



UNIVERSIDADE D
COIMBRA

Carlota dos Santos Silva

UX WRITING – UBIWHERE'S TONE OF VOICE

Dissertation in the context of the Master in Design and Multimedia, advised
by Prof. Paul Hardman and presented to the Department of Informatics
Engineering of the Faculty of Sciences and Technology of the University of
Coimbra.

July of 2023



FACULDADE DE
CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE D
COIMBRA

DEPARTMENT OF INFORMATICS ENGINEERING

Carlota dos Santos Silva

UX Writing — Ubiwhere's Tone of Voice

Dissertation in the context of the Master in Design and Multimedia, advised by
Prof. Paul Hardman and presented to the Department of Informatics
Engineering of the Faculty of Sciences and Technology
of the University of Coimbra.

July 2023



FACULDADE DE
CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE DE
COIMBRA

DEPARTAMENTO DE ENGENHARIA INFORMÁTICA

Carlota dos Santos Silva

UX Writing — O Tom de Voz da Ubiwhere

Dissertação no âmbito do Mestrado em Design e Multimédia, orientada pelo Professor Doutor Paul Hardman e apresentada ao Departamento de Engenharia Informática da Faculdade de Ciências e Tecnologia da Universidade de Coimbra.

Julho 2023

Acknowledgements

I would like to thank my friends for their unwavering support and patience, especially during these recent months.

I extend my heartfelt appreciation to Ubiwhere and its dedicated employees for creating a welcoming environment and assisting me whenever I needed help. I would like to offer special thanks to Ricardo, who provided the most support, as well as the entire design team, whose contribution was invaluable throughout this process.

I am deeply thankful to Professor Paul for his continuous support and guidance throughout the year.

Lastly, words cannot adequately convey my gratitude to my parents and family for their understanding and unwavering support, not only during this year but throughout my academic journey.

Abstract

This dissertation explores the role of UX writing and the contribution to the development of a design system in the context of Ubiwhere, a prominent high-tech company specializing in software-based solutions for Smart Cities, Telecommunications and Future Internet, and New Technologies. The project aims to improve the user experience of Ubiwhere's digital products by integrating effective UX writing practices and contributing to the implementation of a comprehensive design system. It consists of analyzing brand objectives, projects and products, as well as Ubiwhere's target audience; defining the Tone and Voice of the brand; doing a typographic study - typefaces to be used, sizes for different screens; definition of accessibility and inclusivity guidelines - how to create content accessible to all users; develop written content guidelines, with specific cases; creation of visual components based on the rules established previously; development of a glossary of terms - most common expressions and technical languages, as well as those that should not be used; creation of a website (ZeroHeight platform) with all the documentation explaining the various sections; and tests on the written and visual elements by creating a user flow based on an existing product.

The research begins by analyzing the significance of UX writing as a critical element of user interface design, focusing on the impact of well-crafted microcopy in guiding users and improving their interaction with digital interfaces. It investigates the principles, methodologies, and best practices of UX writing, taking into consideration the specific needs and characteristics of Ubiwhere's target users.

In addition, the thesis explores the concept of a design system, an essential tool for ensuring consistency and efficiency in product development. It investigates the benefits of implementing a design system at Ubiwhere, examining its potential to streamline design and development processes, improve collaboration between teams, and maintain a cohesive user experience across multiple products.

The research methodology includes user research, content analysis, and content testing. The study involves gathering insights from Ubiwhere's users and stakeholders to inform the UX writing and design system implementation processes.

The results of this research contribute to the field of UX design and provide practical recommendations for Ubiwhere in improving the user experience of its digital products through the effective use of UX writing techniques and contribution to the implementation of a design system. The results of this study have the potential to positively impact Ubiwhere's product development practices by ensuring a consistent, user-centered approach that aligns with the company's vision.

Keywords

UX writing, Design systems, User experience, Interface design, Typography.

Resumo

Esta dissertação explora o papel da *UX writing* e a contribuição para o desenvolvimento de um *design system* no contexto da Ubiwhere, uma proeminente empresa de alta tecnologia especializada em soluções baseadas em software para *Smart Cities*, Telecomunicações, Internet do Futuro, e Novas Tecnologias. O projeto visa melhorar a experiência do utilizador dos produtos digitais da Ubiwhere, integrando práticas de *UX writing* eficazes e contribuindo para a implementação de um *design system* abrangente. Consiste em analisar os objetivos, projetos e produtos da marca, bem como o público-alvo da Ubiwhere; definir o Tom e a Voz da marca; fazer um estudo tipográfico - tipos de letra a utilizar, tamanhos para diferentes ecrãs; definição de *guidelines* de acessibilidade e inclusão - como criar conteúdos acessíveis a todos os utilizadores; desenvolver *guidelines* de conteúdos escritos, com casos específicos; criação de componentes visuais com base nas regras estabelecidas anteriormente; desenvolvimento de um glossário de termos - expressões e linguagens técnicas mais comuns, bem como as que não devem ser utilizadas; criação de um *website* (plataforma ZeroHeight) com toda a documentação explicativa das várias secções; e testes aos elementos escritos e visuais através da criação de um *user flow* com base num produto existente.

A investigação começa por analisar a importância da *UX writing* como um elemento crítico do design da interface do utilizador, centrando-se no impacto de uma microcópia bem elaborada na orientação dos utilizadores e na melhoria da sua interação com as interfaces digitais. Investiga os princípios, as metodologias e as melhores práticas da *UX writing*, tendo em consideração as necessidades e as características específicas do público-alvo da Ubiwhere.

Para além disso, a tese explora o conceito de *design system*, uma ferramenta essencial para garantir a consistência e a eficiência no desenvolvimento de produtos. Investiga os benefícios da implementação de um *design system* na Ubiwhere, examinando o seu potencial para simplificar os processos de design e desenvolvimento, melhorar a colaboração entre equipas e manter uma experiência de utilizador coesa em vários produtos.

A metodologia de investigação inclui pesquisa de utilizadores, análise de conteúdo e testes de conteúdo. O estudo envolve a recolha de informações dos utilizadores e das partes interessadas da Ubiwhere para informar os processos de *UX writing* e de implementação do *design system*.

Os resultados desta investigação contribuem para o campo do *UX design* e fornecem recomendações práticas para a Ubiwhere melhorar a experiência do utilizador dos seus produtos digitais através da utilização eficaz de técnicas de *UX writing* e da contribuição para a implementação de um *design system*. Os resultados deste estudo têm o potencial de ter um impacto positivo nas práticas de desenvolvimento de produtos da Ubiwhere, garantindo uma abordagem consistente e centrada no utilizador que se alinha com a visão da empresa.

Palavras-Chave

UX writing, Design systems, Experiência do utilizador, Design de interfaces, Tipografia.

Contents

1	Introduction	1
1.1	Ubiwhere	1
1.2	Proposal and division of tasks	3
1.3	Motivation	4
1.4	Framing	5
1.5	Overall Objectives	6
1.6	Structure of the document	7
2	State of the Art	9
2.1	User-centered design and human-centered design	9
2.2	User experience	10
2.3	UX Writing	12
2.3.1	Historical Context	13
2.3.2	General guidelines to good UX writing	14
2.3.3	Tone of voice	16
2.3.4	Writing for user experience — components and best practices	19
2.4	Service Design	23
2.5	Design systems	25
2.6	Typography for the web	27
2.7	Interface design	30
2.8	Conclusions	32
3	Analysis of existing company content guidelines	35
3.1	Spectrum - Adobe’s design system	35
3.2	Material Design - Google’s design system	38
3.3	Mailchimp’s content style guide	41
3.4	Atlassian Design System	42
3.5	Carbon - IBM’s Design System	43
3.6	Polaris - Shopify’s Design System	45
3.7	Conclusions	48
4	Methodology and work plan	49
4.1	Methodology	49
4.1.1	First semester	49
4.1.2	Second semester	50
4.2	Work plan	52
5	Work process and documentation	55
5.1	Survey to understand the relevance of the project	56

5.2	Typographic Study	57
5.2.1	General	57
5.2.2	Font sizes	63
5.2.3	Text formatting	70
5.2.4	Vertical space	71
5.2.5	Line height	72
5.2.6	Line length	72
5.3	Content - UX Writing	73
5.3.1	Research on Ubiwhere’s brand, values, mission, and target audience	73
5.3.2	Questionnaire	74
5.3.3	Ubiwhere’s Tone of Voice	74
5.3.4	Language and grammar	78
5.3.5	Writing for components	84
5.3.6	Language and inclusivity	93
5.3.7	Glossary of terms	100
5.4	Component development and documentation	101
5.4.1	Tooltips	102
5.4.2	Toasts and snackbars	109
5.4.3	Modals	113
5.4.4	Messages	119
5.5	Conclusions	124
6	Content testing and user flow	127
6.1	Methods for evaluating UX writing	127
6.1.1	Cloze tests	127
6.1.2	Highlighter tests	128
6.1.3	A/B tests	129
6.1.4	Usability tests	129
6.1.5	Content testing in the scope of the project	130
6.2	Content testing	131
6.2.1	Defining the participants	131
6.2.2	Defining the test	131
6.2.3	Test	132
6.2.4	Analysis of test results	137
6.2.5	Test conclusions	139
6.3	User flow	139
6.3.1	SmartPAYT Admin platform	140
6.3.2	Choosing the flow	140
6.3.3	Problems identified	141
6.3.4	User flow	145
6.4	Conclusions	147
7	Conclusions and future work	149

Acronyms

CTA call-to-action.

DS Design System.

HCD Human-Centered Design.

IoT Internet of Things.

UCD User-Centered Design.

UI User Interface.

UX User Experience.

List of Figures

2.1	UX writing and User Experience, Google	13
2.2	Eye-tracking studies that prove the “F”/“E” reading pattern, NN/g	15
2.3	Maximum amount of text users could read during an average visit to pages with different word counts, NN/g	15
2.4	Brand voice and UX writing principles, by uxplanet.org	16
2.5	Voice, tone and style Venn Diagram by Pedro Quintino	17
2.6	Example of error message with different tones, Google	18
2.7	Example of a tone map, UX Writers Collective	19
2.8	Onboarding common components, NN/g	20
2.9	UX vs Service Design, NN/g	24
2.10	Brad Frost’s Atomic Design methodology, 2013	25
2.11	Typographic for the web hierarchy example, typography princi- ples by Obys Agency	29
2.12	Example of right-aligned text on navigation menu	29
3.1	Spectrum, Adobe’s Design System	36
3.2	Grammar and mechanics do’s and dont’s, Spectrum	37
3.3	Language and inclusivity do’s and dont’s, Spectrum	38
3.4	Material Design, Google’s Design System	39
3.5	Text label design guidelines, Material Design	40
3.6	Text label implementation guidelines, Material Design	40
3.7	Mailchimp’s Content Style Guide	41
3.8	Atlassian’s Design System	43
3.9	Carbon, IBM’s Design System	44
3.10	Content — writing style, Carbon	45
3.11	Polaris, Shopify’s Design System	46
3.12	Content section organization, Polaris	47
3.13	Language and inclusivity section, Polaris	48
4.1	Scrum methodology representation, in Jeff Sutherland’s Scrum Hand- book, p.11	51
4.2	Work plan for the academic year	53
5.1	Ubiwhere’s font stack documentation	58
5.2	Text types — headings documentation	59
5.3	Text types — body text documentation	59
5.4	Text types — uppercase documentation	59
5.5	Text types — labels documentation	60
5.6	Text types — buttons and links documentation	60

5.7	Text styles used in Urban Platform (website)	64
5.8	Text styles used in Citizen App (mobile app)	65
5.9	Example of 8px text in Urban Platform	66
5.10	Text styles, Figma	67
5.11	Text styles for desktop example, Figma	68
5.12	Text styles for desktop documentation example, ZeroHeight	68
5.13	Text styles for mobile example, Figma	69
5.14	Text styles for mobile documentation example, ZeroHeight	70
5.15	Example of bold text	71
5.16	Example of italic text	71
5.17	Example of underlined text	71
5.18	Examples of vertical spacing for text separation, based on the 8px grid	72
5.19	Examples of the predefined line height applied to different text types	72
5.20	Active voice example documentation	79
5.21	Passive voice example documentation	79
5.22	Avoiding passive voice example documentation	80
5.23	Examples of punctuation documentation	83
5.24	Best practices for empty states documentation	86
5.25	Onboarding design example	88
5.26	Some of the documented best practices for error messages	91
5.27	Documented best practices for success messages	93
5.28	Inclusivity in UX writing, ZeroHeight	95
5.29	Writing about people, ZeroHeight	96
5.30	Writing about people examples, ZeroHeight	97
5.31	Writing for readability, ZeroHeight	98
5.32	Writing with visuals, ZeroHeight	100
5.33	Example of terms and concepts included in the glossary	101
5.34	Default tooltip variants, Figma	102
5.35	Default tooltip properties example	103
5.36	Map tooltip variants	103
5.37	Map tooltip properties example	104
5.38	Default tooltip anatomy	104
5.39	Example of map tooltip with icon in Urban Platform, a product from Ubiwhere	105
5.40	Example of map tooltip with image in Urban Platform, a product from Ubiwhere	105
5.41	Documentation of the default tooltip variants, Zeroheight	107
5.42	Documentation of the map tooltip round variant, Zeroheight	108
5.43	Documentation of the map tooltip square variant, Zeroheight	108
5.44	Documentation of the map tooltip square with image variant, Zeroheight	109
5.45	Toast anatomy	109
5.46	Snackbar anatomy	110
5.47	Toasts variants, Figma	112
5.48	Toast properties example	112
5.49	Snackbars variants, Figma	113
5.50	Simpler modal anatomy	114

5.51	Complex modal anatomy	115
5.52	Components used to build the modals, Figma	118
5.53	Modal variants, Figma	118
5.54	Left-aligned modal variants, ZeroHeight	119
5.55	Centered modal variants, ZeroHeight	119
5.56	Message anatomy	120
5.57	Components used to build the messages, Figma	122
5.58	Message variants, Figma	123
5.59	Left-aligned message variants, ZeroHeight	123
5.60	Centered message variants, ZeroHeight	124
6.1	Cloze test example by T. Falmann, 2018	128
6.2	Highlighter test example, by P. Gale, 2014	128
6.3	A/B test example, by R. Cosra, 2019	129
6.4	Flow of information in a Usability test, Nielsen Norman Group . .	130
6.5	First question test results	132
6.6	Second question test results	134
6.7	Third question test results	135
6.8	Fourth question test results	136
6.9	Login screen, SmartPAYT Admin Portal	141
6.10	Initial dashboard, SmartPAYT Admin Portal	142
6.11	Waste management > Containers, SmartPAYT Admin Portal	143
6.12	Add container, SmartPAYT Admin Portal	144
6.13	Add container required fields error, SmartPAYT Admin Portal . . .	145
6.14	User flow, Figma	146

Chapter 1

Introduction

With the constant company growth and the development of more products and services, Ubiwhere's need to standardize and improve the communication of its products and services to different users by responding to their exact needs has increased. Both design systems and User Experience (UX) writing are used to create consistency between a company's different products. Design systems lay a solid foundation for design, enabling companies to deliver enhanced user experiences and cultivate strong, identifiable brands. UX writing guidelines, typically integrated into design systems, are essential for clear communication, guiding user behavior, improving engagement, ensuring consistency, and handling errors. It contributes significantly to creating intuitive, easy-to-use experiences that meet user needs and support business goals.

