and Notify. These applications cater to more specialised CPaaS solutions.

In early 2021 imi was acquired by Kosmo, a B2B technology business trading globally from their headquarters in San Francisco, CA. Kosmo offers a variety of products both in hardware and software, making CPaaS a smaller product within a larger catalogue. As part of the onboarding, imi was required to rebrand their website to the Kosmo brand style. In September 2022, the name imi was replaced by Kosmo CPaaS, and in September 2023 the imi.com domain name also changed, and the newly branded Kosmo CPaaS website moved to a subdomain under the Kosmo group of websites.

This website serves as a marketing platform to promote the Kosmo CPaaS products and educate relevant audiences. The target audience, as identified in APPENDIX B, cannot directly purchase the product through the website: a conversion in this case is considered to have occurred when a visitor fills out a form either to download content (such as case studies, whitepapers, webinars, etc.) or to book a product demo. Therefore, the website's goal is to inform visitors of the company's products as well as educate them in topics around CPaaS and potentially convert them to prospect customers by filling in a form.

Due to the large volume of pages on the site, estimated to be over 800, conducting a site-wide optimisation during this project would be challenging. Therefore, the site's homepage was selected for

the case study. The homepage was chosen because it provides a comprehensive overview of the company and its products and attracts the most organic traffic, with 81% of incoming users landing there. Additionally, the blog was identified as a valuable asset for the business, offering numerous opportunities to create relevant content and potentially boost traffic. Consequently, the blog post template was chosen as the second focus of the case study.

The goals of the optimisation process for the homepage were twofold: first, to increase user engagement below the fold, encouraging users to scroll deeper and interact with the page elements; and second, to enhance the homepage's visibility on Google search engine results for targeted keywords. For the blog post template, the objectives were to boost user engagement with the blog content, and to encourage users to explore other parts of the website after arriving via a blog post.

### 3.3 Tools

Before proceeding into optimisation strategies for the B2B website it was important to gather comprehensive data on its current state on both UX and SEO, to make informed decisions. A suite of diagnostic and analytical tools was employed during this stage to gather important information. GA was used to gather behavioural quantitative data, and Hotjar complemented it with qualitative data through heatmaps. PageSpeed Insights was used to assess the performance and UX aspects of SEO. Finally, to understand search performance Google's Search Console and Semrush were used.

During the implementation phase of the optimisation several other tools were used to improve design and functionality. For the re-design of the UX and UI of the pages Figma was used, which also facilitates the exporting of CSS language ready for development, usability checks were executed using free online tools such as caniuse.com and webAIM's contrast checker. The implementation of the changes on the pages was done by implementing the Statamic CMS which is customised to the business' requirements.

#### 3.3.1 Caniuse.com (Browser compatibility checker)

[caniuse.com](https://caniuse.com)

Can I Use is a widely used tool for checking browser compatibility. It provides detailed information about the support of web technologies, such as HTML, CSS, JavaScript APIs, and more, across different web browsers.

#### 3.3.2 Figma (Collaborative design tool)

[figma.com](https://figma.com)

Figma is a cloud-based design and prototyping tool that offers a collaborative environment for creating user interfaces, wireframes, and interactive prototypes. Figma provides a range of features like collaborative design, design systems and component libraries, web-focused design features and multiple integrations and plugins. The tool's versatility makes it a preferred choice for designing user interfaces and creating prototypes for web projects.

#### 3.3.3 Google Analytics 4 (Web analytics tools)

[developers.google.com/analytics](https://developers.google.com/analytics)

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Google Analytics is a web analytics service offered by Google that provides detailed statistics and analytics for websites, to help understand their audience, track user behaviour, and make data-driven decisions to improve performance. Insights into user behaviour, website traffic, conversion tracking, e-commerce tracking, and more help make data-driven decisions to improve user experience, optimise marketing efforts, and drive business growth. The current version, 4, is used throughout this study.

### **3.3.4 Hotjar (Page engagement metrics)**

[www.hotjar.com](http://www.hotjar.com)

Hotjar is a web analytics and user feedback tool that provides insights into the user experience on a webpage. Its key features are visual heatmaps, session recordings, conversion funnels, feedback and surveys, form analysis, and usability testing. Hotjar's combination of quantitative and qualitative data provides a comprehensive view of user behaviour and aids in web optimisation efforts. By understanding how users engage with a website, pinpointing areas of improvement, and collecting user feedback, Hotjar enables businesses to make data-driven decisions to enhance user experiences and improve overall webpage performance.

### **3.3.5 PageSpeed Insights (Webpage performance analytics)**

[pagespeed.web.dev](http://pagespeed.web.dev)

PageSpeed Insights is a web performance analysis tool developed by Google. It provides a quick and user-friendly assessment of a webpage's loading speed and overall performance. This online tool analyses both mobile and desktop versions of a webpage, assigning a performance score and offering recommendations for optimisation. PageSpeed Insights takes into account real-world data from the Chrome User Experience Report (CrUX) to provide insights into how actual users experience a website. It also incorporates a Lighthouse audit, assessing technical aspects of a website, making a valuable resource for web developers, designers, and site owners looking to enhance their website's speed, user experience, and search engine visibility.

### **3.3.6 Search Console (SEO tool for Google Search)**

[search.google.com/search-console/about](http://search.google.com/search-console/about)

Google Search Console stands as a potent SEO tool, delivering vital insights into website performance on Google's search engine. It enables site owners to monitor the website's indexing status, identify and resolve issues with indexing, examining search analytics to comprehend user discovery patterns and elevate web page visibility. It also provides data on important SEO elements like click-through rates, keyword rankings, and mobile usability. By leveraging the data and suggestions from Google Search Console, webmasters can make informed decisions for optimising websites to enhance for improved search engine rankings and user experience. Even though the tool only provides insights for Google search results, the search engine's popularity makes it an essential tool for SEO.

### **3.3.7 Semrush (SEO tool)**

[semrush.com](http://semrush.com)

Semrush operates within the digital marketing space, providing data and insights for SEO, PPC, social media and content marketing. It offers a suite of tools for keyword research, competitor analysis, site audit, and rank tracking, enabling professionals to optimise their website for online discoverability.

Semrush' capabilities also extend to analysing backlinks and auditing website performance to ensure adherence to best SEO practices.

### **3.3.8 Statamic (Content management system)**

[statamic.com](https://statamic.com)

Statamic differentiates itself from other content management systems with its flat-file architecture, customisation capabilities, and modern user interface. It targets developers seeking flexibility and control over website structures. It minimises server requests and leverages caching to deliver fast-loading websites. Statamic also emphasises security by following best practices, providing protection against common web vulnerabilities.

### **3.3.9 TinyPNG (Image compression)**

[tinypng.com](https://tinypng.com)

TinyPNG is an online image compression tool designed to reduce the file size of JPEG images. It applies compression algorithms to reduce the file size of JPEG, PNG and WebP images while minimising the loss of visual quality. By reducing the file size, TinyPNG helps improve website loading times, saves bandwidth, and optimises images for web usage.

### **3.3.10 WebAIM (Web accessibility checker)**

[webaim.org](https://webaim.org)

WebAIM.org is a well-known and highly regarded organisation that focuses on web accessibility. It provides a wide range of resources, training, and evaluation tools to promote and support accessible web design. It offers a wide range of articles, tutorials, checklists, and guidelines, to educate web developers and designers about accessibility best practices. These cover various aspects of web accessibility and provide practical guidance for creating inclusive websites.

### **3.3.11 Tools summary**

The selection of these tools for collecting data and implementing optimisations was based on their individual capabilities, but also their ready availability within the business' digital marketing toolkit. By capitalising on resources that the company already had access to, the process was streamlined, avoiding the need for extensive training or additional investment.

### 3.4 Overall site data

Incoming traffic for a website refers to the flow of visitors who access the website from various sources, including search engines, social media platforms, referral links from other websites, and direct visits by typing the site’s URL into their browser. Measuring different aspects of incoming traffic is crucial in UX as it offers insights into how users discover and engage with a website [59]. This data will help make informed decisions that lead to a more user-friendly and effective website, aligning it with user preferences and objectives. It is a critical metric for assessing a website’s performance and impact.

The traffic data in sections 1-4 pertains to the entirety of organic traffic for the website. This data was collected using Google Analytics during a four-month period spanning from May to August 2022. It’s essential to clarify that organic traffic exclusively encompasses visitors who access the website via unpaid, natural search engine results (Google or Bing) or by typing the address on their browser window or using a bookmark (direct traffic), distinguishing them from those directed by paid advertising, or referrals.

#### 3.4.1 Organic traffic

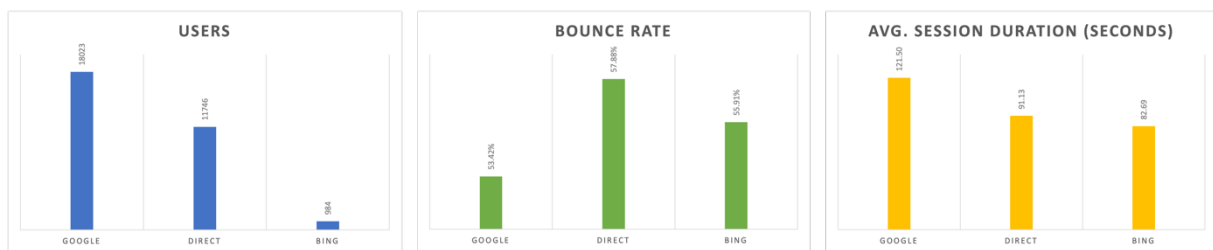


Chart 1 Site wide organic traffic.

These charts show the source of the organic traffic to the business website. Google is the primary source of organic traffic, attracting the largest number of users with a relatively low bounce rate and a respectable average session duration. While direct traffic remains significant, it tends to have a higher bounce rate and shorter session duration when compared to Google. Bing, on the other hand, contributes the least amount of organic traffic, with approximately 300 users per month. This can also be attributed to the fewer overall users of Bing search in general when compared to Google. Bing averages to 7% where Google dominates the market averaging at 85% [93]. Google consistently delivers a higher volume of organic traffic, making it a dependable source worth investing in to further enhance website traffic.

#### 3.4.2 Organic traffic by device

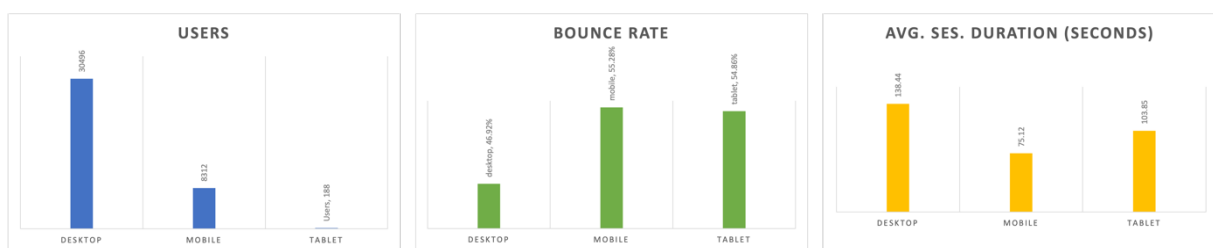


Chart 2 Site wide organic traffic by device.

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According to the data collected during this period, desktop users constitute the primary audience for the website, holding a significant lead of 76.24% over mobile and tablet users. Furthermore, desktop users exhibit the longest average session duration and the lowest bounce rate, indicating higher engagement. Conversely, mobile users demonstrate the highest bounce rate and the shortest session duration, implying that they tend to exit the site after viewing just one page. Tablet users, although a smaller segment, exhibit a comparatively longer average session duration of over 1.5 minutes. Given the robust engagement from desktop users, it remains critical to continually optimise the website to cater to this audience.

3.4.3 Organic traffic by region

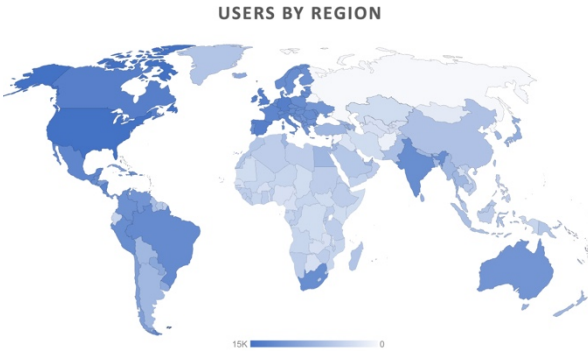


Figure 6 Site wide users by region.

While the organisation operates globally, the majority of the website’s visitors originate from North America. This can be attributed to the fact that the company is headquartered in the USA, and a significant portion of its customer base is also located in this region. Although website traffic in EMEA is 2:3 that of the Americas, it is disproportionately high relative to the sales created in the area.

### 3.4.4 Organic traffic by browser

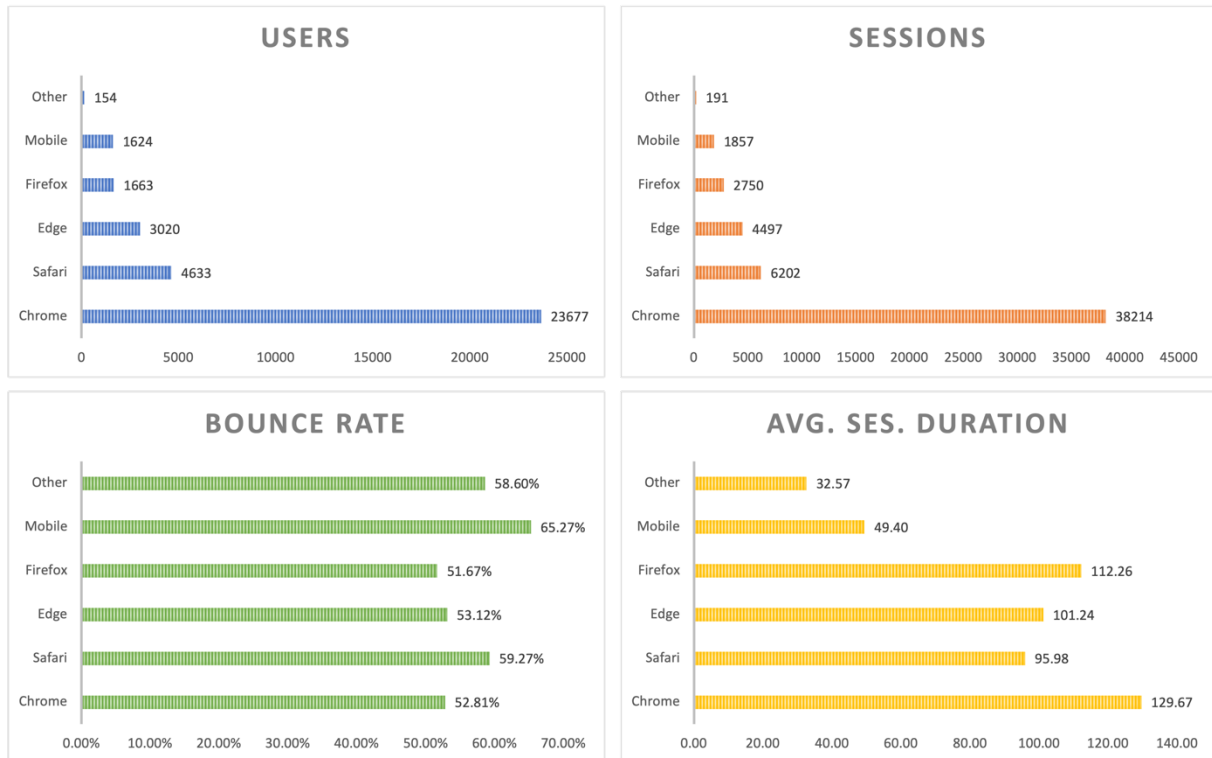


Chart 3 Site wide organic traffic browser use.  
Mobile includes Safari, Samsung, and Android. Other includes Opera and Internet Explorer

The number of visitors using the Chrome browser significantly surpasses that of any other browser, and they also generate the most sessions. Furthermore, Chrome users exhibit the highest average session duration and the second-lowest bounce rate. Conversely, as the number of users and sessions decreases with other browsers, there is a noticeable decline in session duration. Nonetheless, the average bounce rate appears to hover around the 55% mark overall.

### 3.4.5 A note on mobile usability

The overall trend in internet use is away from desktop towards mobile, which contradicts the data collected on the actual website's audience [131]. According to the business' traffic there's only a small amount of traffic that originates from mobile devices and they don't stay engaged with the website for long when compared to the desktop users. A pattern that is supported by a trends study by Semrush, which found that desktop users have more intent, which is shown by lower bounce rates, higher viewership of pages, and longer session duration. Semrush also suggest that users often prefer desktop over mobile browsing to complete more complex tasks, in-depth research, and extended browsing sessions [132]. Additionally, the great adoption of PCs by businesses, means that most business users, navigate the internet on their work computers during office hours. The nature of the company, being a B2B enterprise level SaaS provider, helps identify that their audience is business users who are evidently, according to the data, use desktop browsers to browser on the web. Therefore, it is decided that this case study will primarily focus on addressing the issues on the desktop version of the homepage and optimise accordingly for improved search visibility and usability.

### **3.4.6 Data conclusion**

All the data findings are consistent and align with the same narrative. The Chrome browser, primarily used on desktop, features Google as its embedded search engine, reaffirming that most visitors arrive at the site through Google searches. The significantly higher numbers associated with both Google's search engine and with desktop browser usage confirms that the decision to focus optimisation efforts on Google products and the desktop user experience (UX) is the right one.

### **3.5 Summary**

In this section the industry in which the company operates has been identified as the SaaS B2B technology space. The tools that will be used in the study have been identified as well as the way target audiences are determined, and the ways in which users interact with the website currently. The site has a very niche target audience, largely located in the Americas, and which primarily engages with the website via desktop computer and predominantly uses Google products to browse and search the web. This information will form the basis of the inquiry going forward, as the data collected should and will be considered through the lenses of this existing user research.

## Chapter 4: Implementation

### 4.1 Introduction

In this chapter, the optimisation process is outlined for the business' homepage and blog post template. Per Garrett and Tomlin's frameworks, the optimisation process will follow three steps: UX/UI and SEO data collection and analysis; optimisation recommendation with a user-centric approach; and design and code implementations. After the completion of the optimisation cycle, more data will be collected and analysed to see the effect of the changes that were implemented.

### 4.2 Optimisation of the homepage

The Kosmo homepage was re-designed during the rebrand transition from the imi brand system to the Kosmo brand system in March 2022. The rebrand exercise was purely visual, and only impacted colours, fonts, and imagery – all content remained the same. The focus of the rebrand was to enforce brand consistency across the Kosmo family of websites. The Kosmo brand has previously been tested for web accessibility by the parent company and was implemented without changing any core elements to ensure industry standards were met. Due to the short timeframe of the rebrand, the branding changes were made without addressing the content or user experience.

#### 4.2.1 Step 1 Collection and analysis of UX/UI and SEO data.

The data collection process occurred between May and August 2022 and is outside of the scope of this study. The initial data analysis therefore follows.

##### 4.2.1.1 UX/UI data

##### Acquisition data

Considering the consistency between overall traffic data – encompassing both sessions and users - and site-wide trends, this analysis will concentrate on the organic acquisition of traffic, exploring how users arrive at the site through various channels, including search, direct, and referral traffic. Engagement metrics such as unique page views, bounce rates, and average time on page will provide context for this exploration, offering insights into user behaviour in relation to the acquisition methods.

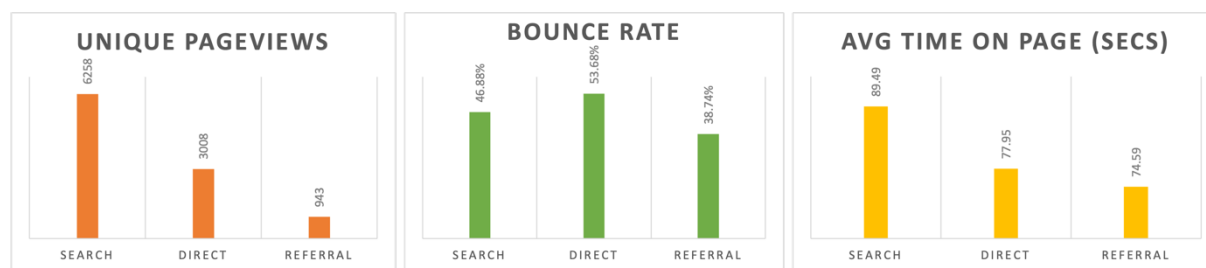


Chart 4 Homepage organic traffic engagement metrics.

The three graphs in Chart 4 show valuable metrics for the homepage's organic traffic. 'Unique pageviews' represents the number of times the page was viewed by a unique user. 'Average time on page' indicates the average number of seconds users spend on the page, while 'bounce rate' represents

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the percentage of users who navigate away from the page or exit the website within 3 seconds of visiting it.

The total number of unique users was 3081 and they primarily arrived from search. Visitors, tended to stay on the page for an average of 1.5 minutes and visit on average six pages during their visit. Users arriving directly to the homepage by typing the domain into their browser likely already knew what they're looking for and where to find it, and as a result, they navigated away from the homepage quickly, which explains both the higher bounce rate and the relatively short time spent on the homepage.

On the other hand, visitors from referrals, access the website's homepage via links from other websites or social media. Although the number of pageviews from such visitors was notably lower, the bounce rate for this group is the lowest of all, which suggests that these users visit the website looking for something specific relating to the link they clicked. The average time spent on the page for this group is slightly over a minute.

It's interesting to note that although the page's bounce rate is averaged at 46% -indicating it is slightly higher than the recommended threshold of 40% - when compared to the SaaS industry, it is significantly lower [77]. According to Capturly's benchmark report, 7 out of 10 visitors to SaaS websites leave a page immediately, which could be attributed to the nature of the industry and that users often visits multiple websites simultaneously to compare their services [133].

### Engagement data

This section explores the specific ways in which users interact with the homepage of the business website, the usability data collected from heatmaps offer quality insights on users' engagement on the page [65].

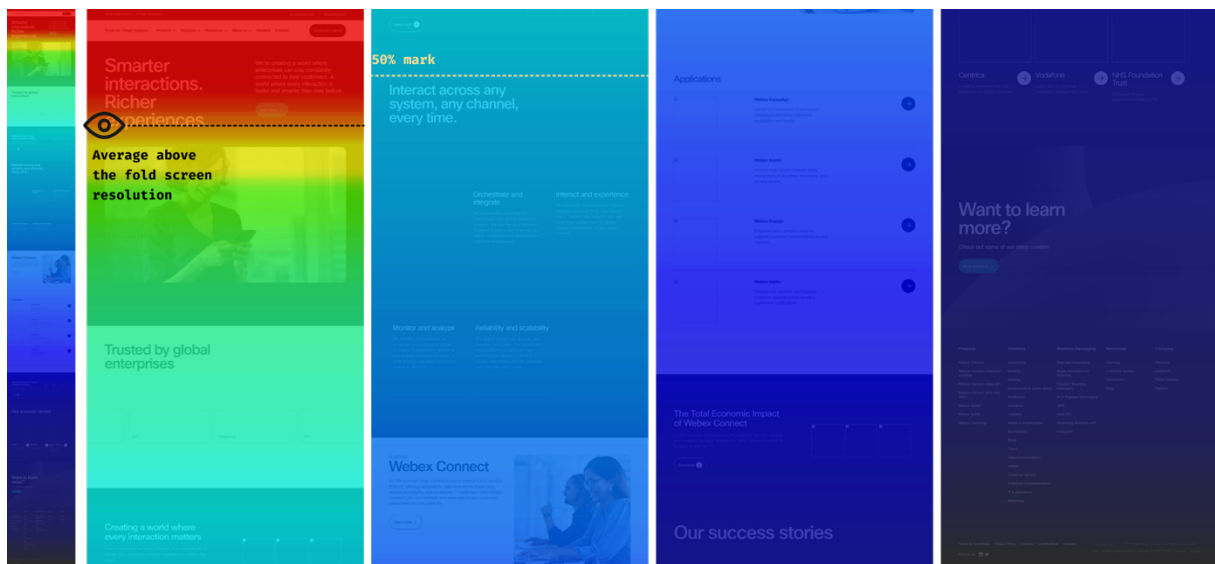


Figure 7 Homepage scroll heatmap.

A scroll depth heatmap conveys user focus on the site and how far they are choosing to scroll to. Warmer colours indicate areas of higher visibility and as the colours get colder, fewer users view the area [134]. As would be expected, the scroll depth heatmap of most webpages get colder in correlation with page

height; where they can prove useful is in identifying the point(s) on the webpage where users leave the page. The lack of interactive elements and unclear copy could be a contributing factor as to why users drop off the page so early.

According to the heatmap, 50% of users only view one third of the homepage as indicated in Figure 7. This incorporates the top ‘hero’ section of the page with an auto-playing animation video, a client/logos section without any interactive elements and a smaller block that has a button that pops up the brand video.

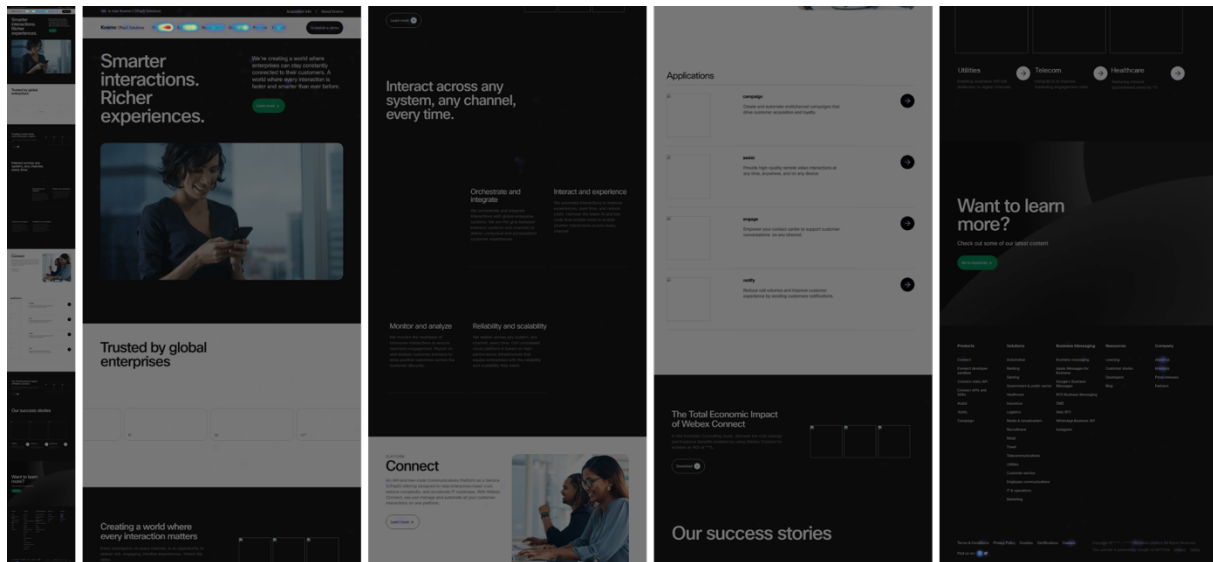


Figure 8 Homepage click heatmap.

The click heatmap in Figure 8 helps visualise what are the most popular and least popular elements on the webpage, based on where users are clicking. Each click leaves a mark on the heatmap, and where there are more clicks the colours warm up [134].

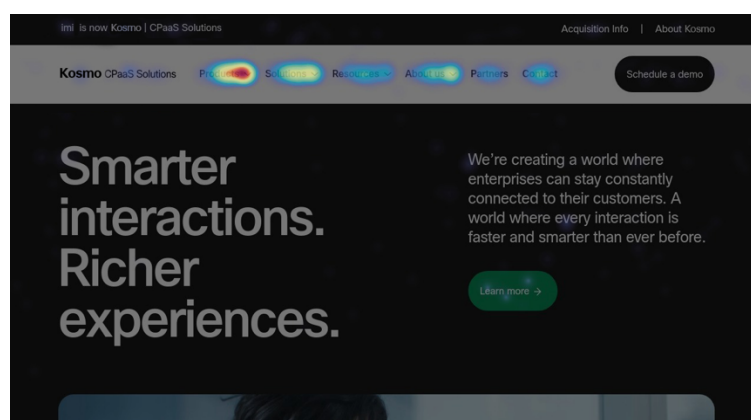


Figure 9 Homepage click heatmap above the fold

Predictably, the navigation links at the top of the page, are the most clicked elements. Looking at the content above the fold, there’s only one button which links to the CIM suite page. Even though its

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prominent position, there are very few marks on this button. Explanations for the lack of clicks include users not understanding where the button leads due to its generic labelling; users not understanding the content above the button and therefore not seeing a reason to click the CTA; and users being uninterested in the content that's presented and thus not clicking the button.

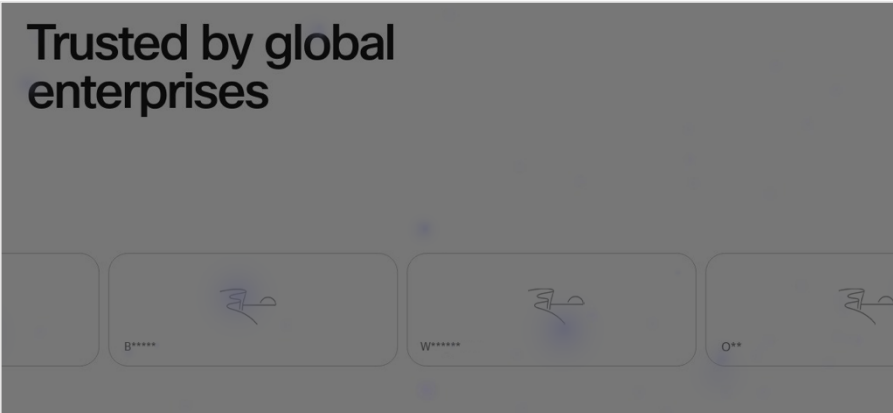


Figure 10 Click heatmap on logos component.

Looking specifically at the second section of the page (client/logos), it can be observed that users click on the logos or the names of the companies, even though the images and names are not links. This section is in the light green area of the scroll depth heatmap, which means that more than 50% of visitors to the page view it.

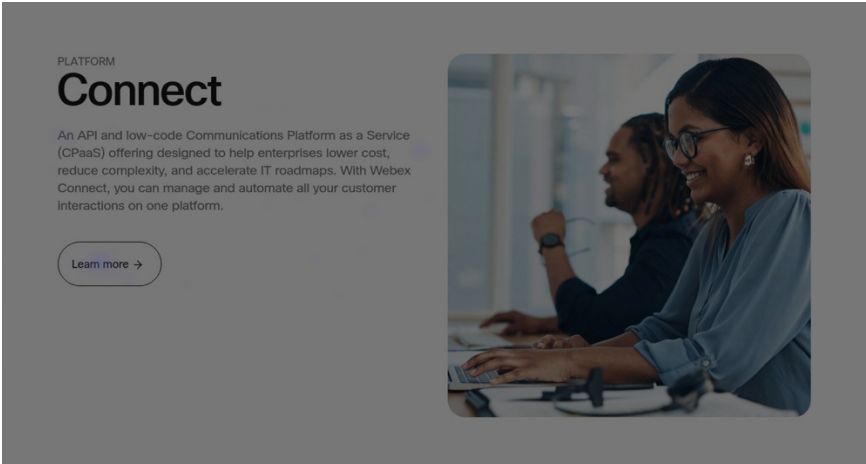


Figure 11 Homepage click heatmap connect section.

One thing that stands out from the 'cold' section of the page, is the comparative popularity of the Connect CTA relative to its placement and visibility, with the same button label to the top CIM suite button. This suggests that although fewer visitors scroll this far down the page, those that do are interested enough in this product to learn more about it.

**Conversion data**

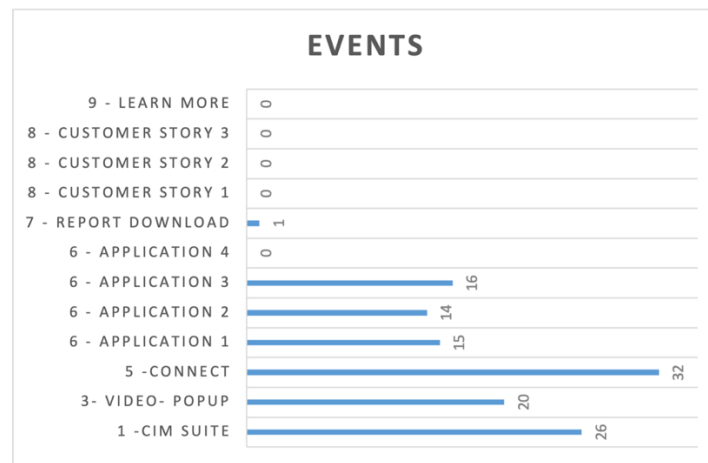


Chart 5 Key events on homepage.

The data presented above reflects the number of times visitors clicked on each button for a month before the optimisation, or what is called an ‘event’ in GA. This data is important because it shows what the users are interested in, how deep they scroll in the page and what type of content they find engaging.

The homepage features a total of twelve CTAs distributed across eight out of ten sections. When examining this data in conjunction with the Hotjar heatmaps, specific metrics can be assigned to each section to gain a better understanding of user behaviour.

Notably, it’s evident that although the CIM suite button is positioned at the top of the page, it is not the most frequently clicked CTA. Instead, the Connect CTA, located further down the page, garners the most user engagement something that was observed in the click heatmaps as well. The second link on the page pops-up a video and received 20 clicks.

Conversely, the component with the download link to a report, only received one click. This is the user’s first opportunity to download any assets from the page. To get to this point, the page would have been scrolled on average eight times, conveying a message of lower importance for any content that has been ‘relegated’ to this position.

The second-to last component, which links to customer case studies, did not receive any clicks. This is somewhat surprising, as Hotjar’s click heatmap indicated a desire to learn more about customers within the logos component. However, it’s worth considering that the relatively low number of users scrolling to this section may account for the lack of engagement.

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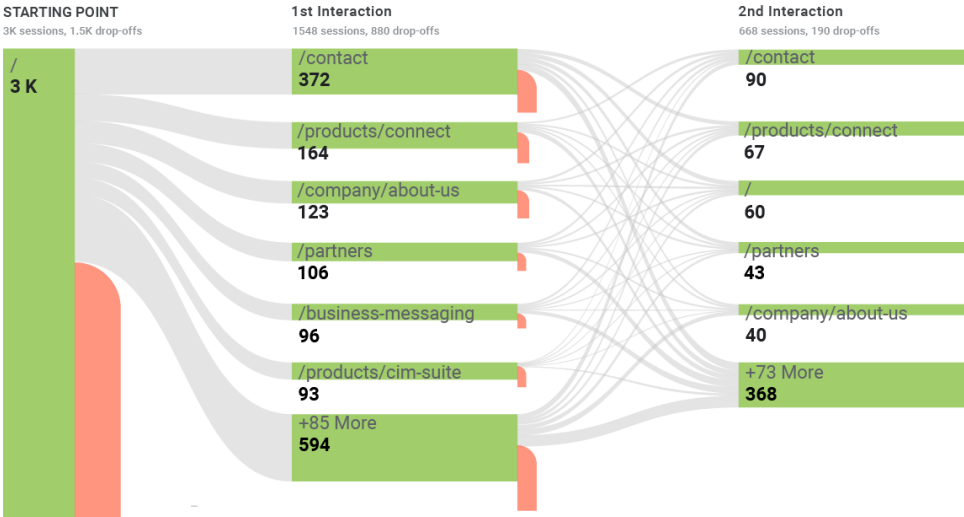


Figure 12 Two-step Next Page Paths from homepage.

Looking at common Next Page Paths against the homepage including navigation links, the Contact and Connect links were the most interacted with, indicating what interests the users most. This is confirmed by observing the next step in the user journey, where the two pages continue to hold the most visited positions, with the return to the homepage being the third most taken route. The drop-off rates from the homepage to the first interaction shows that more than half of the visitors leave the site only after seeing the homepage; on the next step, roughly 60% of users leave the site without exploring further. This suggests that the user’s expectations are not met when they’re landing on the homepage, or that the homepage’s links send them to pages prematurely, without explaining what they should be expecting from those pages.

The Next Page Paths indicate that users proceed to pages that are accessible via the homepage’s content, likely by utilising the navigation menu, as the recorded events on the homepage are significantly fewer than the users visiting those pages after arriving on the homepage. Overall, the conversion data show small number of interactions from users, and high drop-off rates. This could be explained by the incorrect hierarchy of information and poor button labels, resulting in users either utilising the menu to find what they’re looking for, or leaving the site completely.