This project aims to contribute to the development of a Design System (DS) for Ubiwhere, a high-tech company focused on research, development, and innovation of software-based solutions in Smart Cities, Telecommunications, Future Internet, and New Technologies. This contribution will be done through the research, development, and documentation of several sections of the design system, namely the section on typography, sections with guidelines on UX writing, and the creation of five components, with their respective usage rules and best practices.

The current chapter will provide context to the work to be developed, starting with an introduction to Ubiwhere and its core business areas. After this section, there will be an explanation of the project's proposal and task division, motivations, framing, and overall objectives, ending with a description of the document's structure.

1.1 Ubiwhere

Founded in the city of Aveiro in 2007 by Rui Costa and Nuno Ribeiro, Ubiwhere focuses on the research and development of smart and sustainable technological solutions for Smart Cities, Telecommunications, and Internet of Things.

Smart Cities

According to Bowerman, a smart city ought to be “the urban center of the future made safe, secure, environmentally green, and efficient because all structures - whether for power, water or transportation - are designed, constructed, and maintained, making use of advanced integrated materials, sensors, electronics, and networks which are interfaced with computerized systems and comprised of databases, tracking, and decision-making algorithms” [Hall et al., 2000]. In short, smart cities are urban areas that use technology to improve the quality of life of their citizens and may also be used to make it easier for citizens to access information and get involved in decision-making processes.

The urban population keeps growing, challenging cities to find the right balance between urban development needs and global environmental changes. Ubiwhere focuses on addressing smart cities’ challenges by developing mobility, environment, energy, waste, and tourism management innovations capable of improving citizens’ lives.

An example of an Ubiwhere project in this area is PAYT Aveiro — a project that promotes and encourages more efficient management of municipal waste, co-funded by the European Commission and resulting from a partnership between Citibrain, the Municipality of Aveiro and the University of Aveiro. Its main objective is to help municipalities adopt PAYT (pay-as-you-throw) urban waste rates, encouraging and motivating waste prevention and separation, thus contributing to more efficient management of European resources, as well as to the implementation of environmental policies.

More information about this project can be found at <https://www.ubiwhere.com/en/case-studies/smart-cities/payt-aveiro>.

Telecommunications

Telco is short for telecommunications, which refers to the communication of information over long distances, typically by wire, radio, or satellite. It involves the use of various technologies and systems to transmit and receive information, including telephone, internet, and television. The Telco industry includes companies that provide these services to individuals and businesses, as well as the infrastructure required to support them.

UNICLE is an Ubiwhere’s Telco product based on a web platform that solves technological and business problems at the same time. Modern Communications Service Providers (CSPs) should become increasingly digital and streamlined, both in their service offerings and back-office workflows. These providers need to reduce their dependence on the legacy systems and data center infrastructure that have defined and constrained them thus far. Service orchestration is the component that will help telecommunication service providers scale up and face their fast-moving future in the cloud. Moreover, aligned with Zero-Touch Management (ZSM) frameworks, the MVNOs should support the separation of management and automation into different areas of concern, i.e. network man-

agement domains and end-to-end cross-domain service management, leading to higher automation of their network and services.

UNICLE gives access to several orchestration functionalities by dividing its components into two main platforms: Edge Platform and Cloud Platform. After, each platform divides its functionalities into different modules where specific services and applications can be provided.

More information about this product can be found at <https://www.ubiwhere.com/en/products/telco/unicle>.

Internet of Things

"With the advancement in technology, we are moving towards a society, where everything and everyone will be connected" [Zheng et al., 2011]. The Internet of Things (IoT) refers to the growing network of physical devices, vehicles, buildings, and other objects that are connected to the Internet and can collect and exchange data. These devices are equipped with sensors and other technologies that allow them to communicate with each other and with external systems over the internet, often without the need for direct human intervention. The IoT is expected to bring a wide range of benefits, including increased efficiency, improved decision-making, and the ability to monitor and control physical objects remotely. Some examples of IoT devices include smart thermostats, connected appliances, and wearable fitness trackers.

"IoT is considered the future evolution of the Internet that realizes machine-to-machine (M2M) learning" [Huang and Li, 2010a]. The basic idea of IoT is to "allow autonomous and secure connection and exchange of data between real-world devices and applications". [Fan and Chen, 2010] The IoT "links real life and physical activities with the virtual world" [Huang and Li, 2010b].

The role of UX design in the products developed by the company

UX design is an integral part of Ubiwhere's product development process. Products developed for the company's business areas can contain a lot of information, and sometimes information that may not be understood or may be difficult to simplify. The focus on the user, usability, engagement, brand perception, and continuous improvement ensures that products provide outstanding user experiences and meet the evolving needs of their target audience.

1.2 Proposal and division of tasks

A design system should be an iterative process. "A design system is not some document we create once and that is it. It is constantly changing and adapting to new requirements" [Zauner, 2021]. An initial version should be developed and changed over time to ensure continuous improvement, to adapt to possible

changing needs, to incorporate changes that are found to be necessary, to be flexible and scalable, and to ensure a user-centered approach at all times. For a DS to be maintained and effectively support products and user experiences over time, there must be iteration. It is important to mention that the project of this thesis aims to contribute to the development of an initial version of Ubiwhere's design system.

This initial version of the design system was divided into different tasks, separated between myself and another intern at the company, who is also developing her thesis in the design field. In the initial project proposal for this thesis, I was responsible for analyzing Ubiwhere's goals, projects, and products, as well as its target audience; defining the voice and tone of the brand; defining accessibility and inclusion guidelines — how to create content accessible to all users; develop guidelines for written content, with specific examples; develop a glossary of terms — most common technical expressions and language, as well as those that should not be used; creating the documentation of these sections in a code-free web platform; test the developed content guidelines.

The other intern was responsible for defining and documenting the style guide — colors, typography, icons, shadows, and blurs, — and for defining, developing and documenting the components that would be part of this version of the design system.

After a restructuring of the project, I was also responsible for the definition and documentation of the typography, as it relates to text and content development, and the development and documentation of five of the components that usually contain the most text — tooltips, modals, messages, snackbars, and toasts. Besides this, I was also responsible for, not only testing the content guidelines but also creating a user flow using the design system in an administration platform for a Ubiwhere product, which is used by clients, in order to improve its usability, integrating the developed components and content guidelines.

The other intern was in charge of defining and documenting colors, icons, shadows, and blurs and developing and documenting the components: buttons, checkbox, radio, switch, pagination, badges, tags, inputs, slider, dropdown, stepper, avatar, rating, card, date picker, and table.

Although there has been a restructuring of the project, the chapter on the State of the Art still focuses mainly on UX writing, since this is the main focus of the project and the restructuring was only thought of at the beginning of the second semester.

1.3 Motivation

When design teams grow in number, there is a tendency for designers to focus on specific areas of a product being developed. However, this specialization can result in a fragmented visual language, with each designer adopting their own distinct approach and design style. "This happens when designers solve problems

individually and not systematically" [Suarez, 2019]. With the current gradual growth of the company and the development of more products and services, the fact that no writing guidelines exist has become a problem for Ubiwhere, which led them to propose this thesis topic.

UX writing is important for businesses because it improves usability, guides users, and effectively communicate important information, leading to a positive user experience and higher user satisfaction. It helps to create a consistent and cohesive user experience across all of a company's products and services, besides the visual aspect.

"UX writing (user experience writing) is the practice of crafting all of the customer-facing text or copy that appears within digital products" [Wood]. This area of user experience design helps to ensure that the user experience is clear and intuitive.

Despite the decreasing density of content in modern interfaces, it remains vital to consciously evaluate the clarity, usefulness, and user focus of every word used in products or services [Zvirgzdas, 2021]. It is through words that we can capture the user and ensure its satisfaction, promote clarity, improve usability, and reduce errors, among other aspects that ultimately contribute to more successful products.

This holds particular significance for major technology companies like Google or Adobe, as they typically offer a wide range of products to a diverse user base. Maintaining a consistent design language and providing a clear user experience is crucial in building trust and credibility with their users. The same happens with Ubiwhere — given the vast amount of products that are developed for the general population, it is important to maintain consistency and clarity in the content produced, and this is what the company aims to achieve through the creation of UX writing guidelines.

Regarding personal motivation, this came from the will to apply everything I learned in my bachelor's and master's degree in Design and Multimedia (FC-TUC) to a real professional context. I believe that doing an internship in a company that works with real clients and being able to participate in this corporate context may help me in my future entry into the labor market.

1.4 Framing

This dissertation is part of a curricular internship carried out at Ubiwhere, to conclude the Masters in Design and Multimedia. The project mainly focuses on design and copy and consists in contributing to a design system to be created for Ubiwhere, that applies to all of its products and services, taking into account its typical users and their needs. Besides the creation of UX writing guidelines, the project will also consist of the study and definition of the typography and respective rules to be used in the products, and in the creation of five components that contain text and where I can apply the content-related study.

After conducting an internal survey (see Chapter 5: Work process) to the com-

pany's employees, it was concluded that this content guide should be presented in a web page format, to make it easier to use. All the work will be documented on the Zero Height platform - a code-free platform for documenting design systems. In addition, in order to test the work, tests will be made to the content and the design of a flow based on an administration platform of one of the company's products will be developed.

To better understand the framing of the main focus of the thesis — UX writing — several areas of study and concepts will be introduced in the second chapter of the dissertation, such as user experience, service design, user-centered design, human-centered design, design systems, typography for the web, and interface design. A more in-depth analysis will also be made about the main focus itself.

1.5 Overall Objectives

As mentioned in the motivation section, the standardization of the products that Ubiwhere develops for its customers has gained specific importance. From users to technicians or promoters, the various users of the platforms developed by the company need to use written language in different ways (microcopy, error messages, etc), so that they understand, in a clear and effective way, how to use them.

Currently, the various teams of the company have their own way of writing and communicating. Guidelines must be developed so that Ubiwhere's products communicate in a consistent voice that is unique in the market. The main goal of the project is to develop a set of writing guidelines that are accessible by the company, so that they all communicate simply and effectively, regardless of the users' differences.

This dimension of the project includes, as mentioned earlier: analyzing brand objectives, projects, and products, as well as Ubiwhere's target audience; defining the voice and tone of the brand; making an analysis of principles and defining accessibility and inclusiveness guidelines — how to create content accessible to all users; develop written content guidelines, with specific cases; develop a glossary of terms — most common expressions and technical languages, as well as those that should not be used.

In addition to this main dimension of the project, related to the creation of content directed to Ubiwhere's products, it will also be performed: a typographic study — typography to be used, sizes, best practices; development of components for the design system — tooltips, snackbars, toasts, messages, and modals; the creation of a code-free website with all the documentation explaining the various sections previously mentioned; testing the written and visual elements by conducting A/B tests and creating a user flow based on an existing product.

All these project stages will culminate in the contribution to the creation of the initial version of Ubiwhere's design system, contributing significantly to the development of intuitive and easy-to-use experiences that meet users' needs and support the company's business objectives.

1.6 Structure of the document

The present dissertation is divided into seven chapters.

Chapter 1 is the introduction to all of the work to be produced. It introduces the company where the internship takes place — Ubiwhere — the thesis proposal and task division, motivations, framing, and overall objectives to achieve with the project.

Chapter 2 is the State of the Art and focuses on analyzing relevant concepts to the project, such as user-centered design and human-centered design user experience, UX writing, design systems, typography, interface design and service design.

Chapter 3 regards an analysis of several content guidelines from some well-known companies, to understand what will be relevant to develop for the project.

Chapter 4 regards the methodological approach and work plan for the project. It gives an overview of the process to be followed and introduces the expected project timelines.

Chapter 5 showcases the project process executed during the academic year. It includes phases like the phases of research, development and documentation.

Chapter 6 regards the content testing and user flow development using the components and content guidelines created, based on an existing platform.

Chapter 7 represents the conclusion of this dissertation. This is where some final considerations and reflections will be made.

Chapter 2

State of the Art

This chapter explores and analyzes a variety of topics that are crucial to understanding and supporting the work developed.

We introduce some relevant study fields and concepts in the context of the project, such as user-centered design and human-centered design, user experience, service design, design systems, typography for the web, and interface. The concept of UX writing will be investigated more in-depth, including its definition, reasons behind its use, best practices, and applications, since it is the main focus of this thesis.

UX writing is the practice of writing content for user interfaces that is clear, concise, and easy to understand. It is an important part of the overall user experience because the words and language used in the user interface can have a big impact on how easy or difficult it is for users to use a product. It intersects with the areas and concepts mentioned above to create user-focused and cohesive experiences through well-crafted and consistent content within user interfaces.

2.1 User-centered design and human-centered design

User-Centered Design (UCD) and Human-Centered Design (HCD) are similar in the way they both focus on the needs, wants, and limitations of the user. The goal of both approaches is to design products and services that are easy and enjoyable to use.

The main difference between the two approaches is the scope of the design process. The user-centered design focuses specifically on the needs of the user in relation to the product or service being designed. It is concerned with creating a product that is easy to use and meets the needs of the user.

"User-centered design (UCD) is a broad term to describe design processes in which end-users influence how a design takes shape. It is both a broad philosophy and a variety of methods. There is a spectrum of ways in which users are involved in UCD but the important concept is that users are involved one way or another. For example, some types of UCD consult users about their needs

and involve them at specific times during the design process; typically during requirements gathering and usability testing. At the opposite end of the spectrum there are UCD methods in which users have a deep impact on the design by being involved as partners with designers throughout the design process" [Abrams et al., 2014]. HCD, on the other hand, takes a more holistic approach to design that takes into account the larger context in which the product or service will be used. In addition to considering the needs of the user, it also considers the social, cultural, and environmental factors that may affect the design. The goal of human-centered design is to create products and services that not only meet the needs of the user, but also have a positive impact on society and the environment. "The human-centered approach to the design of technology arose as a reaction to perceptions that traditional approaches to technology design deskill technology users and impoverish the quality of working life" [Gasson, 2003].

"The human-centered approach is opposed to the traditional, technology-oriented approach, which prioritizes computer-based information processing and technology-mediated communications over humans and their communicative collaboration" [Gasson, 2003]. In short, user-centered design focuses on the needs of the user in relation to a specific product or service, while human-centered design takes a broader view and considers the needs of the user in the larger context of society and the environment.

By considering the needs, motivations, and behaviors of users, UX writing aims to create content that guides, informs, and engages users, ensuring that the textual elements within a product or service align with their expectations and contribute to a positive, meaningful and effective overall experience.

2.2 User experience

To better understand the discipline where UX Writing is embedded, this section will introduce the concept of user experience and some of its principles.

The success of digital products and services now heavily depends on user experience. It includes both the practical and emotional parts of the overall impression users have when interacting with a design.