**Technical data**

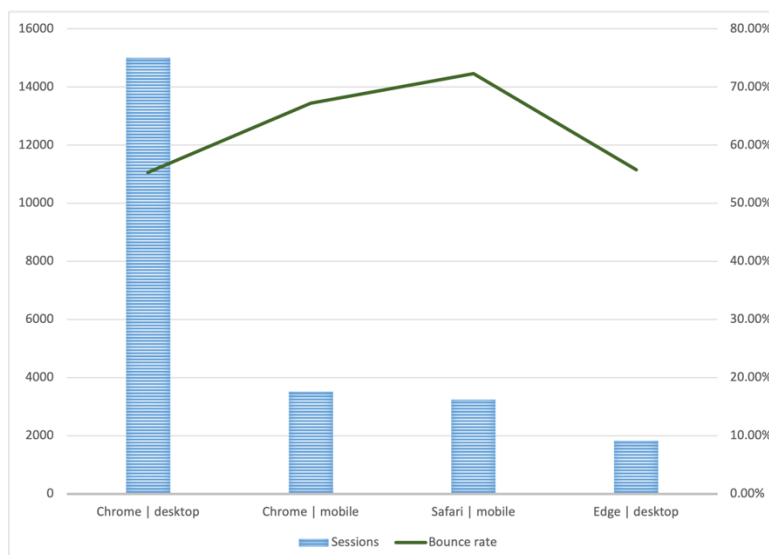


Chart 6 Sessions and bounce rates for most popular browsers.

The technical data for the homepage reflects the same patterns as the overall site. The ratio of mobile sessions to desktop is one to nine, as can be seen in Table 1. Moreover the mobile sessions in Chrome and Safari, as seen in Chart 6, have higher bounce rates than the average of 65% SaaS industry, suggesting that the Bounce rates examined in Chart 4, that are lower than the average for the SaaS industry, are heavily influenced by desktop users who stay on the page longer. The business case for optimising for desktop users is further confirmed.

Table 1 Sessions and enquiries by device.

Screen Resolution	Device	Sessions	Conversion rate
1920x1080	Desktop	1717	0.79%
1440x900	Desktop	974	0.58%
1366x768	Desktop	628	1.19%
1536x864	Desktop	751	1.20%
1280x720	Desktop	693	0.43%
1792x1120	Desktop	422	0.67%
414x896	Mobile	297	0.11%
390x844	Mobile	264	0.38%

Table 1 explores the relation of a device profile to enquiries on the site. The number of sessions that started on the homepage and ‘ended’ to a user filling in a form is miniscule. When consolidating the numbers the average conversion rate for desktop users is 0.8% and for mobile 0.24%. This could indicate that the homepage may not be effectively guiding users towards the conversion goal. This might be due to various reasons, such as unclear CTAs or ineffective content placement.

#### 4.2.1.2 SEO data

Table 2 Homepage search impression data July 2022

Impressions	CTR	Average Position
65,699	10.07%	44.08

The data in Table 2 was collected through Google’s Search Console. ‘Impressions’ here refers to the number of times the homepage has appeared in the search engine result pages (SERPs) for the observing period. Clicks tells how many people who saw the page in the search results clicked on it. CTR, as previously seen, is the ratio of the number of clicks to the number of impressions. CTR is a key indicator of the effectiveness of the search engine listings. The average position indicated the typical ranking of the webpage in the SERPs [135].

The homepage during the one-month period of data collection, appeared 65,699 times on Google’s search results. The average position was 44.08 which would put the page roughly on the fourth page of the results, which is considerably lower than the organisation’s aspiration of being on the first page. It had 10.07% CTR, which when compared to the SaaS industry average of 1.3% looks positive but is still not meeting company expectations [136].

It’s important to note that Google stopped using pagination (returning multiple pages of search results, as opposed to an infinitely scrolling list) since April 2023 but when this data was collected pagination was still in place for all search results. Before then, Google’s search results returned 10 results per page, however, search results varied slightly depending on location, search query and device.

As seen in the literature review, SEO optimisation can be split into two areas: off- and on-page improvements, analyses of both of which now follow.

**4.2.1.2.1 Off-page SEO:**

**Link building:**

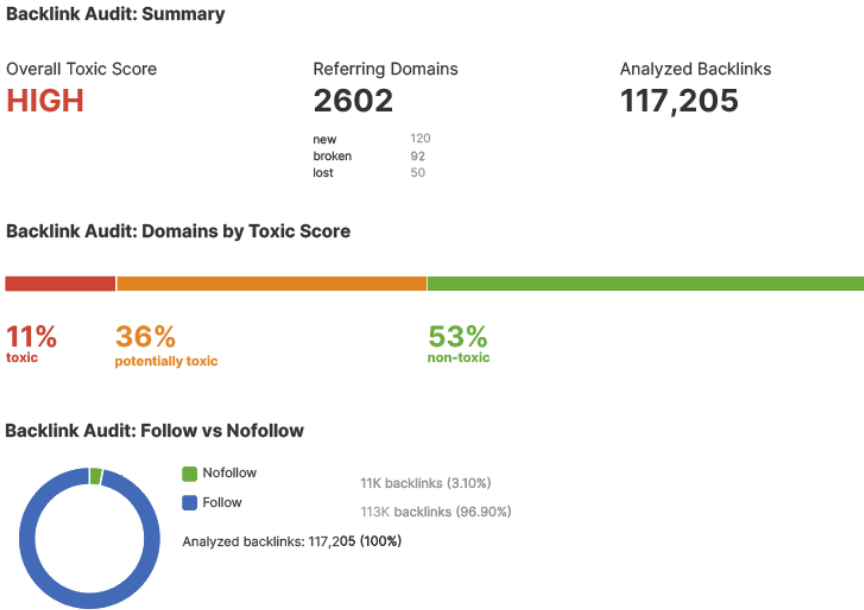


Figure 13 Semrush backlink report May 2022.

Using Semrush' backlink analytics tool, 117K backlinks to the site have been identified, originating from 2.6K external domains. The number of backlinks specifically to the homepage was 22.8%, while the rest varied in various pages such as product pages, channel pages and blogs. The report also evaluated the relevance of each link to the content they linked to, as well as the quality of the origin website and scored them as 'toxic', 'potentially toxic', or 'non-toxic'. Toxic links are considered bad in SEO, and they negatively affect the visibility of the site in search engines. Links are categorised as toxic when they violate Google's link spam guidelines and are thought to be placed on the origin site for SEO purposes rather than to benefit users [137].

As observed in Figure 13, the site's backlink profile is deemed toxic due to the presence of over 12K links classified as toxic. According to Semrush's toxicity metrics, a site's backlink profile is considered to have low toxicity if less than 3% of backlinks are toxic, medium toxicity for a range of 3-9%, and high toxicity for over 10% [138].

The tool also has a built-in function that can export all the bad links so they can be reviewed. There's careful consideration in deciding if a backlink should be removed, and only when certain it affects ranking negatively, a request to disavow to Google should be placed [139]. The tool produced a comprehensive list of over 5K links which would have to be manually assessed and potentially remove the backlink. Another useful audit created using Semrush was the prospects report, which exported a list of websites that could potentially link back to the company. The tool produced a list of around 1K backlink opportunities: to request a backlink from these pages, their admins would have to be contacted personally via email to make the request.

## Domain authority

Table 3 Competitor analysis in search

Company	Domain Authority	Organic traffic	Keywords	Backlinks
<b>imi</b>	38	6.2 K	655	117K
<b>Competitor 1 (C1)</b>	66	397.8 K	193K	15.2M
<b>Competitor 2 (C2)</b>	43	16.2 K	10.5K	499K
<b>Competitor 3 (C3)</b>	53	136.2 K	64.7K	4.4M
<b>Competitor 4 (C4)</b>	42	22.4 K	20.7K	291.5K

Semrush' domain authority report indicated that imi's domain authority was behind its competitors. When conducting a more comprehensive competitor analysis, it became evident that the organisation lagged in every aspect of the market. C1 had a very dominant market presence with a notably strong domain authority, and their website's search performance excelled in all aspects.

The business shortfall in domain authority could be contributed to the low number of backlinks, which, as indicated in Table 3, is low, but also to poor-quality backlinks. As discussed, domain authority plays a very important role in search ranks, so the combination of the low domain authority score, and small number of backlinks, could partially explain the low organic traffic. However, the site only ranks for 655 keywords, 92% fewer than C2 with the second-lowest lowest number. This is a significant oversight,

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and it suggests that most pages, if not all, are not keyword optimised. Understanding how both keywords and domain authority affect search ranking, can potentially explain why the business is far behind its competitors.

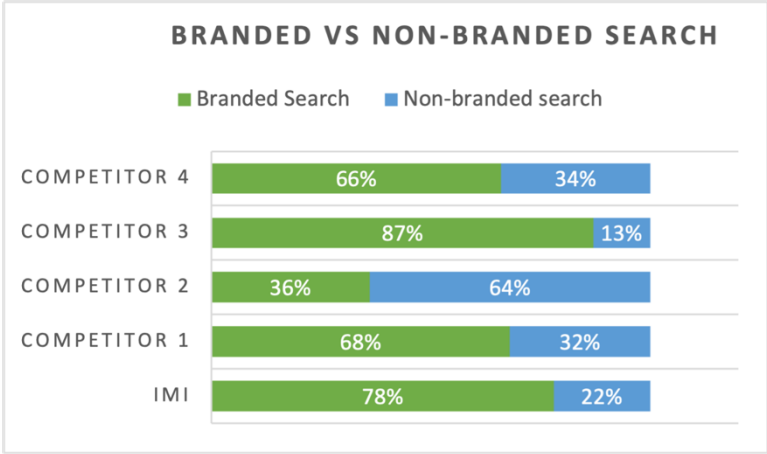


Chart 7 Competitor analysis of branded VS non-branded search.

Chart 7 showcases the competitor analysis for branded VS unbranded searches. Branded searches are a direct result of brand recognition, making them inherently navigational in nature, as users are actively seeking the website. It’s highly likely that, for most branded searches, the website will rank high on the SERP. However, targeting non-branded searches is crucial to reaching a broader audience in the discovery phase and establishing authority [140]. Competitors 1 and 3, despite having lower non-branded search volumes, are successful in attracting the highest traffic as shown in Table 3. In the case of Competitor 1, their 32% non-branded search traffic has the potential to account for approximately 135,000 visitors, surpassing the combined total for both branded and non-branded searches compared to most other competitors. Competitor 2 garners the most traffic from non-branded searches, indicating a robust SEO strategy and substantial growth potential.

**Social media marketing:**

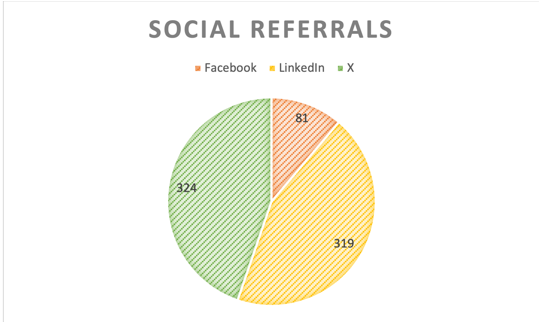


Chart 8 Users referred by social media May-August 2022.

The business holds accounts on the social media platforms of LinkedIn and X (formerly Twitter) and post on them daily with relevant content that links back to the website. However as explained, referrals from the company’s own accounts don’t count as backlinks in SEO. The data in Chart 8, shows that 724 users landed organically to the homepage via social media in August 2022. These users didn’t follow links posted by the business’ accounts rather than other users who shared content online. It’s interesting to note, that although the business doesn’t have a Facebook business profile, 81 users came from links from within the platform.

#### 4.2.1.2.2 On-page SEO

##### 4.2.1.2.2.1 Content & Keywords

Table 4 Top search queries returning the homepage.

Top queries	Clicks	Impressions
<b>imi</b>	<b>4452</b>	<b>14,916</b>
<b>imi plc</b>	<b>126</b>	<b>341</b>
<b>imi explore</b>	<b>90</b>	<b>211</b>
<b>imi private limited</b>	<b>75</b>	<b>390</b>
<b>imi SMS</b>	<b>49</b>	<b>1,074</b>
<b>imi messaging</b>	<b>42</b>	<b>103</b>
<b>imi plc ltd</b>	<b>38</b>	<b>166</b>
<b>imi connect</b>	<b>35</b>	<b>723</b>
<b>imi mobile phone</b>	<b>31</b>	<b>1,031</b>
<b>imi app</b>	<b>1</b>	<b>589</b>

In Table 4 the top ten search queries across all search engines that direct users to the website's homepage are listed. It is evident that these queries are ‘branded searches’, a term referring to searches that include the company name. Branded searches typically originate from individuals who are already acquainted with the company name; therefore, it can be observed that homepage organic traffic from search engines, as demonstrated in Chart 4, is largely from branded searches [140].

As per the organisation’s marketing strategy and objectives, several keywords containing the term ‘communications’ were designated as targets for homepage optimisation. These targeted keywords are: ‘cloud communications platform’, ‘communication platform as a service’, ‘communications platform’, ‘communications platform API’, and ‘communications platform as a service CPaaS’, with the primary focus being on ‘cloud communications platform’.

Table 5 Homepage search performance for targeted keywords.

Search Queries	Clicks	Impressions	CTR	Position
<b>imi cloud communications</b>	11	98	11.22%	2.01
<b>imi cloud communications private limited</b>	6	26	6.82%	2.19

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<b>communications API provider</b>	0	153	0.00%	46.31
<b>how cloud-based communications platforms drive customer engagement</b>	0	131	0.00%	47.18
<b>cloud communications companies</b>	0	96	0.00%	71.95

Table 5 delineates the search queries containing the term ‘communications’ and have generated any impressions for the homepage. Notably, the homepage featured on the first page of the SERPs only for branded searches. The two branded searches have an average ranking of second positions with CTRs of 11.22% and 6.82% respectively. These figures are below the average CTR for second position in the SERP, which according to Advanced Web Ranking, stands at 17.53% for branded searches [89]. For the non-branded searches, the homepage ranks beyond the fourth page, which clarifies the 0% CTR.

Table 6 Keyword research July-August 2022

Keyword	Keyword difficulty	Search Volume	Position on Google’s search results page				
			imi	C1	C2	C3	C4
cloud communications platform	36	170	0	14	34	17	71
communication platform as a service	52	210	0	74	14	19	32
communications platform	58	90	0	10	27	3	54
communications platform API	38	10	0	1	24	3	26
Communication platform as a service CPaaS	48	10	0	47	16	7	24

Table 6 presents a competitor analysis, which includes keyword difficulty and search volume for targeted keywords. Keyword difficulty is a metric indicating how challenging it is to organically rank for the keyword, and is expressed from 0 to 100, with 100 being the highest difficulty. The targeted keywords range from ‘possible’ to ‘difficult’ as rated by the Semrush tool [141]. Search volume refers to the average monthly number of searches for a keyword within a specific timeframe [142].

Among the competitors, Competitor 3 boasts the highest average ranking, suggesting an effective SEO strategy for these keywords. While the effectiveness of other competitors varies, they all appear in the

SERPs for every targeted keyword. In stark contrast, the business does not rank for any of the targeted keywords, which is concerning given its specialisation in cloud communications. The absence from the SERP suggest that the website’s language may be overly generic and marketing-driven, lacking clarity and specificity.

Furthermore, the suboptimal use of keywords within the page is apparent. The page’s metadata, with a title of ‘imi | Every interaction matters’ and a meta description of “Smarter interactions. Richer Experiences. A technology company creating richer connections between global businesses and their customers. We provide cloud communications software and services that manage business-critical customer interactions at scale”, does not effectively utilise the targeted keywords. The most prominent heading, the H1, reads “Smarter interactions, richer experiences.”, and the subsequent H2s and H3s continue in similar fashion of generic marketing titles, without incorporating the essential keywords. The only mention to ‘cloud communications’ is buried in the meta description, and the word ‘communications’ either alone or within a phrase, is conspicuously absent from the body of the page.

#### 4.2.1.2.2 Page Experience and technical data

The evaluation of page experience metrics was conducted using PageSpeed Insights. This tool not only evaluates the Core Web Vitals, which are crucial to UX, but also delves into technical aspects that influence the website’s overall functionality. The PageSpeed Insights report, generated in May 2022, was examined across its designated sections—Core Web Vitals, Performance, Accessibility, Best Practices, and SEO—to glean a detailed understanding of the website’s standing in each of these key areas.

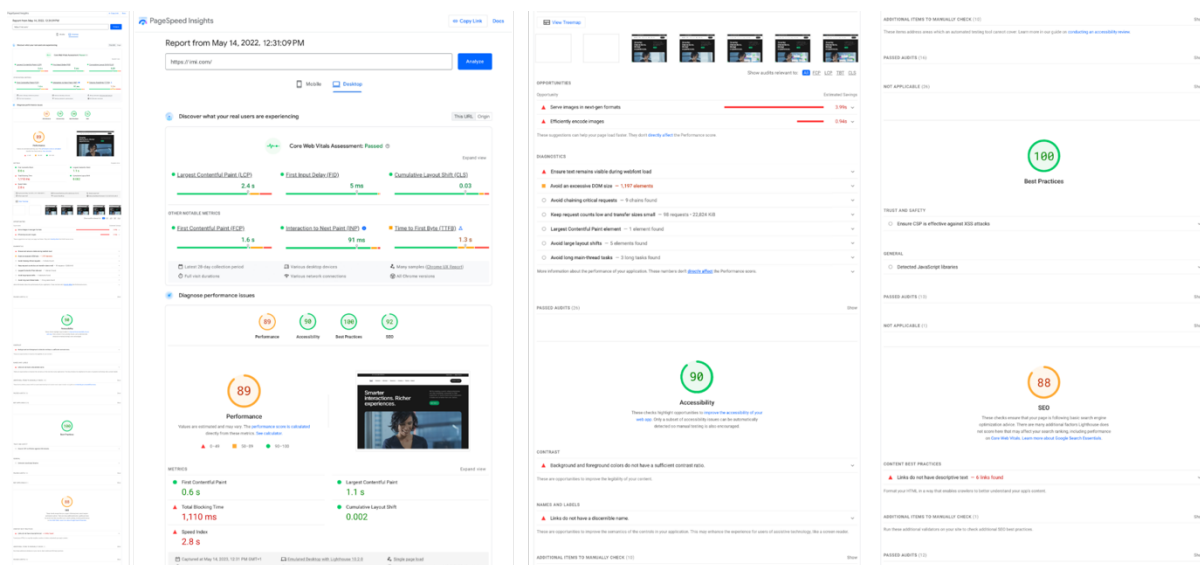


Figure 14 - PageSpeed Insights report May 2022.

#### Core Web Vitals:

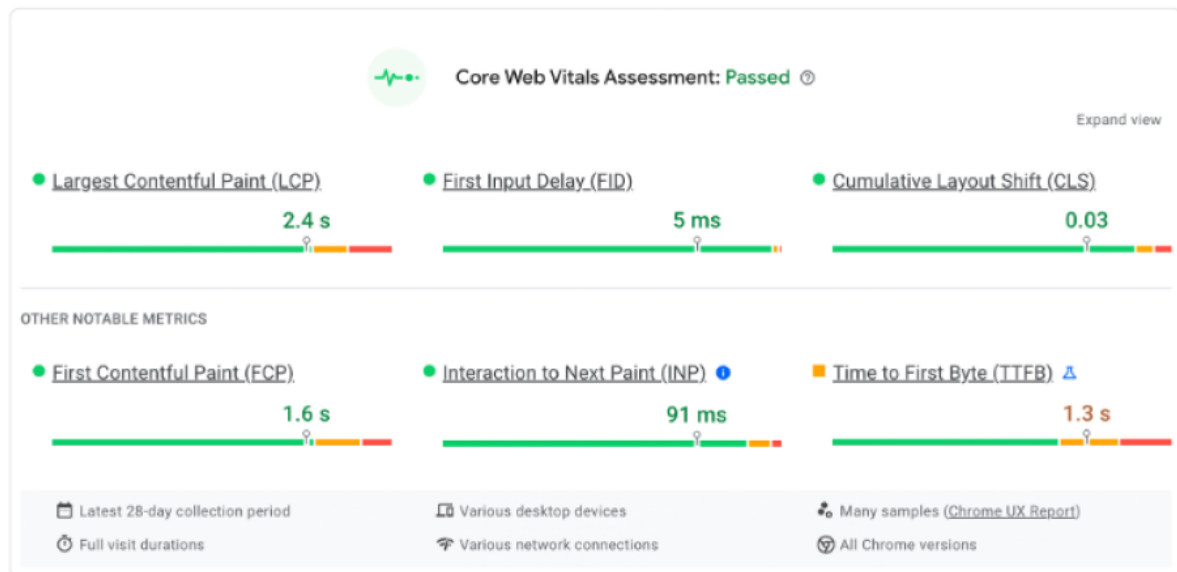


Figure 15 Core Web Vitals PageSpeed Insights report May 2022

The three most important metrics for Core Web Vitals (LCP, FID, CLS) of the homepage all have good scores on Google’s PageSpeed Insights assessment. From the rest of the metrics that don’t directly affect Core Web Vitals the only one that requires attention is the Time to First Byte (TTFB). TTFB measures the server’s responsiveness and calculates the time the server begins to send bytes back when a request is made, or more simply the time from when a user asks to see a webpage to when their browser starts to actually receive data from the server [143]. Google’s recommendation is that because this measurement doesn’t affect Core Web Vitals is not as important to optimise, unless it hinders other speed scores that matter [144].

### Performance:

The report didn’t return many issues and got a performance score of 89/100. On the overview of the page’s performance two metrics are marked as red indicating that are below Google’s threshold: Total Blocking time (TBT) and Speed Index. TBT measures load responsiveness which practically means the total time the user is blocked from interacting with the page [145]. A simple example is when a user tries to click a link on a page while it is still loading and nothing happens because the page hasn’t become fully interactive yet. Speed index shows how quickly the contents of the page are visibly populated [146]. This metric is easier to visualise by looking at the timeline of the page load, below the performance audit in Figure 16. The opportunities and diagnostics in the performance section could be indicators as to why these two speed metrics are slower than Google’s recommendation.

The performance audit identified two opportunities to improve the page speed affected by the images on the page: use next-gen image formats, and encode images more efficiently. These two opportunities for optimisations would potentially help the page speed by approximately 5s.

Next-gen image formats are either WebP (Web Picture), which is based on the VP8 video format, or AVIF (AOMedia Video Image Format). Both formats offer higher compression rates than JPEG, PNG, or GIF images. AVIF is the newest type of next-gen image, with version 1 released in early 2019, and offers the best compression and quality of the two. Efficiently encoding images means compressing them to load faster. PageSpeed Insight’s audit examines JPEGs and BMPs, and if it identifies that a

compressed version could save more than 4KiB, it flags it as a candidate for space-saving (and timesaving). Moreover, images often play a crucial role in influencing the Largest Contentful Paint (LCP) on a page. Thus, optimising the load time could potentially improve the LCP of a page where the image is positioned above the fold.

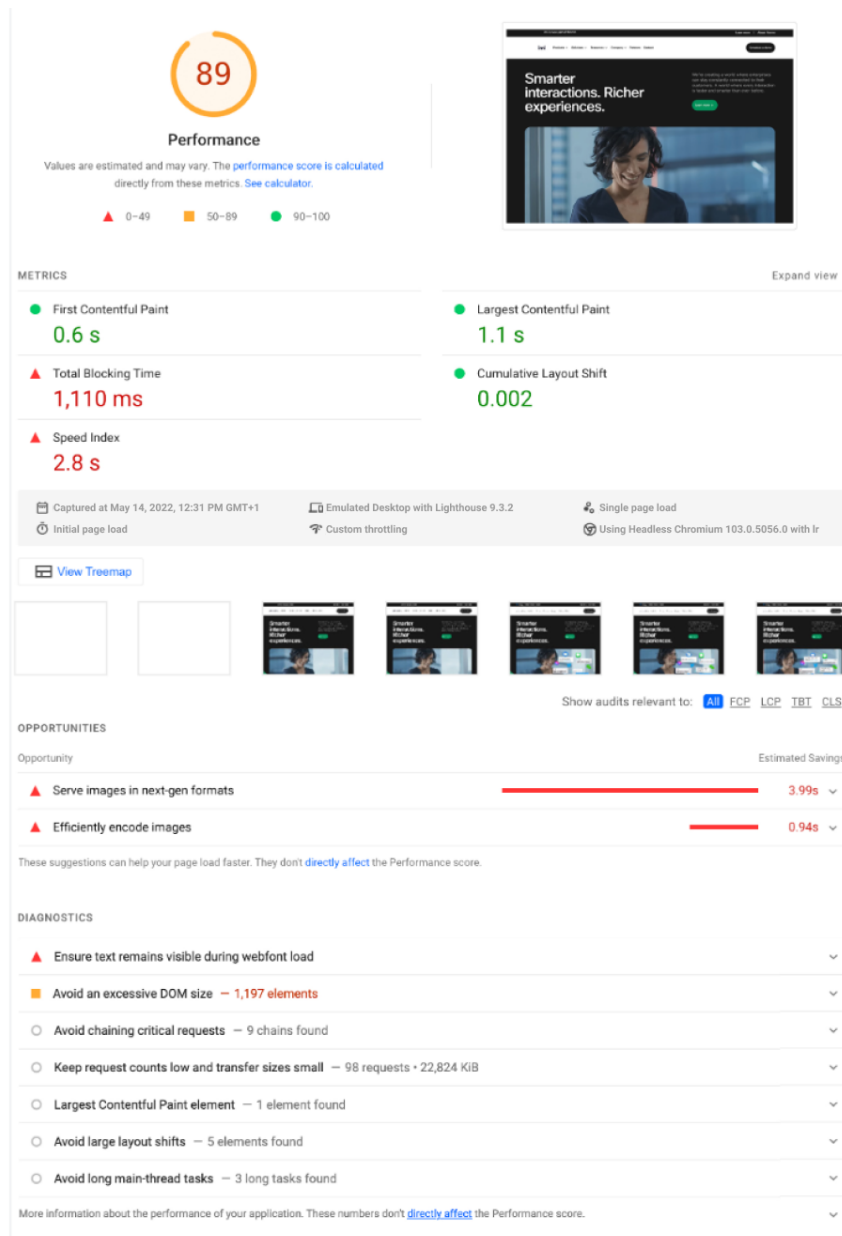


Figure 16 Performance.

In the diagnostics section of the report there are two identified: Ensure text remains visible during webfont load and avoid an excessive DOM size. The former pertains to an occurrence where text on the page is not visible during the loading of the company's custom font [147]. This issue arises in certain browsers that do not display any text until the custom font has fully loaded. Should the font take an extended time to load, with other page elements loading more quickly, it could result in the content

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shifting once the font does load. This is recognised as contributing to a Cumulative Layout Shift (CLS) issue.

The excessive DOM size issue is marked amber which indicates that is not as critical however large DOM sizes can potentially impact website performance by slower page rendering, increased memory usage, and potential interactivity issues. To mitigate these effects, it's best to optimise the DOM structure by removing unnecessary elements and ensuring efficient JavaScript handling. Several optimisation tasks are already integrated into the website's development process, including the use of Content Delivery Networks (CDN), lazy loading, browser caching, and code minification. However, certain factors contribute to the DOM's large size, such as complex content, nested elements, dynamic content, and unoptimised third-party code that is crucial to the marketing activities of the website [148].

### Accessibility:

PageSpeed Insights tests website accessibility based on the WCAG's four principles of accessibility: perceivable, operable, understandable, and robust. This means that to score well on the tool's accessibility audit, website content "must be presentable to users in ways they can *perceive*", be *operable* by users with different levels of physical ability (including the site's UI), be *understandable* (alongside the site's UI), and be *robust* enough to "be [interpretable] reliably by a wide variety of user agents, including assistive technologies" (W3C, 2023). Regarding this website the main accessibility concerns relate to visual impairment.

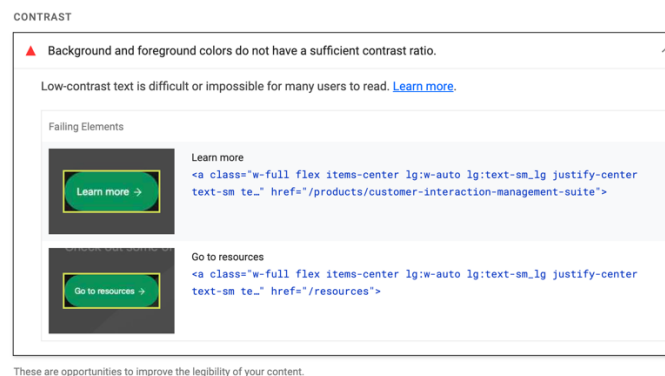


Figure 17 Background and foreground colours do not have sufficient contrast ratio.

The first accessibility issue that came up was the low contrast ratio between the background and foreground colour on the primary buttons on the dark themed components, and as identified could be detrimental to the legibility of the content and negatively affect the brand's reputation.

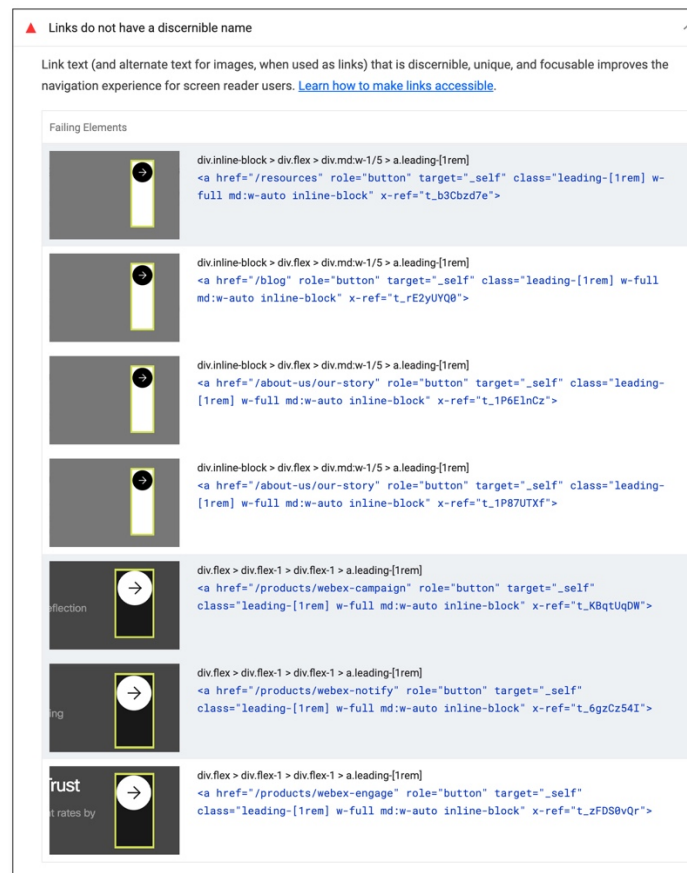


Figure 18 Links do not have discernible name

The second error of ‘links do not have a discernible name’ is referring to the seven icon buttons that are on the homepage. To make these buttons accessible and compatible with WCAG 2.1 standards and guidelines, an aria-label - a piece of metadata which identifies page elements for screen readers - has to be set within the <a> tag since there’s no hyperlinked text.

## SEO:

The only SEO-specific issue that was flagged when auditing the webpage is the generically tagged links in buttons and other hyperlinked copy as seen in Figure 19. As seen, generic text doesn’t help search engines or visitors understand the content, or how it relates to the other pages, and negatively impacts page ranking as a result. Additionally, Google has published a ‘blocklist’ of words and phrases that considers bad practice in button labelling as seen in Figure 20.

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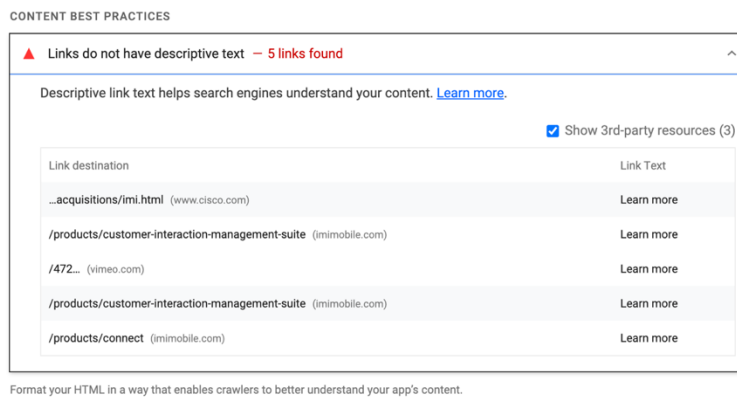


Figure 19 Links do not have descriptive text

```
const BLOCKLIST = new Set([\n  // English\n  'click here',\n  'click this',\n  'go',\n  'here',\n  'information',\n  'learn more',\n  'more',\n  'more info',\n  'more information',\n  'right here',\n  'read more',\n  'see more',\n  'start',\n  'this',\n]);
```

Figure 20 Google's blacklisted button labels [149].

The reports shows that all the links that are marked are using the blacklisted label 'Learn more'. Additionally, as observed in Chart 5 these buttons have shown little engagement from users which could be attributed to their generic labelling as indicated in this report.

### 4.2.1.3 Summary of Step 1.

During the UX/UI and SEO data analysis for the website's homepage there were several opportunities for optimisations identified. Low engagement from users was shown from the shallow scroll depth and users not clicking on the buttons on the page, especially the lack of engagement on the button above the fold. Some frustration from users was indicated by the increased number of clicks on random places on the logos blocks. The search data has indicated that the homepage only ranks for branded searches and even then, the CTR is comparatively low to other websites. The competitor analysis highlighted that business' search performance is considerably behind its competitors and from the PageSpeed insights report there were several issues that came up in performance, accessibility and SEO that should be considered for optimisation.

### 4.2.2 Step 2: Optimisation recommendations using a user-centric approach.

The previous data has indicated a lot of opportunities for optimisation to improve the website's performance and search engine ranking. Most obviously, there was no SEO around any targeted keywords, which had a large negative impact on the page's ranking on the SERP. There was considerable room for improvement on the metadata and header tags, as well as the speed index. On the UX side, there were sections on the page where visitors seemed frustrated with the lack of interactivity, or bad web practices were used which created an unpleasant experience. Failings in all these areas, alongside with the need to stay competitive in the market, led to the need for reform the homepage. The next section will look in detail at each of the issues that were flagged during the analysis and make appropriate recommendations for SEO and UX/UI optimisations.

#### 4.2.2.1 UX/UI recommendations.

There were four major pain points that were identified as problematic and in need of immediate rectification. The first was to remove the use of the pop-up video from the third component of the page, as pop-up videos in 2023 are not only considered bad web practice but are also penalising the search performance. The content of the video itself is a broad introduction to the company's line of work so it was still important enough to keep within the page in a prominent position but needed to be presented in a different way. On the logos section, the random distribution of clicks from visitors demonstrated users' desire to interact with the component. This led to the next deliverable, the addition of interactivity to the same component. The increased interest in the company's core product Connect, and the need to explain what it is and how it works, created a need to present this information in an engaging way. Lastly, looking at competitors' websites, it was common to include a section on the homepage exploring some of the industry applications of their equivalent products, which added pressure to create a similar section on the website's homepage.

Accordingly, the four problems that needed to be addressed were: remove the pop-up function from the video, add interactivity to the logos component, present what Connect is and what it does in an engaging way, and add a section about industry solutions.

Regarding the rest of the content on the page, there were a few more updates that needed to be considered at this time. Three components were flagged for smaller edits because either the data showed that users didn't seem interested, or because the content became irrelevant or needed simplification. The last component before the footer with the big call to action would be removed altogether because it didn't get any interaction from users as seen Chart 5, the antepenultimate component which featured a download resource would also be removed because of the very limited number of traffic it received from visitors and the asset re-introduced elsewhere on the page. The number of applications should be reduced from four to three because one of them is no longer available, and lastly, condensing the content of the about the company section, it should be reduced to take less space.

The new homepage design should try and maintain a concise length while maximising interactivity. The UX optimisations should gear towards enhancing overall user experience and increasing engagement.

#### 4.2.2.2 SEO recommendations

##### 4.2.2.2.1 Off-page SEO

The following recommendations are addressing some of the issues that were identified through Semrush backlink analytics tool and the traffic analytics from social media referrals.

##### **Link building:**

The off-page SEO assessment of the site came back with several opportunities to increase backlinks as well as to review the existing quality of backlinks. Even though this would be a manual and tedious process, it was recommended to examine the backlinks as the quantity and quality of them is a highly influencing factor in domain authority and search ranking. Since the business works mainly with enterprise-level companies, it could be assumed that their websites would have authority in the search market, so links from their websites could potentially help the business with their off-page SEO. Therefore, referrals from partner and client websites could be beneficial to the business' link building efforts. Moreover, the company should consider other ways to increase the backlinks such as guest

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posting and PR, as well as investigate the opportunities identified within the Semrush tool. Over the short period of this study, it's not expected to overtake any competitors, but to see improvement on these numbers.

### **Domain authority and competitor analysis:**

Additionally, as seen in the competitor analysis imi's disproportionate distribution of branded vs non-branded searches, combined with low volume of traffic, suggest a need to diversify traffic sources and reduce dependency on brand-related searches. The competitor analysis also highlighted the lack of backlinks and low domain authority as already discussed.

### **Social media marketing:**

The social media marketing has yielded several organic referrals so far, the company should continue to be active on social media and incorporate new strategies to increase its presence and potential backlinks from social. Company-wide social ambassador initiatives often help with valuable referrals from social media. These programs enable company employees to post on their social networks curated content and reach new audiences. To the understanding of this project, social media marketing is part of the overall marketing strategy of the business and relevant recommendations are already considered and in motion.

#### **4.2.2.2.2 On-page SEO**

The following recommendations are addressing the issues that were identified during the audit of the page.

##### **4.2.2.2.2.1 Content and keywords**

During the analysis of keyword placement as well as the overview of the page's position on the SERP for said keywords, it became apparent that a better content strategy and keyword placement must be implemented to achieve the business' goal to rank on the SERP.

To improve the SERP ranking of the homepage for the targeted keywords, the keyword itself should be included to be included in the page title, meta description, h1 tag, and body copy. The primary keyword was set to be 'cloud communications platform'.

##### **4.2.2.2.2.2 Page experience and technical**

#### **Core Web Vitals**

The only metric that was indicated that needs improvement was the TTFB with an 'amber' status. Given that google doesn't consider this a Core Web Vital, or of high importance, the recommendation at this point is to not focus on this score unless it becomes crucial to the site's performance.

#### **Performance**

The performance section of the PageSpeed Insights presented two opportunities: 'serve images in next gen formats' and efficiently encode images', and two diagnostic issues: 'ensure text remains visible during webfont load' and 'avoid an excessive DOM size'. According to the report handling the issues appropriately could speed up the page.

The presence of images within the body supplements and enhances the content, but if they slow down the page, they contradict their intention by contributing to a bad UX. The recommendation is that images should be optimised and encoded accordingly to help improve the loading performance.

The diagnostic served one critical issue ‘ensure text remains visible during webfont load’. The slow loading of webfonts leads to hidden text which causes CLS issues and contributes to a distracting UX. As identified, CLS is part of the Core Web Vitals score which is part of Google’s ranking algorithm, therefore it is suggested that a solution for optimisation is considered by the developer for the identified issue of ‘.

The last diagnostic is about avoiding the DOM size, due to the ‘amber’ status of this diagnostic, as well as the workload and time pressures, no specific actions are recommended to reduce the DOM size in this exercise, it’s important to recognise that as the website becomes more complex and interactive, the DOM size may naturally increase.

### **Accessibility**

The accessibility section of the report indicated two problems: ‘background and foreground colours do not have sufficient contrast ratio’ and ‘links do not have a discernible name’.

The business’ aim is to score 100/100 for the accessibility audit, moreover W3C states that it’s good web design practice to adhere to Web Content Accessibility Guidelines (WCAG) strive for inclusivity [150]. So, it’s suggested that in order to adhere to WCAG 2.1 standards and ensure visual impaired users can access the site effectively, both the issues identified are rectified during the implementation. The UI design should address the colour contrast issue, and developers should find a solution to the lack of aria-labels as well as implement the colour changes.

### **SEO:**

As the page is due to be re-designed and some of the flagged buttons will be removed or changes it is suggested to avoid new links being flagged in future audits, that all the CTAs should have descriptive labels and not employ the words on the blocklist in Figure 20. Eschewing the phrases and words that are on Google’s blocklist should prevent these types of errors coming up in the future and maintain the SEO score of the page.

#### **4.2.2.3 Summary of Step 2**

During the second step of the optimisation process the optimisation recommendations were made based on the issues identified in the first step. The UX/UI recommendations consisted of several optimisation requests that not only serve the website’s demands, but also should present new and better opportunities for users to interact with. From an SEO perspective the keyword implementation seemed imperative for the website to rank on the SERP, furthermore various other suggestions were made to improve the website’s performance, accessibility, and SEO scores.

#### **4.2.3 Step 3: Implementation of proposed optimisations.**

The third step of the optimisation process is the most technical as it requires UX/UI design and web development expertise. Tasks for implementation will be defined in a similar manner to the previous steps, albeit they may be executed by different functions. It is important to note that the goal of the implementation was to identify and address UX/UI and SEO issues; consequently, tasks requiring extensive back-end coding were deferred and specifically assigned to back-end engineers.

### 4.2.3.1 UX/UI implementations.

The optimisation for UX/UI started with wireframing which laid the groundwork for creatively addressing the outlined requests. The full list of requests included: removing the pop-up function from the video, adding interactivity in the logos component, present what ‘Connect’ is and what it does in an engaging way, adding a section on industry solutions, relocate the resource download function, condensing the ‘About’ section, removing the fourth application, and removing the last component. The following sections examine the steps taken to fulfil each task, the decision-making process that shaped these steps, and the solutions devised to resolve the UX/UI issues in alignment with the project's objectives.

#### **Task: Remove the pop-up function from the video.**

To comply with best web practices, the removal of the pop-up function from the video required careful consideration. Initially, the option to link directly to the YouTube channel was contemplated, which would have entailed minimal development effort. However, this approach posed a risk of diverting users away from the page, potentially resulting in a loss of engagement. Consequently, an alternative was proposed: embedding the video within the top component of the page, where the looped animation was previously hosted. This solution would ensure the video remained on the page, removed the pop-up element, and gave the video prime visibility as an important introductory piece to the company. Embedding the video using an iframe was identified as a feasible approach that would not require video hosting, thereby offering a seamless and non-intrusive UX. This change was anticipated to improve the page speed, ensure mobile responsiveness, and improve user engagement. The initial wireframe is shown in Figure 21, maintained the existing layout, with content amendments as advised in the SEO recommendations. Moreover, the section's two buttons would direct users to the ‘Connect’ page, and to the Business Messaging page, reflecting the primary areas of interest in the subject of CPaaS.

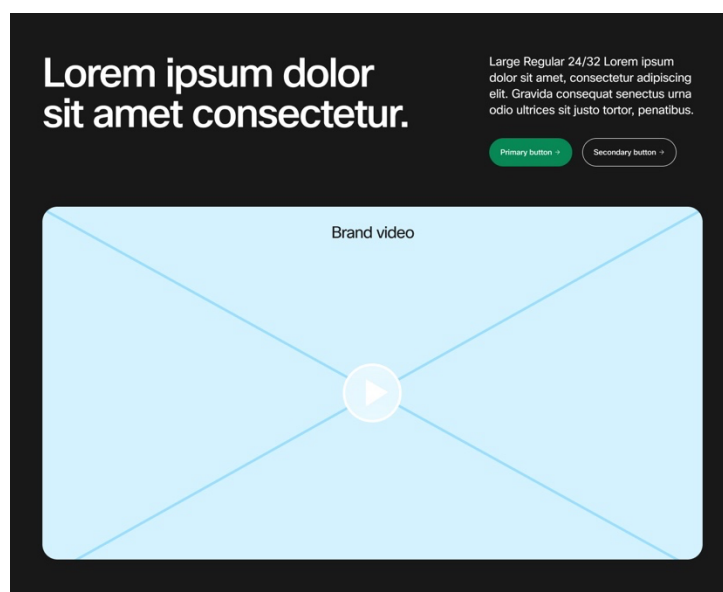


Figure 21 Top component wireframe V1

#### **Task: Add interactivity to the logos component.**

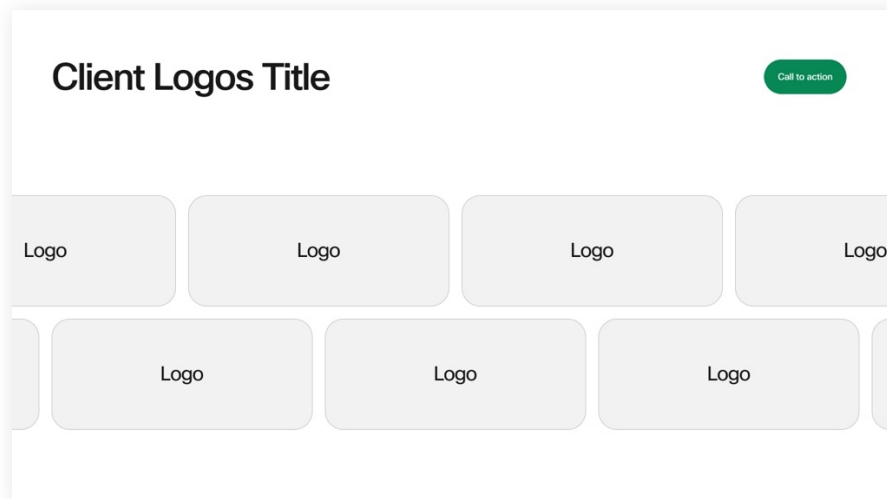


Figure 22 Logos component wireframe.

The random allocation of clicks on the logos component indicated that users were interested in knowing more about the business' work with its clients. Initially, the proposal was to embed hyperlinks within each logo container, directing visitors to the customer stories landing page. Nonetheless, a potential issue was identified: the most prominent clients displayed on the homepage did not necessarily correspond with the case studies featured on the website. This incongruity could lead to user frustration if clicking a company's logo resulted in landing on a page devoid of relevant information about that company. To circumvent this, a straightforward solution was adopted by incorporating a conspicuous primary button into the component. This button was intended to intuitively guide users to more information about the company's partnerships with renowned global enterprises. On mobile devices, the button was designed to stack neatly beneath the title, preceding the logo slider, thereby maintaining the user's navigational flow. The addition of this actionable element was expected to facilitate user guidance.

The implementation of the button was streamlined, as it was a pre-existing element within the design system. The incorporation of the button required only the insertion of a partial into the component. The transition from design to development was simplified to the specification of spacing rules, which were devised to ensure the button's position remained constant, regardless of the variance in label length. Consequently, the title's width was restricted to a maximum of two-thirds of the component's width, allowing the button's width to adjust dynamically to the text. The full wireframe of the component and accompanying CSS code is located in Figure 84 Figure 85 APPENDIX C.

**Task: Present what Connect is and what it does in an engaging way.**

The objective was to present the Connect product compellingly, highlighting its position within a business ecosystem and its operational mechanics. The chosen method involved an illustrative depiction of Connect's integration with business systems, complemented by a succinct explanatory paragraph. The concept of enhancing user engagement through interactivity was embraced from the outset. Several interactive features were contemplated, ranging from hover states that elucidate Connect's functionality to a tabbing system that allows exploration of its various aspects.

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The finalised design manifested as a three-part illustrative infographic, delineating the synergy between business systems, the Connect product, and digital messaging channels. Clicking on a part of the graphic, would trigger an animation that illustrated the operational flow relevant to that part, simultaneously revealing associated explanatory text. The wireframe of the newly designed component is seen in Figure 23. The storyboard of the animation can be seen on APPENDIX C - Figure 86.

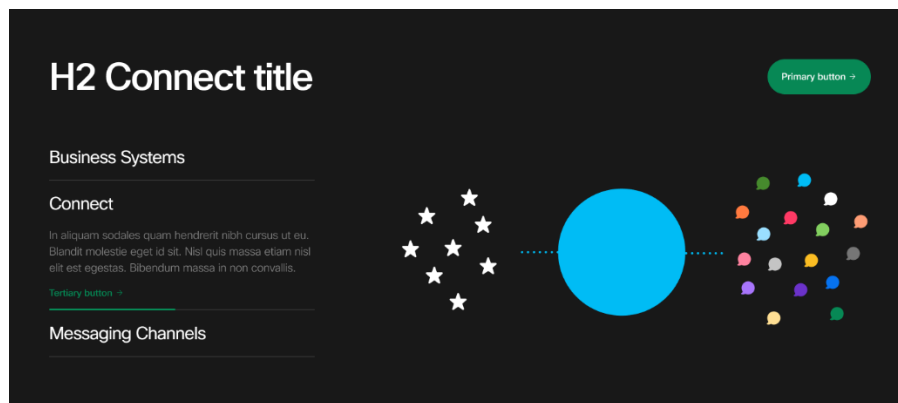


Figure 23 Connect Component Wireframe

Design considerations were multifaceted. Stakeholders initially insisted on positioning the company's product first both in the copy section and the animation sequence. Despite this prioritisation, the necessity to preserve a left-to-right reading order in the illustration was recognised as critical to avoid user disorientation and to enhance the component's interactivity. Therefore, the decision was made to start the text and animation with the leftmost element, which is business systems. Consequently, the animation and text were initiated with the leftmost element – the business systems.

To enable interactivity in the illustration, the animation operated on an autotimer. An advancing green line beneath the text, traversing a grey line, denoted the timer's progression and prompted the subsequent animation. The animation was programmed to cease after two loops or upon user interaction with any element of the text or graphic.

The animation was created using the Adobe After Effects, with the Lottie files plugin employed to transmute the vector-based animation into a JSON format suitable for web implementation. The implementation on the page, was executed by using a JavaScript player that could control the Lottie animation. A JavaScript player managed the Lottie animation on the webpage through HTML5 canvas and SVG rendering. This player encompassed a JavaScript library to control and tailor the animation, such as introducing interactive elements.

Swiper.js, a JavaScript library designed for creating dynamic sliders, was utilised to implement autoplay, start, and pause functions within the tabs. This library's integration expedited the development process, ensuring a robust and comprehensive feature set.

The user was given the choice to either observe the animation loop or directly interact with the text or graphics to navigate the tabs. Prior to the integration of dynamic functionalities, both Swiper.js and Lottie libraries were initialised to confirm their seamless interaction. Swiper.js managed the carousel's autoplay and coordinated with the Lottie animations to mirror the active tab's content. Callback functions were employed upon each autoplay transition to pause and activate the relevant animation,

maintaining visual consistency. Furthermore, the Lottie animations were equipped with event listeners, allowing user interactions to prompt Swiper to shift to the relevant tab. This synergy of automated progression and user control provided an immersive, graphically enhanced experience for users, that was both responsive and engaging.

### Task: Add a section on industry solutions

To stay competitive, senior marketing stakeholders resolved to introduce a new section dedicated to demonstrating the versatility of CPaaS across various industries. This component was designed to feature screenshots of actual customer interactions, accompanied by concise explanatory paragraphs and tertiary buttons. These buttons would direct users to dedicated landing pages, offering deeper insights into customer experiences within different sectors. Such real-world illustrations serve as potent evidence of the product's capacity to revolutionise customer communications.

The initial plan was to leverage an existing component from the CMS library to arrange the graphics and copy adjacently, dedicating a unique subsection for each industry. Yet, this method risked elongating the page excessively, contradicting the overall effort to maintain brevity and readability. An alternative proposition entailed listing industries names, supporting copy and CTAs, devoid of imagery, employing another pre-existing component, for swift deployment and conciseness of the homepage. Although, the consensus was that images were instrumental in augmenting the content and enriching the UX, leading to the dismissal of the list-only concept.

To efficiently accommodate multiple industries without overly extending the webpage's length, the new module adopted the interactive design akin to that of the Connect component. This consistency in design approach, coupled with the reuse of code partials and the swiper.js library, was anticipated to accelerate the development timeline and simplify the user experience.

The implemented wireframe of this component, as displayed in Figure 24, is highly structured, with a clear hierarchy and visual elements that are strategically placed to enhance user engagement and interaction.

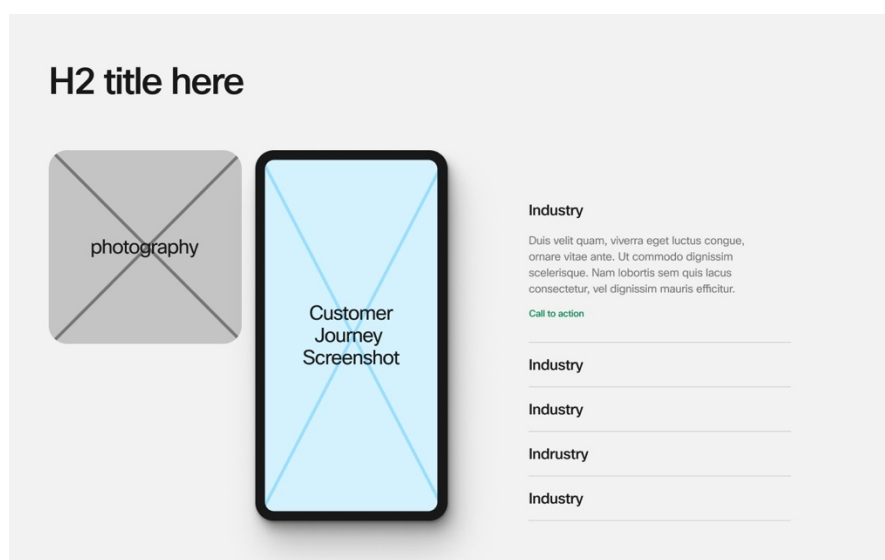


Figure 24 Industry solutions component wireframe

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Unlike the previously discussed component, this module did not feature interactive elements within the image area. Instead, activation of each tab unveiled content relevant to specific mobile customer interaction scenarios. This content was paired with an in-situ photograph, providing context, and demonstrating the application of CPaaS solutions across different industries. The vertical orientation of the mobile phone screenshots, effectively accommodated for the presentation of the five industries, without creating excessive whitespace or deepening the page further.

The complete design scope of this new component would be added into the CMS library and is detailed in APPENDIX C, Figure 87 Industry solutions full component wireframe..

**Task: Relocate of the Resource Download.**

Marketing stakeholders recognised the importance of prominently featuring a download option to showcase the business’ production of high-quality educational material that potential prospects can utilise to expand their knowledge of CPaaS. An initial approach mirrored the Kosmo homepage by suggesting the use of a floating banner at the top of the page, which was previously employed to promote various events and press-releases. The convenience of this existing feature on the parent website made it an attractive option for quick implementation.



Figure 25 Heatmap of floating banner on Kosmo site.

However, upon further investigation of the banner’s click heatmap, as seen in Figure 25, it became apparent that the banner’s CTA was not the primary point of engagement. Instead, user interaction was more frequent with the close button, suggesting that the banner may have been perceived as an intrusive element akin to spam. This insight necessitated a re-evaluation of the banner’s effectiveness as a resource promotion tool.

The subsequent concept involved the adaptation of the exiting hero component to incorporate content cards next to the video, which would simultaneously reduce the video’s screen real estate. Concerns arose regarding the potential content imbalance that might occur by placing multiple cards next to the video. To remedy this, specific scroll rules were defined, where the cards would scroll independently alongside the video container before the rest of the page continues its normal scrolling behaviour.

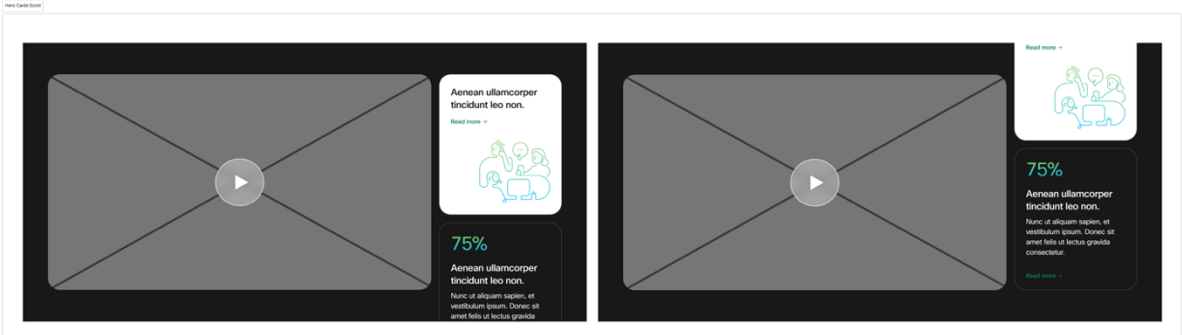


Figure 26 Content card scroll next to video container

The newly introduced content cards were meticulously designed to align with the brand's guidelines, and to ensure they presented an attractive visual appeal. Crafted with versatility in mind, they were intended to accommodate a variety of content types to support the marketing team's needs. To enhance the design, multiple layout versions were created, offering a range of configurations, and a palette of colours was introduced to establish a visual hierarchy and inject vibrancy into the UI. The CSS associated with these cards was developed to encapsulate the flexibility and modularity of the component. The finalised design of the component, together with the corresponding CSS, was documented and passed along to the development team for implementation, as seen in Figure 83 in APPENDIX C.

### Task: Condense the About section

The endeavour to streamline the About section involved a collaborative effort between the UX/UI team and content writers, aiming to refine the content to an optimal length for ease of reading. The section was reduced from four to three icon boxes, and the margins were adjusted accordingly. These alterations were designed to create a more succinct and focused area minimising the space it occupied on the page. Additionally, a link to the comprehensive 'About us' page was contemplated to accommodate users interested in reading more.

The restructured layout featured clear, meaningful headings and supportive icons that worked in harmony with the text, and helped readers digest the content better. The updated wireframe for this section is presented in Figure 27. The practical application of the changes was straightforward and completed via the CMS as the existing component allowed for such adjustments. Spatial amendments were affected by updating the CSS padding value of the component: the top and bottom paddings were changed to 80px from the former 120px and 200px, respectively. Furthermore, the removal of the decorative line below the boxes reclaimed an additional 80px gap, summing up to a total of 240px in height. This economisation of space equated to revealing 20% more vertical space based on the site's average users' screen resolutions, which practically meant that users could view more content within a single scroll.

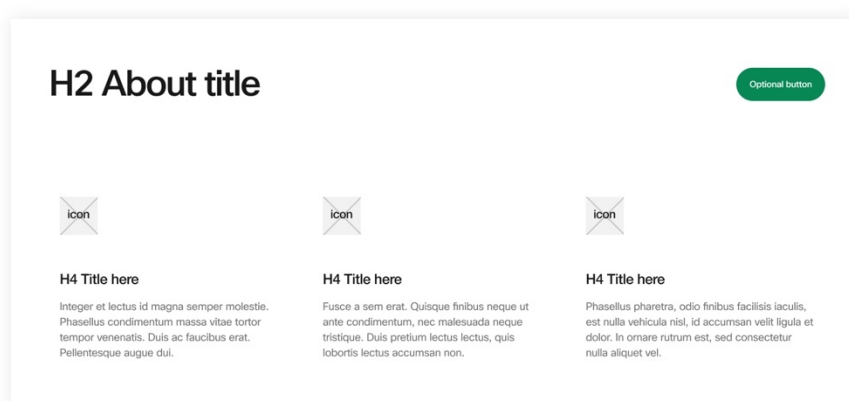


Figure 27 About section wireframe.

### Task: Remove fourth application and remove the last component

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The task of removing the fourth application from the display, as well as the last component on the page, was addressed utilising the site's CMS. The CMS offers a user-friendly interface that simplifies content manipulation, enabling changes to be made efficiently and with little effort. The inherent flexibility of the CMS ensures that removal of content can be conducted without adversely affecting the overall structural integrity and layout of the website.

The principal focus of this task was to consider the ramifications on the final wireframe of the page following the removals. It was essential to evaluate how the changes would affect UX and visual balance, ensuring the remaining elements were presented cohesively and the page's purpose remained clear.

### **4.2.3.1.1 UX/UI implementation summary**

The page's UX/UI optimisation involved a series of strategic updates to improve navigation and user engagement. Key developments included the reimagining of the top component, the refining of the Connect section with interactivity, and introducing the Industry Solutions to demonstrate CPaaS adaptability. Additionally, unneeded elements were removed or altered to tighten the content focus and simplify the display. The cumulative effect of these tasks has resulted in a more intuitive and engaging homepage. The homepage's new wireframe is detailed in Figure 28.

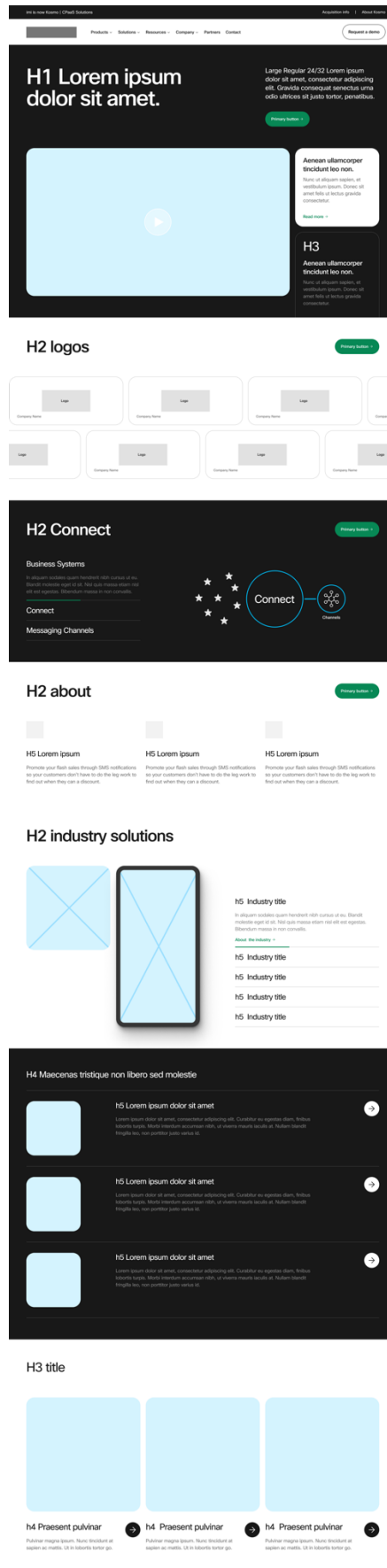


Figure 28 Homepage wireframe.

### **4.2.3.2 SEO implementations**

The following section examines the implementation of recommendations addressing the identified SEO issues, beginning with off-page factors.

#### **4.2.3.2.1 Off-page SEO**

As recommended, the business manually examined the toxic links as well as the opportunities produced through Semrush's tool. The total links that the team submitted to Google to disavow exceeded 4K. These were mainly links from spam websites that had no content besides links, and some fake websites that impersonated the business were also identified. For the rest of the links the report, the business couldn't confirm if they actually negatively affected SEO so the request for removal wasn't submitted but rather the decision to monitor them was made and possibly decide at a later time.

On the opportunities report there were around 1K pages identified that could potentially link back to the website's pages. Through the report 321 opportunities were from pages that the business was familiar with, such as other Kosmo websites, close partners, or media sites, so the request for a backlink and the implementation happened swiftly. For the rest of them, the marketing stakeholders felt that there was limited interaction with the website's owners, so the suggested email approach, would not yield the desired results. Instead, they decided, to seek other ways to build a stronger partnership with them, especially with businesses that had multiple opportunities, and wait for a longer strategy,

Other recommendations included increasing guest posting and PR and looking for opportunities for partners and clients. The long-term marketing and PR strategy of the businesses agreed that these are all important avenues to pursue not only for SEO, but for general marketing activities and company exposure. Most of these strategies take a long time to achieve, but it's interesting to note, that the business came to an agreement to guest post to the Kosmo family of websites at least once a month. Moreover, some discussions were made around improving analyst relationships and publishing articles in relevant technology online journals.

Off-page SEO is a long-term endeavour, as it involves building the reputation and authority of the website over time. Even though most of the recommendations were implemented, no dramatic changes were expected. The off-page SEO tasks were seen as an opportunity to begin a sustained effort for strategic outreach, that can have beneficial impact on search visibility in the future.

#### **4.2.3.2.2 On-page SEO**

The implementation of on-page SEO will focus on content and keyword optimisation, as well as enhancements to page experience and technical aspects, following the recommendations outlined in the previous step of the optimisation process.

##### **4.2.3.2.2.1 Content & Keywords**

In line with the recommendations aimed at enhancing the SERP ranking for targeted keywords, it is essential to integrate these terms prominently within key on-page elements. This includes their inclusion in the title tag, meta description, and the H1 heading. Furthermore, strategically incorporating these keywords into additional headings and the main body of the page will reinforce their relevance to search engines. The primary keyword, 'cloud communications platform', must be given priority placement to

ensure it features in the most critical positions, thereby optimising the homepage’s visibility and searchability.

### Task: Add keywords in the title tag and meta description

The meta title and meta description for the homepage have been meticulously composed to encapsulate the core offerings and value proposition of the company.

The new title “Kosmo CPaaS Solutions | Cloud Communications Platform” concisely highlights the primary keyword and clearly indicates the service focus. The new meta description "Automate your end-to-end journeys on a centralised cloud communications platform for smarter interactions with every customer. 16+ channels including SMS, RCS, WhatsApp Business, Google Business Messages, & more. Speak to an expert today.", provides a comprehensive overview of the available communication channels but also integrates key search terms to extend the company’s search visibility. This revision marks a departure from the previous marketing-dominant language, moving towards content that leverages strategic keyword placement to optimise for search engines without compromising the descriptive quality that engages users.

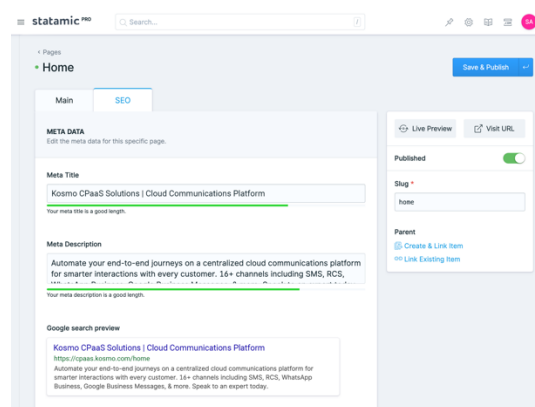


Figure 29 Change of meta data via the site’s CMS.

Leveraging the capabilities of the Statamic CMS, the update of the homepage’s meta data accomplished with ease and efficiency. Each page within the CMS features a dedicated SEO tab, allowing for quick and intuitive editing. Once the changes were applied, Statamic automatically assigned the updated values to the appropriate HTML tags, ensuring the modifications were accurately implemented within the site’s underlying code. This automated process expedited the optimisation task, enabling those with minimal technical background to effectively enhance the site’s SEO, while confirming that the updates were fully integrated into the website’s existing structure.

### Task: Add keyword in the H1

The revision of the homepage’s H1 heading was carefully considered, not only to incorporate the primary keyword but also to ensure relevance and clarity within a 62-character limit. While the original heading, was catchy, it lacked specific reference to the company’s core offering. The chosen replacement, “Cloud communications that empower richer customer experiences.” integrated the keyword, while aligning with the company’s emphasis on customer experience (CX). An alternative such as “Enhance outreach with our cloud communication platform” was contemplated, but ultimately

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dismissed for being too generic and failing to convey the specific premise of the business' services in CX, even though it effectively used the primary keyword. The final H1 kept a balance between SEO alignment and meaningful content that communicated the brand's value proposition to visitors.

### **Task: Add keywords on other headings and body.**

The task of embedding keywords into other headings and the body of the page was approached with a strategic lens, considering the existing structure and thematic divisions of the content. Although it proved challenging to directly include the targeted keywords within the redesigned page's section headings due to their distinct meanings and contexts, a concerted effort was made to weave the keywords throughout the page's content. Special attention was given to the content above the fold, to ensure immediate visibility of the keywords to both users and search engines. Across the entirety of the homepage, all five targeted keywords were successfully integrated a combined total of nine times, reinforcing the SEO focus without compromising the page's thematic integrity.

### **4.2.3.2.2 Page experience and technical**

The page experience and technical recommendations outlined the issues that should be addressed from the PageSpeed Insights report. From performance: 'serve images in next gen formats', 'efficiently encode images', and 'ensure text remains visible during webfont load', from accessibility: 'background and foreground colours do not have sufficient contrast ratio' and 'links do not have a discernible name' and for SEO,

### **Task: Serve images in next-gen formats**

The report found 12 JPEG images that could potentially be optimised however, since the page had been redesigned, its new version would feature 17 images, so the potential page load speed would be even greater. As mentioned, for an image to be in next-gen format it should be in .WebP or .avif format. Before implementing the image conversion, browser compatibility for both types was checked for the most popular browsers using caniuse.com:

	Chrome	Edge *	Safari	Firefox	Opera	Chrome for Android	Safari on iOS *	Samsung Internet	Opera Mini *	UC Browser for Android
							15.6			
							16.0			
							16.1			
109							16.2			
111		111	15.6	111			16.3			
112		112	16.3	112	97		16.3			
113		113	16.4	113	98	113	16.4	20	all	13.4
114			16.5	114			16.5			
115			TP	115						
116										

Figure 30 Support of AVIF on most common browsers. – caniuse.com

Chrome	Edge *	Safari	Firefox	Opera	Chrome for Android	Safari on iOS	Samsung Internet	Opera Mini	UC Browser for Android
						15.6			
						16.0			
109						16.1			
111	111	15.6	111			16.2			
112	112	16.3	112	97		16.3			
113	113	16.4	113	98	113	16.4	20	all	13.4
114		16.5	114			16.5			
115		TP	115						
116									

Figure 31 Support of WebP on most common browsers. – caniuse.com

Microsoft Edge’s total lack of support for AVIF would present a specific problem for the business, since the data has indicated that there’s a considerable number of unique visitors using Edge. WebP was more widely supported, making it the preferred choice.

Chrome	Edge *	Safari	Firefox	Opera	IE
4-8				10.1	
9-22		3.1-13.1		11.5	
23-31	12-17	14-15.6	2-64	12.1-18	
32-112	18-112	16.0-16.3	65-112	19-97	6-10
113	113	16.4	113	98	11
114-116		16.5-TP	114-115		

Figure 32 Support of WebP on all known browsers – caniuse.com

Looking at a wider range of browsers there were some compatibility issues for WebP from older versions of popular browsers, so an alternative format for each image would have to be available to support visitors using such legacy formats. HTML’s <picture> tag supports the inclusion of several sources for images, with the browser returning only the best fit and not loading the others. This element is useful in responsive layouts as well as multiple image formats. The picture tag is also able to serve a default image using the <img> tag within its code, which is useful for browsers that might not support the <picture> element. Figure 33, shows the indicative HTML code of how the element worked.

```

<picture>
  <!--image source-->
  <source type="image/webp" srcset="./example-image.webp">
  <!--alternate image source, if preferred source is not supported-->
  <source type="image/jpeg" srcset="./example-image.jpg">
  <!--alternate img tag, if picture tag is not supported-->
  
</picture>

```

Figure 33 picture element function in HTML

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The practical conversion of images from JPEG to WebP was done using Adobe Photoshop, which allows to export images in both formats. The new formatted images, when uploaded to the site's database to the exact same paths as their JPEG equivalents, to ensure the picture tag would work as expected.

### Task: Efficiently encode images

Google's documentation provides various steps to optimise images effectively, some of which had already been incorporated, such as lazy loading, which only loaded the image once the user scrolls to where it was on the page, and the use of image CDN, which was utilised in order to fetch images from the database, resize them according to the user's viewport and serve the optimal format. Google also recommends compressing images, replacing GIFs with videos, ensuring correct dimensions for images, and using WebP image format.

Since the website didn't use GIFs, that particular step was irrelevant, and using WebP format for images had already been implemented during the last task. The remaining item from Google's suggested list was to compress the images. The reason this wasn't implemented before was due to time pressures and concerns over losing image quality. To achieve good compression while maintaining quality, employing a lossy compression tool would be beneficial in further reducing the file size. The task involved bulk compression using an online tool, followed by re-uploading the images to the database, replacing the old instances, and refreshing the cache. This ensured that the next time the images were loaded, the page would fetch the newly compressed versions. To accomplish this, [tinyjpg.com](http://tinyjpg.com) was employed, which supports bulk upload, compression, and download without altering the image names which facilitated achieving the desired result more efficiently.

### Task: Ensure text remains visible during webfont load.

To prevent the display of invisible text during the loading of custom fonts, a simple solution was to temporarily use a system font. By incorporating `'font-display: swap'` into the `@font-face` style in the site's CSS file, the invisible text could effectively get eliminated in the majority of contemporary browsers.

Chrome	Edge *	Safari	Firefox	Opera	IE
4-48			2-45	10-35	
49-59	12-18	3.1-11	46-57	36-46	
60-116	79-116	11.1-16.6	58-117	47-102	6-10
117	117	17.0	118	103	11
118-120		17.1-TP	119-121		

Figure 34 Font swap support by browsers. – caniuse.com

After checking with [caniuse.com](http://caniuse.com) (Figure 34) for compatibility across web-browsers and according to the site's data about the browsers visitors use to access the website, as observed in Chart 3, the `'font-display: swap'` was safe to use. The amended code can be seen in APPENDIX C Figure 88.

### Task: Background and foreground colours do not have sufficient contrast ratio

The low contrast ratio between the background and foreground colour referred to the green ‘primary’ buttons on the dark themed sections and the white text within the button. According to the design system, two shades of green were used for primary buttons on the page, depending on the background colour of the component.