According to Don Norman and Jakob Nielsen, world leaders in research-based UX and founders of the Nielsen Norman Group, UX "encompasses all aspects of the end-users interaction with the company, its services, and its products" [Norman and Nielsen]. The term "User Experience" first appeared in acclaimed UX design expert Donald Norman's book, *The Design of Everyday Things*, which was first published in 1988. In an interview, Norman said "I invented the term because I thought human interface and usability were too narrow. I wanted to cover all aspects of the person's experience with the system including industrial design graphics, the interface, the physical interaction and the manual" [Bunt, 2019]. User experience places users at the center of the design process, prioritizing their needs, preferences, and pain points.

Donald Norman affirms, "The real issue is not designing the user interface; it's designing your user's experience" [Norman, 1999]. He argues for the importance of focusing on usability, and especially the central position of the user. As is common knowledge, people are frustrated by the malfunctioning of poorly designed systems. People work more efficiently and safely with well-designed, highly usable systems. It will therefore be essential to focus on the users, to think about what each one needs, given their distinct characteristics, and to know in advance that they themselves don't know what they need. This will require putting users at the center: how they think, work, and behave; how they relate, communicate, and cooperate; and finally, how these insights can be used to design highly usable systems. By creating intuitive and seamless interactions, UX design aims to minimize frustration, facilitate task completion, and ultimately improve user satisfaction. A positive user experience fosters a sense of delight, leading to increased engagement and a higher likelihood of returning users.

"The book *The Design of Everyday Things* demonstrates the potential for effective, useful design. The guidelines are straightforward: make things visible, use connections between function and control that naturally occur, and use restrictions wisely. The objective is to seamlessly direct the user to the proper action on the proper control at the right moment" [Norman, 2013]. User experience plays a pivotal role in shaping brand loyalty. As Don Norman puts it, "It's not enough that we build products that function, that are understandable and usable; we also need to build products that bring joy and excitement." [Jacob-Puchalska, 2023]. A positive and memorable user experience creates an emotional connection with users, fostering trust and loyalty. Brands that consistently deliver exceptional user experiences become synonymous with quality and reliability, resulting in long-term customer relationships.

User experience has become an integral part of modern design, transforming how products and services are created and perceived. By focusing on user satisfaction, driving business outcomes, fostering brand loyalty, embracing continuous improvement, and prioritizing accessibility, designers can deliver exceptional experiences that captivate users and drive success. It is through outstanding user experiences that designers can achieve greatness and leave a lasting impact on users and society as a whole.

According to the UX Design Institute [Institute, 2022], some of the key principles of UX design are:

User-centered design. It is essential that user experience design decisions are based on an understanding of the user's needs, goals, and behaviors. This means conducting user studies, creating user personas, and involving users throughout the design process. The principle of user-centered design is closely tied to UX writing because both approaches share a common goal: putting the user at the center of the design process. By adopting user-centered design principles, UX writers can ensure that their written content aligns with users' needs and meets their expectations.

Consistency. Consistency in design elements, interactions, and visual aesthetics improves user understanding and reduces cognitive load. Users should be able

to recognize and predict how different elements behave across the entire product. Consistency can be achieved through the use of design systems and style guides. This principle is related to UX writing as it can contribute to a cohesive and intuitive user experience. Language, tone of voice, messaging, formatting, as well as other aspects of UX writing promote familiarity, reduce cognitive load, and allow users to navigate the User Interface (UI) more efficiently.

Hierarchy. The visual hierarchy should be used in order to prioritize information based on its importance. By using size, color, contrast, and typography, the users' attention is directed to the most important elements, making it easier to understand information and task completion. Through effective content organization, clear headings, navigation labels, well-crafted call-to-action (CTA), appropriately prioritized error messages, and thoughtful microcopy, UX writing contributes to the establishment of a clear and intuitive hierarchy within the user interface.

Usability. Usability focuses on making products intuitive and easy to use. The design of user experiences should have clear and logical navigation, concise and meaningful content, and efficient flows. Usability testing helps to identify and resolve any usability issues. By focusing on clarity, simplicity, instructional guidance, feedback, consistency, and information organization, UX writing enhances the usability of a product or service. Well-written and user-friendly copy contributes to a smoother and more intuitive user experience.

Accessibility. Accessibility ensures that products are usable by people with disabilities. Designers should follow accessibility guidelines to provide equal access to information and functionality for all users, taking into consideration visual impairments, hearing impairments, motor disabilities, and cognitive limitations. By incorporating accessibility principles into UX writing, we can help create more inclusive experiences that can be accessed and enjoyed by a broader range of users. Clear and concise language, appropriate alt text, descriptive error messages, keyboard accessibility, and attention to color contrast are just a few examples of how UX writing can enhance the accessibility of digital products and services.

Through the creation of clear, concise, and user-centric content within interfaces, while considering tone of voice and aligning with user needs, UX writing plays an active role in providing a positive and captivating user experience. This ensures that users can effortlessly comprehend and engage with a product or service, resulting in enhanced usability, minimized obstacles, and overall user satisfaction.

2.3 UX Writing

"UX Writing bridges the gap between content strategy and design" [Quintino, 2020]. Also known as microcopy or interface writing, UX writing refers to the practice of crafting text elements within user interfaces to enhance the user experience. It involves writing clear, concise, engaging content that guides users, providing instructions, and communicating important information about digital products or services. Its aim is to help users understand how to interact with

a product, complete tasks, and make informed decisions. This practice requires careful consideration of language, Tone of Voice, terminology, and placement of text to ensure clarity, usability, and an overall positive user experience. It's a type of writing that is user-centered and focuses on a target audience, considering their context, mental model, attitudes, and behavior.

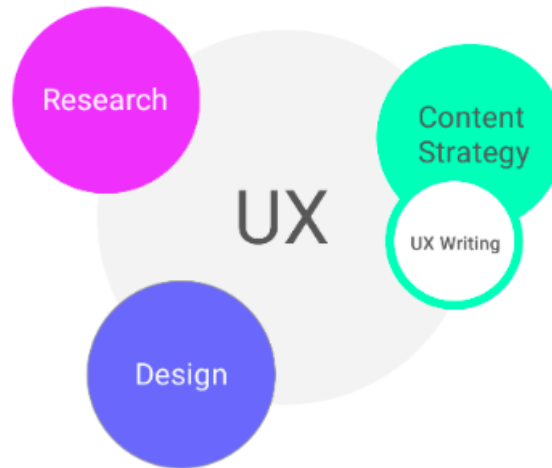


Figure 2.1: UX writing and User Experience, Google

"UX writers, people dedicated to creating UX content, can bring knowledge of best practices, UX text patterns, structures for voice, iterative editing, and review" [Podmajersky, 2019a]. A UX Writer is responsible for developing text for various components within an interface, such as onboarding, user support instructions such as login forms, error and success messages, pop-up modals and tooltips, labels and empty states, and product features such as settings menus.

2.3.1 Historical Context

The concept of user experience (UX) has been around since the early 1990s, but it wasn't until the rise of the web and mobile apps that UX writing specifically began to emerge as a discipline. In the early days of the web, designers and developers focused mainly on functionality, with little attention paid to the user's experience of interacting with the site or app. However, as the web and digital products became more prevalent in our daily lives, it became clear that the quality of the user experience was crucial to the success of these products.

As a result, UX writing emerged as a way to improve the user experience by crafting clear, concise, and compelling copy that guides users through the product and helps them achieve their goals. Today, UX writing is an integral part of the design process, with UX writers working to create products that are both functional and enjoyable to use.

2.3.2 General guidelines to good UX writing

Writing text for user interfaces is a complete and robust process. "While it's impossible to provide universal rules for writing UI text, it's possible to provide some general rules to follow" [Munro, 2020]. Some of the best practices to develop UX writing guidelines can be considered as follows:

Being concise and clear: Using short, simple sentences and avoiding jargon or ambiguous language is very important since the goal is to make it easy for all types of users to understand and navigate the product and have a great experience.

UX writing exists in the context of digital products, and it has unique constraints. Both the size of the screen and the way people comprehend the information in a digital space affect the copy. As a result, copy should be concise and yet communicate the meaning effectively. But concise doesn't mean short; it means something closer to efficient. When we write concisely, we make sure that every word on the screen has its function. It is best to remove any potential clutter and any information that may not be necessary for the people who will interact with this product. As Mark Twain stated "Writing is easy. All you have to do is cross out the wrong words" [Munro, 2020].

Using active voice: Active voice makes the writing more direct, engaging, and easy to understand. For example, "Click the button to submit your form" is clearer than "Your form can be submitted by clicking the button".

The use of active voice in most of the content writing for interfaces results in greater clarity since it clearly indicates who is performing the action, eliminating ambiguity and improving the user's understanding. It conveys a sense of frontality where the subject is the user, which makes the content more engaging and relatable and aligns with the user-centered approach by allowing the user to take control and make informed decisions. Active voice tends to be more concise compared to passive voice as it requires fewer words to convey the same message. It also supports usability by guiding users through the interface and providing clear instructions, helping users understand the next steps, and encouraging them to complete tasks more effectively. All these advantages ultimately result in a more positive and user-friendly product or service.

Using headings and subheadings to break up content and prioritize: This helps users quickly scan and understand the information on the page.

In the early 1990s, the Nielsen Norman Group discovered (through eye-tracking studies) that people read by following a pattern that looks like an 'F' or an 'E', reading the first few lines and then skimming underneath, catching only the first few words of the following sentences [Nielsen, 2006]. "The red dots are the dots corresponding to where users looked the longest, followed by the yellow and blue areas, the least seen. The gray areas did not arouse any interest" [Quintino, 2020]. Therefore, in order to be able to capture users' attention to the most important information first, it is crucial to ensure that the organization of the content is in line with these patterns of web reading behavior [Munro, 2020].



Figure 2.2: Eye-tracking studies that prove the “F”/“E” reading pattern, NN/g

Nielsen Norman Group also found that people read only 20-28 percent of the words on an average web page. "The following chart shows the maximum amount of text users could read during an average visit to pages with different word counts" [Nielsen, 2008]:

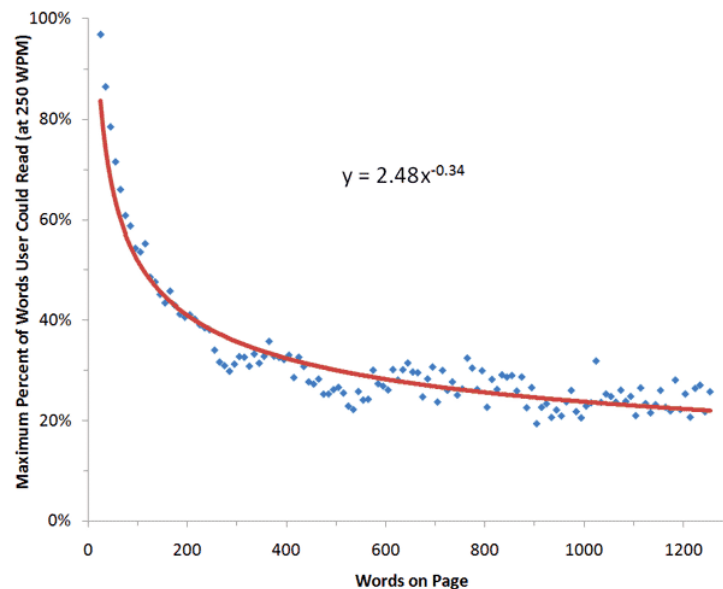


Figure 2.3: Maximum amount of text users could read during an average visit to pages with different word counts, NN/g

"On an average visit, users read half the information only on those pages with 111 words or less. In the full dataset, the average page view contained 593 words. So, on average, users will have time to read 28 percent of the words if they devote all of their time to reading. More realistically, users will read about 20 percent of the text on the average page" [Nielsen, 2008]. This is why it is essential to organize content and reduce cognitive load by not adding text blocks that are too extensive.

Using appropriate tone: The tone of the writing should match the tone of the product and target audience. For example, a casual, friendly tone might be appropriate for a social media app, while a more formal tone might be appropriate for a financial management tool.

"Good UX writing not only makes interfaces more usable but also builds trust. But in order to build trust, the copy must embody the voice of the organization" [Munro, 2020]. The language chosen for writing the various elements that build an interface should align with the brand's vision and mission, by defining the tone of voice, so that users feel they can achieve their goals and overcome their pains.



Figure 2.4: Brand voice and UX writing principles, by uxplanet.org

Testing and iterating: It is important to regularly test the writing with real users and gather feedback, using this feedback to make iterative improvements to the writing and ensure that it is meeting the needs of the users.

Writing regarding accessibility: "According to the World Health Organisation, over 1 billion people live with some form of disability, which can be visual, auditory, cognitive, neurological, or speech-related. That's a huge audience that we don't want to risk losing" [Alilovic, 2022]. According to the Web Content Accessibility Guidelines 2.1 (WCAG), there are several ways to create more accessible user experiences. When developing UX writing content, we should be accessible wherever possible, considering users with different language abilities and backgrounds. This is why it is important to define accessibility guidelines for written content.

2.3.3 Tone of voice

In UX writing, voice, tone, and style are all related but distinct concepts that can impact the effectiveness of the copy.

The **voice** refers to the overall personality and character of the company and is usually described through adjectives. It should be consistent with the brand's voice and values and should appeal to the target audience.

The **tone** refers to the attitude and emotion conveyed by the writing. It is the way in which the content adapts according to the target audience, circumstance, or topic in question.

The **style** refers to the specific words and phrases used, as well as the overall structure and organization of the copy. The style should be consistent and appropriate for the audience and purpose and should aim for clarity and concision.

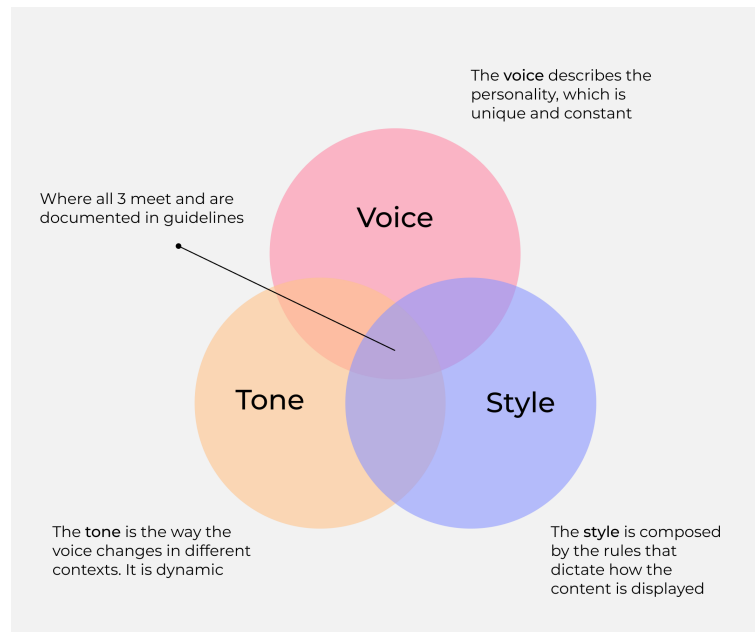


Figure 2.5: Voice, tone and style Venn Diagram by Pedro Quintino

"Establishing the tone and voice of an entity or product offers plenty of benefits, including shaping perceptions, fostering trust and loyalty, strengthening the brand-product relationship, creating a sense of simplicity, infusing a human and authentic touch, influencing behavior, and showcasing credibility and knowledge" [Quintino, 2020]. When writing copy for digital products, you should not only focus on what you are saying, but how you are saying it, and how the text will be perceived by its audience [Dabrowski, 2021]. By identifying the tone of voice, we can create a persuasive microcopy that is essential for effective communication, brand differentiation, and building lasting relationships with customers. It helps create a distinct and recognizable brand personality that resonates with the target audience and supports the company's overall business objectives.

According to Kinneret Yifrah [Yifrah, 2017b], there are four key stages that lead to the design of a complete and effective tone and voice guide:

- **Stage 1:** Read the design, branding, and communication documents written to date and extract essential information about the brand and its target audience. This step allows us to understand what the needs of this audience are and to shape our writing to their needs and constraints.
- **Stage 2:** Realize the opinions of the target audience, extract quotes from this audience if possible, as well as extract any concepts that might be seen as motivators or setbacks.
- **Stage 3:** Conduct an interview or structured meeting with key personnel of the company, asking a series of questions about the brand and its target

audience. The participants in this session should be chosen in such a way that they have the best insights into the data we want to collect.

- **Stage 4:** Develop voice and tone guidelines applied to the company. These guidelines should be documented based on previously collected information, gathered and organized, and are used to guide product development teams to perform the best possible copy.

Defining brand personality

After research is conducted about the brand, its target audience, its market, its vision, mission, and goals, we are able to define its voice, what we can also name brand personality. The voice should convey all these characteristics and should be described through adjectives such as formal, innovative, friendly, among others. Initially, it is good to define three to four of these adjectives, which will be the brand's personality traits and will serve as the basis for defining the tone of voice.

Defining tone of voice

According to Dabrowski, "the tone of voice should be a reflection of the brand's personality, adjustable depending on the context the user is in" [Dabrowski, 2021]. To create the Tone of Voice guidelines we can take the characteristics of Voice and think about how these characteristics should vary in different contexts. Adapted to digital products, we can think for example about what kind of screens and components we should use one tone over another, thinking about how users will perceive the message and taking into account the feelings users may be experiencing at certain points in their user journey. For example, in error messages, we should adopt a more encouraging tone, supporting and guiding the user, to avoid confusion or frustration, while in success messages we have a little more freedom to convey a more relaxed character, of celebration and joy.

Below is an example of the same message with two different tones. While the words "Wrong password" may be too aggressive for an error message, the phrase "That password doesn't look right" adds a more sympathetic tone, and takes some of the weight off the user for making that mistake.

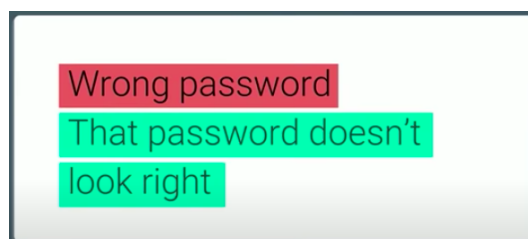


Figure 2.6: Example of error message with different tones, Google

"Nielsen Norman Group developed a universal tool for sketching out basic tone profiles in 2016" [Moran, 2016]. Since then, industry leaders have disseminated

the concept innumerable times. Establishing Tone of Voice guidelines for UX writing has become something of an industry-standard in recent years. The primary tone-of-voice dimensions defined by Nielsen Norman Group are: funny vs. serious, formal vs. casual, respectful vs. irreverent, and enthusiastic vs. matter-of-fact.

These dimensions can be a starting point when creating guidelines for the tone of a company or product, but there should be a mapping of key moments to best appropriate the tone of voice to a given product, taking into account its target audience. "After identifying the two extremes in the tone map, it's necessary to determine the different touch points of the user journey. These touch points can include happy moments, like success messages or welcome screens, and serious moments, like fraud alerts or error messages" [Quintino, 2020].

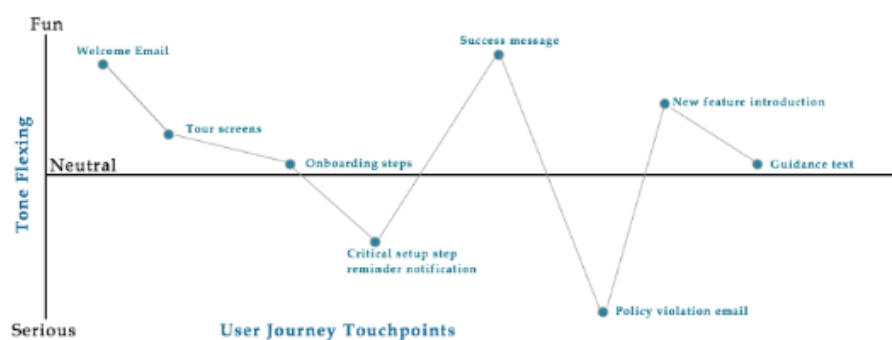


Figure 2.7: Example of a tone map, UX Writers Collective

2.3.4 Writing for user experience — components and best practices

This section discusses some general UX writing best practices for some user interface components and screens, namely onboardings, empty states, messages, modals, tooltips, buttons, links, CTAs, forms, and error and confirmation messages.

Onboarding

Onboarding refers to the process of familiarizing and integrating users or customers into the interface of a product or service. It is intended to help individuals understand and navigate the features, functionality, and benefits of a product or service so that they can use it effectively and efficiently.

"Onboarding is not limited to first-time users — existing users may also be onboarded when new features or redesigns are released. Thus, onboarding can occur at multiple points in a user's lifecycle of an app, not just the first launch" [Joyce, 2020]. The goal of onboarding is to provide a smooth and positive user experience during the several stages of user interaction. It involves guiding users through the steps necessary to set up their accounts, configure preferences, and gain a basic understanding of how to use the product.

The common components in mobile onboarding flows are feature promotion, customization, and instructions. Their objectives are illustrated in the image below.

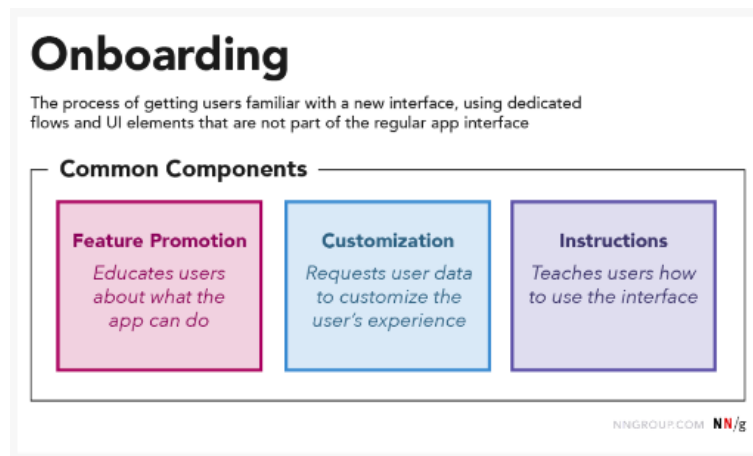


Figure 2.8: Onboarding common components, NN/g

By implementing effective onboarding strategies, organizations can reduce user frustration, increase user engagement, and improve user retention. A smooth onboarding experience helps users quickly understand the value and benefits of a product or service, leading to a positive long-term relationship between the user and the organization.

When creating content for onboarding screens design, some best practices include keeping it simple, being visually appealing, providing a clear call-to-action, using storytelling, personalizing the experience, being concise, and using progress indicators.

Empty States

"Words don't only empower and sharpen an experience, they can also create it, even when it seems that there is nothing to experience" [Yifrah, 2017c]. Creating content for empty state screens is a good example of this.

An empty state is a user interface design pattern that refers to the visual representation of a lack of data or content in a specific area of an application or website. An empty state is typically displayed when there is no data or content to display in a specific area. Empty states are an important part of user interface design because they provide a clear indication to the user that the current state is intentional and not an error. They also help guide the user on what to do next, such as adding new data or content to the app or website.

According to the Atlassian Design System, these messages are "a way to celebrate, add energy, and motivate people to get on with their next task" [Atlassian, 2023a]. Some best practices for writing for empty states include concise, clear messages to inform why there is no content and to guide users on what they can do next; using action-oriented language, providing instructions or suggested actions to help users follow the next steps; using visual clues and icons to reinforce the meaning of the empty state and make it more visually appealing; providing

contextual information about why the state is empty and how users can fill it with information; paying attention to the visual design of the empty state, ensuring that it is visually distinct from other content areas and attracts users' attention without being too distracting.

Messages and modals

Messages and modals are types of components that pop-up, which can appear at specific times in the user journey. Typically, messages are informative and contain no action buttons, while modals contain one or more options for the user to choose from.

Messages are used to display information to the user. They typically do not require any action from the user but may include a button to close the dialog box. They are used to provide feedback, confirm actions, or display messages. Modals, or decision pop-up dialog boxes, on the other hand, require the user to make a decision or provide input. They typically include options for the user to choose from, such as "Confirm" or "Delete," and may also include input fields for the user to enter data. They are used to prompt the user for confirmation or make a decision, such as whether to save a file before closing it or which printer to use when printing a document.

Tooltips

Tooltips are brief, informational text boxes that appear when a user hovers their cursor (or uses a keyboard-hover gesture) over a specific element on a webpage. They usually provide additional context or explanation about specific elements or features in a user interface. "Thus, tooltips are highly contextual and specific and don't explain the bigger picture or the entire task flow" [Joyce, 2019].

The main purpose of tooltips is to provide supplemental information, guidance, or clarification without overwhelming the interface or users with excessive content. Tooltips should not be an essential element for the user to perform a task, as the most important information should already be displayed there. They offer a way to provide concise, contextual information precisely when users need it, improving the overall user experience.

According to Alita Joyce, some of the tooltip usage guidelines that should be followed so we don't misuse it are "not using tooltips for information that is vital to task completion, providing brief and helpful content inside the tooltip, supporting both mouse and keyboard hover, using tooltip arrows when multiple elements are nearby and using tooltips consistently throughout a site" [Joyce, 2019]. Effective tooltips are concise, easily scannable, and relevant to the user's current context. They should be visually distinct from other interface elements, appear near the associated element to establish a clear connection and disappear when the user moves the cursor away or interacts with the interface. By using tooltips carefully, designers can provide useful information and improve the usability and accessibility of their interfaces by helping users understand functionality, reduc-

ing confusion, and facilitating interactions.

Buttons, links and CTA

"Buttons and other interactive text are any text that a person interacts with by tapping, clicking, or speaking to get to their next step. Sometimes they are called links, calls to action, or commands, but whether they are performing an action, taking the person to the next screen, or navigating elsewhere, we will consider them together in this pattern" [Podmajersky, 2019c]. Buttons, links, and calls-to-action are fundamental elements in user interfaces that facilitate interactions and guide users to specific actions or destinations.

Buttons are typically rectangular or circular graphical elements that users can click or tap to perform an action within the interface. They can be found in many different types of software and websites, such as a "submit" button on a form or a "play" button on a video player. The importance of buttons cannot be overrated. So that users can get what they came for to the site or app, and so that their browsing turns into their desired outcome, users must click a button. "Microcopy for buttons is full of surprises, and changing just one word on the button can increase or drop conversion rates significantly. Investing in A/B testing is very important to maximize conversion rate" [Yifrah, 2017a].

Links are clickable text or images that, when clicked, take the user to another page or location on the same page. They are often used to navigate between pages on a website or to access additional external information.

Calls-to-action (CTA) are buttons or links that are specifically designed to encourage users to take a specific action, such as making a purchase or signing up for a service. They are commonly used to encourage users to engage with a product or service.

Pedro Quintino states that some of the best practices for writing content for buttons, links, and call-to-action are that they "should focus on clarity, tell the user what happens next, start with a verb that reflects the action the user can take, and use words that respect the content that precedes the button. In the case of buttons, they should only have up to 3 words" [Quintino, 2020].

Forms

Forms are a common element in user interfaces (UI) that allow users to input and submit information. They can be found in many different types of software and websites. Forms typically consist of a set of input fields, such as text fields, drop-down menus, checkboxes, and radio buttons, that users can fill in with information.

"Forms should be short and contain only the necessary fields, display labels next to the respective fields, display fields in a single column layout, avoid text inside the fields (placeholders), explain rules next to the respective field, follow people's need for order and logic, not overload the user with information, display fields

consistently and clearly, use error messages that guide and help the user and offer relevant information with tooltips and microcopy" [Quintino, 2020].

Error messages

Error messages are the only text we write that we hope users will never see. However, users are most likely to see some of your error messages, and thus you need to word them so that they offer real help. "Error messages need to fulfill the goals to: explain simply and clearly that there is a problem and what that problem is; provide a solution so that users can return and complete the process immediately; turn the delay into an experience that is as pleasant as possible" [Yifrah, 2017d].

"When writing error messages, we should avoid blaming the user for the error, causing alarm or insecurity, using jargon or technical language, and resorting to humor, exclamations, and interjections" [Quintino, 2020]. An error message should clearly explain what happened, provide solutions to resolve the error (if they are not obvious), and be concise, concrete, and empathetic.

Confirmation messages

According to T. Podmajersky, "the purpose of confirmation messages is to reassure the person that the progress or results they expect are complete" [Podmajersky, 2019b]. Confirmation messages are messages that are displayed to users to confirm that an action they have taken has been successful.

Confirmation messages are an important aspect of user experience (UX) design, as they help to provide reassurance and feedback to users, and can help to reduce the likelihood of errors or confusion. They also help to build trust and credibility with users, by showing that the system is working as intended and that their actions have been successful. "When writing confirmation messages, the use of humor, interjections and exclamations, technical jargon and passive voice should be avoided" [Quintino, 2020].

2.4 Service Design

"Service Design helps to innovate (create new) or improve (existing) services to make them more useful, usable, desirable for clients and efficient as well as effective for organizations. It is a new holistic, multi-disciplinary, integrative field" [Moritz, 2005]. Service design aims to improve the quality and effectiveness of service by considering the entire service journey from the perspective of the user, and designing all aspects of the service around their needs and expectations. This includes things like the physical environment, the tools and resources used by the service provider, and the communication and interactions between the service provider and the user.

"Service design is the process of designing and organizing the elements of a ser-

vice in a way that effectively meets the needs of both the provider and the customer. It [Service Design] aims to ensure service interfaces are useful, usable and desirable from the client's point of view and effective, efficient and distinctive from the supplier's point of view" [Mager, 2009]. Effective service design can lead to improved customer satisfaction, loyalty, and retention, as well as increased efficiency and effectiveness for the service provider. It is an important part of creating successful and sustainable service-based businesses and organizations.

The image below is an illustration of how service design relates to UX design.