To further investigate the issue the relevant CSS attributes of the button were examined so they can be cross-references with WebAIM’s contrast checker. The relevant attributes were the background colour (#05935B), the text colour (#FFFFFF), and the font size which was 15px across all size screens.

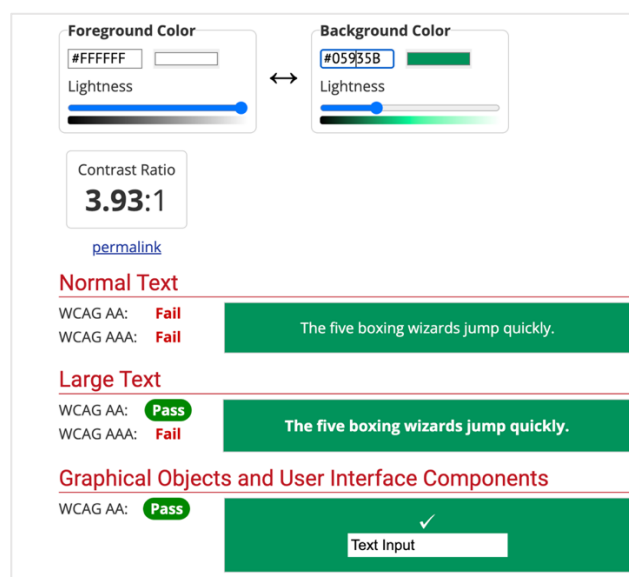


Figure 35 WebAIM contrast checker #FFFFFF against #05935B - webaim.org

As the button’s text size was at least 15px, WebAIM recognised it as ‘large text’. The required contrast ratio for large text to pass WCAG 2.0 AA is 3:1 and for WCAG AAA needs to be 4:5:1: the button only met AA standard. The combination of colours used for this button passes the WCAG AA standard but doesn’t quite meet the AAA level. Given the impact of accessibility on page ranking and in alignment with the company’s ethos, striving for the AAA standard was deemed necessary.

To change the green colour of the button the branding guidelines had to be taken into consideration, as well as basic aesthetic principles. Colours, fonts, and text sizes on the website are controlled through a global CSS file called global.css. Changing the theme’s colour everywhere through the CSS file would affect other elements using the same colour, so careful consideration needed to be taken.

In order to maintain consistency between primary buttons on the website, colour used on the primary button (#078855) that is used on the light theme was selected to replace the current green (#05935B). This green hasn’t been flagged for accessibility in any reports, so seemed an appropriate solution to the current issue.

To implement this change, the `color-button-accent` element of the `theme-black` class was amended to reflect the new colour. As can be seen in Figure 36, other references to the green (#05935B) were not amended, as they were used in different elements.

```

.theme-black {
  --color-text-base: #FFFFFF;
  --color-text-muted: #818181;
  --color-text-inverted: #181818;
  --color-fill: #181818;
  --color-button-accent:#078855;
  --color-button-accent-hover: #FFFFFF;
  --color-button-muted: transparent;
  --color-button-muted-border: #FFFFFF;
  --color-button-muted-hover: #05935B;
  --color-button-muted-hover-border: transparent;
  --color-text-button-hover-muted: #FFFFFF;
  --color-grey: #4F4F4F;
  --color-contrast: #FFFFFF;
  --fill-icon-bg: #FFFFFF;
  --fill-icon-bg-hover: #05935B;
  --fill-icon-inner: #05935B;
  --fill-icon-inner-hover: #FFFFFF;
  --fill-icon-lg-bg: #FFFFFF;
  --fill-icon-lg-bg-hover: #05935B;
  --fill-icon-lg-inner: #05935B;
  --fill-icon-lg-inner-hover: #FFFFFF;
  --fill-icon-sm: #078855;
  --fill-icon-sm-hover: #FFFFFF;
  --fill-icon-sm-inner: #FFFFFF;
  --fill-icon-sm-inner-hover: #000000;
  --fill-border-light-grey: #818181;
  --color-grey-background: #E1E1E1;
  --color-border-grey: #E1E1E1;
}

```

Figure 36 CSS color-button-accent change for black theme.

### Task: Links do not have a discernible name.

As explained, this error indicated a need to introduce an aria label within the <a> tag of the icon button, which lacked any accompanying text. A straightforward approach involved adding a generic aria-label such as ‘icon button’ to indicate the visual nature of these buttons. However, this solution would not provide sufficient context to screen readers regarding the button’s destination or purpose. A more effective solution was implemented: allowing CMS users to add provide a descriptive label for each button similar to those used for text buttons. Utilising the CMS’s button label field, page editors could assign meaningful text alternatives that enhance accessibility. In turn, this label text, would be automatically included in the button’s HTML code as an aria-label using the assignment `aria-label="{{ label }}"` (Code in Figure 89 aria-label set up in button code., APPENDIX C). This ensured that when the page was rendered live, each button would be equipped with an appropriate aria-label. Figure 37 illustrates an example of how this has been put into practice.

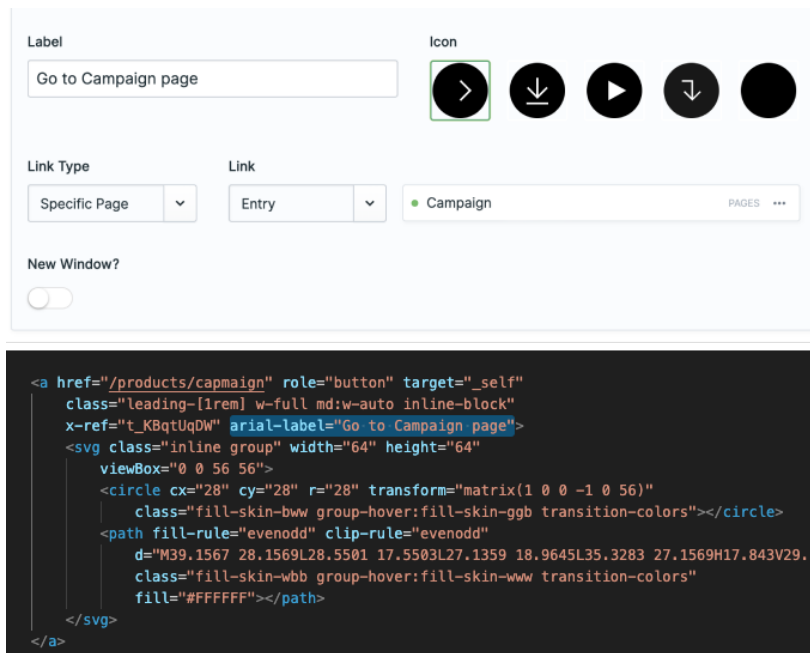


Figure 37 aria-label implementation from CMS to live code

**Task: Links do not have descriptive text.**

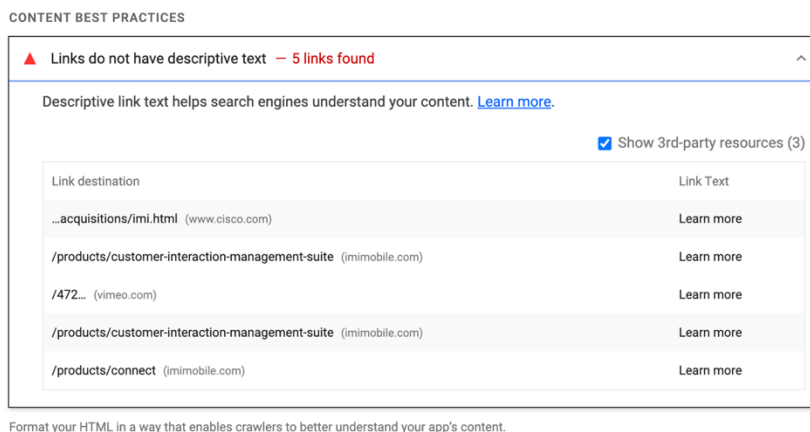


Figure 38 Links do not have descriptive text - PageSpeed Insights report.

The SEO concern raised by PageSpeed Insights referred to the use of non-descriptive labels for buttons, which Google flagged as ‘not meaningful’. These labels are considered ‘blacklisted’ because they fail to convey the purpose or destination of the links to which they are attached, thereby impeding user navigation, and potentially affecting the site’s SEO performance. There was a total of five links flagged as seen in Figure 38.



Figure 39 The top hat link that affects every page.

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The first link identified in the report was situated in the top-hat (above the menu bar) items and directed visitors to a press release about the company’s acquisition. Given that this link was featured on every page across the website, it was imperative to address the issue promptly. To provide clarity and context, the link text was amended to “Acquisition info”, informing users about the content they would encounter upon clicking the link. This change ensured that the link was both descriptive and informative, aligning with best practices for web accessibility and SEO.

The subsequent link assessed in the report was associated with the primary button in the top section, which originally directed users to the CIM suite page. According to updates in the new wireframe, this button was to be repurposed to lead users to the Connect page. While the existing button label was generic enough to apply broadly, it was decided that a more context-specific label would be beneficial given the button’s new function. After considering the surrounding content and the intended user action, two potential labels emerged: ‘About Connect’ and ‘Explore the platform’. The former was deemed less compelling due to its passive language, while the latter, with its active invitation to ‘explore’, was more likely to engage users and encourage interaction. Therefore, ‘Explore the platform’ was selected as the more appropriate label for the button.

The rest of the buttons identified as problematic in the report were rendered obsolete. The Vimeo button, that popped up the video, was moved to an embedded format within the top section of the page, eliminating the need for a separate button. The button to the CIM suite was removed altogether, while the Connect section underwent a redesign which included the introduction of a new button. As previously mentioned, the selected label for this button, guiding users to the Connect page, was ‘Explore the Platform’.

To preclude similar issues from arising in future Lighthouse audits, a policy has been implemented stipulating that CTA buttons must bear descriptive labels that avoid using terms from the blocklist outlined in Figure 20. Steering clear of the verbiage on Google’s blocklist is a proactive measure intended to avert the recurrence of such errors and to safeguard the page’s SEO standing. A comprehensive list of links, along with the optimised link text employed on the homepage, is detailed in Table 7.

Table 7 All buttons/links on homepage

<b>Button destination</b>	<b>Link text</b>	<b>Page location/Button type</b>
<b>/products/connect</b>	Explore the platform	Hero / Primary button
<b>/business-messaging</b>	Messaging channels	Hero / Content Card
<b>/cx-research-report</b>	Download report	Hero / Content Card
<b>/resources/customer-stories</b>	Customer stories	Logos / Primary button
<b>/products/connect</b>	Explore the platform	Connect / Primary button
<b>/products/connect</b>	Explore the platform	Connect / Tertiary CTA

<b>/business-messaging</b>	Pick your channels	Connect / Tertiary CTA
<b>/solutions/banking</b>	Visit banking	Solutions / Tertiary CTA
<b>/solutions/healthcare</b>	Visit healthcare	Solutions / Tertiary CTA
<b>/solutions/logistics</b>	Visit logistics	Solutions / Tertiary CTA
<b>/solutions/retail</b>	Visit retail	Solutions / Tertiary CTA
<b>/solutions/telecommunications</b>	Visit telecommunications	Solutions / Tertiary CTA

#### 4.2.3.2.3 Summary

To improve search visibility of the homepage, a series of SEO-related tasks were taken during the implementation phase of the optimisation process. Off-page SEO entailed requesting the removal of weak backlinks that negatively affected the site's reputation, as well as seeking new opportunities for stronger linking relationships with authoritative websites. On-page SEO efforts focused on revising the content to align with SEO objectives, and strategically placing keywords within crucial elements such as the title, meta description and H1 tag. Additionally, technical issues from PageSpeed Insight report were addressed, improving text visibility and site speed. The colour scheme and labels of buttons were amended to enhance accessibility, and a policy against non-descriptive labels was implemented to uphold SEO standards and prevent future issues.

#### 4.2.3.3 Summary of Step 3.

During the implementation of the proposed optimisations, practical steps were taken to improve the UX/UI and SEO of the homepage. The UX/UI tasks included creating innovative new ideas for presenting content in a more clear and engaging way that promoted interactivity on the page. It also saw the consolidation of information and achieving an overall shorter page that's easier to navigate. On the SEO side, off- and on- page optimisations were implemented to help enhance search engine visibility. Off-page SEO initiatives set in motion a long-term strategy aimed at reinforcing the site's authority, reputation and nurturing relationships with key partner and clients. On-page SEO addressed content issues such as lack of keyword usage and vague language, and rectified technical issues that affected the site's performance and accessibility. The combined efforts of the SEO and UX/UI implementations laid the groundwork for an optimised user-centric homepage, strengthening the website's online presence. The high-fidelity wireframe of the re-designed homepage encompassing all the content and image changes can be seen in Figure 40.

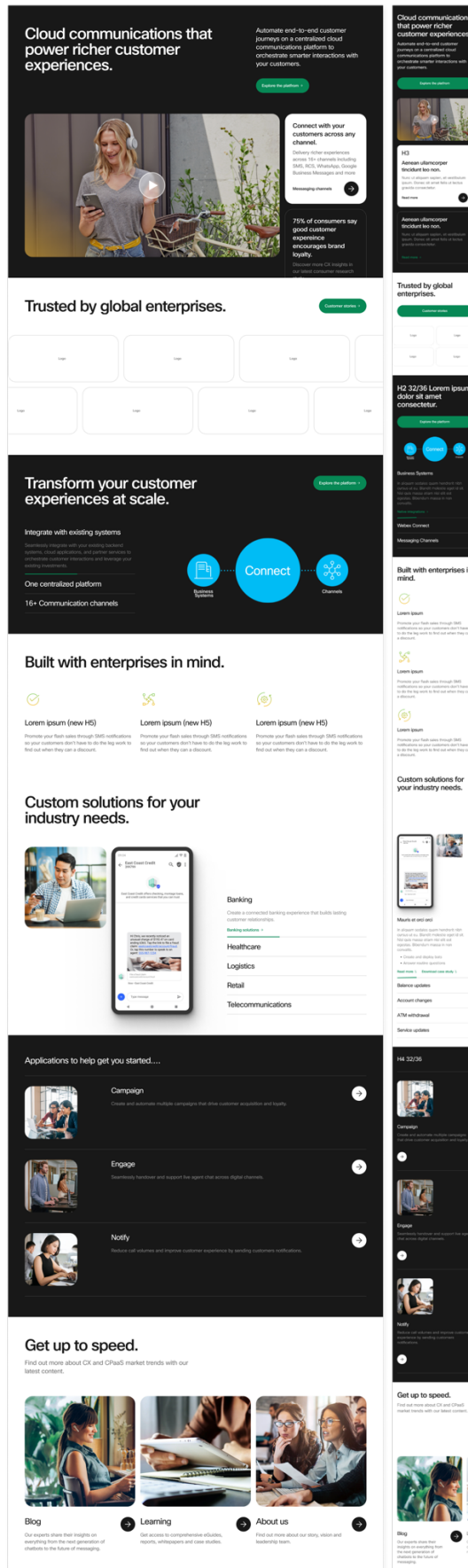


Figure 40 Homepage high fidelity optimised design.

#### 4.2.4 Assessment of the homepage optimisation

Following the completion of the web optimisation process, the revised homepage was published in the beginning of September 2022. In order to assess the impact of these changes, additional data was collected with the aim of recognising any shifts in user behaviour on the page and evaluating the website's performance in search rankings. The next section will delve into an analysis of data, that represent the snapshot of the activity on the business' website between May and December 2022. This assessment will serve to measure the efficacy of the optimisation efforts.

##### 4.2.4.1 UX/UI data

The subsequent sections will review and compare the updated acquisition, engagement, conversion, and technical data post-optimisation and compare it with the corresponding metrics gathered before the optimisation was implemented.

##### 4.2.4.1.1 Acquisition data

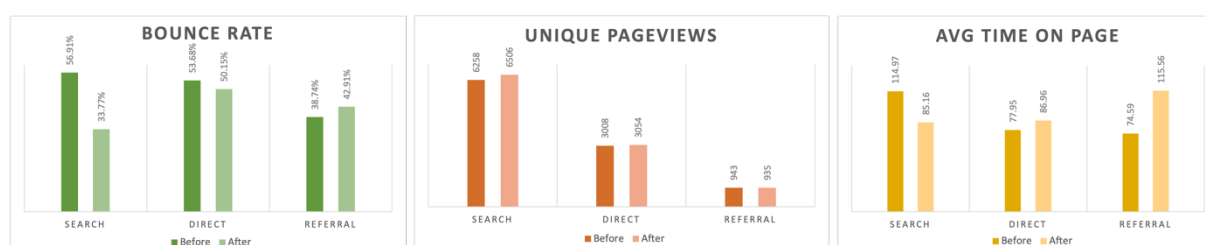


Chart 9 Comparison of homepage organic traffic and engagement.

The post-optimisation organic traffic data revealed a notable improvement in user engagement and site performance metrics. The number of unique users increased only by 100, however, these users visited on average four more pages than before. The bounce rate had been universally decreased, indicating that users were finding the page more compelling across all traffic sources. Direct traffic users, typically familiar the site and likely to move on to other pages quickly, showed a small yet meaningful reduction in bounce rates, suggesting that the optimised homepage engaged them more effectively.

Direct traffic users spent an additional 9 seconds on the page, reflecting a positive response to the new layout and content. Referral traffic, also saw an increase in engagement, which rose to close to 2 minutes, underlining the success of the optimisation in making the site more accessible and relevant for users. Conversely, the average session duration for users from organic search decreased by 26 seconds. Despite this, the overall level of engagement on the page surpassed the 82-second average for the B2B sector in 2022, highlighting the page's strong performance even before the optimisation [151].

Furthermore, the slight rise in unique page views post-optimisation, while not dramatic, was an encouraging sign of retained user interest. Coupled with the decreased bounce rate and mixed results in session durations, these metrics collectively suggested an improved UX. The analysis, considering the bounce rate, unique page views, and average time on page, supported the conclusion that users were not only staying on the homepage longer, but also engaging more meaningfully with the content following the redesign and SEO efforts.

##### 4.2.4.1.2 Engagement data

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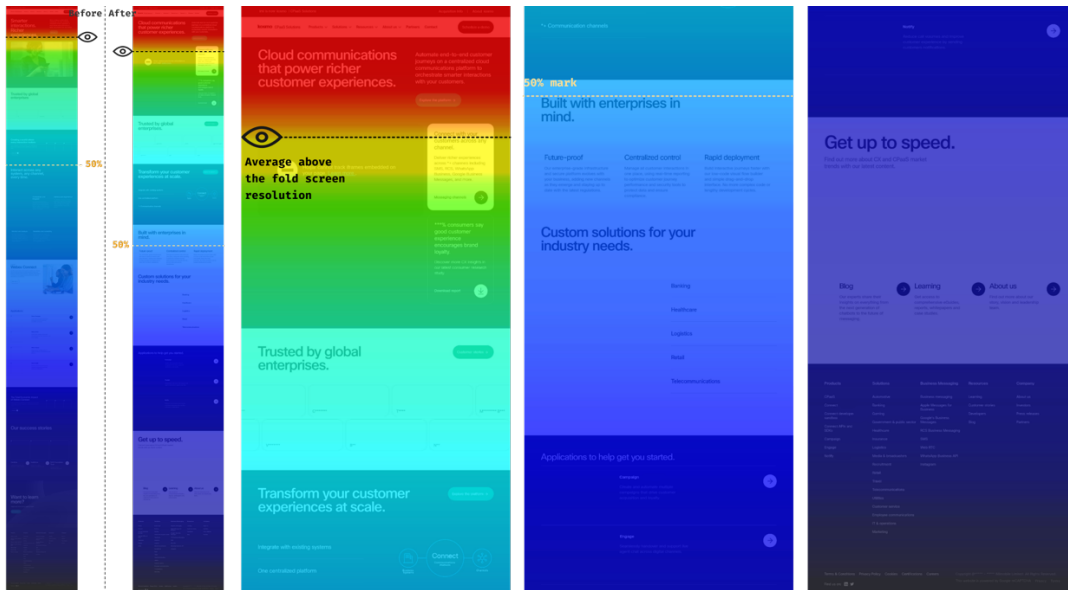


Figure 41 Homepage scroll heatmap post-optimisation.

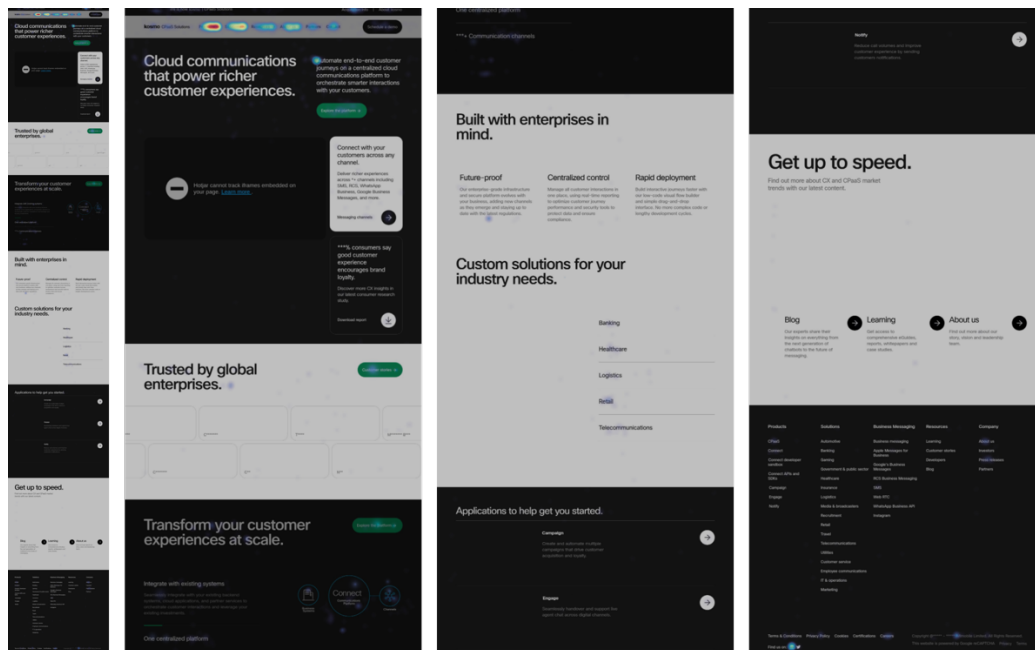


Figure 42 Homepage click heatmap post-optimisation.

The scroll heatmap presented in Figure 41, shows a more gradual transition on the updated chart, which clearly demonstrates that users were scrolling marginally further down the page compared to the previous version. It is important to note that the redesigned page was significantly shorter than its predecessor, requiring an average of seven scrolls to reach the bottom, whereas the earlier version typically necessitated around twelve.

The optimisation also included the consolidation of the title at the top of the page, effectively bringing more content into the initial view. Consequently, upon landing on the page, users could immediately see the heading, introductory copy, primary button, the top part of the brand video, and the first line of the initial content card's title. This design change subtly encouraged further exploration of the page.

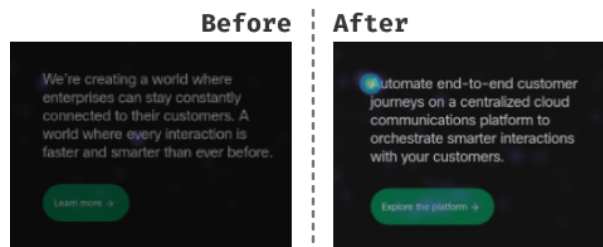


Figure 43 Above the fold button click heatmaps.

The click heatmaps revealed a substantial increase in the number of visitors interacting with the button located above the fold post-optimisation. This increase in engagement could likely be attributed to a combined effect of the re-written copy and button label, which transitioned from a company-centric marketing message to action-oriented, solution-based copy aimed at business users.

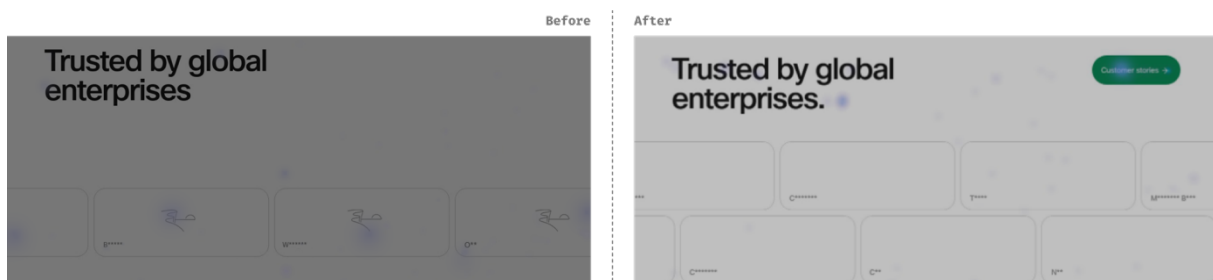


Figure 44 Logos component click heatmaps.

The click heatmap of the logos component displays a significant shift in user interaction between the two versions. In the original version, users clearly expected the logos to be interactive, but the updated version shows a distinct engagement with the ‘customer stories’ button. Although there are still some sporadic clicks across the component, their frequency has substantially decreased.

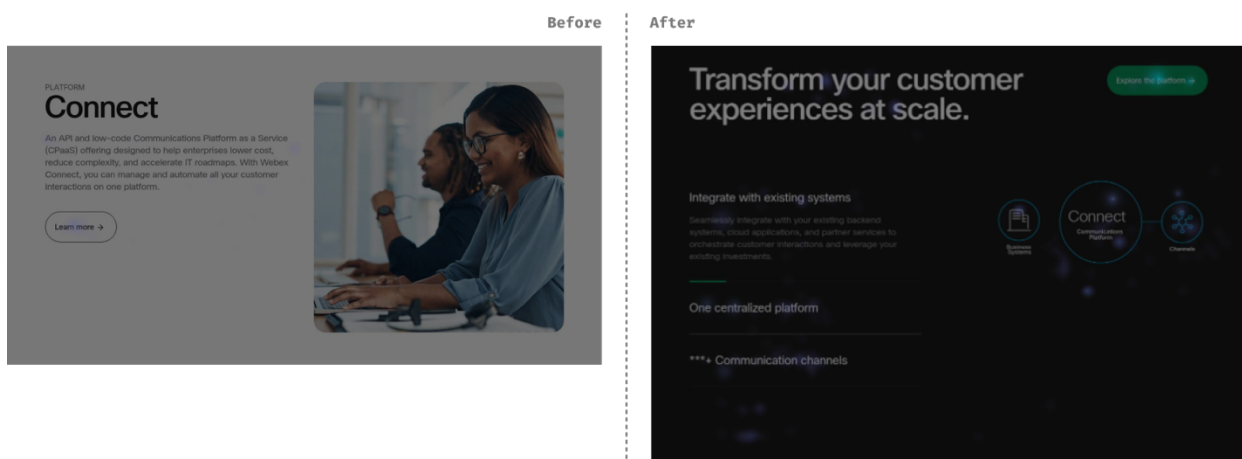


Figure 45 Connect component click heatmaps.

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The Connect section of the page, underwent significant changes, including a strategic move up the page to enhance visibility and the addition of an interactive graph that provided insights into the product and its functionality. When compared to the previous scroll depth chart, this section was viewed more than it had in the past. The click heatmaps in Figure 45 revealed distinct user interest in all elements of the component. Users actively engaged with each of the tabs, the interactive illustration, and the ‘Explore the platform’ button located at the top. This pattern of interaction suggested that the redesigned Connect component was well received by visitors, who chose to interact with it in a comprehensive manner.

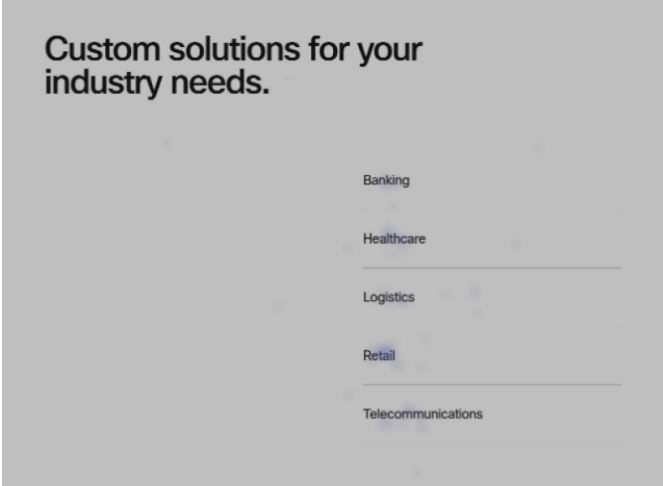


Figure 46 Industry solutions component click heatmap.

The homepage saw the addition of a new section dedicated demonstrating use cases for five prominent industries that commonly employ CPaaS solutions. This section was positioned on in a similar location to where the Connect section appeared on the previous version of the page, typically requiring around five scrolls to reach. Engagement levels for each tab, as depicted in Figure 46, indicate that users who scrolled to this depth showed a genuine interest in the content and chose to interact with it.

Table 8 Homepage scroll events.

Event Label	Total Events	Percentage
Navigation	1270	23.49%
Hero	844	15.61%
Logos	746	13.80%
Connect	729	13.49%
About us	557	10.30%
Industry Solutions	469	8.68%
Applications	253	5.27%
Routing cards	253	4.68%
Footer	285	4.68%
	5406	100%

During the optimisation process a new metric was introduced within GA, the scroll event. This metric is a type of user interaction tracking that quantifies how far a user scrolls down a webpage [152]. While it's conceptually akin to the scroll tracking that Hotjar provides, GA's approach differs in that it uses specific points determined by the website owner, rather than average viewpoints, in order to track scrolling. This metric serves to quantify the information presented in Hotjar heatmaps, aiding in the understanding of user engagement levels and the identification of areas of interest. Following the optimisation, events were configured to correspond to each page component, allowing for a more granular analysis of individual component performance.

The data revealed that a mere 4.68% of users scrolled through the entire page. Approximately half of the users exited the page after viewing the logos component, and a staggering 75% did not scroll past the top component. These statistics provide further insights when considered alongside the click heatmap on Figure 42. Combined with conversion data, they could offer a clearer picture of the user journey, correlating the percentage of users who viewed a section with those who engaged with its CTAs.

#### 4.2.4.1.3 Conversion data

This following data represents a comparison of the unique user engagements in the action of clicks on buttons in the main body of the homepage, with their previous counterparts and is stacked from the top upwards with CIM Suite/Connect being the first event on the page.

The data presented in Chart 10 offers a comparative analysis of unique user engagements, specifically focusing on button clicks within the main body of the homepage. This comparison contrasts current user interactions with those from the previous iteration of the homepage. The data is organised in ascending order, starting from the top of the page with 'CIM Suite/Connect' as the initial event tracked.

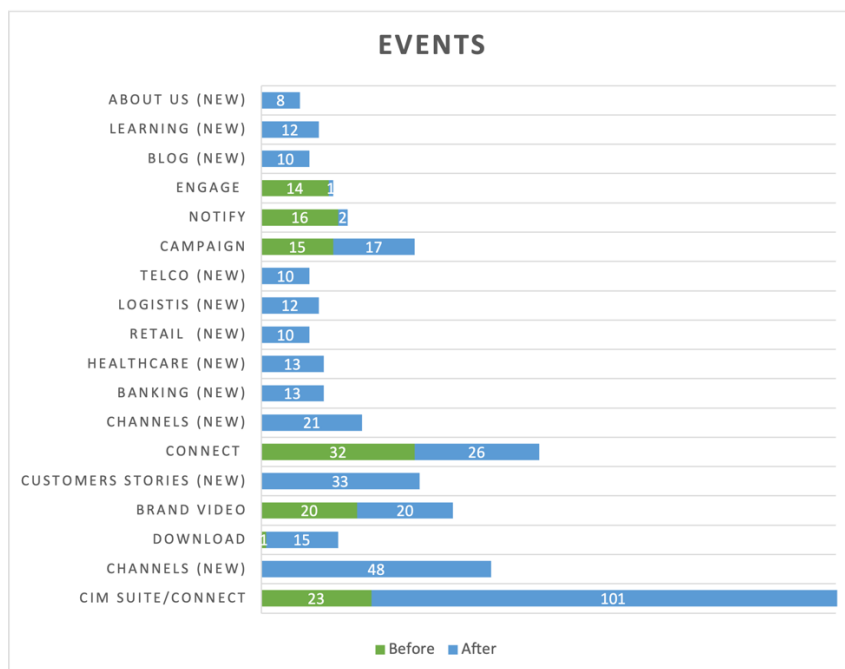


Chart 10 Homepage Key events pre- and post- optimisation.

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The optimisation of the homepage, induced a strategic increase in CTAs, rising from 11 to 18, spread across six of the seven page section. The first month after implementing these changes saw a total of 421 clicks on these CTAs, a substantial rise from the 124 clicks recorded in the month prior, equating to a 239.5% increase in user engagement.

As part of the process, the links on the page were revised to remove those of little interest and introduce more relevant ones. Moreover, the button labels were carefully written in keeping with good UX and SEO practices. This was reflected in the improved average scroll depth and the increased click-through rates for links in various positions on the page.

The first link on the page, had historically seen a low amount of interest, even though it was positioned above the fold. Following the change of the preceding copy and button label, the updated button received a 339% increase in engagement, with 101 users choosing to visit following the CTA.

Further analysis revealed contrasting levels of interaction with the two content cards on the top of the page: the Channels (Business messaging) card and the resource download card. The report's download link showed the lowest engagement among the top three components, with only 15 out of 844 users who viewed the section using the link. In contrast, the neighbouring Channels card received the second highest level of engagement on the page. The unexpectedly low interaction with the resource download card, which featured an asset considered 'top of the funnel', suggested that further investigation should be prioritised by the web optimisation team. A/B testing could examine on whether the content's relevance or its placement is the underlying issue.

The addition of a button to the logos component has effectively turned this section into one of the most engaging elements on the homepage, drawing users interested in the company's business customers.

The industry solutions component and its links were new, as this information was previously accessible only through the main navigation menu. Prioritising these page's visibility has been validated by the increased scroll depth and the rise in interactions with the individual solution pages, with each industry link witnessing engagement.

The last three buttons, positioned in the last component of the page, directed users to different sections of the website, diverging from the initial focus on customer stories. Prior to the optimisation, this component saw no user engagement; however, following the optimisation, it started to attract clicks, leading users to explore further. Although the volume of clicks in this section is modest, it's worth noting that this is the last section of the page, and typically fewer visitors scroll to this extent. Nevertheless, the section now represents a positive outcome post-optimisation, with data showing that 10% of users who scrolled this far engaged with the component.

In conclusion, the full homepage, has seen an organic distribution of clicks, indicating a trend where the deeper users scroll on the page, the fewer the clicks observed. This pattern contrasts with the previous version of the page, which displayed overall low engagement levels, except for the Connect component, which, as noted earlier, was situated around five scrolls down. The current distribution suggests a more evenly balanced engagement across the entire page post-optimisation.

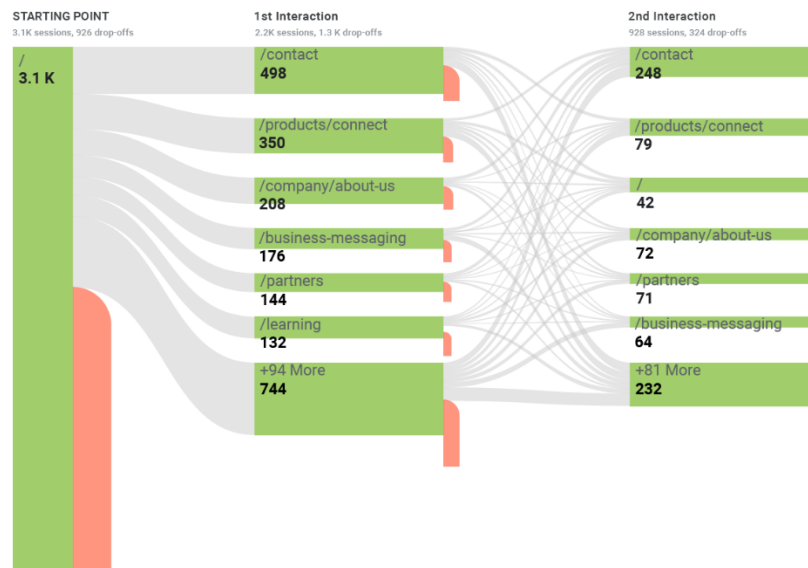


Figure 47 Two-step Next Page Paths from homepage post-optimisation.

Post-optimisation, the analysis of the Next Page Paths from the homepage indicates a decrease in the drop-off rate when users transition from the landing page to subsequent pages. With the new layout, Business Messaging has emerged as the fourth most popular destination, and the Learning landing page has also seen a surge in visits. This reduction in drop-off rates at the first interaction, combined with the rest of the page’s engagement as previously examined, reflects positively on the homepage’s redesign, which has successfully directed user attention towards different sections of the website.