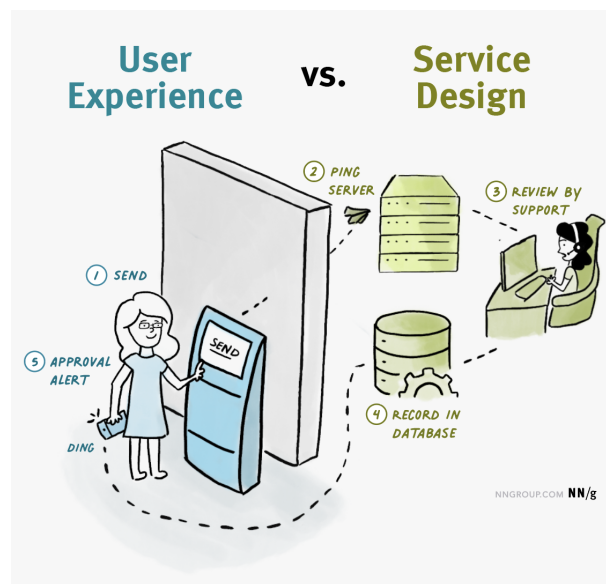


Figure 2.9: UX vs Service Design, NN/g

"User experience is what the end user encounters: the kiosk, its interface, and the resulting notification on mobile. Service design is the orchestration of technology, people, and processes that makes the user's experience possible: pinging the server, connecting the request with the right support agent, and documenting the outcome" [Gibbons, 2021]. Briefly, while UX design focuses on individual touchpoints and digital interfaces, service design takes a broader view of the entire service ecosystem.

"It is important to think about what the end users encounter, while also considering logistically how that experience gets delivered" [Gibbons, 2021]. Combining service design and UX design offers a collaborative and integrated approach that has advantages such as a holistic user experience, focus on the user, seamless touchpoint integration, emotionally engaging experiences, and improving business value. By integrating UX writing into service design processes, organizations can create service experiences that are user-centered, coherent, engaging, and aligned with the brand. UX writing helps shape the language, content, and messaging within the service ecosystem, contributing to a seamless and meaningful user experience.

2.5 Design systems

Design systems are revolutionizing the way companies approach the creation of digital products and experiences. "A design system is a set of standards to manage design at scale by reducing redundancy while creating a shared language and visual consistency across different pages and channels" [Fessenden, 2021]. A design system works as a centralized resource that establishes and enforces design standards promoting efficiency, consistency, and better user experiences in the development of digital products or experiences. A design system involves documentation, design patterns, rules to follow, and guidelines about UX.

"You'll often see the terms design system, pattern library, component library, and style guide used interchangeably. While these concepts are connected, they refer to different parts of a whole" [UXPin, 2022]. To clarify the concept of design system, these other concepts will be addressed, in order to distinguish them.

A style guide focuses on visual and branding guidelines, primarily addressing the visual elements of a product or brand. It is "a piece of documentation that provides context and instructions for a design system's patterns and components — for example, color HEX codes, typography scales, usage, dos and don'ts, etc. [UXPin, 2022]".

The difference between components and patterns can be explained using Brad Frost's Atomic Design methodology:

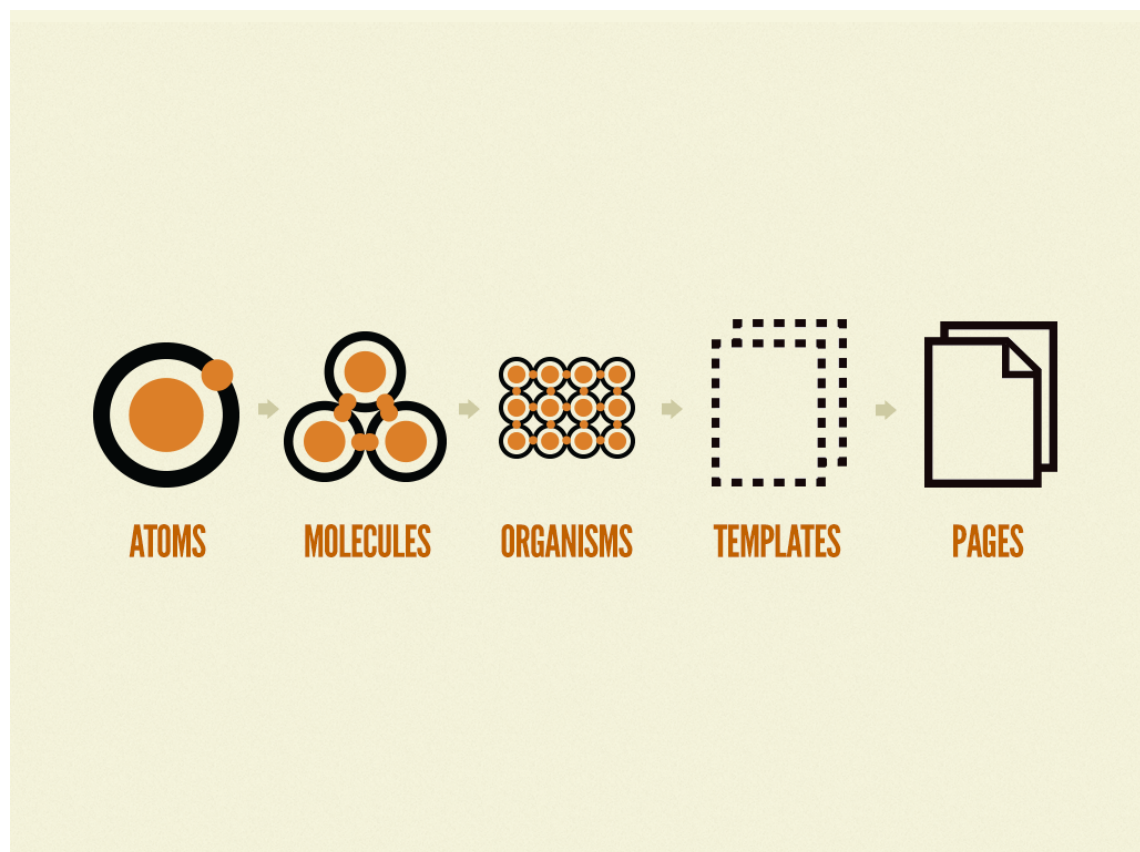


Figure 2.10: Brad Frost's Atomic Design methodology, 2013

Brad Frost's Atomic Design is a methodology that proposes a modular approach to designing and building digital interfaces. It draws inspiration from chemistry's atomic structure, dividing interfaces into smaller, reusable components called atoms. These atoms are combined to form molecules, which then form organisms and eventually complete user interfaces. The Atomic Design methodology promotes a systematic and scalable approach to design, allowing for consistent and efficient development across various platforms and devices.

According to this methodology, atoms are the fundamental design elements that cannot be subdivided, such as buttons or icons, for example. Molecules are created by combining atoms to make slightly more complex components, such as breadcrumbs or pagination. Organisms are complex patterns that shape the interface with elements such as cards or navigation bars. Templates are wireframes that include atoms, molecules and organisms, and begin to resemble the final version of a web page or mobile application. Finally, pages are the combination of all these elements in high fidelity.

Using Atomic design, it is possible to define patterns and components as follows:

"Component library (Atoms): A component is a reusable block of code that can stand alone or form part of multiple UI patterns — for example, a button. A component library is a collection of UI components within a design system" [UXPin, 2022]. It is a subset of a design system that specifically focuses on documenting reusable design patterns.

"Pattern library (Molecules and Organisms): A pattern is a group of components that designers use to solve usability issues—for example, a navbar with a logo, links, search form, and CTA button. A pattern library is a collection of UI patterns within a design system" [UXPin, 2022]. It provides pre-designed UI components for consistent implementation.

A design system is a comprehensive set of guidelines and assets that covers all aspects of design and development, including visual elements, interaction patterns, and design principles. "Designers and engineers must use the components as building blocks. They must follow the system's guidelines, style guide, principles, and other documentation to design consistent-looking user interfaces — like following the instructions to build a Lego set" [UXPin, 2022].

A design system applied to a company has numerous advantages, including scalability, maintainability, efficiency, consistency, improved code and design quality, better knowledge sharing, avoiding siloed knowledge, closing the brand-product gap, promoting the company's design philosophy and principles, better brand and guideline adoption through shared ownership, and promoting equality [Oppermann, 2022].

Some of these principles take on special importance for Ubiwhere, such as:

Scalability: As companies grow and develop new products or functionality, design systems provide a scalable structure to maintain a cohesive and unified language. In addition, they allow for faster prototyping, iteration, and adaptation to changing needs, ensuring that the design remains adaptable and future-proof.

Efficiency: Design systems consist of centralized repositories of reusable components, styles, and assets, and also provide guidelines for good use of the components and language to be used. By taking advantage of these pre-established assets, designers and developers can optimize the design and development process, saving time and effort. By providing clear UX writing guidelines and standards, teams can work more efficiently and effectively, reducing the need for back-and-forth iterations and ensuring a cohesive user experience throughout the product development process.

Consistency: By establishing a set of solid components, standards, and guidelines, we are able to ensure consistency of visual, written, and interactive elements across our products and platforms. Consistency helps create brand recognition, as all products will have a similar foundation and improves the user experience by reducing the cognitive load on users when navigating. Including UX writing guidelines helps maintain consistency in the voice and tone, style, and language used in the user interface copy. Consistent messaging and terminology contribute to a cohesive and familiar experience for users, regardless of where they interact with the product.

Brand alignment: A design system enables the consistent application of brand guidelines and visual identity across all products and touchpoints. By using these guidelines, design elements are able to reflect the brand's personality, values, and aesthetics, enhancing brand recognition and trust. UX writing guidelines help define the brand's voice and tone, ensuring that the language used in the product aligns with the brand's personality and values. Consistency in voice and tone builds brand recognition and strengthens the overall brand identity. It also helps users connect with the product on an emotional level and fosters a sense of trust and familiarity.

By prioritizing user-centered principles, design systems also enable teams to create intuitive, usable, and accessible interfaces. Well-designed, consistent components and solid guidelines improve the overall user experience, resulting in a better understanding and interaction with digital products or services. Since design systems aim to provide consistent and modular components, UX writing plays a crucial role in ensuring that textual elements in the interface conform to the structure and guidelines of the design system.

2.6 Typography for the web

Ubiwhere uses typography not only for digital products, but also for graphic material such as flyers or merchandising, for example. In the context of the project, the important thing is to discuss the use of typography for the web.

"95 percent of the information on the web is written language. It is only logical to say that a web designer should get good training in the main discipline of shaping written information, in other words: Typography" [iA., 2006]. Typography refers to the art and technique of arranging typefaces (fonts), letters, and other visual elements in a visually appealing and readable manner. There are two di-

mensions of typography — macro-typography and micro-typography. Together, they encompass several aspects such as font selection, font styles, sizes, spacing, and hierarchy, among others. Typography plays a crucial role in communication and visual design in general, having as its main objectives to convey information, organize content, and improve legibility and readability.

When adapted for the web, it focuses specifically on the use of typography for digital environments, such as websites or applications. Typography for the web takes into account the unique characteristics and constraints of digital media and has to be designed to be effective and visually appealing. It involves thinking about issues such as considering what are the best typefaces to use on the web, responsive typography for different screen sizes, line lengths, the behavioral patterns of reading in digital media, and promoting accessibility for all users.

In order to achieve its goals and contribute to an effective, accessible, and visually appealing reading, typography for the web can follow some principles, among which we can highlight:

Legibility. The typography must be legible and easy to read, ensuring that the text is clear and understandable for different types of users and also adapted to the various screen sizes of each device. The key factors that influence legibility for typography on the web can be considered font choice, font sizes, typography hierarchy, line length, paragraph spacing, text alignment, and accessibility considerations. Let's look at some of these factors for web typography.

Hierarchy. The typography should establish a clear hierarchy of information, in order to guide users to focus on the most important elements first and aid in the reading and understanding of the content. It is necessary to keep in mind that reading on the web is different from reading on paper, since reading patterns differ and on the web there is a tendency to "scan" along the text, rather than read its entirety. "Most web sites are controlled by hierarchies in an even more systematic way than print documents" [Lupton, 2004a]. Typographical hierarchy holds specific relevance on websites due to factors such as the need for digitization, adaptation to different screen sizes, interaction, reading speed and accessibility. An effective typographic hierarchy makes it easier to navigate and understand the content.

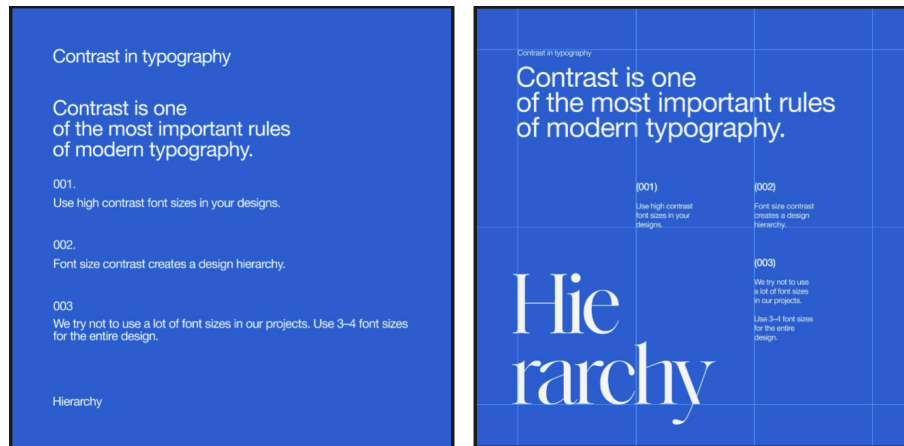


Figure 2.11: Typographic for the web hierarchy example, typography principles by Obys Agency

Alignment. The alignment of text elements contributes to a clean, tidy and consistent look, which results in improved readability and greater visual appeal.

Left justified text is familiar, fast, and reliable. It should be used in most cases for web typography, since it helps readers read at an optimal, undiminished reading speed [Website Architect, 2020].

Center alignment can be used for small text, and is most common for elements such as tables, or page titles that are not too long. It should be used with caution, since in longer texts it can become difficult for the user to read, since on each line they have to look for the beginning of the text.

Right alignment should not be used because it goes against the normal way a person reads, from right to left. Right alignment should not be used other than in navigation menus, for example, for text with only one or two words [Website Architect, 2020].



Figure 2.12: Example of right-aligned text on navigation menu

Line length. While there is no hard and fast rule for the ideal line length, it is generally recommended to keep the range between 45-75 characters per, which provides a comfortable reading experience and facilitates efficient scanning and comprehension. "Shorter lines are more comfortable to read than longer lines. As line length increases, your eye has to travel farther from the end of one line to the beginning of the next, making it harder to track your progress vertically" [Butterick]. This character count to define the line length is a general rule, but it is relevant to consider other factors such as font size, line spacing and overall page layout when determining the optimal line length for a specific design, since these aspects can affect the definition of line length.