#### 4.2.4.1.4 Technical data

The technical data, mirroring site trends, tried to assess user interactions across various browsers and devices. This analysis was intended to correlate technical variables with key performance indicators, and to evaluate the relationship between device types and metrics such as sessions and conversion rates.

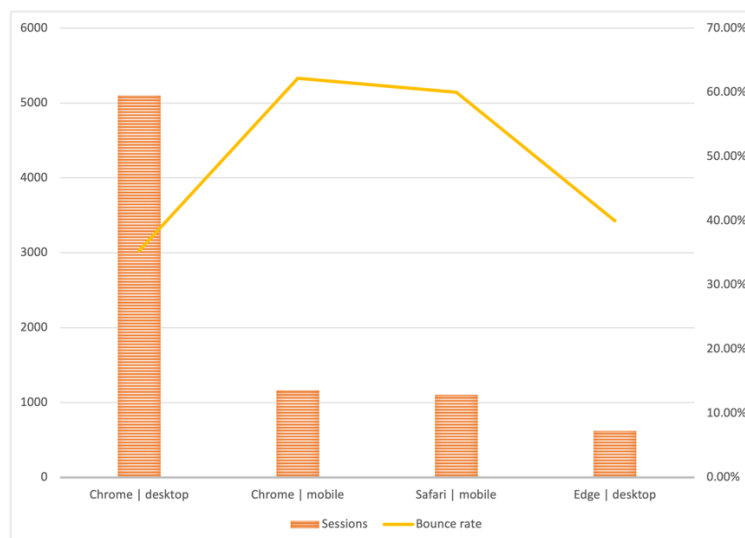


Chart 11 Sessions and bounce rates for most popular browsers.

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Chart 11 presents data on sessions and bounce rates for the most popular browsers, indicating that user preferences for browsers have remained consistent post-optimisation. However, a decline in the bounce rate for Chrome users is noteworthy, as detailed in the graph. This finding aligned with the broader trend of reduced bounce rates for most users following the homepage redesign, as evidenced in the acquisition data from Chart 9.

Table 9 Sessions and enquiries by device type post-optimisation.

<i>Device</i>	<i>Sessions</i>	<i>Conversion rate</i>
Mobile	559	1.43%
Desktop	6205	4.01%

In terms of device usage, the total number of sessions has not seen a significant shift after the homepage improvements, but there has been a notable increase in user enquiries. The mobile conversion rate experienced a substantial rise from 0.24% to 1.43%, a jump from one user filling in a form to eight. Despite the absolute numbers being relatively small, this change signifies a heightened level of user interest. On desktop, the conversion rate saw an impressive increase of 401.25%, climbing from 0.8% to 4.01%. This data suggests that the optimisation efforts have been more effective in guiding users towards completing forms, indicating an improvement in the conversion funnel.

4.2.4.2 SEO data

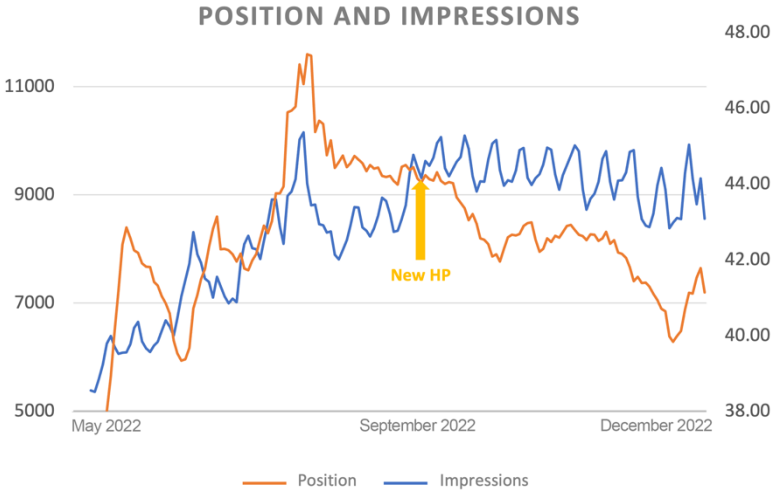


Chart 12 Impressions and position on SERP for the observing period.

Chart 12 illustrates the fluctuations in impressions and SERP positions for the homepage from May to December, coinciding with the period of analysis and optimisation. The average position of the homepage in SERP was influenced by various factors, such as domain authority and keyword placement. Following the optimisation, there was a noticeable trend of improvement in the SERP position. The average ranking has shown fluctuations, settling around the 41st position, an improvement from the

earlier average of 44. The most result of the SEO efforts on the homepage was that it received around 11% more impressions, and while the CTR has not experienced significant changes, this outcome aligned with expectations considering that the homepage predominantly appeared on the fourth page of search results, where lower CTR is generally observed. As seen, changing ranking on Google or any other search engine is complicated and often difficult, so even though the changes observed were not significant, as more optimisations are implemented, an increase in the average position should be expected.

#### 4.2.4.2.1 Off-page SEO

##### Link building.

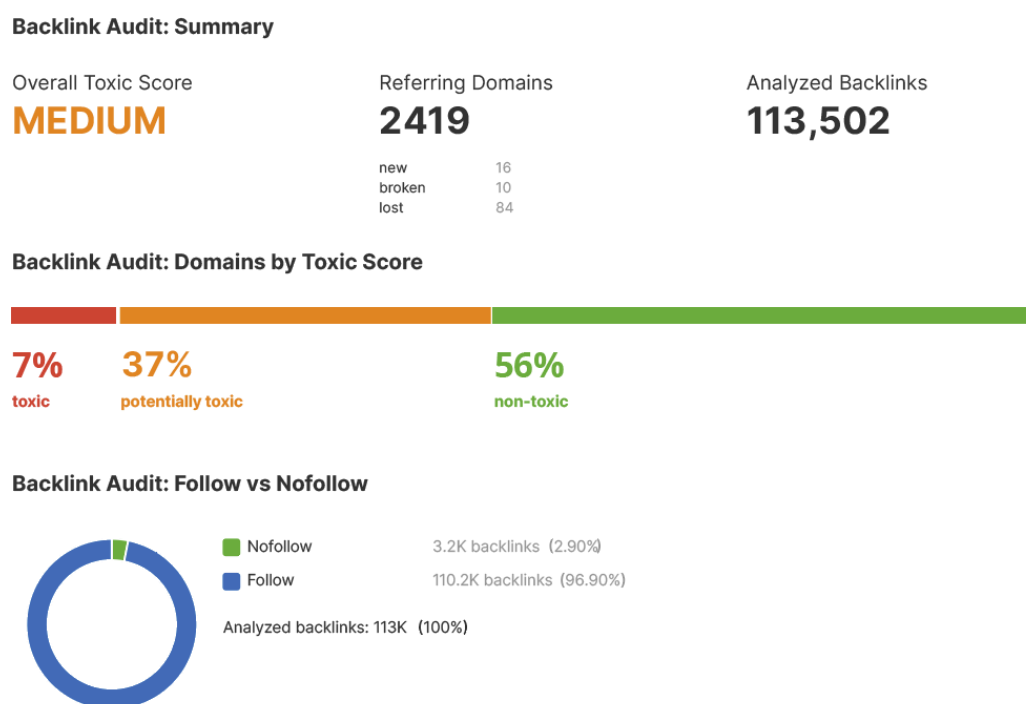


Figure 48 Semrush backlink report December 2022

During the optimisation implementation phase, concentrated efforts were made to improve the website's backlink profile. This initiative led to the removal of over four thousand backlinks that were identified as toxic according to Semrush's report. Consequently, even though there was a temporary decline in the total number of backlinks and referring domains, the remaining backlinks' quality improved, as evidenced by the data in Figure 48. The site's toxicity score also reflected this improvement, transitioning from 'toxic' to 'medium'. These changes suggested a trend towards a healthier backlink profile, likely to contribute positively to the website's SEO status. Additionally, efforts have been initiated to strengthen relationships with authoritative sites from partners and clients, the full benefits of which may not yet be visible. With an ongoing commitment to the dual strategy of monitoring existing backlinks for quality and actively seeking to acquire new, healthy backlinks, the site's link building profile could be well-positioned for further improvement.

**Domain Authority**

Table 10 Comparison of Domain Authority scores and key SEO metrics May - December 2022

<i>Date</i>	<i>Domain Authority</i>	<i>Organic traffic</i>	<i>Keywords</i>	<i>Backlinks</i>
May 2022	38	6.2 K	655	117K
December 2022	42	6.5 K	847	113K

Within the observation period dedicated to improving the site’s SEO standing, there was a deliberate focus on domain authority as a key metric for search algorithms. During this time, the domain authority score increased by four points, positioning the site’s score at the same level as Competitor 4 and one point behind Competitor 2, as indicated in Table 3. This shift suggested the potential for further progress in the website’s domain authority. The site’s association with the Kosmo website, which maintained an authority score of 91, would potentially be advantageous over the long term. Such a connection should contribute positively to the website’s perceived credibility and trustworthiness, which are important in SEO success.

Additionally, the website registered an increase in visibility, generating impressions for an additional 192 keywords. This can be attributed not solely to the homepage redesign but also to a collective effort across various marketing activities and the diligent keyword placement throughout the site's content. These coordinated activities have created a synergistic effect, strengthening the website's SEO impressions.

**Social Media**



Chart 13 Users referred by social media Sept-Dec 2022

The data suggested that the referral traffic from social media platforms has remained consistent, with no significant fluctuations observed between the pre-optimisation (Chart 8) and post-optimisation (Chart 13) periods. Despite the stable performance of social media referrals, it is worth noting that social media efforts outperform SEO initiatives within the broader marketing strategy. This indicates potential opportunities for growth and optimisation in off-page SEO.

**4.2.4.2.2 On-page SEO**

#### 4.2.4.2.2.1 Content and keywords

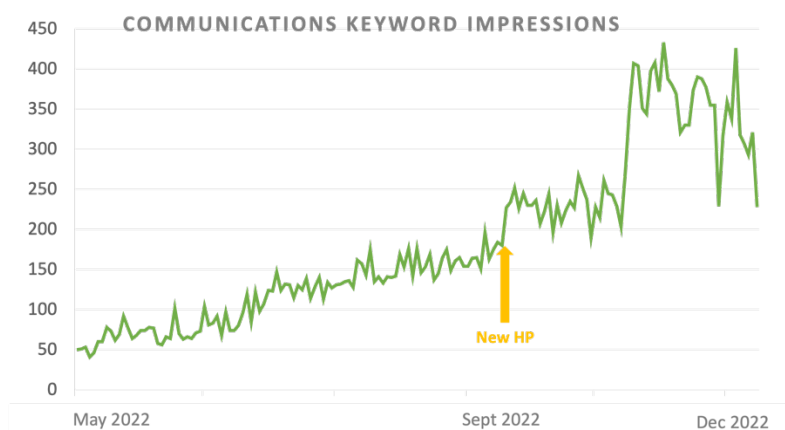


Chart 14 ‘Communications’ keyword impressions for the observing period.

Despite the homepage’s average position not changing significantly following the web optimisation process, specific keywords targeted during that process showed a dramatic increase.

The post-optimisation data showed that the homepage impressions for search queries including the word ‘communication’ and at least one of the other target keywords (cloud, platform) showed a sizable increase. Looking at the primary keyword, ‘cloud communication platform’, the homepage impressions shot up from 0 to 2,816, and the ranking position from 0 to 55.5. The CTR remained unchanged, but this was to be expected as the page’s position, despite improvement, is still really low on the SERP results.

Table 11 Keyword competitor analysis post-optimisation

<b>Keyword</b>	<b>Keyword difficulty</b>	<b>Position on Google’s SERP</b>				
		<b>imi</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>
<i>cloud communications platform</i>	36	52	22	21	21	0
<i>communication platform as a service</i>	52	80	99	14	14	35
<i>communications platform</i>	58	62	7	30	30	60
<i>communications platform api</i>	38	47	1	34	34	22
<i>communications platform as a service cpaas</i>	48	27	16	20	20	22

When examining the changes in the business’ SERP positioning for the targeted keywords, it is evident that the imi website has made discernible progress in comparison to its competitors. Whilst it remained behind its competitors in certain respects, the targeted keywords generated impressions for the homepage, where on the previous report, the site’s presence on the SERP was non-existent. This advancement signified a step towards enchasing the site’s scoring on the search algorithm, and with

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continuous commitment to SEO best practices, the site should continue its upward trajectory increasing its online visibility.

### 4.2.4.2.2.2 Page experience and technical data.

Following the optimisation, the site was audited in September 2022 using PageSpeed Insights to assess the site's Core Web Vitals and technical metrics. The Core Web vitals have remained relatively consistent, with incremental improvements in LCP and INP scores. The TTFB metric, categorised as 'amber' in the pre-optimisation report, has not showed any change. Figure 49 illustrates that a significant number of the previously highlighted concerns, notably in the areas of accessibility and SEO, have been successfully rectified, leading to a perfect score of 100/100 for these elements. Despite this progress, the performance was still rated at 89/100, maintaining its 'amber' status.

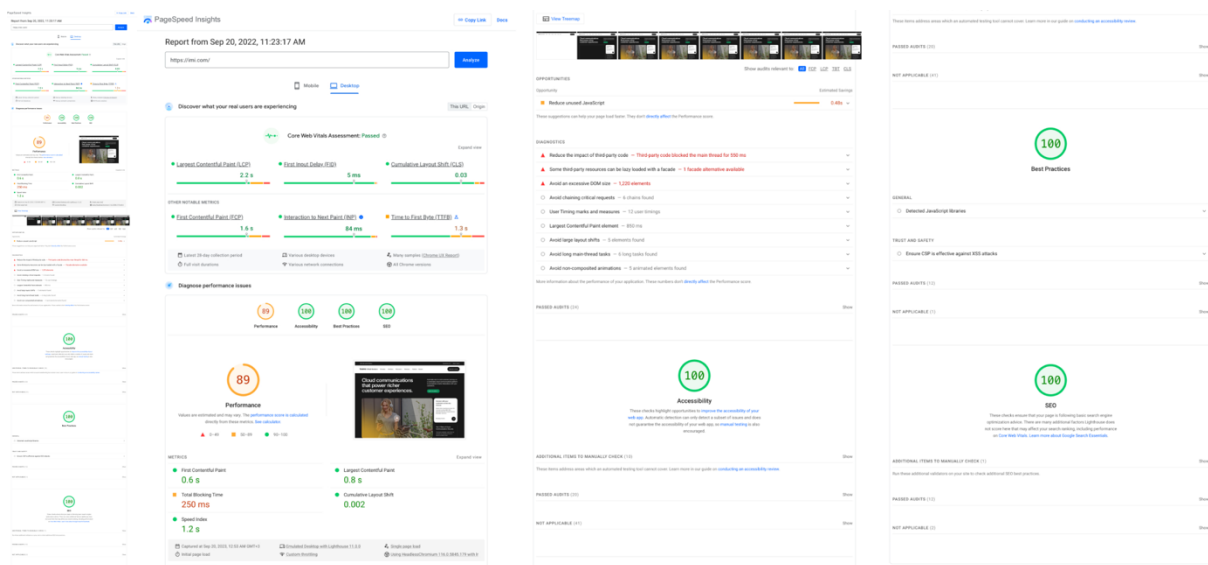


Figure 49 PageSpeed Insights report September 2022

### Performance:

The optimisation process addressed two opportunities, and a critical diagnostic as identified in the report in Figure 16. Nonetheless, the performance score in the subsequent report has not shown any change. The updated report pinpointed one opportunity for optimisation, namely 'reduce unused JavaScript', and highlighted three diagnostics: 'reduce the impact of third-party code', 'some third-party resources can be lazy loaded with a facade', and 'avoid an excessive DOM size'. The status of the identified opportunity was marked as 'amber/needs improvement', while all the diagnostics were categorised as 'red/poor'.

**▲ Reduce the impact of third-party code** — Third-party code blocked the main thread for 550 ms

Third-party code can significantly impact load performance. Limit the number of redundant third-party providers and try to load third-party code after your page has primarily finished loading. [Learn how to minimize third-party impact.](#) [TBT](#)

Third-Party	Transfer Size	Main-Thread Blocking Time
<b>YouTube</b> <a href="#">Video</a>	<b>977 KIB</b>	<b>484 ms</b>
...www-embed-player.vflset/www-embed-player.js (www.youtube.com)	95 KIB	301 ms
...en_US/base.js (www.youtube.com)	779 KIB	183 ms
Other resources	104 KIB	0 ms
<b>Unpkg</b> <a href="#">Cdn</a>	<b>15 KIB</b>	<b>63 ms</b>
...dist/cdn.min.js (unpkg.com)	15 KIB	63 ms
<b>digitaloceanspaces.com</b>	<b>114 KIB</b>	<b>0 ms</b>
/Functional/logo-reverse.svg (nyc3.cdn.digitaloceanspaces.com)	97 KIB	0 ms
/Functional/cpaas-solutions-black.svg (nyc3.cdn.digitaloceanspaces.com)	10 KIB	0 ms
Other resources	7 KIB	0 ms
<b>Cloudflare CDN</b> <a href="#">Cdn</a>	<b>63 KIB</b>	<b>0 ms</b>
...3.9.1/gsap.min.js (cdnjs.cloudflare.com)	23 KIB	0 ms
...3.10.4/ScrollTrigger.min.js (cdnjs.cloudflare.com)	15 KIB	0 ms
...2.9.2/parsley.min.js (cdnjs.cloudflare.com)	12 KIB	0 ms
...1.1.0/jquery.magnific-popup.min.js (cdnjs.cloudflare.com)	7 KIB	0 ms
Other resources	6 KIB	0 ms
<b>Other Google APIs/SDKs</b> <a href="#">Utility</a>	<b>49 KIB</b>	<b>0 ms</b>
...google.internal.waa.v1.Waa/Create (nm-pa.googleapis.com)	32 KIB	0 ms
...th/glybE_mf...js (www.google.com)	15 KIB	0 ms
<b>jQuery CDN</b> <a href="#">Cdn</a>	<b>31 KIB</b>	<b>0 ms</b>
/jquery-3.5.1.min.js (code.jquery.com)	31 KIB	0 ms
<b>Google Fonts</b> <a href="#">Cdn</a>	<b>23 KIB</b>	<b>0 ms</b>
...v18/KFOICnqEu...woff2 (fonts.gstatic.com)	11 KIB	0 ms
...v18/KFOmCnqEu...woff2 (fonts.gstatic.com)	11 KIB	0 ms
<b>Google/DoubleClick Ads</b> <a href="#">Ad</a>	<b>2 KIB</b>	<b>0 ms</b>

Figure 50 Reduce the impact of third-party code error.

The integration of third-party code into the website was highly valuable as it played a critical role in optimising performance, enhancing the user experience, and supporting various marketing activities. The report underscored a TBT of 550ms caused by third-party code, with almost 90% of the issue attributed to YouTube, which was used for the video in the top component. UNPKG also introduced a delay of 63ms. UNPKG is a CDN that was used for caching and overall performance optimisation for pages and their elements.

Google's scoring suggests that the ideal TBT should be under 200ms [145]. To enhance the score and improve page performance, further investigation would be needed to understand the impact of YouTube's code and explore ways to improve it. While UNPKG did affect the score, its contribution to the TBT was relatively insignificant compared to the value it added. Recognising the substantial contribution of UNPKG's code to the website's functionality and overall success, it's advisable to retain it. Future phases may involve exploring optimisation options if the numbers change.

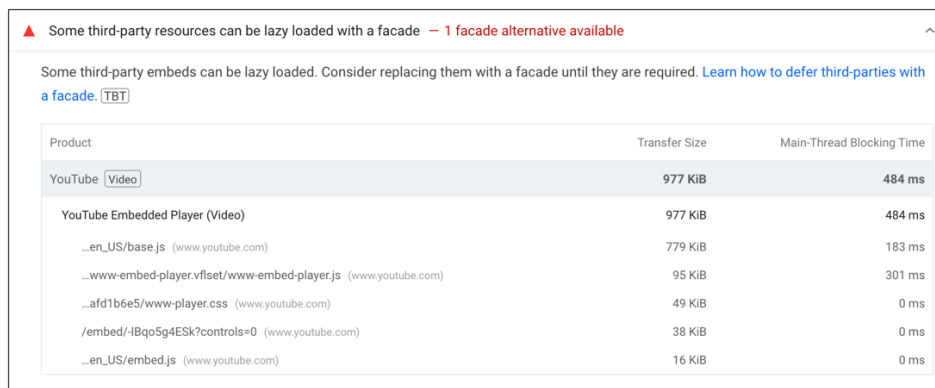


Figure 51 Some third-party resources can be lazy loading with a façade.

PageSpeed Insights recommended that loading YouTube’s embedded code with a façade would improve loading times, which correlated with the TBT issue. Using a façade could facilitate lazy loading of the embedded code, triggering it only upon user interaction (when the user clicks the play button), thus reducing TBT. This optimisation could be achieved through a straightforward process: 1 - load the façade on page load, 2 - pre-connect to the third-party resources on mouseover, in this case, YouTube, and 3 - replace the façade with the actual third-party product on click.



Figure 52 Avoid an excessive DOM size.

The last diagnostic concern was the DOM size, a carryover issue from the previous report that due to its previous ‘amber’ status and time constraints, was not fully addressed. The escalation of its status to ‘red’ in the new report was a result of the DOM element count rising from 1,100 to 1,220. This increment was somewhat anticipated following the optimisation and the introduction of new website features. Each newly designed component on the homepage was created to accommodate various types of content and imagery, a core part of the UI optimisation strategy, to maximise component utility across multiple pages. While this approach contributed to a more dynamic CMS and paved the way for future page development, it has also contributed to an increase in the site’s DOM size, potentially impacting its loading speed over time.

#### **4.2.5 Summary of homepage optimisation**

This study documented and considered one optimisation cycle of a B2B website's UX/UI and SEO approaches. The primary goals of the homepage's optimisation project were to increase user engagement below the fold and increase the page's visibility on Google search engine for targeted keywords.

To realise these goals, an analytical framework was adopted, which started with an in-depth examination of the site's pre-optimisation user behavioural data. This analysis provided a baseline understanding of the site's engagement levels and identified areas for potential enhancement. Parallel to this, the study examined both off-page and on-page ranking factors to understand the page's initial search engine performance.

Upon the completion of the preliminary analysis, a series of actionable recommendations were formulated, predicated on their anticipated efficacy in improving both the UX and SEO performance of the page. These recommendations were then implemented, with due consideration given to aligning them with the project's objective and timelines.

Following the implementation step, additional data were collected and analysed in depth to review the effectiveness of the optimisation efforts. The analysis of user behavioural data provided insights into the changes in UX, while the off- and on- page SEO data, demonstrated the shifts in the SEO profile of the page.

In summary, the methodology of this project was constructed to assess the influence of UX/UI and SEO enhancements as evidenced by empirical data, particularly in relation to user engagement and search visibility. The methodologies and analytical techniques used, laid a solid foundation for ongoing optimisation endeavours, and yielded insightful revelations regarding the efficacy of data-driven and user-focused design strategies on the site's overall performance.

#### **4.3 Optimisation of the blog template**

Blogs are a way for organisations to retain continued engagement, as new posts can be promoted on email or social channel to encourage return traffic or attract new following [153]. In this section the business' blog post template will be examined.

When the observation period began for the imi blog, the collection included 130 entries with dates ranging from January 2016 to December 2022. These blog posts uniformly adhered to the same template design. Consequently, any changes made to the blog template would impact all the existing entries on the website.

A blog entry was selected to represent the UX and SEO performance of an average blog post on the website. The blog's name was 'What is CPaaS? Communications Platform as a Service explained' and was first published on 21st September 2022. The content of the blog is typical to a knowledge-sharing article where the author explores a topic of interest related to the field of the company. This blog was written with the purpose to increase keyword usage around the subject of CPaaS and was part of a series of articles that explored CPaaS, each going deeper on one aspect of the subject.

### 4.3.1 Step 1 Collection and analysis of UX/UI and SEO data.

The process of collecting data took place from January and March 2023 and falls beyond the purview of this project. Consequently, the preliminary analysis of the data will be discussed next.

#### 4.3.1.1 UX/UI data

##### Acquisition Data

Similarly to the first step of the optimisation of the homepage, the acquisition data for the blog was examined through the lens of traffic sources and engagement data to better understand users' behavioural patterns.

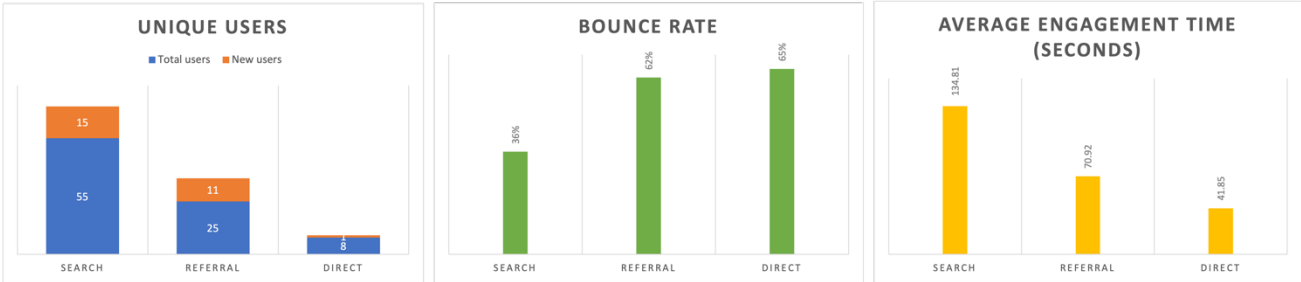


Chart 15 Blog post organic traffic engagement metrics.

Organic search was the leading source of traffic for the blog post, with the highest number of total and new users. The bounce rate for organic search was the lowest among the three channels, which suggests that users coming from search engines were finding content they were interested in and stayed engaged with it as shown by the average engagement time, which was also the highest.

Referral traffic had 25 unique users of which 44% is new, which could be a sign of growth from social media and other sites linking back to the blog post. However, the bounce rate was significantly higher than organic search, suggesting that while referrals were effective at bringing in new visitors, the content might not have met the expectations of these users, or the referring sites might not have been closely aligned with the blog's topic. The average engagement time was a little bit over a minute indicating that people possibly scanned the page.

Direct traffic was the smallest source in terms of users and only one new user. This is not unexpected, as typing the direct URL of a blog post is not considered common practice, but possibly some users navigated either through history or bookmarks. The high bounce rate and low average engagement time may indicate that these users were quickly checking for updates or specific information and then leaving.

##### Engagement Data

This section analyses quantitative and qualitative data that shows the ways in which users interacted with the blog post.

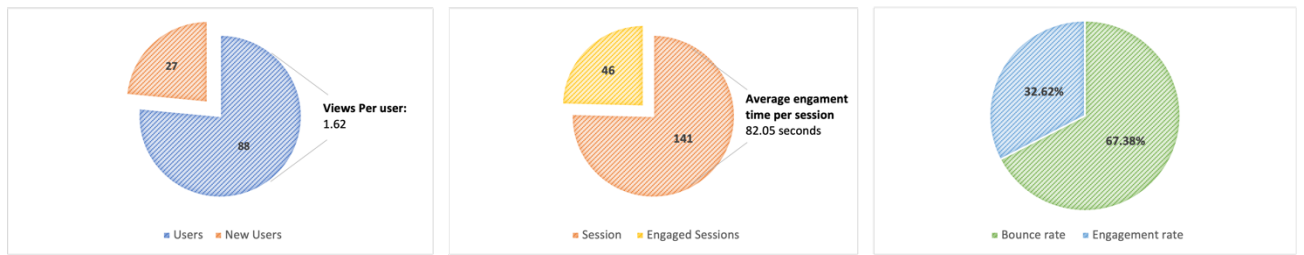


Chart 16 Traffic and engagement data.

During the observation period the blog saw a total of 88 unique users of which roughly one third were new users, indicating that the blog attracted some new readers. Each user, on average, viewed the blog 1.62 times which shows that users come back and find the content potentially interesting. The blog was viewed 141 times, but only 33% of the sessions saw the users interacting with the content and stayed engaged on average of 1 minute and 22 seconds which is about one third of the blog’s full read time. Lastly the bounce rate for the blog was 67.38% which is quite high but in keeping with the SaaS industry average of 65% [133].



Figure 53 Blog post scroll heatmap.

From the scroll heatmap it’s observed that users scrolled quite deep on the page compared to the homepage for example, which saw the blue colours come a lot sooner on the page. The blog post had a few hyperlinks in the body text, but they didn’t see a lot of clicks from the users and combined with the eye tracking, it can be observed that users noticed the links placed in the middle of the page, but they chose not to interact with them. There was no indication of any users noticing the links at the bottom of the page with any of the heatmaps. When combining the eye tracking and the scroll heatmaps it’s evident that even though users scrolled down the page, they didn’t pause on the page to read what’s on it, which matched the result of the engagement time being less than the read time, as observed from the data in Chart 16.

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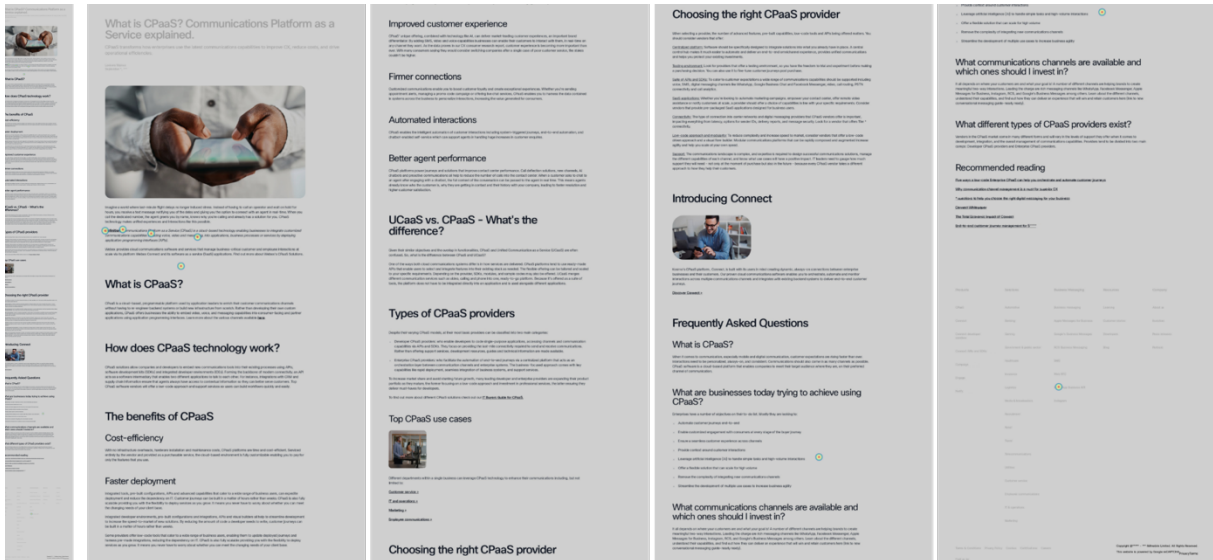


Figure 54 Blog post click heatmap.

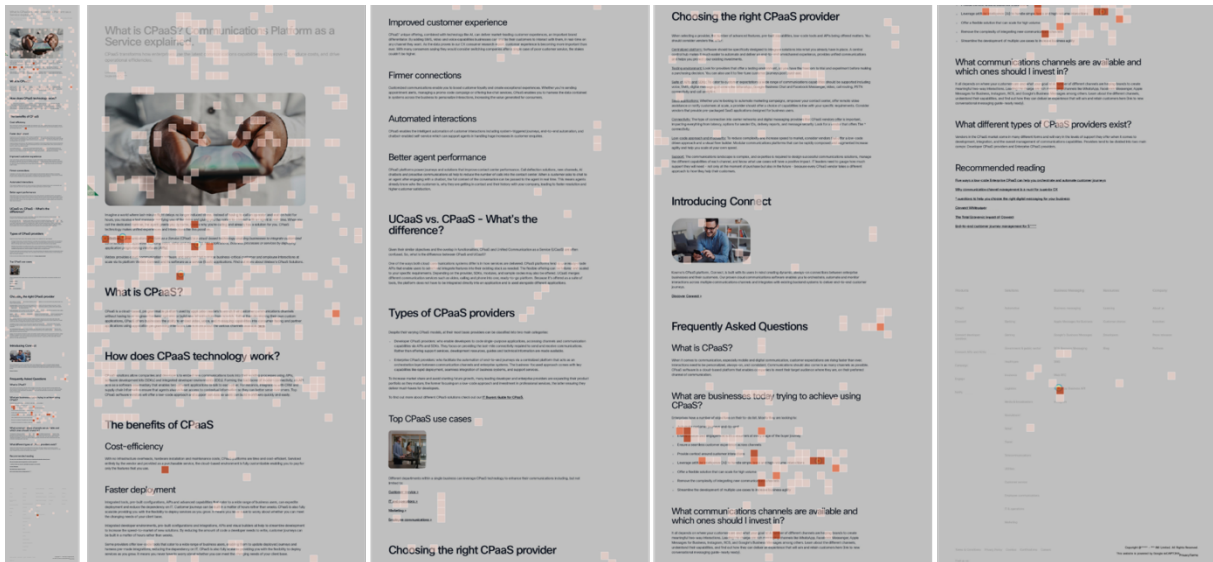


Figure 55 Blog post eye tracking heatmap.

Most of the user engagement on the eye tracking heatmap was on the top of the post-which was expected, as more users viewed that part. The definition area specifically also attracted some clicks as shown on the click heatmap, even though it doesn't contain any links. The other two places of the body text that had higher visibility were: 'Choosing the right CPaaS provider', and the answer to the Frequently Asked Question (FAQ) 'What are businesses today trying to achieve using CPaaS?'. The first contained very structured short paragraphs and the FAQ answer was in a bullet point format. Looking at all three sections that were read more by users, the definition, the short paragraphs, and bullet points, it can be observed that users preferred to engage with well-structured short text and stopped to read when there was an opportunity to skim the copy faster.

## Conversion data

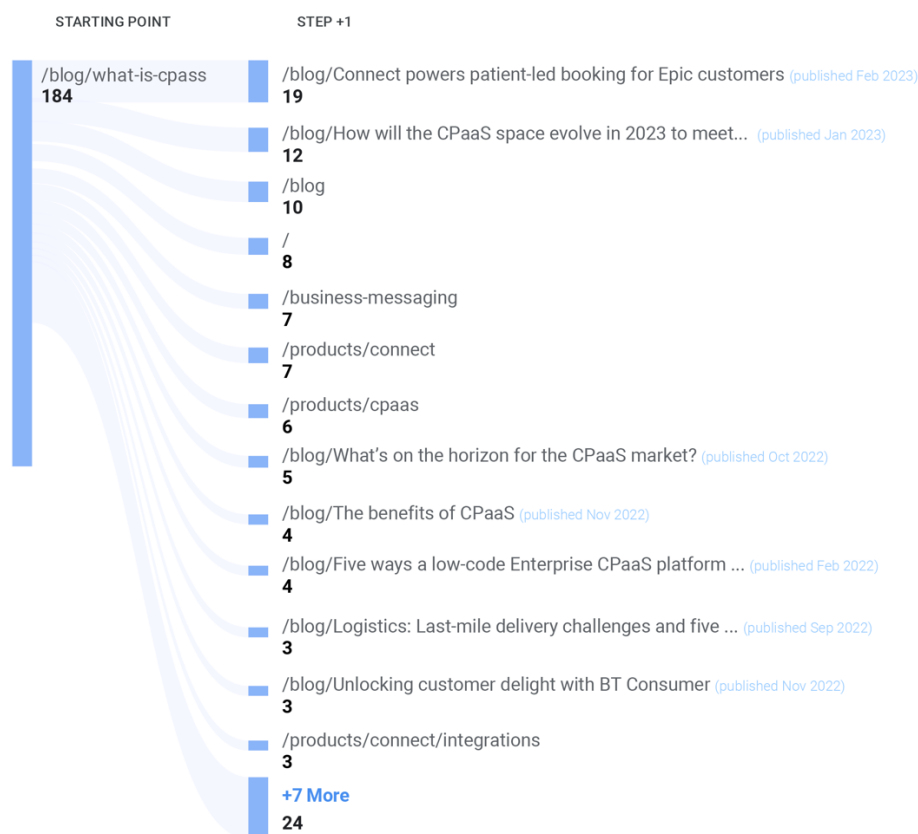


Figure 56 Blog Next Page Paths.

In the given timeframe, the article attracted 184 users, 115 of them explored other pages on the website after landing on this blog, making the exit rate for the blog 37.5%. However, only four links out of the thirteen that appeared within the blog were used, which could be interpreted that most visitors used the main navigation, the footer, and possibly the browser back button to navigate to other pages. The lack of clicks on the internal links from the body copy of the blog was also confirmed through the click heatmap in Figure 54.

Table 12 Clicks on links on the page.

<b><i>Internal links on page</i></b>	<b><i>Times clicked</i></b>
<i>learning/IT buyers guide</i>	0
<i>solutions/Customer service</i>	0
<i>solutions/IT and ops</i>	0
<i>solutions/Marketing</i>	0
<i>solutions/Employee comms</i>	0
<i>products/Connect</i>	6
<i>blog/Five ways a low-code Enterprise...</i>	3
<i>blog/Why communication channel ma...</i>	0
<i>blog/7 questions to help you choose...</i>	2
<i>learning/connect-whitepaper</i>	0
<i>learning/TEI report</i>	2

Notably, the hyperlink to the Connect page garnered the most clicks, despite its less prominent placement. This once again underscored the visitors’ interest in the company’s main product. The most common user journeys included moving on to the latest blogs at the time, followed by the blog landing page. Impressively, 63% of the total users continued their exploration of the website, and among them, 58% ventured on to other blog pages. These trends indicated that users were genuinely interested in consuming more blog content and learning further.

**Technical data**

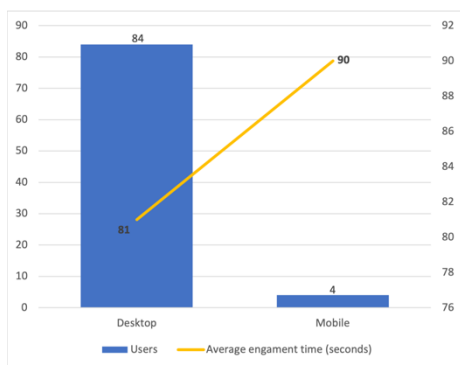


Chart 17 Desktop VS mobile users and engagement time.



Chart 18 Chrome VS Safari engagement time and pages visited.

The technical data on the blog looked similar to the rest of the site where desktop and Chrome users surpass the rest by forming the majority of website visitors. Examining technical and engagement data together, it can be observed that the mobile blog users, even though small in number, they remained engaged on the blog for 1,5 minutes where desktop users a bit less than that. Furthermore, when examining engagement rate by browsers, it’s observed that blog visitors using Safari were 3.4% more engaged than Chrome users, however, most viewed only the blog page during their visit, where more than half of Chrome users visited at least two pages.

**4.3.1.2 SEO data**

Table 13 Blog post search performance.

<i>Impressions</i>	<i>CTR</i>	<i>Average Position</i>
6,094	0.02%	53.83

During the observation period, the blog post appeared 6,094 times on the SERP with the average position placing it on the fifth page of the results which explains the very low CTR, which practically accounts for only 1 click out of the total impressions.

**4.3.1.2.1 Off-Page**

Off-page SEO is an overall site endeavour so there was no specific set of data to be analysed for the blog at this section. Moreover, the observation period for the blog started at the point when the optimisation period of the homepage finished, so the data shown in section 4.2.4.2.1 was the same data available at the time. The domain authority of the site was 42, with 113,000 backlinks and the site ranked for 847 keywords.

The SEO analysis continues with the on-page data.

#### 4.3.1.2.2 On-Page

##### Content & Keywords

A broader marketing goal, which aligns with the area of the business, was to elevate the website's ranking for CPaaS-related keywords, recognising that keyword terms, serve as crucial entry points to the website. The top ten long-tail keywords, as selected by senior stakeholders, are presented in Table 14. It can quickly be observed that the site didn't rank for the majority of the targeted terms; it only appeared really low on the on the page for two of the keywords.

Table 14 Keyword analysis for targeted terms in blog

<b><i>Core long-tail keywords</i></b>	<b><i>Searches</i></b>	<b><i>Difficulty</i></b>	<b><i>Position</i></b>
<i>communications platform</i>	1300	55	0
<i>messaging platform</i>	390	45	0
<i>enterprise communications</i>	320	38	0
<i>enterprise cloud communications platform</i>	260	26	0
<i>customer messaging platform</i>	260	50	0
<i>communication platform as a service</i>	210	52	60
<i>cloud communications platform</i>	170	28	0
<i>enterprise communication platform</i>	90	47	90
<i>business messaging platform</i>	40	52	0
<i>enterprise messaging platform</i>	44	40	0

Many of the business' blog posts target these keywords along with others that are specific to the subject of the blog. That was done with the intention of emphasising the relevance of the business to these terms.

This case study blog was specifically written to target long-tail CPaaS keywords, so it contained mentions of the above keywords but also using the word cpaas. The primary keyword was 'what is CPaaS' which was featured in the h1, meta description, URL, h3 and within the body copy of the page.

Table 15 Keywords the blog ranked for January to March 2023.

<i>/blog/what-is-cpaas</i>		
<b><i>Keyword</i></b>	<b><i>Position</i></b>	<b><i>Search volume</i></b>
<i>what is a cpaas</i>	11	13
<i>what is cpaas</i>	14	399
<i>cpaas definition</i>	14	30
<i>cpaas model</i>	15	8
<i>cpaas meaning</i>	16	590

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<i>define cpaas</i>	16	13
<i>cpaas technology</i>	19	10
<i>what does cpaas mean</i>	19	9
<i>what is cpaas platform</i>	22	14
<i>what is cpaas provider</i>	25	12
<i>cpaas</i>	28	2420
<i>how does cpaas work</i>	29	15
<i>cloud communications platform as a service</i>	49	10
<i>cpaas providers</i>	68	115
<i>benefits cpaas</i>	69	12

Table 15 presents the keywords the blog ranked for, and as observed even though the terms varied, they all but one contained the word ‘cpaas’ which was the overall goal of the of the blog. The search terms were mainly of informational intent, meaning that users use these terms when looking for information on the subject. The search volume for most terms was very low and the blog was positioned from the second to the seventh page of results. The term ‘cpaas’ which had the highest search volume and the blog ranked on the third page of results was also targeted by the ‘CPaaS Overview’ page which at the time ranked at the ninth position on the SERP.

Additional to this blog post, the business had previously posted a similar blog post with title ‘What is CPaaS? Everything you need to know’. It’s important to note that, the older blog post was not SEO optimised for any keywords, and the difference in keyword ranking as presented in Table 16 is significant. The older, not optimised blog post was ranking for four keywords, where the newer one ranked for fifteen. Out of the four terms, three also appear on the new blog as well, which could be potentially problematic if the two blogs were competing for the same keywords since their content is in similar nature.

Table 16 Keywords older blog ranked for.

<i>/blog/what-is-cpaas-everything-you-need-to-know</i>		
<b><i>Keyword</i></b>	<b><i>Position</i></b>	<b><i>Search volume</i></b>
<i>cpaas architecture</i>	12	120
<i>define cpaas</i>	28	30
<i>what is cpaas provider</i>	40	10
<i>what does cpaas mean</i>	95	32

**Page experience and technical data.**

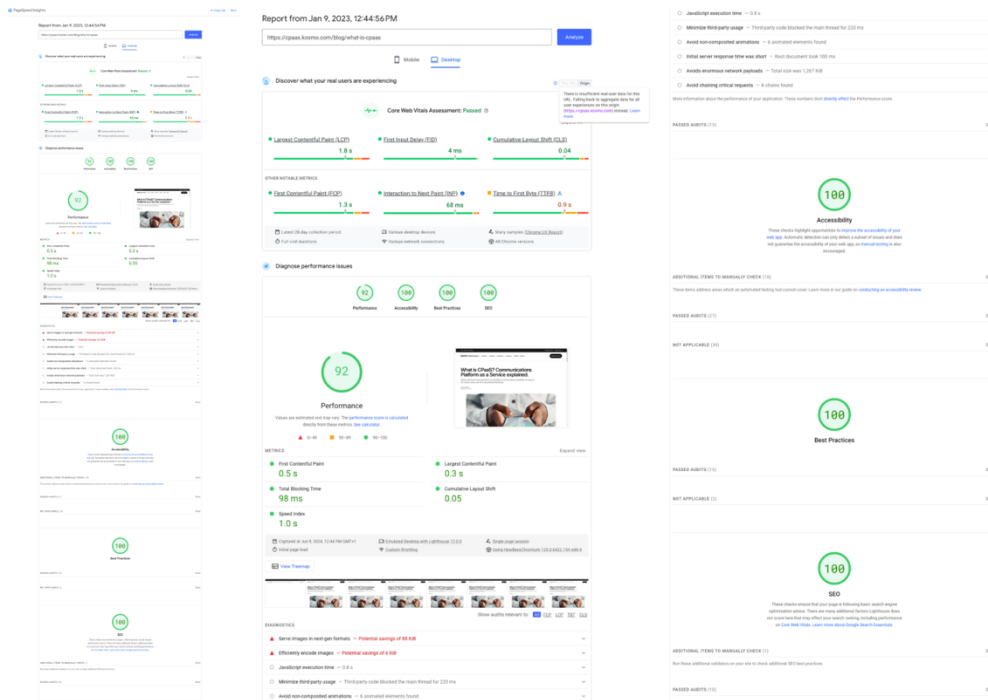


Figure 57 PageSpeed Insights Report January 2023

The page experience and technical aspects of the page were audited with the PageSpeed Insights tool. All the areas of the report including Core Web Vitals, Performance, Accessibility, Best Practices, and SEO, passed the audit.

Specifically on the Core Web Vitals, it’s important to note that the tool did not have sufficient real-user data for the specific blog, leading to the use of data from the origin URL which in this case was the homepage.

On the performance audit of the page, the tool scored the page at 92/100 and identified two problems. When examined these were the same as the homepage prior to the optimisation and referred to the compression and next gen formats of the images. These issues occurred possibly due to the images on this page not been updated to the new ones yet.

**Schema markup:**

The examined blog post featured a section of FAQs, composed of headings and body copy. However, upon further inspection of the page’s HTML, it was noted that there was no structured data markup, such as JSON-LD, Microdata, or RDFa, in the <head> section or within the body content to define the type as an "FAQPage". The absence of structured data markup does not aid the SEO of the page, which could otherwise potentially yield a rich result in SERP when the search term matches one of the FAQs.

**4.3.1.3 Summary of Step 1.**

During the first step of the optimisation process for the blog post template of the business website, the UX data was analysed to identify opportunities for improvement. The data indicated low engagement

from users on the case study blog post, as shown by shallow scroll depth and high bounce rates. More than half of the blog's visitors stayed on the website and explored more pages; however, they did not utilise the links on the blog itself, as these showed little to no clicks. Lastly, the SEO performance of the blog indicated that, even though it was keyword optimised and scored well on the PageSpeed Insights report, the template did not use the FAQ schema, which could potentially help the blog return rich results on the SERP.

### **4.3.2 Step 2: Optimisation recommendations using a user-centric approach.**

The data analysed in the previous section indicated some opportunities to improve the UX and search engine performance of the page. For the few engaged users of the blog, the eye tracking heatmap revealed their preference for structured text, while the Next Page Paths further indicated that navigation primarily occurred through the menu or browser, with in-blog links being less utilised. These findings underscore the need to enhance the blog post's structure, introduce more visual cues, and encourage user engagement and continued reading. The SEO data showed that the blog performed as expected, however there were some opportunities for improvement.

#### **4.3.2.1 UX/UI recommendations**

As observed through the heatmaps, users did not engage with the entirety of the blog and showed a preference for structured text that allowed for skim reading. Consequently, the task to enhance the ways to structure the body of the blog more, was considered. The conversion data showed very few users using the links within the blog itself to navigate to the pages that the business wanted to promote within the blog. In response to this, the next task was to create more visual CTAs within the blog that will encourage users to engage with other resources and pages. As seen from the Next Page Paths, many users navigated to more blog content, so a quicker way to navigate to related articles should be added for each blog to encourage visitors to continue reading. This would also be in-keeping with common blog practices among competitors and the Kosmo website. Scroll heatmaps and bounce rates indicated that some users disengaged rather quickly from the blog, likely due to difficulty in locating desired information. As a result, an in-page navigation was suggested to be added as an optional feature for lengthier articles. Lastly, a newsletter sign-up section was recommended as an additional feature to the template. This would present an opportunity to collect visitor data, expand the company's email database, and potentially engage with users beyond the website. As a result of the multiple tasks that require new functions, the blog post template should be considered for a redesign in order to address all these tasks and recommend any other enhancements they might see fit.

#### **4.3.2.2 SEO recommendations**

##### **4.3.2.2.1 Off-page SEO**

In regard to off-page SEO, even though no new data was acquired, it was recommended that the business continues its efforts in link building and enhancing domain authority. The recommendations included forging stronger relationships with authoritative sites closely related to the business's niche and increasing the visibility of blog content on social media to encourage more backlinks to the site.

Furthermore, to increase the blog's authority, it was suggested that the business should consider featuring content from authors who were experts in their field, whether from within the company or as guest contributors. This recommendation was made with the understanding that such a strategy would not only reinforce readers' trust in the content's reliability but also enhance the site's overall credibility.

[72]. Looking ahead, the introduction of author profiles was also recommended as a measure to further increase user confidence and boost the site's visibility.

#### **4.3.2.2.2 On-page SEO**

The use of keywords in the blog post was quite effective as they were placed in all the key points that matter to search engine crawlers. The business should continue to monitor the blog's performance in search and seek opportunities to create new content that supports the blog. Additionally, since there is an older blog with similar content on the website, the business should implement canonical tags to resolve duplicate content issues by designating an authoritative page for search engines to index and rank. This will help to clarify which version of the content is the primary one, especially if multiple pages have substantially similar or identical content.

The PageSpeed Insights audit of the blog post revealed few actionable items, with only two image issues flagged in the report that should be rectified. The solutions for these issues were already implemented during the homepage optimisation. Additionally, there was an opportunity to enhance the FAQ section of the blog post template by adding proper markup, which could enable the blog to benefit from rich results in SERPs.

#### **4.3.2.3 Summary of Step 2**

The recommendations step of the optimisation process created several tasks for consideration by the UX/UI and SEO functions of the business. The tasks for the UX/UI team included redesigning the blog post template to create more opportunities for structured copy, visual CTAs, related blog content, in-page navigation, and newsletter sign up. The off-page SEO recommendations were to continue the efforts initiated with the homepage, to maintain the momentum of link-building activities, and to engage credible experts as authors for the blog posts. For on-page SEO, the tasks were to continue assessing the effectiveness of the keywords used in the blog, to address the image issues identified in the PageSpeed Insights report, and to implement schema markup for the FAQ section.

### **4.3.3 Step 3: Implementation of proposed optimisations/**

The third step in optimising the blog post template involved reviewing the tasks outlined during the recommendation phase. Similar to the homepage implementation, solutions for the tasks were identified; however, when extensive programming was required, those aspects of the implementation fell outside the project's scope and were delegated to back-end engineers.

#### **4.3.3.1 UX/UI implementations.**

The UX/UI design started with creating wireframes for the new blog template which proposed various concepts for better-structured text, prominent CTAs, a new in-page navigation system, sign-up form for the newsletter and additionally created new avenues for integrating links to related content. Furthermore, a small revision was made to authors to include a profile picture and lastly an FAQ section was created to leverage the FAQ schema to simplify the implementation for SEO purposes.

#### **Task: More opportunities for structured copy**

The current blog format offered limited customisation options for the main body, primarily supporting h2 and h3 titles, bullet points, and block quotes. This simplicity could make the content less engaging.

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To address this, the new wireframe introduced three additional ways to structure long-form text: content callouts, content highlight and sub copy paragraphs.

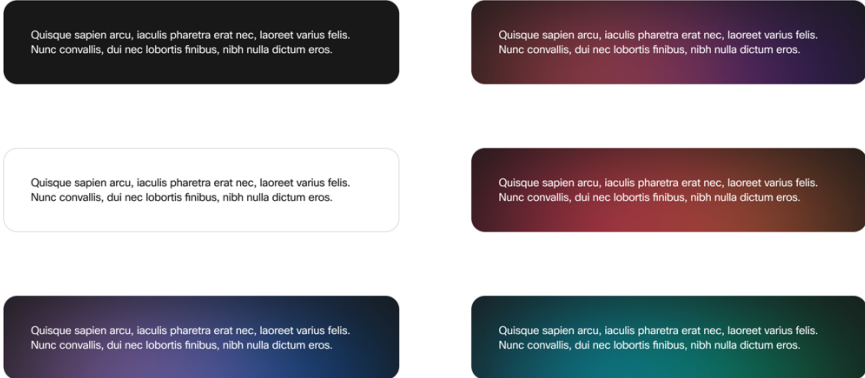


Figure 58 Content callout design.

This content callout style employed paragraph text enclosed in a box to highlight specific information, such as definitions or statistics, that the writer deemed important. The text within the box is larger than the rest of the body copy and a variety of vibrant colours were selected, making it ideal to attract user attention. Originally introducing the content callouts without any limitation to the amount of text or their use was considered, but when run a heuristic evaluation of the design among the team, it was brought to light that too much copy and the repeated use within the blog could be overwhelming to the reader. Consequently, to maintain visual balance, a character limit for callout boxes was introduced at 250 characters and their use was limited to two content callout boxes per blog post to retain their impact.

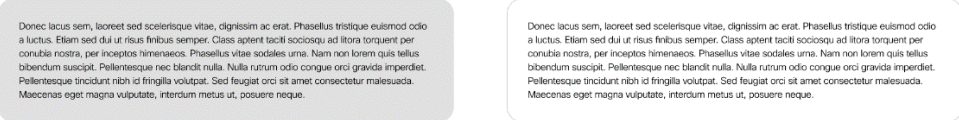


Figure 59 Content highlight design.

The content highlight box was designed for longer paragraphs, and its purpose was to enhance readability by using background colours. Unlike the content callout, this style didn't alter text size, it only introduced a subtle separation from the rest of the copy to draw attention to a particular section or break up lengthy text.

**Sub copy title /// Small/Bold 15/20 -1% Black #121212**  
 Subcopy text: Small/Light 15/20 -1% Grey #767676  
 Etiam at fermentum eros. Maecenas nunc magna, rutrum eget accumsan eu, pharetra in ex. Ut maximus arcu sit amet magna pretium, a pellentesque nunc luctus. [In tempus, elit](#) sit amet tincidunt suscipit, justo sapien finibus diam, et ultrices diam ante eu massa.

**Phasellus sed gravida tellus.**  
 Subcopy text: Sed nunc ante, congue at cursus sed, suscipit nec odio. Donec lectus arcu, mattis scelerisque sapien ut, gravida hendrerit metus. Suspendisse hendrerit nisi dui, eu maximus lectus porttitor in.

**Quisque vel risus sed.**  
 Maecenas ut erat nunc. Sed aliquam dignissim metus non semper. Praesent eleifend velit hendrerit purus laoreet, eu volutpat nisi aliquam. Aliquam vitae tincidunt diam. Pellentesque ac diam sit amet erat finibus ultrices. In facilisis est vitae tellus faucibus, eget imperdiet quam tincidunt. Sed varius semper odio ac aliquet. Phasellus dapibus orci accumsan, scelerisque elit et, lacinia neque.

**Vestibulum lobortis magna nisi.**

- Aliquam et magna sed arcu eleifend cursus.
- Nullam ac nibh in lectus finibus conwallis sagittis a nisi.
- Curabitur sed ullamcorper libero.

Figure 60 Sub copy paragraphs design.

The sub copy paragraphs style was created with the intention of replacing short paragraphs or providing alternatives to bullet points. The key feature of this proposed structure was that the sub copy was presented in a lighter colour compared to the title, indicating that this text was less critical than the rest of the content, enabling users to skim the titles or delve deeper into each subject. When originally considering this style, the sub copy was the same colour as the rest of the body copy, but that did not offer sufficient separation to the paragraph title, hence the colour changed to the grey which is used throughout the majority of the site for similar styled paragraph copy.

### Task: Visually prominent CTAs

The existing blog posts supported hyperlinked text for directing users to internal or external webpages. However, despite the consistent inclusion of links in the blog, the user journey data indicated that these links were underutilised. To address this, the introduction of buttons was considered, as they were already part of the UI system. Adding all button types: primary, secondary, and tertiary was suggested. The use of primary and secondary buttons across the rest of the site is limited to either the top of a component where the whole component is leading to a relevant page or at the end of a clear actionable section. This very specific use of these buttons could possibly create user confusion if these were to be inserted in the middle of the blog copy where a hyperlink used to be, making them unsuitable for the purpose. Tertiary buttons on the other hand, could offer authors the option to present clear CTAs to readers without interrupting the flow of the blog as they are considerably smaller and the same size as the paragraph copy.

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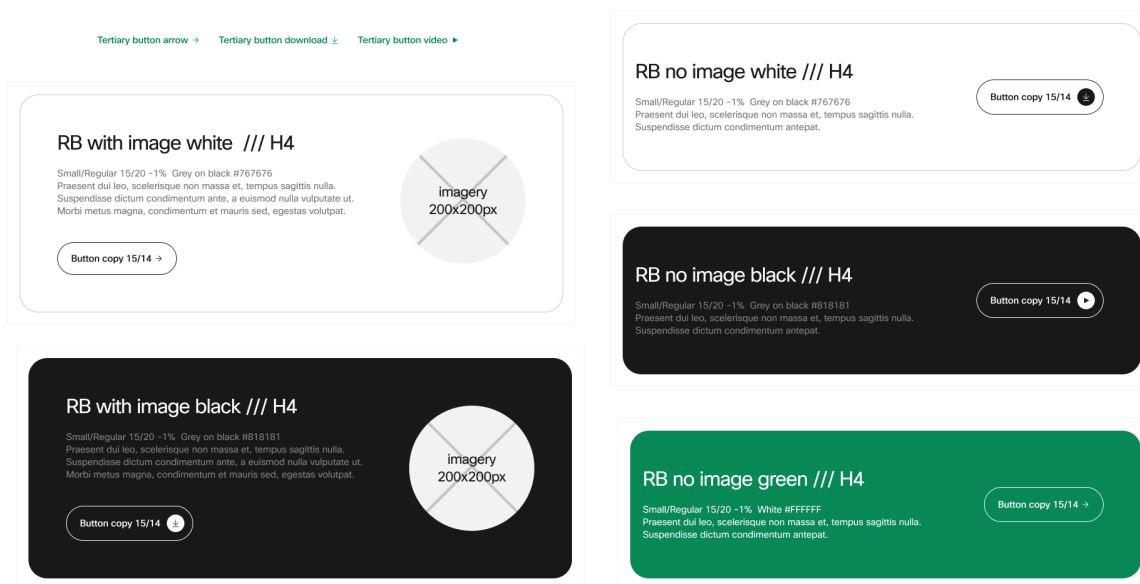


Figure 61 Visual CTAs additions.

In addition to the tertiary buttons, two resource banners, similar to existing design system elements, were proposed. These could seamlessly incorporate the code from the website’s resource banners, and quickly incorporate various colour themes and layouts. However, some adjustments would be necessary to accommodate the blog’s limited width space, primarily in terms of paddings and image sizes.

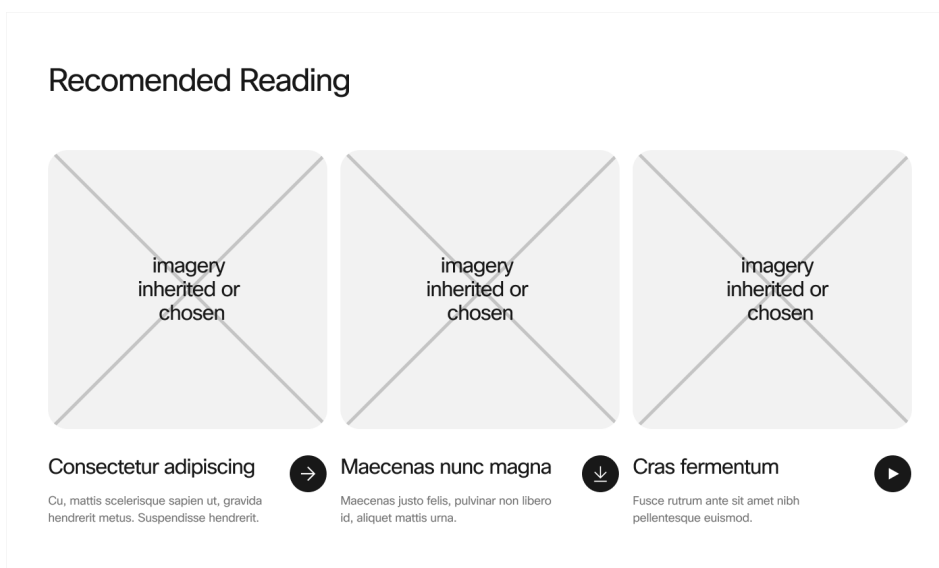


Figure 62 Recommended reading section.

In line with the introduction of buttons and resource banner elements, another new section was designed that would facilitate user navigation to relevant content throughout the website. This visually engaging

section would guide users by employing the routing cards component from the website’s library. With its use, authors would be empowered to include up to three additional resources within the blog post.

This enhancement was introduced to eliminate the need for multiple resource banners, which could disrupt the blog’s flow. Notably, the ‘Recommended reading’ section would consistently appear at the bottom of the blog post.

**Task: Related blog content**

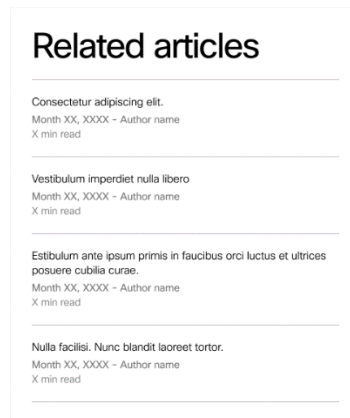


Figure 63 Related articles.

This addition of this new module would showcase other blog posts that cover similar topics. This could be added to the bottom of the blog as a list of relevant links, however that might be a bit too far down if placed after the recommended reading component, if placed before then the recommended reading would be too far down. Instead, a recommendation to add these to the side of the of the blog was made in which the full blog’s main copy would be pushed to the right side (previously was placed in the centre) and a sidebar would be created that can house this section. This would facilitate that the articles are not elongating the page further. On mobile designs however, they should be placed at the bottom of the blog copy as there would not be enough width for a sidebar.

The practical implementation of the related articles involved creating a tagging system to catalogue the blogs in categories and all existing blogs would need to be updated accordingly. Some logic would be applied to present up to four recent blogs that are most relevant to the current blog’s tags.

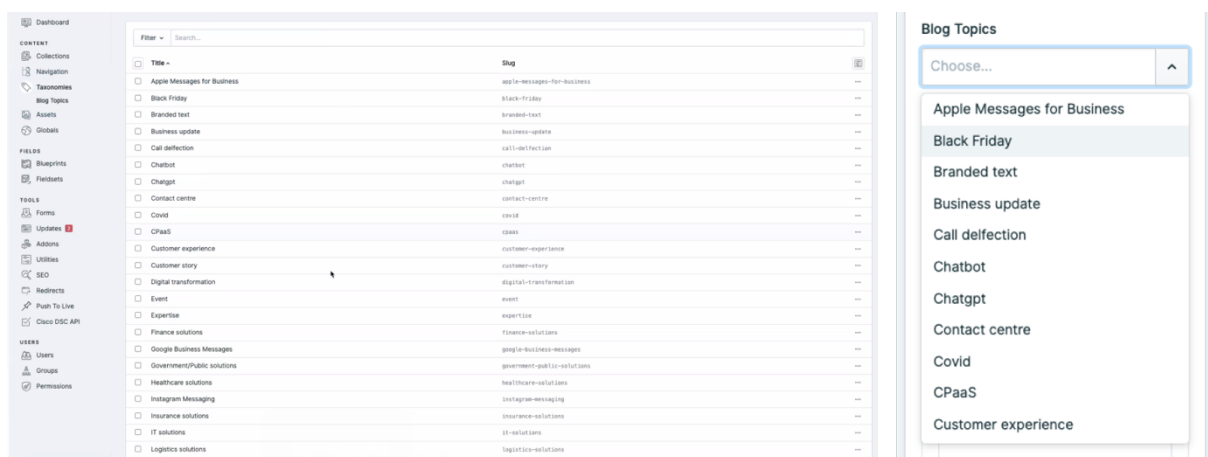


Figure 64 Taxonomies directory and selection on CMS.

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To establish this system, a new taxonomy named ‘blog topics’ was created using the CMS’s taxonomy menu, leveraging a valuable feature offered by Statamic. This CMS feature, not utilised previously, simplified the management of complex tagging systems. The initial tagging library for blog topics comprised fifty keywords. On each blog page, CMS users could select tags that best align with the content.

On the backend, blog topics would be compared with those of other blogs, and the four most recent blogs with matching tags would be displayed on the sidebar. Implementing this logic and utilising taxonomies laid the foundation for developing a more extensive tagging system to streamline website management in the future.

```
<section class="md:mb-20 mb-10" data-id="sidebar-related-content">
  <h2 class="text-h4 mb-5 text-skin-bwg">Related articles</h2>
  {{ collection:blog as="blogs" limit="4" paginate="false" :taxonomy:blog_topics="blog_topics" url:isnt="{url}" }}
  {{ if no_results }}
  <p class="text-skin-grey">Sorry, there are no other articles related to this blog</p>
  {{ else }}
  {{ blogs }}
  <a class="py-5 border-t border-skin-grey-light last:border-b block group" href="{{ slug }}">
    <h3 class="text-sm font-light text-skin-bwg group-hover:underline" href="{{ slug }}">{{ title }}</h3>
    <p class="pt-1 text-skin-grey text-sm">{{ date }} {{ if author }} - {{ author:title }}</if ></p>
    <p class="text-sm text-skin-grey md:text-sm_lg font-extralight">{{ article | where:type:text | pluck:text | join | read_time:200 }} minute read</p>
  </a>
  {{ /blogs }}
  {{ /if }}
  {{ /collection:blog }}
</section>
```

Figure 65 Relevant blog posts selection.

## Task: In-page navigation

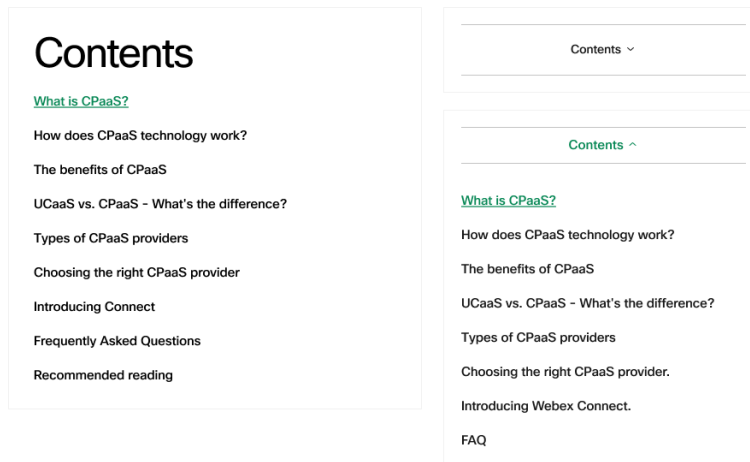


Figure 66 Contents section on sidebar desktop and mobile view.

Another new addition to the blog, was the in-page navigation. This was originally suggested to be fixed to the top of the blog, under the standfirst and before the blog’s image however that method felt that it was too early to introduce all the contents of the blog and might discourage the users from scrolling further down. Instead, the implantation suggested for the in-page navigation to be added to the newly created sidebar, under the related articles section.

```

Alpine.data('blog', () => ({
  dayMode: true,
  init() {
    const h2s = this.$refs.post.querySelectorAll('h2')
    const relatedcontent = this.$refs.relatedCont.querySelector('h2')
    let contents = document.querySelectorAll('.blog_contents')
    h2s.forEach((x, i) => {
      if (x.innerHTML !== 'Contents') {
        this.createAContentLink(x, i, contents)
      }
      if (i === (h2s.length - 1)) {
        if (relatedcontent) {
          this.createAContentLink(relatedcontent, i, contents)
        }
      }
    })
  },
  createAContentLink(x, i, contents) {
    contents.forEach(content => {
      const id = x.innerHTML.replace(/\s+/g, '-').toLowerCase()
      x.id = id;
      const a = document.createElement('a')
      const li = document.createElement('li')
      a.innerHTML = x.innerHTML
      li.classList.add(['block'])
      a.href = `#${id}`
      a.classList.add('text-sm_lg', 'hover:underline', 'hover:text-skin-ggw', 'font-normal', 'text-skin-bwg')
      x.style = style="scroll-margin-top: 10rem"
      if (i !== 0) { li.classList.add('mt-5')}
      li.appendChild(a)
      content.appendChild(li)
    })
  }
}))

```

Figure 67 Creation of content items from H2s in the body copy.

The blog navigation on the sidebar was designed to extract H2 titles from within the blog's copy, forming the list displayed on the sidebar. For this purpose, a partial was generated, activated when the contents menu is enabled on the CMS. The partial code would read the blog contents and generate an HTML list, which is then incorporated into the blog's final code.

```

<section class="sticky top-[150px] hidden md:block" data-id="contents-menu">
  <h2 class="text-h4 mb-5 text-skin-bwg">Contents</h2>
  <ul class="blog_contents">
    </ul>
</section>

```

Figure 68 HTML for in-page navigation.

The new UI design recommended that the in-page navigation was sticky, remaining visible as users scrolled down the blog page, making it even easier to navigate within an article. However, for shorter content, an option should be available to turn the navigation off, as it may not be necessary.

On mobile the contents should be placed at the top of the article, just below the featured image, and remain in the 'closed' state until the users decide to utilise it.

## Task: Newsletter sign up

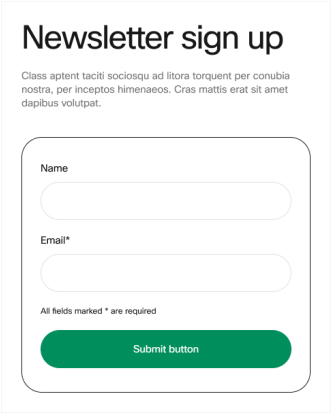


Figure 69 Newsletter sign up section.

The newsletter sign-up module provided a space for visitors to sign up to the business’ monthly newsletter. On the parent Kosmo website this section was positioned at the bottom of the blog copy before any other content was promoted and even though originally considered as an option, it unnecessarily lengthened the page. Moreover, with the newly added sidebar there would be space for the module there. However, since the contents section would be sticky, the newsletter section would be placed above it, so the content section can move freely. Lastly, on the mobile layout the module should move to the bottom of the blog below the contents.

**4.3.3.2 SEO implementations.**

**4.3.3.2.1 Off-page SEO**

There weren’t many SEO recommendations for the blog post, as previously highlighted in the SEO implementation of the homepage, the business had agreed to increase its off-page SEO activities with guest posting and promoting content on social media and other platforms.

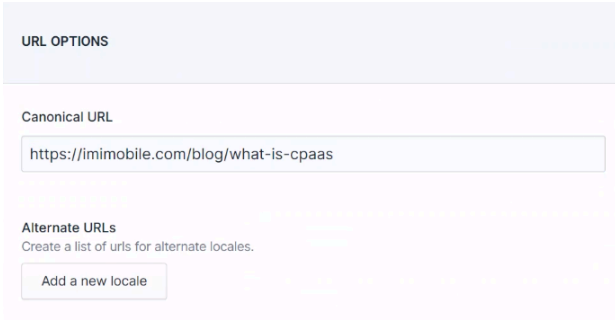
**Task: Author profiles**

The title section of the blog underwent a minor revision, to incorporate the author’s profile picture which would facilitate the future development of dedicated profile pages for each author to showcase their expertise and increase the user’s trust on the site.



Figure 70 Title, standfirst and author section.

**4.3.3.2.2 On-page SEO**

**Task: Use of canonical tags**

The screenshot shows a 'URL OPTIONS' section in a CMS. It features a 'Canonical URL' field containing the text 'https://imimobile.com/blog/what-is-cpaas'. Below this is an 'Alternate URLs' section with the instruction 'Create a list of urls for alternate locales.' and a button labeled 'Add a new locale'.

As observed, the older ‘What is CPaaS’ blog entry ranked for some of the same keywords as the newer blog. By utilising the SEO tab in the CMS, a canonical URL was added to the older blog post. This canonical tag will indicate to search engines that the newer blog post should be considered the preferred version for indexing, helping to prevent duplicate content issues and consolidate ranking signals.

**Task: Fix image issues**

The two issues on the PageSpeed Insights report were to ‘serve images in next-gen formats’ and ‘efficiently encode images’, which are identical with the issues the homepage images had prior to the optimisation process. To rectify both issues the images on the page were converted to ‘.webp’ and compressed in a similar manner as seen on page 60-62.