Line spacing. "Line spacing is the vertical distance between lines of text" [Butterick]. By considering line spacing we can enhance readability, accessibility, com-

prehension, and the overall visual appeal of the text. It helps create a more pleasant reading experience and ensures that the content is accessible and legible to a wide range of users. "For most text, the optimal line spacing is between 120 percent and 145 percent of the point size" [Butterick]. While this is the "ideal ratio," various aspects such as font size, font style, line length, and content type can influence line spacing choices. This is why it is important to test your choice of line spacing when laying out text in a user interface.

Accessibility. "Many designers are passionately committed to building accessible sites for the Web (...) in order to provide universal access to information (...), regardless of a user's physical abilities or access to specialized software" [Lupton, 2004b]. Typography should comply with accessibility standards, ensuring that users with visual impairments or reading difficulties can access and understand content using assistive technologies. "Techniques for achieving accessibility include the captioning of all layout tables, the consistent use of "alt tags", and the placement of page anchors in front of repeated navigation elements that enable users to go directly to the main content" [Lupton, 2004b].

These are just some general principles about typography for the web. There should be in-depth research on these topics when choosing a typeface and font sizes for various screen sizes for products and services. These principles collectively contribute to creating a visually pleasing, readable, and engaging experience on the web, facilitating effective communication and enhancing the overall user experience, and will serve as the basis for the development of the section on typography. Therefore, when defining typography for Ubiwhere's design system, it will be important to address aspects such as fonts to be used, text types (titles, body text, etc), font sizes for desktop and mobile, text formatting, paragraph spacing, line height, and line length, as well as some general rules for using typography.

2.7 Interface design

Interface design refers to the process of creating visual and interactive elements that facilitate user interactions with digital products or systems, dealing primarily with the visual and aesthetic aspects of a user interface. "User interface (UI) design focuses on anticipating what users might need to do and ensuring that the interface has elements that are easy to access, understand, and use to facilitate those actions. UI brings together concepts from interaction design, visual design, and information architecture" [Usa, 2014]. This area of design involves creating the visual elements that users interact with, such as buttons, menus, icons, color schemes, typography, and layout.

Its main goal is to ensure that the interface is not only visually appealing but also easy to understand and provides a clear and intuitive structure for user navigation. Factors such as branding, usability, accessibility, and the overall look and feel of the interface should be taken into consideration.

In the book *Designing the User Interface: Strategies for Effective Human-Computer*

Interaction, Ben Shneiderman describes eight golden rules of UI design [Shneiderman et al., 2018]. Of these rules, the ones that are most important given the context of the project are:

Making user interfaces consistent. This principle emphasizes the importance of maintaining consistency throughout the design of user interfaces, by using similar elements, behaviors, and patterns across different parts of the interface to create familiarity and predictability for users. When there is consistency and cohesion in user interfaces, users can more easily understand and interact with different elements because they follow established conventions. This allows users to transfer their knowledge and experience from one part of the system to another, reducing the need for relearning and eliminating possible confusion, which contributes to a more efficient and seamless user experience.

To achieve consistency, we can establish and adhere to design patterns, guidelines, and standards, such as the use of consistent terminology, visual styles, interaction patterns, and navigation structures. By making user interfaces consistent, we can improve usability, reduce cognitive load, and increase user satisfaction. By using consistent terminology, concise and clear instructions, and coherent messaging, UX writing ensures that users can understand and interpret interface elements in a consistent manner. This clarity promotes ease of use and reduces the chances of confusion or misinterpretation.

Provide informative feedback. This principle emphasizes the importance of providing users with timely and meaningful feedback in response to their actions on an interface. This feedback plays a crucial role in guiding users, confirming their actions, and helping them understand the system's response, make informed decisions, and be clear about the system's status or progress. Feedback should be immediate, clear and contextual, appearing close to the user's action, and can be given through various means, such as text messages, animations, and visual or auditory cues.

UX writing takes great importance in providing informative feedback, since it is through the texts crafted for messages, notifications, alerts or instructions that users are informed about their actions, progress and potential problems. The application of UX writing guidelines promotes clear, concise, user-directed writing, which helps users make informed decisions, reduce possible uncertainty, and increase overall user satisfaction and trust in the product or service.

Prevent error as much as possible. This principle holds that it is more effective and efficient to prevent errors from occurring in the first place than to rely solely on error detection and correction. By anticipating and mitigating potential errors, we can improve the overall usability as well as the user experience.

UX writing guidelines may include the importance of topics such as validating form fields, writing for error and confirmation messages, providing clear instructions, and providing contextual help. All of these aspects contribute to a user experience that prevents errors, guides and supports users.

Support internal locus of control. This principle highlights the importance of empowering users and allowing them to feel that they are in control of their

interactions with a system. The term "internal locus of control" refers to an individual's belief that they have control over the outcomes of their actions. In the context of user interface design, supporting internal locus of control means providing users with clear and meaningful choices, feedback, and control over their interactions. This empowers users to navigate, interact, and accomplish their goals with confidence, perceiving the system as responsive and adaptable to their needs.

By utilizing empowering language, providing clear instructions and guidance, ensuring transparency and clarity, offering feedback and progress indicators, providing help and support messaging, and delivering clear error messages, UX writing supports to feel capable, informed, and in command of their interactions.

The use of these "golden rules" enables the creation of interfaces that prioritize user needs, improve usability, and increase overall user satisfaction. Applying UX writing to these user interface principles leads to a user experience that is clear, engaging, takes into account possible errors, and is user-centric, resulting in increased usability and user satisfaction, helping users to achieve their goals effectively in the interface.

2.8 Conclusions

All the areas and concepts analyzed in this chapter contribute to explaining what the importance of UX writing is and its contribution to the development of products and services that prioritize the user and the user experience when navigating these products.

The chapter on user-centered design and human-centered design allowed us to conclude that UX writing is related to these areas as it plays a crucial role in shaping user interactions and experiences by focusing on the effective use of language and written content, and by focusing on the user, putting their needs, behaviors, and preferences at the forefront of the design process. By creating guidelines for carefully crafted language, tone and messaging, UX writing ensures that the content and communication of a product or service resonates with users, supports their goals and increases their overall satisfaction and usability, helping to create meaningful connections between users and the digital experiences they engage with.

The chapter on user experience allowed us to understand that UX writing takes into account the overall user journey, needs and expectations, and seeks to improve usability, clarity and engagement of the interface through effective language and communication. Thus, contributes to the overall user experience by providing clear instructions, guiding users through tasks, establishing a cohesive brand voice, and ensuring that users can easily understand and interact with the interface. It plays a crucial role in shaping the emotional connection and perception users have of a product or service, influencing their satisfaction and loyalty. By aligning with UX principles, UX writing contributes to creating user-centric, intuitive, and enjoyable digital experiences.

The chapter on service design led us to conclude that UX writing takes into account not only the content of the digital interface, but also customer support, notifications, emails, and other communication channels. It aims to create a unified, user-centric experience by establishing a consistent tone of voice, providing informative and helpful instructions, and responding to users' needs and expectations at each stage of the service journey. By aligning with the principles and goals of service design, UX writing contributes to providing an pleasant service experience for users.

We were also able to conclude that UX writing helps establish a consistent and effective language for systems design, collaborates with interface design to optimize content presentation, and considers typographic principles to improve the readability and visual appeal of written web content.

All of these areas are relevant to understanding the proposed topic of this thesis and also to developing the practical work to be done.

Chapter 3

Analysis of existing company content guidelines

Since the main aim of this dissertation is to create UX writing guidelines to include in Ubiwhere's design system, several examples of existing guidelines from other well-known tech companies will be analyzed to help understand which topics will be relevant to present in the work.

In order to choose the relevant content to integrate into Ubiwhere's design system, more specifically the UX writing guidelines to be created, it is crucial to analyze some already existing in other companies, which are usually included in the design systems.

3.1 Spectrum - Adobe's design system

Adobe Spectrum is Adobe's design system for creating consistent and intuitive user experiences across its products. The goal of Spectrum is to help designers create consistent and high-quality experiences that are easy for users to understand and use. Some of the key principles of Spectrum include usability, simplicity, flexibility, and inclusivity. It is intended to be a resource for designers and developers working on Adobe's products and can be used to ensure that all Adobe products have a consistent look and feel.

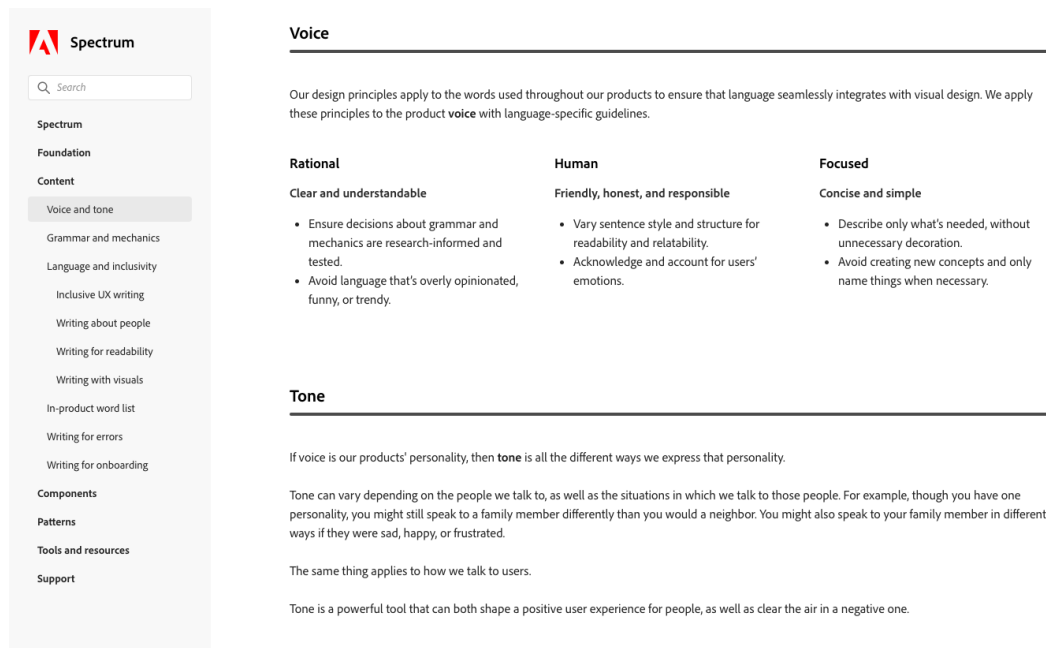


Figure 3.1: Spectrum, Adobe's Design System

On the content section, Spectrum focuses on the following topics:

Voice and tone. This section introduces and provides an explanation of the company's voice characteristics, as well as the tone spectrum — the variations that the voice can have and how often they are used.

Grammar and mechanics. This section presents rules and best practices on language and grammar, covering the topics of active and passive voice, contractions, verb tenses, capitalization, pronouns, punctuation, abbreviations, numbers, dates and time, and lists. The fact that there are do's and dont's illustrating most of the rules described in these sections makes the guidelines easier to understand and apply.

Spectrum

Search

Spectrum

Foundation

Content

Voice and tone

Grammar and mechanics

Language and inclusivity

In-product word list

Writing for errors

Writing for onboarding

Components

Patterns

Tools and resources

Support

Spectrum CSS

React Spectrum

Spectrum Web Components

Second person

Most of the time, use second person (*you, your, you're*) to address users and services.

First person

Use first person (*me, I, my*) only in these situations:

- Someone responds to the interface or answers a question they've been asked directly
- When additional sensitivity is necessary, or to indicate privacy
- When there's a legal need to use first person to ask for consent (e.g., "I agree to these terms and conditions")

On rare occasions, it can be appropriate to use *we* or *us* to mean "Adobe":

✓ You can export your data here

Your profile / Your work

✗ I can export my data here

My profile / My work

✓ Yes, I agree to these terms of service

✗ You agree to these terms of

Figure 3.2: Grammar and mechanics do's and don't's, Spectrum

Language and inclusivity. Spectrum features an extensive section on accessibility, covering topics on inclusive UX writing, writing about people, writing for readability and writing with visuals. In addition to these sections, the design system has a set of links to useful references with more information about inclusivity. The organization of this section gives us an overview of the accessibility principles to take into account when creating content.

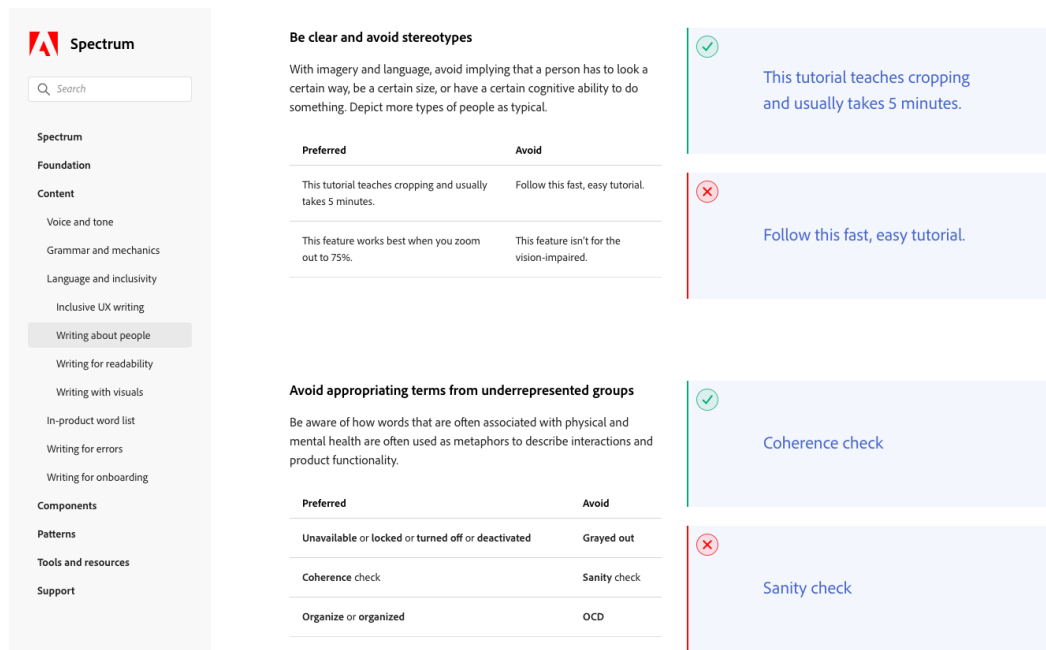


Figure 3.3: Language and inclusivity do's and dont's, Spectrum

In-product word list. This section focuses on presenting in-product terms that should be used, avoided, or used with caution, with relevant notes on their usage.

Writing for errors and writing for onboarding. These sections present more in-depth rules about creating content for this type of components, where writing is usually of great importance in transmitting messages. These sections also provide illustrative examples of the good practices they mention.

Regarding content, Spectrum is notable for its illustrative examples of do's and don't's in almost every section, making it easy to apply its guidelines.

This will certainly be one of the design systems that will serve as inspiration and basis for creating the content guidelines applied to Ubiwhere, especially the sections on language and grammar and language and inclusion. Because it is so complete, has so many use case examples, and because of its organization, this guide is easy to understand and details deep aspects of writing and language that can really elevate product design.