**4.3.3.3 Summary of Step 3**

During the implementation phase of the blog, several new sections were added to the template, resulting to the full redesign of the template. The changes aimed to enhance the visitor's experience and encourage engagement as well as increase user-trust. The wireframe for the new blog post template can be seen in Figure 71. When the new template finished with development it was released to the CMS and became available for users to use and update the existing blog post entries



### 4.3.4 Assessment of the blog optimisation

After the web optimisation process was completed, the updated blog post template was made available on the CMS in April 2023. The case study blog was then revised to include the new features, and new data were gathered to assess the impact of these changes. The data provided insights into how user behaviour on the page changed and how search performance was affected. The next section of this paper will analyse the data to determine the success of the optimisation process.

#### 4.3.4.1 UX/UI data

##### Acquisition Data

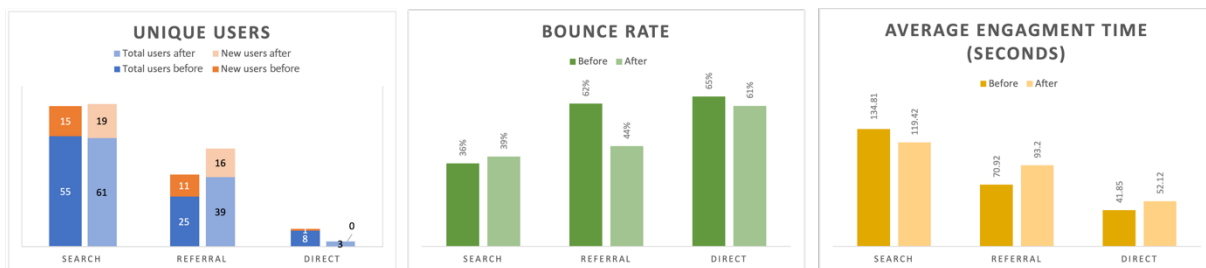


Chart 19 Comparison of blog post organic traffic and engagement.

The data in Chart 19 compares the unique users, bounce rate and average engagement time by traffic source for the blog post before and after the optimisation of the template. As the data shows the quality of users from referrals has increased as more users have accessed the blog with decreased bounce rates and higher engagement times. The users from search also increased, however the bounce rate didn't change significantly, and the engagement time decreased a little. This could also be attributed to the better structure of the content maybe hinting that users are getting to the information they searched for quicker and leaving the article sooner. For direct traffic users, even though the bounce rate decreased and engagement time increased, the number of total users is very small with no new users making the results less significant.

##### Engagement Data

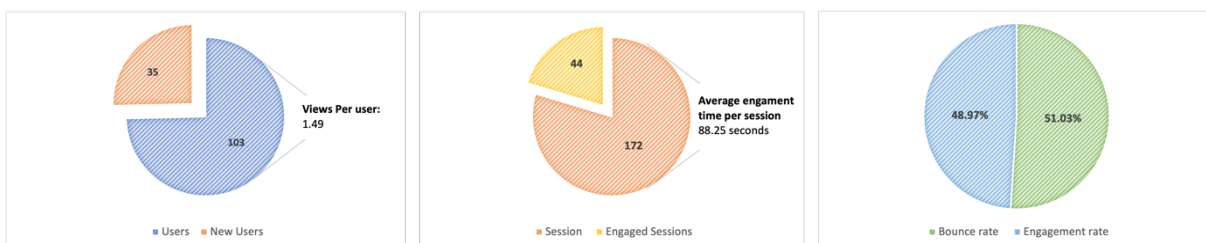


Chart 20 Traffic & engagement data post-optimisation.

Following the optimisation, the redesigned blog attracted 103 unique users, of whom 35 were new, maintaining a similar ratio to that observed prior to the changes. On average, each viewer visited the page 1.49 times, which is not significantly different from the figure recorded before the optimisation.

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Although the blog experienced 31 additional views compared to the pre-optimisation period, the percentage of engaged sessions decreased to 18%, despite the average engagement time per session rising by approximately 7 seconds. Lastly, the engagement rate increased by 16.35%, indicating that, on average, more users read more of the content after the optimisation was implemented.

To further understand how users interact with the content post-optimisation, the data from Hotjar's scroll depth, click, and eye tracking heatmaps helped to further was collected for analysis.

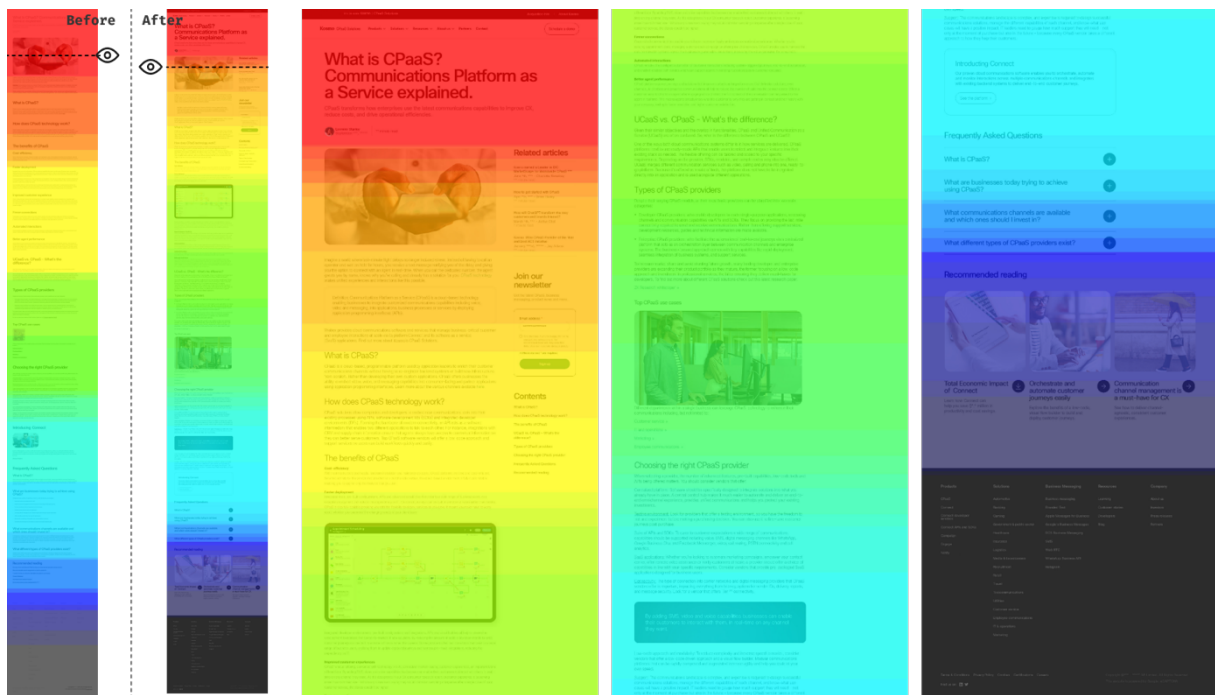


Figure 72 Blog post scroll heatmap post-optimisation.

The examined blog post, even though shorter than its last version, showed a faster transition in colder colours in the scroll heatmaps, indicating that users scrolled less, however, the majority of the main body of the text remained within the green area of the heatmap.

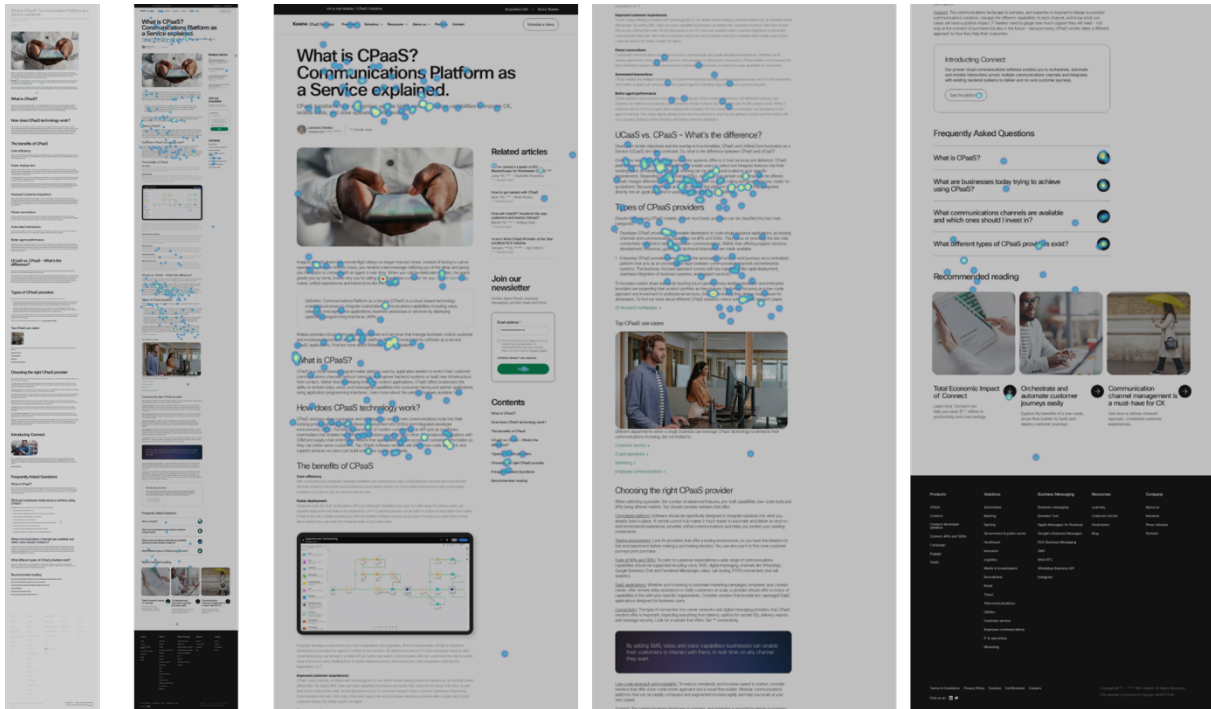


Figure 73 Blog post click heatmap.



Figure 74 Blog post eye tracking heatmap.

The click and eye-tracking heatmaps (Figure 73 and Figure 74) showed a notable increase in interaction from the users. The click heatmap indicated that users were utilising the in-page navigation and were interacting with the FAQ section of the blog by clicking at the expanding buttons. Additionally, several clicks were distributed on the various CTAs on the page. The eye tracking heatmap indicated that users

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were engaging with the article significantly more than before the optimisation, it also showed that the various designs made to format the text and concentrate the user attention had been successful.

Conversion data

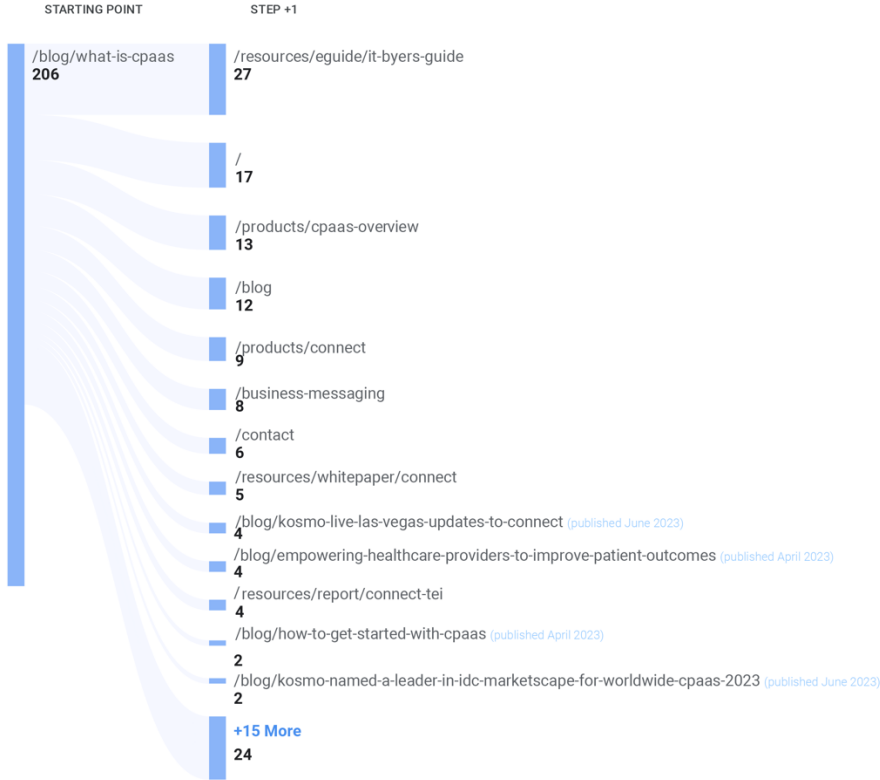


Figure 75 Blog Next Page Paths post optimisation.

The Next Page Path data indicated an increase in the diversity of pages visited, with a rise of seven pages to 28 different pages in total and a reduction in the drop-off rate from 37.5% to 33.49%. A significant change post-optimisation was the variability in the pages visited subsequent to viewing the blog; this varied considerably across different data periods. Prior to optimisation, visitors predominantly browsed other blog posts, likely by returning to the blog’s landing page to access recent entries. As evidenced in Table 12, most links on the blog were underutilised.

In contrast, after optimisation, the Next Page Path data reveals that the majority of pages visited following a blog post were embedded within the same page. Apart from the homepage, contact page, and blog landing page, the subsequent pages visited were all directly linked from within the blog post itself. Furthermore, Table 17 demonstrates that all links on the page gained some level of user interaction.

Table 17 Clicks on links on the page post-optimisation.

<b><i>Internal links on page</i></b>	<b><i>Times clicked</i></b>
<i>blog/Kosmo named a leader in IDC marketscape...</i>	2
<i>blog/How to get started with CPaaS</i>	2
<i>blog/How will chatGPT transform the way cust...</i>	2
<i>blog/Kosmo wins CPaaS provider of the year...</i>	2
<i>products/CPaaS overview</i>	13
<i>Business messaging</i>	8
<i>learning/connect whitepaper</i>	5
<i>learning/IT buyers guide</i>	27
<i>solutions/Customer service</i>	1
<i>solutions/IT and ops</i>	2
<i>solutions/Marketing</i>	1
<i>solutions/Employee communications</i>	1
<i>products/Connect</i>	9
<i>learning/TEI report</i>	4
<i>blog/Why communication channel management...</i>	1
<i>blog/Five ways a low-code enterprise...</i>	1

Additional to previous conversion data, the new blog post template featured a newsletter sign up module on the side bar. The new component had 5813 impressions across the five most recent blog posts and generated 90 new sign ups to the newsletter which translates to a 2% conversion rate. The previously examined conversion rate as seen in Table 9, was 4% for desktop users across the site, which placed this lower than the rest of the site, however taking into account this was only live for a short period of time, it hints that there is space for it to grow and as more blog post are published using the new template, impressions and sign ups would increase.

In addition to the previously analysed conversion data, the updated blog post template included a newsletter sign-up module in the sidebar. This new feature garnered 5,813 impressions across the five most recent blog posts, resulting in 92 new subscriptions to the newsletter, equating to a conversion rate of 2%. When compared to the site-wide conversion rate for desktop users, which stands at 4% as shown in Table 9, the newsletter sign-up rate appears lower. However, considering that the module was only recently implemented, there is potential for growth. It is anticipated that as more blog posts are published using the new template, both impressions and sign-ups will increase.

### **Technical data**

Chapter 4:

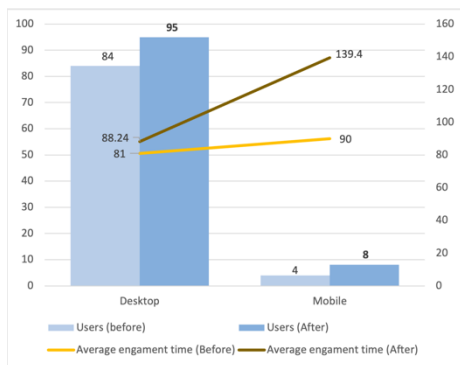


Chart 21 Desktop VS mobile users and engagement time before and after optimisation.

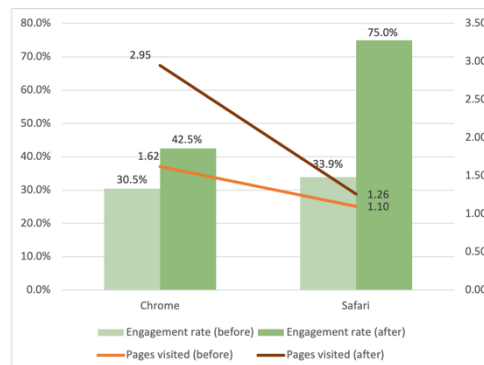


Chart 22 Chrome VS Safari engagement time and pages visited before and after optimisation

Although the blog had only eight unique users accessing it via mobile devices, these users spent significantly more time on the blog page compared to desktop users. Prior to the optimisation, mobile users were slightly more engaged than desktop users, with an average difference of 9 seconds. However, after the optimisation, the average engagement time for mobile users increased by over two minutes, making it approximately 51 seconds longer than that of desktop users.

In terms of browser usage, a similar pattern emerged. Safari users were marginally more engaged than Chrome users before the optimisation. Following the optimisation, Safari users’ engagement rate soared by 42%, reaching 75%. However, they typically visited only one page per session, whereas Chrome users visited nearly three pages on average.

The data presented in Chart 21 Chart 22 illustrate that mobile users, while highly engaged, tend to visit fewer pages. In contrast, desktop users, although less engaged, view multiple pages during their visit to the business site. This suggests that optimisation efforts have successfully increased engagement, particularly on mobile devices, which could be due to a more responsive design or improved user experience. However, the challenge remains to encourage deeper navigation within the site, especially for mobile users. Future optimisation could focus on strategies to increase page visits without compromising user engagement, potentially leading to greater overall site retention and conversion rates.

#### 4.3.4.2 SEO data



Chart 23 Impressions and clicks graph December 2022 to July 2023

The search performance of the blog remained relatively stable throughout the observation period. Impressions, as shown in Chart 23 exhibited a gradual decline over time, which was somewhat anticipated as the blog post aged and moved further from its original publication date. However, there was an improvement in the average search position, which climbed to 29.1 from the previously recorded 53.8. This advancement positions the blog, on average, on the third page of search results. Additionally, the graph illustrates that both the number and frequency of clicks have experienced an increase following the implementation of the new template.

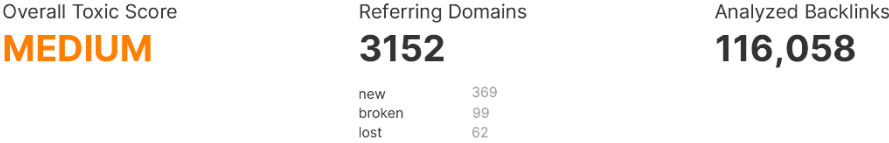
##### 4.3.4.2.1 Off-page SEO

Throughout the optimisation cycle of the blog post, there were no new off-page SEO activities to evaluate or tasks to carry out, other than maintaining the initiatives commenced during the homepage optimisation. Given that an additional six months have elapsed since the last data set was analysed, which followed the optimisation of the homepage, and assuming that off-page efforts continued throughout this interval as recommended, the forthcoming analysis will revisit the data from a site-wide perspective.

##### Link building.

Chapter 4:

Backlink Audit: Summary



Backlink Audit: Domains by Toxic Score



Backlink Audit: Follow vs Nofollow

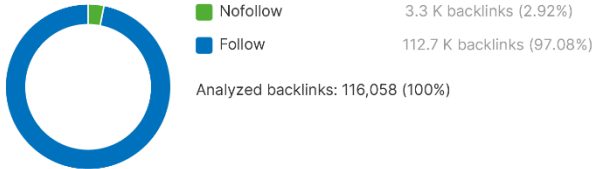


Figure 76 Semrush backlink report July 2023.

Throughout the course of this project, numerous efforts were made to enhance the site’s link-building strategy. These included improving key partnerships and client relationships, engaging in guest posting, promoting content on other websites, and continuously monitoring the relevance and quality of inbound referring domains. As seen in Figure 76 the site’s toxicity score remained within the ‘medium’ quality range; however, the proportion of toxic links decreased to 4%, with non-toxic links constituting the majority of backlinks.

Additionally, the number of referring domains increased to over 3K, and there was a general uptick in the number of backlinks. Although the current figures have not yet matched the pre-optimisation peak of 117K backlinks—due in part to the process involving the disavowal of numerous links—the trajectory of link building is positive. With sustained commitment, the quality and quantity of backlinks should continue to improve.

Domain Authority

Table 18 Comparison of Domain Authority and key SEO metrics May 2022 - July 2023.

<i>Date</i>	<i>Domain Authority</i>	<i>Organic traffic</i>	<i>Keywords</i>	<i>Backlinks</i>
May 2022	38	6.2 K	655	117K
December 2022	42	6.5 K	847	113 K
July 2023	57	9.1 K	1.7 K	116 K

Overall, the latest data demonstrated significant improvements across all principal SEO metrics, suggesting that the optimisation efforts have been fruitful. The increase in Domain Authority to 57 is particularly noteworthy, as it positions the site ahead of three out of four competitors, as detailed in Table 3. This increase not only underscored the site’s competitive standing but also reflected a substantial fortification of its backlink profile. While the number of backlinks has shown a small increase, the significant rise in Domain Authority points to an improvement in backlink quality, signalling a more authoritative and influential backlink profile.

Organic traffic has experienced an increase of around 40%, suggesting that the website was more discoverable through organic search, likely a result of improved search engine rankings and enhanced online visibility. This growth in organic traffic is also a testament to the broader SEO strategy, which included optimisation across various pages for a multitude of keywords, leading to a total of 1.7K ranking keywords—a factor that has undoubtedly contributed to attracting a larger audience.

### Social Media

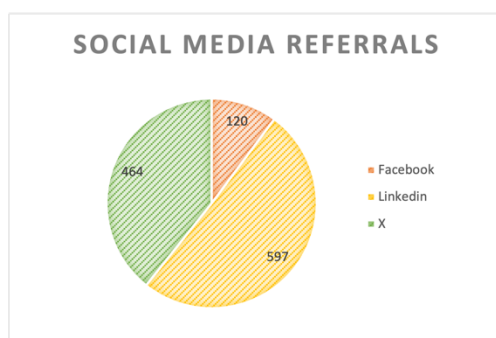


Chart 24 Users referred by social media April-July 2023

The social media referral traffic remained largely unchanged following the homepage optimisation. However, after the blog post template was optimised, there was a notable increase in referral traffic from social media, with a growth of approximately 73%. This increase suggests that the initiatives implemented during the period under review have had a positive impact. Although the social media strategy encompasses more than just SEO, its contribution to SEO was substantial. With continued and broader marketing efforts, social media referrals are expected to further increase, thereby supporting the off-page SEO strategy objectives.

#### 4.3.4.2.2 On-page SEO

### Content & Keywords

As seen in the first analysis of the blog, it performed,

Table 19 Ranking keywords for blog post-optimisation

<i>/blog/what-is-cpaas</i>	
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Chapter 4:

<b>Keyword</b>	<b>Position</b>	<b>Change</b>	<b>Search volume</b>
<i>define cpaas</i>	12	+4	10
<i>cpaas model</i>	12	+3	10
<i>what is a cpaas</i>	13	-2	10
<i>cpaas definition</i>	13	+1	32
<i>cpaas meaning</i>	14	+3	570
<i>cpaas technology</i>	16	+3	10
<i>what is a cpaas provider</i>	17	+8	10
<i>what is cpaas</i>	17	-3	390
<i>what does cpaas mean</i>	17	+2	10
<i>what is cpaas provider</i>	20	+6	10
<i>what is cpaas platform</i>	25	-3	10
<i>how does cpaas work</i>	39	-10	10
<i>benefits cpaas</i>	47	-1	10
<i>benefits of cpaas</i>	55	-15	10
<i>how companies use cpaas</i>	70	-15	10
<i>cpaas providers</i>	-	-32	110
<i>cloud communications platform as a service</i>	-	-51	10
<i>cpaas</i>	-	-72	2400

Looking at the changes in the blog’s performance with ranking keywords, some changes can be seen, where some keywords performed better post-optimisation and some were dropped, specifically at the cpaas keyword, the site showed on the SERP for various terms, as seen in The only keyword that appeared in both the core targeted keywords and the top search queries is ‘cpaas’, which had the highest impressions but did not generate any clicks for the blog. This was expected since it appeared very low in the result pages. Examining the rest of the terms, the branded terms, similarly to the homepage, resulted in the blog ranking on the first page and capturing the majority of the clicks. Additionally, a couple more search terms positioned the blog in the first page of results; however, they did not attract many clicks due to the low number of impressions for those terms. The rest of the queries in Table 19 positioned the blog from the second to the seventh page in the result pages and yielded very few clicks.



Chart 25 Post-optimisation impressions of two blogs.

Furthermore, the implementation phase, canonical tags were applied to blog posts covering similar topics. This practice signals to search engines that the new 'what is CPaaS' blog post should be prioritised for indexing and ranking. Chart 25 reveals that the impressions for the older, non-optimised blog post have gradually diminished, while the newer, SEO-friendly blog post has been gaining increased traction throughout the observation period. This trend highlights the value of using canonical tags to direct search engine attention and improve the visibility of targeted content.

### Schema markup:

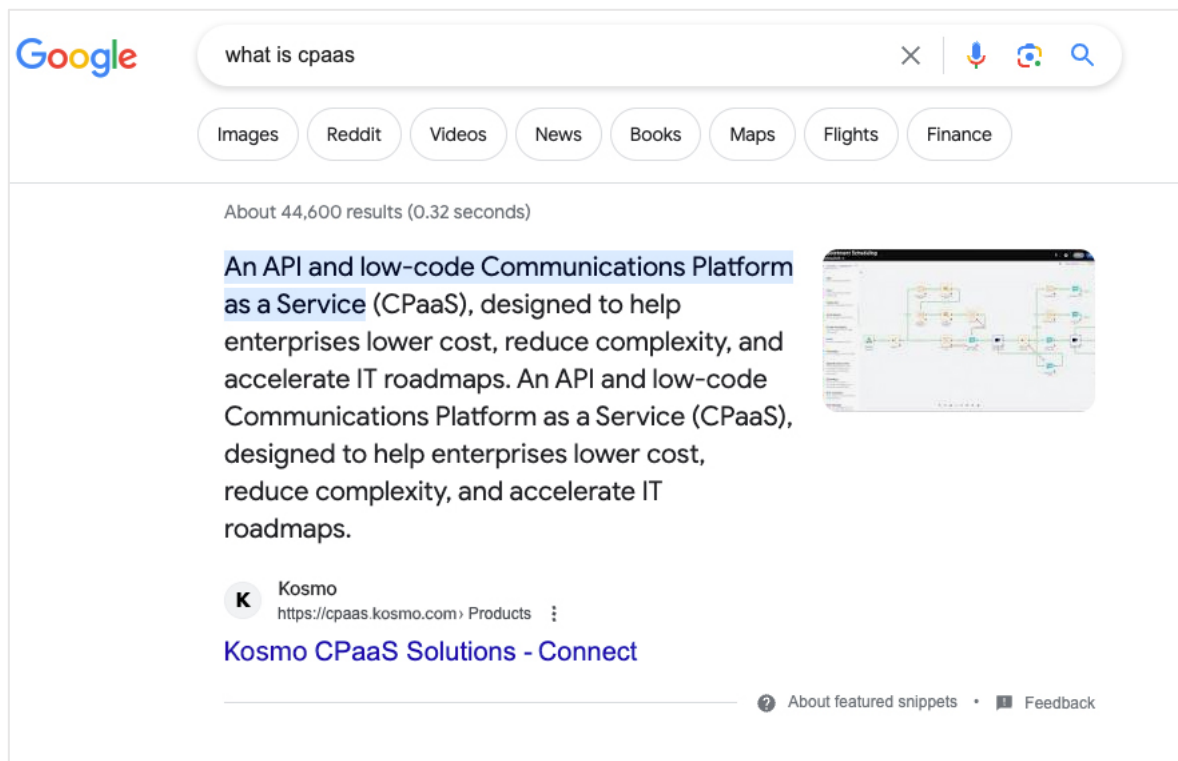


Figure 77 Rich result for 'what is cpaas' search term - google.com

The introduction of the FAQ module to the blog post template has been instrumental in targeting question-based searches, with a strategic emphasis on structured text. This tactic not only aligned with long-tail keyword strategies but also enhanced the blog's visibility and relevance for CPaaS-related queries.

As illustrated in Figure 77, the targeted keyword 'what is CPaaS' yielded a rich result in Google's search engine results pages (SERPs), drawing the definition directly from the page's FAQ schema. The FAQ section, now featured across multiple blogs and pages on the site, has made a significant impact. In the first month following its implementation, it generated a total of 4,634 impressions, with approximately 22% attributed to the newly optimised blog post. This data underscored the effectiveness of the FAQ module in improving the site's search presence.

#### **4.4 Chapter 4 summary**

This section analysed the optimisation process of the homepage and blog post template of a large B2B website. Different methods of improvement were considered and explored, and various techniques for attracting traffic and increasing usability were investigated. The process was data-led, and decisions were taken based on observations of actual user behaviours and UX design best practices. A comparative analysis was conducted to evaluate the impact of the recommended optimisations, comparing metrics from before and after their implementation.

According to the results of the post-optimisation analysis, the process appears to have been successful in improving the metrics it was intended to. However, some of the actions taken did not yield the expected results, which demonstrates that a data-led approach is only as good as one's interpretation of the data: something as simple as tailoring a strategy to different audiences on different platforms can produce dramatic differences in results.

## Chapter 5: Discussion

### 5.1 Introduction

The final section of the methodology examined the UX/UI and SEO post-optimisation data of the company's website. With empirical evidence in hand, this discussion aims to dissect the pivotal decisions that guided the optimisation process and evaluate their impact. The rationale behind each modification will be investigated, to understand the cause-and-effect dynamics at play in the optimisation process. Furthermore, the correlation between the applied SEO techniques and the observed metrics will be explored.

### 5.2 Discussion

The key goals of this optimisation process were to improve user engagement below the fold, to increase the homepage's visibility on Google search engine for the targeted keywords for the homepage, and to increase user engagement and retention on the blog post page. Some smaller optimisations were also implemented to address additional requests that were made by the marketing team of the business, such as the inclusion of some additional information, and the condensing or removal of some content, and reemphasis of others. Additionally, some SEO optimisations were suggested.

User engagement did indeed increase on both the homepage and the blog, which is demonstrated by the evidence of both deeper scroll depths and below-the-fold click activity on heatmaps. The organisation's search visibility did improve, but it remained unable to break the top page of Google results and so the increase was of questionable use: it may be argued that this was an optimistic goal to begin with. The user retention rates for visitors arriving via blog posts also went up.

The one improvement which would have hugely benefitted this study is more and richer sources of data, especially qualitative. In many cases, unusual user behaviour was observable but the reasons behind it remained opaque, making it difficult to divine the exact nature of the issue: one example of this is the link to access the downloadable content, which the data showed wasn't being clicked, but failed to provide an explanation as to why. This and other examples meant that some aspects of optimisation necessitated more guesswork than was desirable. User interviews or session recordings would likely have shone more light on the motivations underpinning user behaviour.

The new UI design of the homepage created several new opportunities for interactivity for visitors, by introducing new features such as the content cards, the interactive Connect component, and the vertical tabs. Such a drastic revamp could potentially alienate returning visitors in the middle of their buying journey, who may struggle locating the information that was there before. Still, the average time spent on the page by familiar users, as seen through direct traffic, has increased by roughly 10%, which suggests that the benefits outweigh the negatives.

The post-optimisation heatmap data showed that more users viewed deeper parts of the homepage, which was one of the major goals of the project. The balance of interactivity on the page was key to its success: when the page was lacking interactive elements, users did not find it sufficiently engaging and dismissed it. By contrast, if the page felt crowded by interactive elements, users may feel overwhelmed by the overabundance of choice and leave the page with negative impression of the brand. Therefore, the approach that was applied was considered by the design team to be an appropriate method of achieving this goal.

## Chapter 5:

The events data indicated a more gradual distribution of clicks when compared to pre-optimisation, where the page had a spike of clicks on the connect section halfway down the page: by contrast, the blog was receiving very few clicks at all. The improved hierarchy of information on the post-optimisation homepage would seem to have contributed to the more standardised diffusion of clicks, in contrast to the more haphazard previous arrangement. However, this conclusion should perhaps be considered in the light of the lack of success of the relocation of the resource download: despite being moved to a far more visible section it failed to attract as much interest as the surrounding elements, suggesting a disconnect between what the business believes is useful information and what the users themselves find useful. Post-optimisation, the increase visibility on the blog page would seem to have made them a more appealing prospect for the users as the overall click rate on the page increased.

The decision of exactly which keywords to target was taken by senior stakeholders and inherited by the SEO team. The selected keywords all incorporated ‘communications platform,’ which is the description of the core product of the business. By targeting such keywords, the business positioned itself among its competitors who also target the same queries. The keywords targeted in this optimisation process might be considered ‘solution-centred’: that is, they described the solutions to problems, rather than the problems themselves. An alternative approach might have been to focus on *problem*-centred language. When business buyers begin their research journey, it seems likely that they will search for the problem they wish to be solved, rather than trying to predict the solution. Using problem-centred keywords would seem to be a way to capture such buyers: however, it’s also the case that once these buyers have identified the solution to their issue, they will then search for that term. In either case, this demonstrates the importance of educating site visitors about the exact nature of the product, thereby positioning it as the best solution to their problem [86].

Following the optimisation process the homepage was receiving new impressions for the targeted keywords, but it was not yet ranking on the first page of results. While the page did technically appear on the SERP, its position was on page four or lower, and as seen, any ranking below the first page hardly receives any traffic. This outcome was expected by the stakeholders, as the page had only been live in its new version for a short period at the time of data collection. Moreover, it is suggested that additional pages be strategically optimised with semantic variations of the keywords to help Google understand the site’s overall relevance to ‘cloud communications’, and to cover the topic more comprehensively, which can be valuable both for SEO and visitors.

The request for change on both the website’s homepage and the blog post template could have been carried out in many ways, several more dramatic than what was ultimately decided upon. The existing framework of the website incorporates the use of a CMS, which enables multiple users to update pages as and when it’s needed. Hardcoding the page would make for a faster initial development process but would make updating the page less flexible: it would be especially beneficial for singular, one-off elements, such as the top hero block and interactive connect, which are not repeated elsewhere on the site. Hardcoding the page could also potentially contribute to keeping the DOM size smaller. Even though the option of hardcoding the page was considered, the choice to develop fully reusable components for the CMS was implemented, to allow more flexibility and adaptability in the future. Having to rely upon the availability of a web developer every time a minor change is needed can frustrate development. Additionally, the new components on the CMS can be readily available for optimisations on other pages of the site, such as allowing for blog posts to be more customisable than before, as seen in the implementation process.

The new homepage design saw the addition of three entirely new components. The decision to use all-new elements, rather than repurpose existing ones, was made in order to present new content in an innovative way, avoiding repetition and keeping the page length short, despite requiring more development and testing time. At the same time, the decision was made to add the sidebar to the blog which incorporated the in-page navigation links, related articles section, and newsletter sign up section. As with the homepage, this was an entirely new element again to increase the visual distinctiveness of the page and reduce its overall length.

The recommendation process chose not to correct for two ‘amber’ issues identified by the PageSpeed Insights report, even though both could potentially affect the speed of the site. The DOM size issue in particular was upgraded to ‘red’ post-optimisation, and still ignored. By using fully customisable CMS elements that can be easily changed visually for multiple themes and host different types of content, the DOM was expected to increase in size. Additionally, as identified through the report, the third-party code may increase the DOM size, affecting the site’s speed. Consequently, further opportunities for optimisation could be identified in manipulating the way third-party scripts are loaded, reducing their impact on the DOM size.

The domain authority of the website over the length of this project, has increased by 19 points, from 38 to 57. This may reflect that the company’s decision to cull over two thousand weak backlinks, which may have seemed a risky strategy, instead helped them cultivate a stronger domain authority through the increased quality of the remaining links to the site. The backlinks slowly grew back to 116k from 113k, only slightly fewer than before any optimisation begun. The improved domain authority may also be attributed to the decisions made around increasing guest posting across the Kosmo family of websites and growing the number of external backlinks from authoritative partner sources. While the Semrush opportunities report identified several non-Kosmo organisations to potentially pursue linking relationships with, the business elected to keep link activity as closely connected as possible: again an action which may have seemed a gamble, but which demonstrably improved the domain authority score.

As expected, and despite the diligent implementation of best off- and on-page SEO practices, the homepage didn’t immediately achieve a prominent ranking in the SERP. However, the homepage began to generate impressions, which is indicative of the period immediately following the completion of an optimisation cycle. It underscores the fact that SEO is not a one-time endeavour, but a continuous effort that requires ongoing refinement and adaptation: expecting quick results from SEO optimisation is naive. Moreover, it was theorised that, as the website continues to grow in its authority, and potential opportunities for improvement are identified by examining the SEO and UX data post-optimisation, a gradual improvement in search engine visibility will be observed.

Finally, the site optimisation would doubtlessly have been improved if more time had been allotted to the process, which would have provided more space for designers and developers to better identify aspects of user behaviour, to test and explore alternative design ideas, and conduct heuristic evaluations. The prospect of optimising the mobile site was also overlooked as a direct result of time constraints.

### **5.3 Chapter 5 summary**

The optimisation process examined in this study was led by a data-driven approach: the optimisation team measured user actions, and made decisions about the page’s future direction based on that data. This method, taking users’ actual behaviours into account, formed the backbone of the overall UX design strategy: that the approach to optimisation should be user-centred. This of course also means that the process is only as robust as the data collected: the more accurate the systems used to measure

## Chapter 5:

behaviour, the stronger the foundation of the decision-making. New and richer types of data should be continually collected, not only to fine-tune the website's performance, but also to deepen the organisation's understanding of its audience. Quantitative and qualitative data are not just metrics, but conversation pieces that enable the researcher to question, hypothesise, and debate the most effective strategies moving forward. It also means that the guidance provided by search engines, particularly Google, is pivotal to this discussion, for good or bad. Their insights are not merely directives to be followed, but represent an additional voice in the conversation – a voice that reflects the complex interplay between user behaviour, web design and online visibility.

Much of the optimisation process focused on ensuring that the user experience was as engaging as possible – that the time the user spent on the page was pleasant, efficient, and memorable. Usability is paramount in this context, as a website must first and foremost facilitate a seamless and intuitive user experience: but this should not halt creativity, innovation, or experimentation. The exercise of redesigning the homepage and blog post template provided opportunities to try new ideas and approaches, which were validated through listening to users' reactions. It is through the process of trial and testing that the technological landscape continues to expand its boundaries of who it reaches and how. A well-structured layout that guides users through content with ease and clarity, paired with an easy-to-use and aesthetically pleasing UI, makes a website that is enjoyable to use.

Throughout this process, it has been repeatedly demonstrated that the web optimisation process requires the continual balancing of shifting priorities. Time and resources are finite, and as such strategic prioritising of objectives is required, while maintaining awareness that each choice carries a weight and consequence. The optimisation journey is marked by the delicate interplay between improving user satisfaction and catering to search engine techniques to improve visibility. Professionals must navigate the fine line between immediate results and the patience required by long-term growth strategies such as SEO. Embracing these contrasts is essential; it's through a holistic and persistent approach that the optimisation process truly flourishes. Lastly, optimisation should not be viewed as a singular construct but as a perpetual process, a consistent cycle of refinement that adapts to the shifting technological advancements and user behaviour.

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## APPENDIX A : Terminology

### **Bounce rate.**

Bounce rate is a metric that reflects the percentage of visitors who navigate away from a site after viewing only one page without interacting with the content.

### **Branded search**

A branded search query is when the query contains the brand name associated with the website. For example, “Kosmo cloud communications” is a branded query whereas “cloud communications” is unbranded. With a branded search, the website in question is very likely to rank highly in the search results page.

### **CIM suite**

The Customer Interaction Management (CIM) suite was made up of the main product of Connect, and four secondary products in the form of applications that served as plugins to the platform or as standalone.

### **CMS**

A CMS (Content Management System) is a software application or platform that enables users to create, manage, and organise digital content on websites easily, without requiring extensive technical expertise. For example, it would allow blog users to easily embed video without having to write any code.

### **Component or module**

This is a pre-designed and pre-formatted visual element that can be added to a webpage such as a banner, or an image-text combination. CMS users can select and combine multiple building blocks to create and structure a webpage according to their needs. Components are like ready-made templates for different types of content or functionality. Modules in a CMS empower users to construct webpages efficiently and flexibly, making web content management more accessible and user-friendly.

### **Connect (Product)**

Connect is the flagship product offered by the organisation. It serves as a Cloud Communications Platform that empowers businesses to connect popular messaging channels to their internal systems, thereby automating customer journeys. In essence, Connect is a Communication Platform as-a-Service (CPaaS).

### **CTA:**

CTA stands for ‘Call to action’ and is a marketing term used to describe the desired action for the user to take after engaging with the content. CTAs are typically clear and actionable statements or buttons that encourage the audience to do something specific, for example “Book a demo”. This website has five styles of CTAs: primary button, secondary button, tertiary button, icon button, and hyperlinked text.

- Primary Button: These are the most important buttons, driving user engagement and conversions. On this website, primary buttons are solid green with white text and matching icons, available in both light and dark modes.

- Secondary Button: These buttons are less prominent, used for less critical actions or alternatives to the primary call to action. They share the same size as primary buttons but have a different appearance, being outlined in white or black. They often accompany primary buttons or are used in less important modules.
- Tertiary Button: Tertiary buttons are even less prominent, following secondary buttons in importance. They are highlighted in green with accompanying icons and are typically positioned after longer paragraphs or in rows to guide users to less critical actions.
- Icon Button: Icon buttons are round buttons featuring icons, varying in appearance depending on the section, and indicate the expected content upon clicking. They are often paired with explanatory text and are integrated into larger design elements.
- Hyperlinked Text: In HTML, hyperlinked text is any text enclosed within `<a>` `</a>` tags. On this website, it refers to text within a paragraph that is hyperlinked, but not presented as a button, simply as underlined text.

## **DOM**

DOM stands for Document Object Model. The DOM is a programming interface that represents the structured content of a webpage, allowing developers to access and manipulate elements using scripting languages like JavaScript.

## **Engagement**

An engagement is any user interaction with the site including: viewing of content, scrolling, time spent on a page, watching a video, downloading a resource, clicking on a button, and more.

## **Façade**

A facade is a static element that closely resembles the actual embedded third-party component but lacks functionality. It offers a more straightforward and controlled method for managing the integration and loading of third-party components into a website, reducing the strain on page load times.

## **Key Event or Event**

A key event or event is a specific interaction on the website, as set in GA by the website's owner. This can be a click on a link, or adding an item in the basket, or filling in a form etc.

## **Lazy loading**

Lazy loading is an optimisation technique that delays the loading of resources such as images or scripts, until they are needed. The approach of lazy loading can reduce the initial load times and improve the overall UX by ensuring that users are not waiting for unnecessary resources to download before they can interact with the page.

## **Organic traffic**

Organic traffic refers to the visitors that arrive on a website naturally through unpaid search results, rather than through paid ads. It also includes visitors that land on a page through other websites' links or by typing the URL on their browser's address bar.

## APPENDIX A

### **Resource download**


This is a component or element on the page that its primary purpose is to prompt the user to download an asset.

### **Session**

A session as measured by GA, is all the user's engagements with the website within the same visit. It begins when the user first loads the page and ends by default after 30 minutes of inactivity.

## APPENDIX B : Personas

These are the four key personas that the organisation used to start the digital optimisation of its website. They are a combination of design and proto personas, created using data from the marketing department’s messaging framework for 2022/2023. Using the organisation’s positioning message as a foundation, the personas were constructed considering the three key themes of engagement of consideration – ‘digital transformation’, ‘future of messaging’, and ‘enterprise readiness’ - as well as the industries, job titles, regions, and buyer needs identified by the marketing department as key targets. For example, the theme of ‘digital transformation’ and ‘future of messaging’ were used to create Dave’s tasks, while ‘enterprise readiness’ was a key consideration in defining Graham. Though these four personas do not cover every aspect of the marketing plan, it is felt that they are broadly representative of the company’s targeted audience.



Job Level	Team Type
C-level VP <b>Director</b> Senior Manager	<b>Customer Service</b> Employee Comms IT & Ops Marketing
Customer Base	Agent Base
1,000,000+ 10,000,000+ <b>50,000,000+</b>	100 500 <b>1000</b>
Computer Type	Domain Expertise
<b>Desktop</b> Tablet Mobile	Low <b>Average</b> High

### Dave


Dave is in his late forties and is a CX Director for a large retail corporation. Dave is charged with making his company stand out in a very competitive field. Their customers are bombarded with information from competitors, and Dave needs to make sure that his organisation stands out by effectively using the latest communication channels. Dave wants to create a unified experience throughout the customer lifecycle and is looking for a platform that will help consolidate the vast number of data points he has and orchestrate the customers’ journeys. He’s also pressured to reduce agent spend and streamline their work.

**Critical tasks:**

---

- 1: Reach customers on their preferred channel.
- 2: Build a framework for customer self-serve.

Figure 78 Dave, Customer Experience Director in Retail.



Job Level	Team Type
C-level VP Director <b>Senior Manager</b>	Customer Service Employee Comms <b>IT &amp; Operations</b> Marketing
Customer Base	Agent Base
1,000,000+ <b>10,000,000+</b> 50,000,000+	100 <b>500</b> 1000
Computer Type	Domain Expertise
<b>Desktop</b> Tablet Mobile	Low <b>Average</b> High

## Michele


Michele, early 40s, was recently appointed as a digital transformation officer for a large group of hospitals in the Pacific Northwest. She has a tech background, and believes in the potential of modern communication technologies. She's eager to improve patient experience by enabling self-serve and two-way communication between patients and helathcare providers while reducing processing patient time. Michele is particulary keen to encourage older patients to engage with digital channels. Some of the clinics in the group have experimented with video calling during the recent COVID pandemic and Sally is tasked with consolidating the various video services into one platform.

**Critical tasks:**

---

- 1: Reduce costs by automating patient communications.
- 2: Introduce/streamline video consultations.

Figure 79 Michele, Senior Manager in Healthcare



Job Level	Team Type
C-level <b>VP</b> Director Senior Manager	Customer Service Employee Comms <b>IT &amp; Operations</b> Marketing
Customer Base	Agent Base
1,000,000+ <b>10,000,000+</b> 50,000,000+	<b>100</b> 500 1000
Computer Type	Domain Expertise
<b>Desktop</b> Tablet Mobile	<b>Low</b> Average High

## Graham


Graham, 60, has been VP of Operations in a large UK bank for 6 years. His bank has been with our organisation for many years but in a different capacity. Recently a SIM swap fraud scandal has created political pressure on the bank to tighten up its anti-fraud measures. Graham also thinks that introducing one-time passwords (OTP) for business customers is a way for the bank to appear proactive regarding customer security. The banks' records exist on various antiquated formats, and also use a variety of other applications and backend systems which need to be centralised and streamlined to create accurate customer profiles.

**Critical tasks:**

---

- 1: Address SIM swap fraud.
- 2: Create a database of confirmed customer profiles.
- 3: Roll out OTPs for business users.

Figure 80 Graham, VP of Operations in BFSI.



## Sarah

Sarah is in her fifties and is the CMO of a major European telcommunication company. The organisations' marketing database shrank as a result of the 2018 GDPR reform, Sarah has a target to re-establish these records and needs a service which makes it simple for customers to register their preferences. She also wants to leverage the information they hold for each customer to delivery device-targeted and personalised communications. She wants to make sure her investment is future-proof and will be able to incorporate new channels in the future.

<b>Job Level</b>	<b>Team Type</b>
<p style="color: #00a651; margin: 0;">C-level</p> <p style="margin: 0;">VP</p> <p style="margin: 0;">Director</p> <p style="margin: 0;">Senior Manager</p>	<p style="margin: 0;">Customer Service</p> <p style="margin: 0;">Employee Comms</p> <p style="margin: 0;">IT &amp; Operations</p> <p style="color: #00a651; margin: 0;">Marketing</p>
<b>Customer Base</b>	<b>Agent Base</b>
<p style="margin: 0;">1,000,000+</p> <p style="margin: 0;">10,000,000+</p> <p style="color: #00a651; margin: 0;">50,000,000+</p>	<p style="margin: 0;">100</p> <p style="margin: 0;">500</p> <p style="color: #00a651; margin: 0;">1000</p>
<b>Computer Type</b>	<b>Domain Expertise</b>
<p style="color: #00a651; margin: 0;">Desktop</p> <p style="margin: 0;">Tablet</p> <p style="margin: 0;">Mobile</p>	<p style="color: #00a651; margin: 0;">Low</p> <p style="margin: 0;">Average</p> <p style="margin: 0;">High</p>

**Critical tasks:**

---

- 1: Empower customers to provide informed consent.
- 2: Facilitate dynamic mobile-first marketing campaigns.

Figure 81 Sarah, Chief Marketing Officer in Telco

# APPENDIX C : Supporting figures and code.

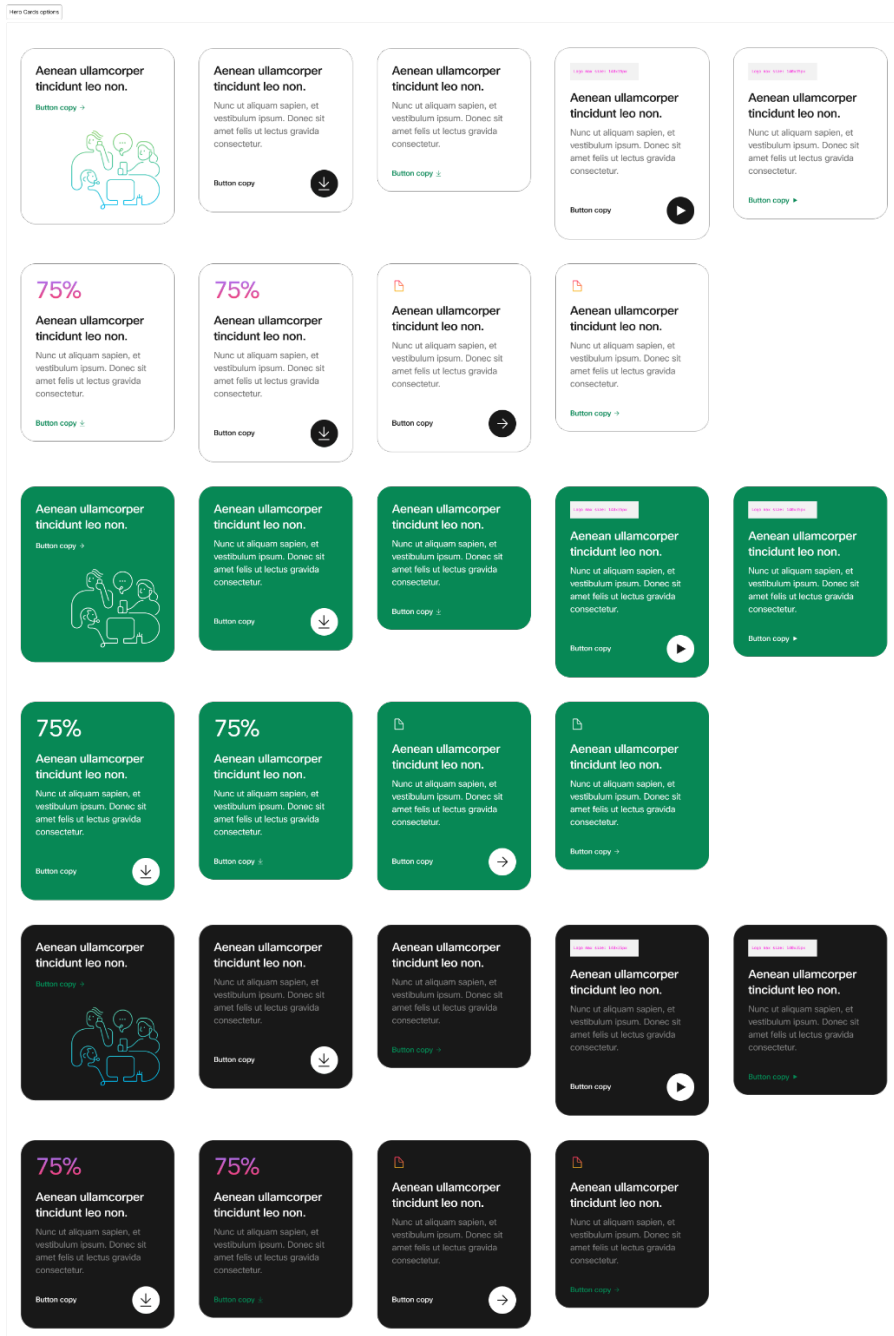


Figure 82 Content cards wireframes.

```

4  /* style for all cards */
5  .card-global { padding: 30px; font-family: Helvetica, Arial, sans-serif; text-align:left; border-radius:30px; }
6
7  /* style for cards that choose theme light */
8  .theme-light { background-color: #FFFFFF; border-type: solid; border-color: #C4C4C4; border-size:1px; color: #181818; }
9
10 /* style for cards that choose theme accent */
11 .theme-accent { background-color: #07BB55; color: #FFFFFF; }
12
13 /* style for cards that choose theme dark */
14 .theme-dark { background-color: #181818; border-type: solid; border-color: #C4C4C4; border-size:1px; color: #FFFFFF; }
15
16 /* style for cta text */
17 .tertiary-cta { font-size: calc(15px + .1vw); letter-spacing: -0.02em; line-height: 100%; padding-right:4px; padding-top:40px; }
18
19 /* style for titles (global class) */
20 .body-large-medium { font-weight: 500; font-size: calc(24px +1vw); line-height:133%; letter-spacing: -0.02em; padding-bottom:10px; }
21
22 /* style for paragraph (global class) */
23 .body-medium-regular { font-weight: 400; font-size: calc(18px +1vw); line-height: 144%; letter-spacing: -0.02em; }
24
25 /* style for h4 (global class) */
26 H4 { font-weight: 400; font-size: calc(32px +1vw); line-height: 112%; color: inherit; }
27
28 /* style for card with illustration */
29 .card-illustration{ max-width: 180px; width: 100%; height: auto; max-height: 100%; padding-top:40px; }
30
31 /* style for card with icon at the top */
32 .card-icon { width: 30px; height: 30px; color: inherit; padding-bottom:20px; }
33
34 /* style for card with icon at the top */
35 .card-logo { width:100%; max-width: 135px; height: 35px; height: 100%; }
36
37 /* changes to CSS for tablet breakpoint */
38 @media screen and (max-width:1024px) and (min-width:721px) {
39   .card-global { border-radius: 20px; padding:40px 20px; }
40   .body-large-medium { font-size: calc(22px + .1vw); line-height: 135%; }
41   .body-medium-regular { font-size: calc(16px +1vw); line-height: 138%; }
42   .h4 { font-size: calc(26px +1vw); line-height: 115%; }
43 }
44
45 /* changes to CSS for mobile breakpoint */
46 @media screen and (max-width:720px) {
47   .card-global { border-radius:16px; padding:40px 20px; }
48   .tertiary-cta { font-size: calc(14px + .1vw); }
49   .body-large-medium { font-size: calc(18px + .1vw); line-height: 144%; }
50   .body-medium-regular { font-size: calc(16px +1vw); line-height: 138%; }
51   .h4 { font-size: calc(22px +1vw); line-height: 127% }
52 }
53

```

Figure 83 Content cards CSS code.

## : APPENDIX C

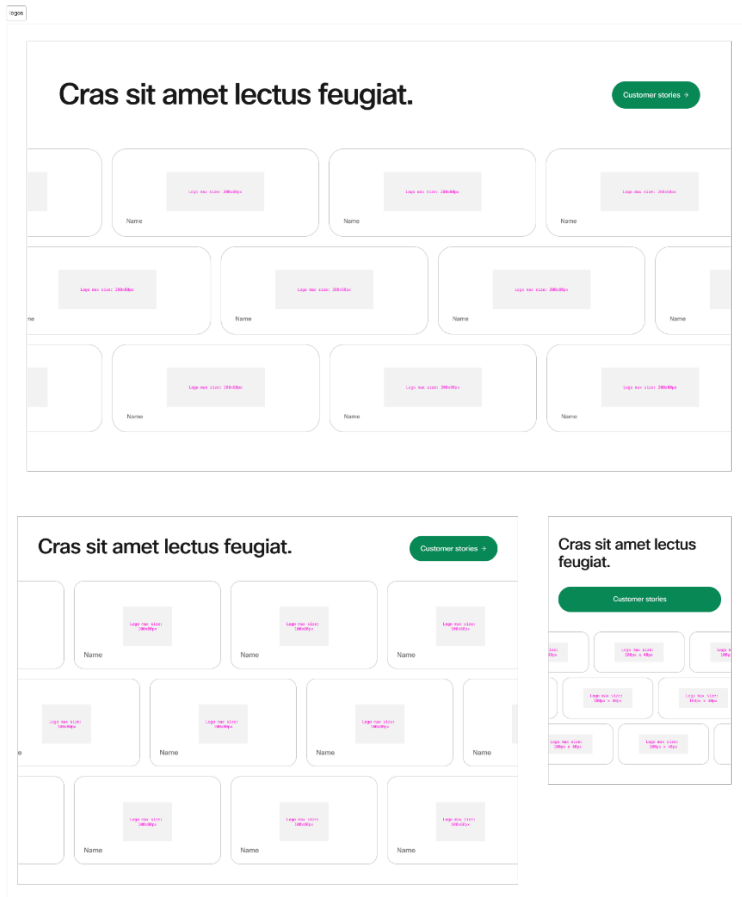


Figure 84 Logos component wireframe for desktop, tablet and mobile sizes.

```
1  .introcontainer {
2    display: flex;
3    width: 1312px;
4    justify-content: space-between;
5    align-items: flex-start;}
6  h2.introheading {
7    display: -webkit-box;
8    -webkit-box-orient: vertical;
9    -webkit-line-clamp: 3;
10   align-self: stretch; }
11 @media only screen and (max-width: 1024px) {
12   .introcontainer {
13     display: flex;
14     width: 70%;
15     justify-content: space-between;
16     align-items: flex-start; }
17   h2.introheading {
18     display: -webkit-box;
19     width: 70%;
20     -webkit-box-orient: vertical;
21     -webkit-line-clamp: 3; } }
22 @media only screen and (max-width: 720px) {
23   .introcontainer {
24     display: flex;
25     flex-direction: column;
26     align-items: flex-start;
27     gap: 32px; }
28   h2.introheading {
29     display: -webkit-box;
30     width: 100%;
31     -webkit-box-orient: vertical;
32     -webkit-line-clamp: 3; } }
```

Figure 85 Logos component CSS spacing rules.

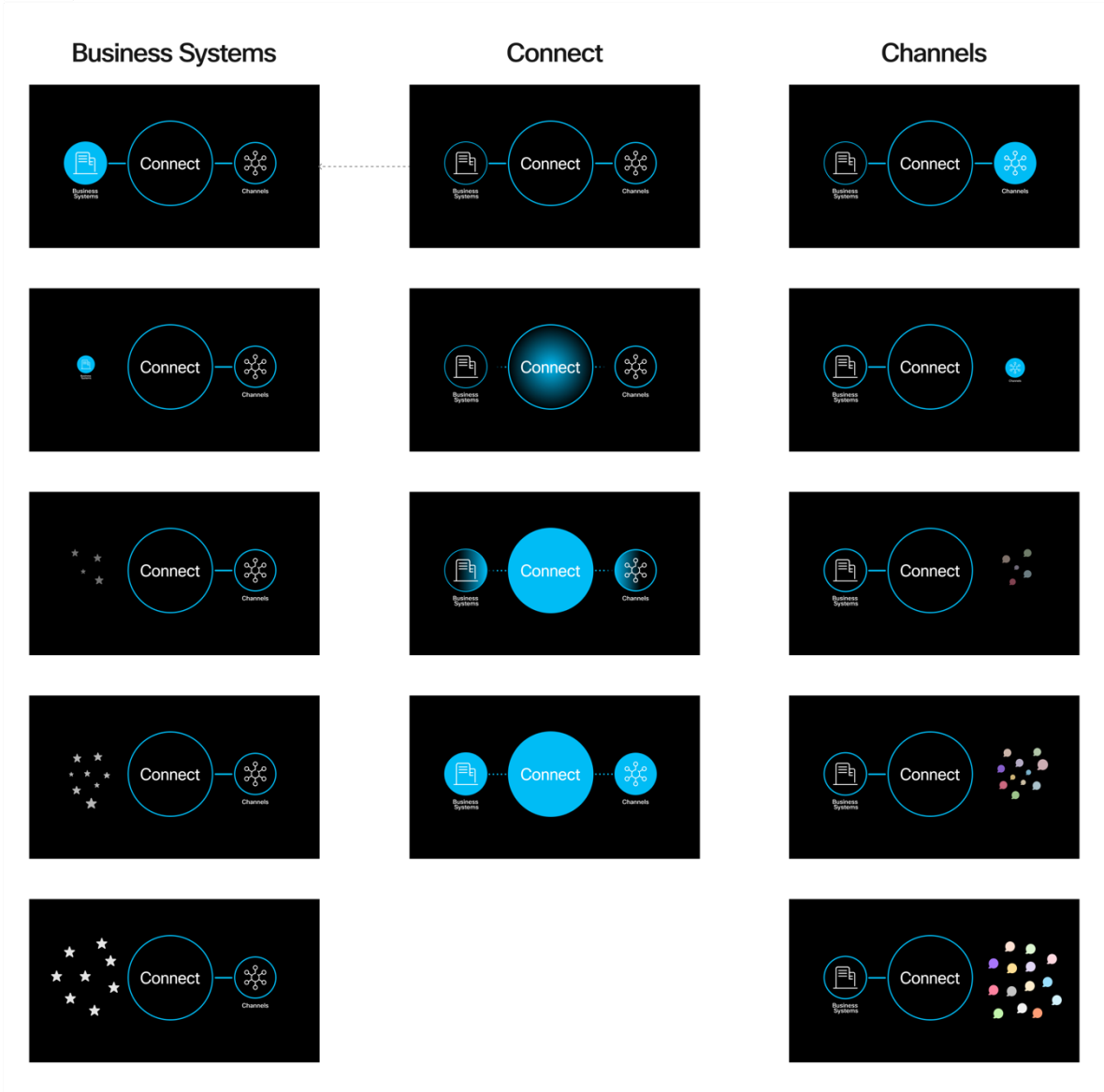


Figure 86 Connect animation storyboard.

: APPENDIX C



Figure 87 Industry solutions full component wireframe.

```

▼ @layer base {
  /* Fonts */
  ▼ @font-face {
    font-family: KosmoSans;
    font-weight: 200;
    src: url('/public/fonts/KosmoSans/KosmoSansTTEExtraLightOblique.woff2') format('woff2');
    font-style: italic, oblique;
    font-display: swap;
  }

  ▼ @font-face {
    font-family: KosmoSans;
    font-weight: 200;
    src: url('/fonts/KosmoSans/KosmoSansTTEExtraLight.woff2') format('woff2');
    font-style: normal;
    font-display: swap;
  }

  ▼ @font-face {
    font-family: KosmoSans;
    font-weight: 300;
    src: url('/fonts/KosmoSans/KosmoSansTTLightOblique.woff2') format('woff2');
    font-style: italic, oblique;
    font-display: swap;
  }

  ▼ @font-face {
    font-family: KosmoSans;
    font-weight: 300;
    src: url('/fonts/KosmoSans/KosmoSansTTLight.woff2') format('woff2');
    font-style: normal;
    font-display: swap;
  }

  ▼ @font-face {
    font-family: KosmoSans;
    font-weight: 400;
    src: url('/fonts/KosmoSans/KosmoSansTTRegular.woff2') format('woff2');
    font-style: normal;
    font-display: swap;
  }

  ▼ @font-face {
    font-family: KosmoSans;
    font-weight: 500;
    src: url('/fonts/KosmoSans/KosmoSansTT-Medium.woff2') format('woff2');
    font-style: normal;
    font-display: swap;
  }

  ▼ @font-face {
    font-family: KosmoSans;
    font-weight: 700;
    src: url('/fonts/KosmoSans/KosmoSansTTBold.woff2') format('woff2');
    font-style: normal;
    font-display: swap;
  }
}

```

Figure 88 font-display: swap implementation in CSS file.

```
1  {{ if link or link_type }}
2  <a aria-label="{{ label }}" href="{{ if link_type === 'pdf' }}{{config('app.CDN')}}{{ pdf
3  {{ /if }}
4
5
6  {{ if type === 'large' }}
7    {{ if icon }}
8      {{ partial src="buttons/button_{icon}_lg" }}
9    {{ /if }}
10  {{ elseif type === 'tertiary' }}
11    {{ partial src="buttons/button_tertiary" }}
12  {{ elseif type === 'quaternary' }}
13    {{ partial src="buttons/button_quaternary" }}
14  {{ else }}
15    {{ if type === 'primary' }}
16      {{ partial
17        src="buttons/button_standard"
18        size="28"
19        btnClasses="border border-transparent bg-skin-ggw text-skin-wwb hover:bg-skin-
20      }}
21    {{ elseif type === 'secondary' }}
22      {{ partial
23        src="buttons/button_standard"
24        size="28"
25        btnClasses="bg-transparent border-skin-bww text-skin-bww hover:border-transpar
26      }}
27    {{ /if }}
28  {{ /if }}
29
30
31  {{ if link or link_type }}
32  </a>
33  {{ /if }}
34
35  {{ if link_type === 'video' }}
36  {{ partial:tools/magnificPopup }}
37  {{ /if }}
38
```

Figure 89 aria-label set up in button code.

## APPENDIX D : Relevant Code

### Swiper.css: Styling swiper elements to match design.

```
.swiper-container-horizontal>.swiper-pagination-bullets .swiper-pagination-bullet {
  margin: 0;
  margin-right: 20px;
}

.swiper-button-next,
.swiper-button-prev {
  --swiper-navigation-size: 40px;
  --swiper-navigation-color: #ffffff;
}

.swiper-pagination-bullet {
  position: relative;
  width: 5px;
  height: 5px;
  text-align: left;
  border-radius: 0;
  opacity: 1;
  margin-right: 20px;
  background-color: transparent;
  overflow: hidden;
}

.swiper-pagination-bullet i {
  position: absolute;
  bottom: 0;
  left: 0;
  z-index: 1;
  width: 5px;
  height: 5px;
  border-radius: 20px;
}

.theme-dark .swiper-pagination-bullet i,
.theme-dark .swiper-pagination-bullet-active {
  background-color: #4F4F4F;
}
```

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```
}

.theme-light .swiper-pagination-bullet i,
.theme-light .swiper-pagination-bullet-active {
  background-color: #E1E1E1;
}

.swiper-button-disabled {
  display: none;
}

.swiper-pagination-bullet b {
  position: absolute;
  bottom: 0;
  left: 0;
  z-index: 2;
  width: 0%;
  height: 5px;
  border-radius: 20px;
  background-color: green;
}

.swiper-pagination-bullet-active {
  width: 30px;
  border-radius: 20px;
  height: 5px;
}

.swiper-pagination-bullet-active b {
  width: 30px;
  animation-name: countingBar;
  animation-timing-function: ease-in;
  animation-iteration-count: 1;
  animation-direction: alternate;
  animation-fill-mode: forwards;
}

@keyframes countingBar {
  0% {
    width: 0;
  }
  100% {
```

```
        width: 100%;  
    }  
}
```

### globals.css : Global theme and fonts CSS

```
@import "tailwindcss/base";  
@import "site";  
@import "tailwindcss/components";  
@import "tailwindcss/utilities";  
/* Needs to be in utilities or lg: classes are overridden */  
@layer utilities {  
    /* Cookiebot banner styling fix */  
    #CybotCookiebotDialogBodyContentTitle {  
        @apply text-h4 lg:text-h4_lg font-medium;  
    }  
    h1 {  
        @apply text-h1 lg:text-h1_lg font-medium;  
    }  
    h2 {  
        @apply text-h2 lg:text-h2_lg font-medium;  
    }  
    h3 {  
        @apply text-h3 lg:text-h3_lg font-medium;  
    }  
    h4 {  
        @apply text-h4 lg:text-h4_lg;  
    }  
    h5 {  
        @apply text-h5 lg:text-h5_lg;  
    }  
  
    .text-h1 {  
        @apply lg:text-h1_lg;  
    }  
    .text-h2 {
```

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```
        @apply lg:text-h2_lg;
    }
    .text-h3 {
        @apply lg:text-h3_lg;
    }
    .text-h4 {
        @apply lg:text-h4_lg;
    }
    .text-h5 {
        @apply lg:text-h5_lg;
    }
    .text-lg {
        @apply lg:text-lg_lg;
    }
    .text-base {
        @apply lg:text-base_lg;
    }
    .text-sm {
        @apply lg:text-sm_lg;
    }
    .text-xs {
        @apply lg:text-xs_lg;
    }
}
@layer base {
    /* Fonts */
    @font-face {
        font-family: KosmoSans;
        font-weight: 200;
        src:          url('/public/fonts/KosmoSans/KosmoSansTTEExtraLightOblique.woff2')
format('woff2');
        font-style: italic, oblique;
        font-display: swap;
    }
    @font-face {
        font-family: KosmoSans;
```

```
font-weight: 200;

src: url('/fonts/KosmoSans/KosmoSansTTEExtraLight.woff2') format('woff2');

font-style: normal;

font-display: swap;
}

@font-face {

font-family: KosmoSans;

font-weight: 300;

src: url('/fonts/KosmoSans/KosmoSansTTLightOblique.woff2') format('woff2');

font-style: italic, oblique;

font-display: swap;

}

@font-face {

font-family: KosmoSans;

font-weight: 300;

src: url('/fonts/KosmoSans/KosmoSansTTLight.woff2') format('woff2');

font-style: normal;

font-display: swap;

}

@font-face {

font-family: KosmoSans;

font-weight: 400;

src: url('/fonts/KosmoSans/KosmoSansTTRegular.woff2') format('woff2');

font-style: normal;

font-display: swap;

}

@font-face {

font-family: KosmoSans;

font-weight: 500;

src: url('/fonts/KosmoSans/KosmoSansTT-Medium.woff2') format('woff2');

font-style: normal;

font-display: swap;

}

@font-face {

font-family: KosmoSans;

font-weight: 700;
```

## APPENDIX D

```
src: url('/fonts/KosmoSans/KosmoSansTTBold.woff2') format('woff2');

font-style: normal;

font-display: swap;

}

/* Themes */

:root {

  --color-text-base: #181818;

  --color-text-muted: #767676;

  --color-text-inverted: #FFFFFF;

  --color-fill: #FFFFFF;

  --color-button-accent: #078855;

  --color-button-accent-v2: #078855;

  --color-button-accent-hover: #181818;

  --color-button-muted: transparent;

  --color-button-muted-border: #181818;

  --color-button-muted-hover: #078855;

  --color-button-muted-hover-border: transparent;

  --color-text-button-hover-muted: #FFFFFF;

  --color-grey: #C4C4C4;

  --color-contrast: #000000;

  --fill-icon-bg: #078855;

  --fill-icon-bg-hover: #FFFFFF;

  --fill-icon-inner: #FFFFFF;

  --fill-icon-inner-hover: #078855;

  --fill-icon-lg-bg: #078855;

  --fill-icon-lg-bg-hover: #181818;

  --fill-icon-lg-inner: #FFFFFF;

  --fill-icon-lg-inner-hover: #FFFFFF;

  --fill-icon-sm: #078855;

  --fill-icon-sm-hover: #181818;

  --fill-icon-sm-inner: #FFFFFF;

  --fill-icon-sm-inner-hover: #FFFFFF;

  --fill-border-light-grey: #e5e7eb;

  --color-grey-background: #E1E1E1;

  --color-border-grey: #E1E1E1;

}
```

```
.theme-black {  
  --color-text-base: #FFFFFF;  
  --color-text-muted: #818181;  
  --color-text-inverted: #181818;  
  --color-fill: #181818;  
  --color-button-accent: #05935B;  
  --color-button-accent-v2: #078855;  
  --color-button-accent-hover: #FFFFFF;  
  --color-button-muted: transparent;  
  --color-button-muted-border: #FFFFFF;  
  --color-button-muted-hover: #05935B;  
  --color-button-muted-hover-border: transparent;  
  --color-text-button-hover-muted: #FFFFFF;  
  --color-grey: #4F4F4F;  
  --color-contrast: #FFFFFF;  
  --fill-icon-bg: #FFFFFF;  
  --fill-icon-bg-hover: #05935B;  
  --fill-icon-inner: #05935B;  
  --fill-icon-inner-hover: #FFFFFF;  
  --fill-icon-lg-bg: #FFFFFF;  
  --fill-icon-lg-bg-hover: #05935B;  
  --fill-icon-lg-inner: #05935B;  
  --fill-icon-lg-inner-hover: #FFFFFF;  
  --fill-icon-sm: #078855;  
  --fill-icon-sm-hover: #FFFFFF;  
  --fill-icon-sm-inner: #FFFFFF;  
  --fill-icon-sm-inner-hover: #000000;  
  --fill-border-light-grey: #818181;  
  --color-grey-background: #E1E1E1;  
  --color-border-grey: #E1E1E1;  
}  
  
.theme-alternate {  
  --color-text-base: #FFFFFF;  
  --color-text-muted: #FFFFFF;  
  --color-grey: #078855;  
  --color-fill: #078855;
```

## APPENDIX D

```
--fill-icon-sm-inner: #181818;  
--color-button-accent: #FFFFFF;  
}  
}
```