3.2 Material Design - Google's design system

Material Design is a design system developed by Google in 2014. It is a visual design framework that provides a consistent look and feel for digital interfaces across different devices and platforms. The goal of Material Design is to create a cohesive user experience across all devices, from mobile to desktop.

"Material is an adaptable system of guidelines, components, and tools that support the best practices of user interface design. Backed by open-source code, Material streamlines collaboration between designers and developers and helps

teams quickly build beautiful products" [Google, 2023].

Although it focuses more on the visual identity and its various applications in the elements of a user interface, Material Design presents some general rules with illustrative examples of what one should or shouldn't do when writing for these interfaces, providing general guidelines such as using clear and concise language, using active voice to make the language more direct and engaging, using appropriate tone for the product and the target audience and using clear headings and labels.

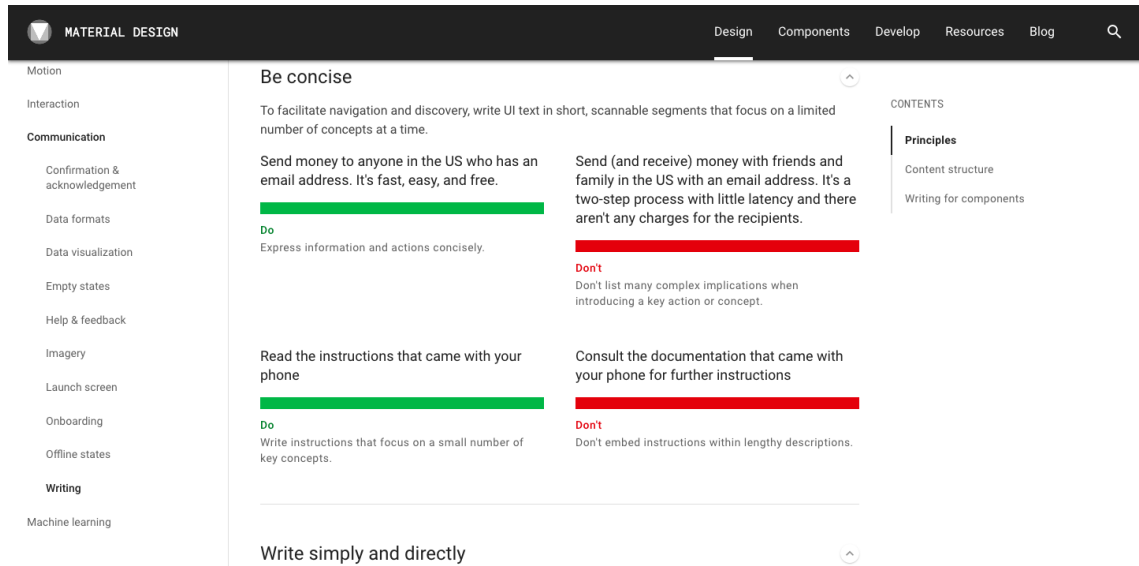


Figure 3.4: Material Design, Google's Design System

These content guidelines can be useful in sections, for example like grammar and mechanics, as they address more specific topics like punctuation, how to address users, and broader topics on how to write concisely, directly and simply.

This design system is probably the most popular on the market. It stands out from the other ones because when it comes to writing content, it presents a version for design and the same version for implementation.

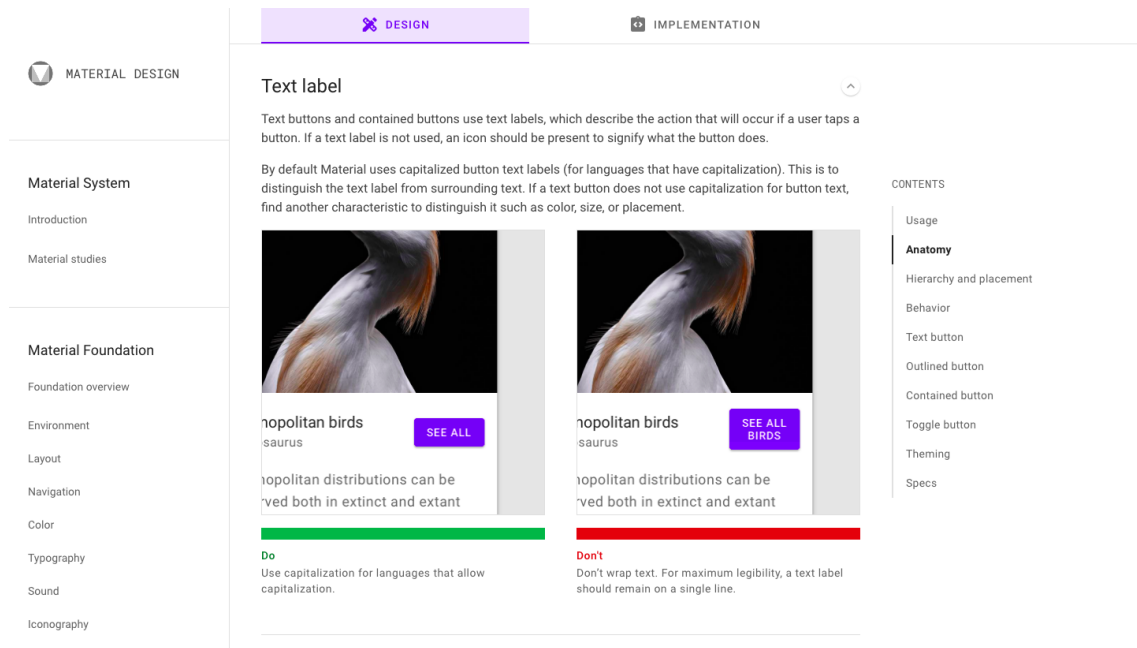


Figure 3.5: Text label design guidelines, Material Design

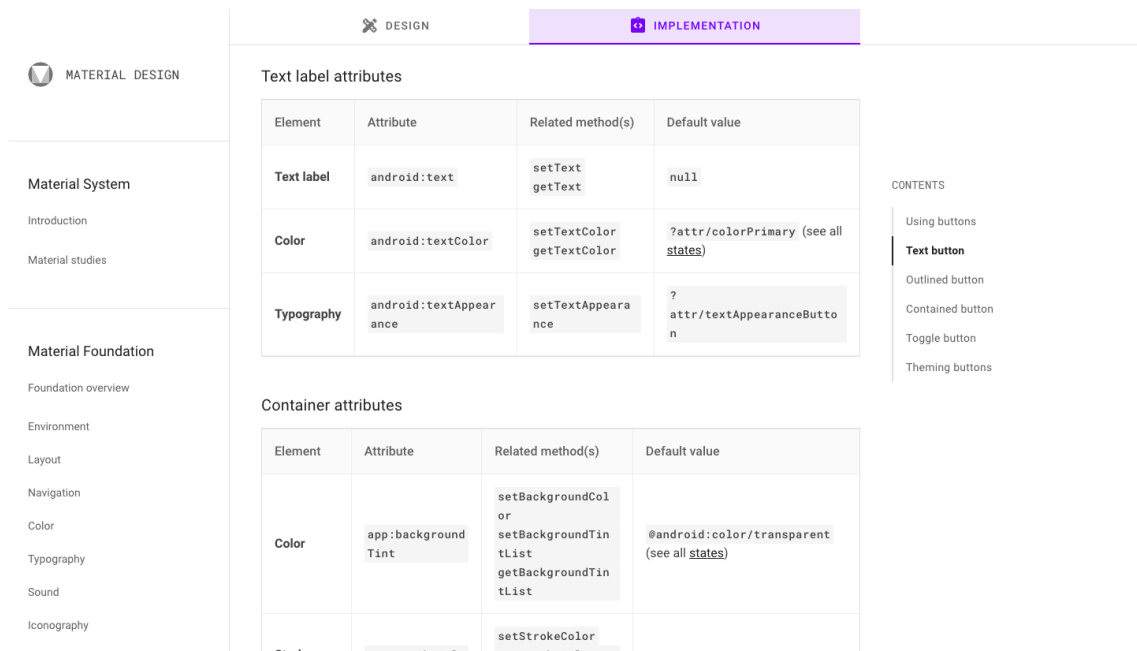


Figure 3.6: Text label implementation guidelines, Material Design

By presenting both the design and implementation version, Material Design gets teams to develop consistent products that are governed by common rules and documentation. As far as the design part is concerned, it might be a good design system to evaluate regarding the creation of writing rules for some specific components or screens, which can be included in Ubiwhere's design system.

3.3 Mailchimp's content style guide

Founded in 2001, Mailchimp is an American marketing automation platform and email marketing service.

This company stands out for not having a design system, but rather a content style guide, which is a document entirely dedicated to the area of UX Writing [Mailchimp, 2022].

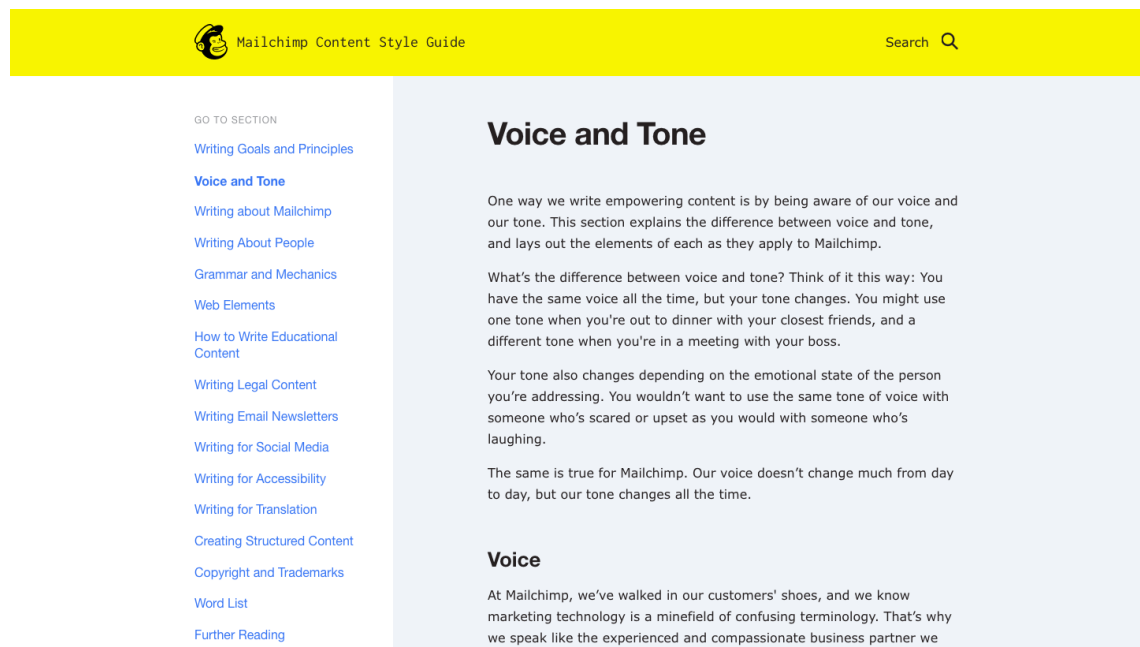


Figure 3.7: Mailchimp's Content Style Guide

This guide covers numerous topics that help products become clear and concise for users. Some relevant sections in this content style guide are:

Writing goals and principles. This section presents a short text about the brand's goals and how they can achieve them through the creation of relevant content.

Voice and tone. This section briefly but clearly presents the definition of voice and tone, as well as what the brand's voice is and the different tones that can be used in the messages they want to convey.

Writing about people. This section concerns content that is accessible to various types of users and covers topics such as age, disabilities, gender, sexuality, hearing, heritage, nationality, medical conditions, mental and cognitive conditions, race, and vision.

Grammar and mechanics. This section includes best practices for grammar, with examples of what to do and what not to do, in terms of punctuation, text formatting, and other aspects that are important for clear and consistent writing at all times.

Web elements. This section is to describe how the writing for various web components should be performed.

Writing for accessibility. In addition to the section on writing about people, this section presents some more general principles of how we should write with accessibility in mind, mentioning topics such as hierarchy, descriptive links, providing alt text, and other important aspects that promote the use of products by as many users as possible. There are also some relevant links about accessibility at the end of the section to be consulted for more information.

Word list. This section lists words and explains how to spell them correctly. In addition, it mentions terms to use with care and terms to avoid.

This content style guide, despite presenting fairly simple guidelines, ends up mentioning important aspects for creating content that is relevant and aligned with the brand's values, taking into account its target audience, and not leaving out potential users, since there are guidelines on accessibility and other relevant issues on inclusivity. All the sections mentioned above are relevant and should be considered for inclusion in Ubiwhere's design system.

3.4 Atlassian Design System

Founded in 2002, Atlassian is a company that provides a range of software products for team collaboration, project management, and issue tracking. The Atlassian design system is a set of design guidelines, resources, and tools that help teams at Atlassian create user interfaces that are consistent, effective, and scalable.

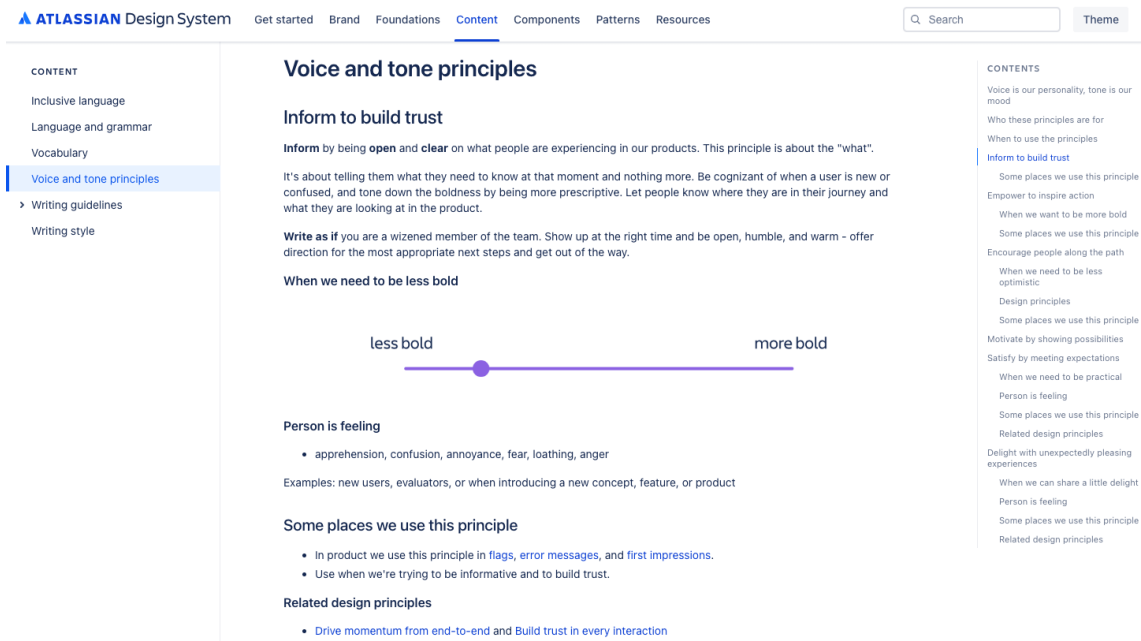


Figure 3.8: Atlassian’s Design System

Atlassian has very complete guidelines for content creation, including sections on inclusive language, language and grammar, vocabulary, voice and tone principles, writing guidelines, and writing style.

One section to highlight in this design system is the tone and voice section, which we can see in the image shown above. For each personality trait, which translates into the company’s voice, tone principles are presented about where we should use the personality trait more or less prominently. This includes an explanation of each principle, the components or screens where it should be used, and what the user may be feeling. The organization of this section should be considered for application in Ubiwhere’s design system, as it makes the tone variants quite clear and indicates where they should be used.

3.5 Carbon - IBM’s Design System

IBM (International Business Machines Corporation) is a multinational technology company that specializes in providing computer hardware, middleware and software, and consulting services.

IBM’s Design System, Carbon, is a collection of design guidelines, reusable UI components, and tools that help designers and developers create consistent, user-centered experiences across IBM’s digital products and platforms. Carbon includes guidelines for visual design, interaction design, and front-end development, and it is intended to help IBM’s design teams work more efficiently and effectively.

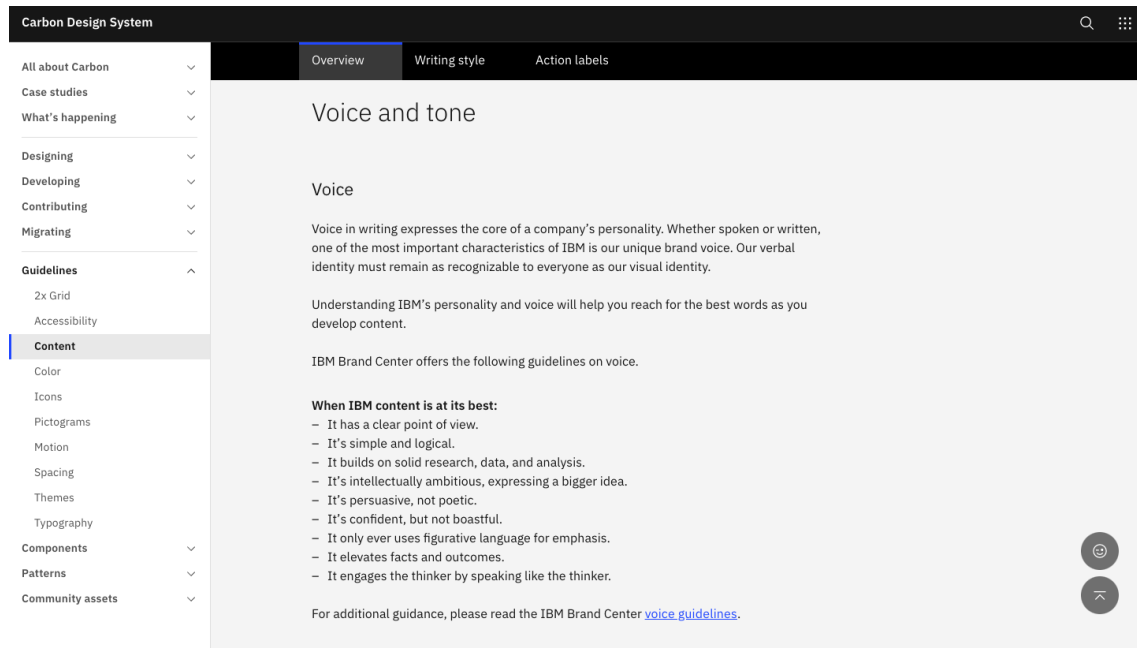


Figure 3.9: Carbon, IBM's Design System

Regarding UX Writing guidelines, there is a subsection in this DS dedicated to content. Here the tone and voice of the entity is presented and the writing for accessibility is highlighted, although not as in-depth as in other design systems previously analysed. It also introduced the writing style (composed of capitalization, simple writing, dialogue style, inclusive terminology, pronouns, and active/passive voice) and provided a list that includes the most common terms of an interface, usually associated with CTAs.

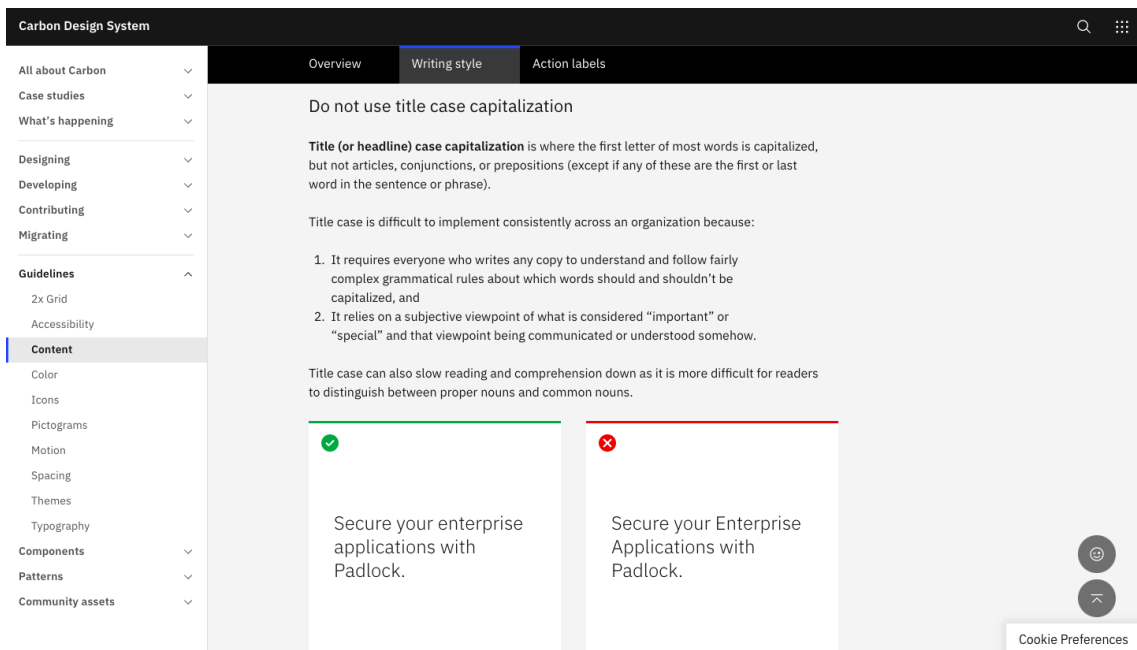


Figure 3.10: Content — writing style, Carbon

There are also illustrative examples of good and bad practices related to content development that can contribute to the creation of guidelines for Ubiwhere's design system, as we can see in the image above.

3.6 Polaris - Shopify's Design System

Founded in 2004, Shopify is a Canadian multinational company dedicated to e-commerce. It is a platform that allows the creation of online shops, with a set of services including payment tools, marketing, product management, and stock, among others.

The goal of Polaris, Shopify's design system, is to provide a consistent, high-quality user experience across all of Shopify's products and platforms by providing a set of design guidelines, components, and resources for developers and designers to use. This helps to ensure that all of Shopify's products have a consistent look and feel, making it easier for merchants to use and navigate the platform, and helping to build trust and credibility with customers.

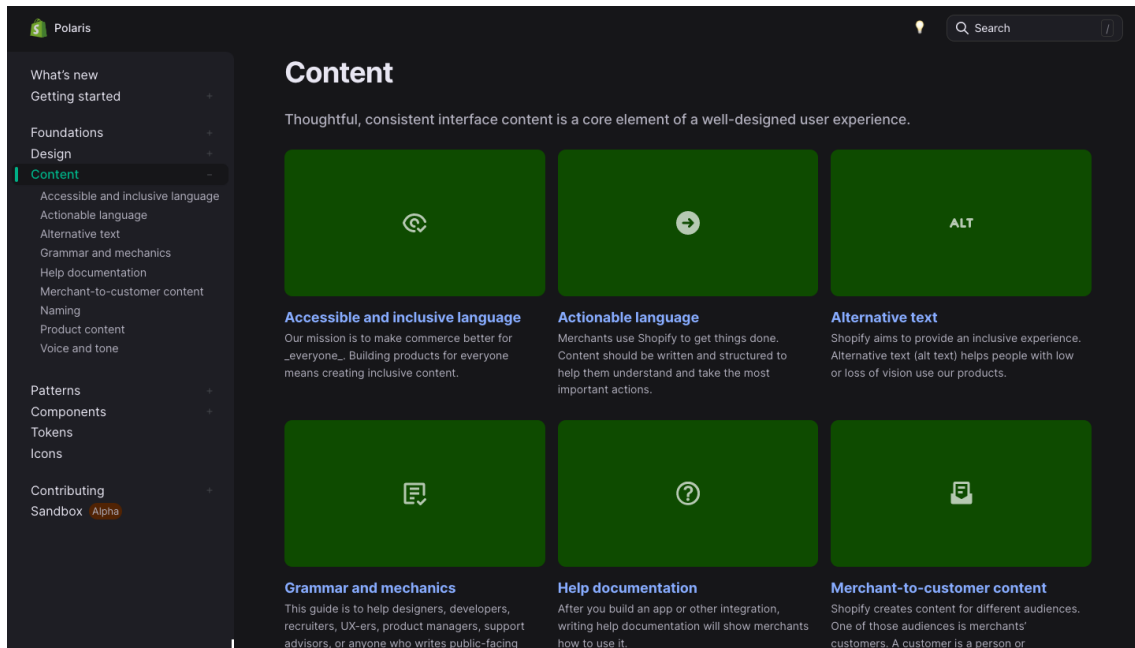


Figure 3.11: Polaris, Shopify’s Design System

Regarding content, Polaris includes sections on accessible and inclusive language, actionable language, alternative text, grammar and mechanics, help documentation, merchant-to-customer content, naming, product content and Voice and Tone. These all include do’s and don’t’s, which facilitate the use of these guidelines.

One of the topics to highlight in this design system is the organization of the content section. The presentation of the content subsections in small cards with icons, titles and brief explanation of the subsections makes the navigation through the various themes more intuitive. This organization can be considered for the Ubi-where design system, although it also depends on the platform chosen for its documentation.

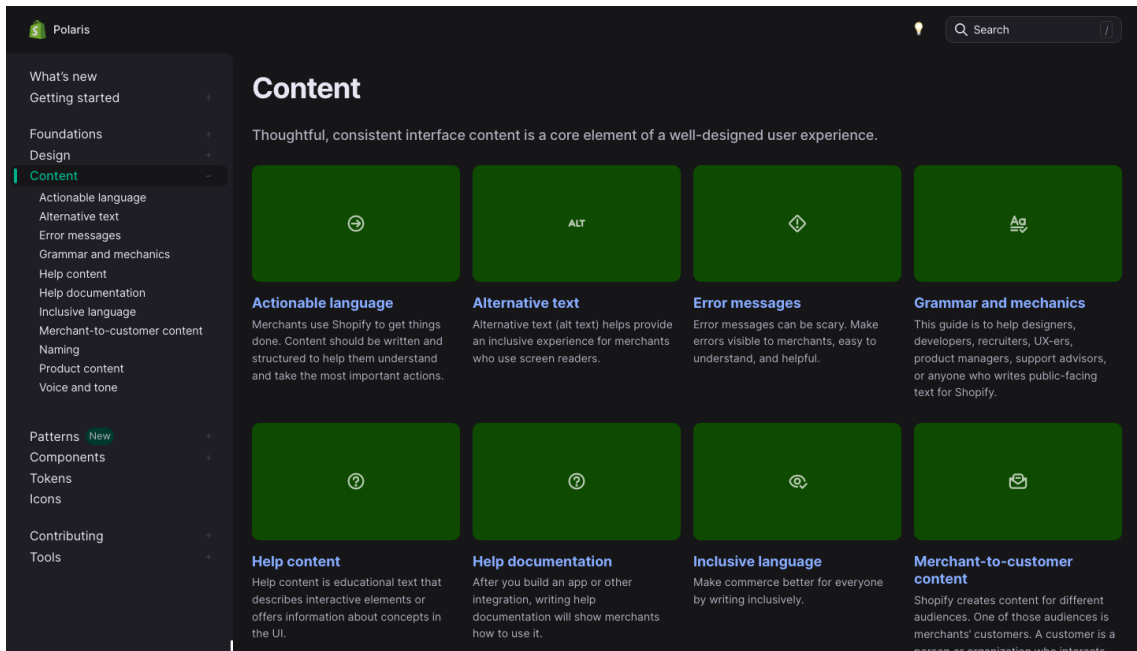


Figure 3.12: Content section organization, Polaris

Another topic to highlight in this design system is the section on language and inclusiveness, which is quite extensive and presents many examples of what we should or should not write with accessibility and inclusiveness in mind.

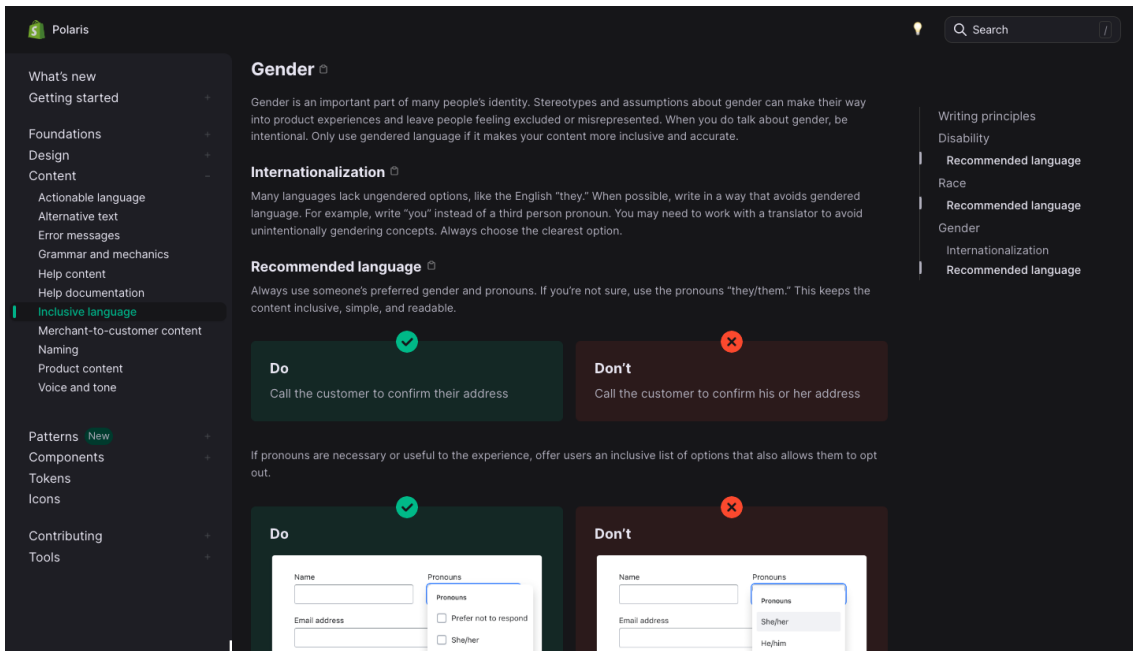


Figure 3.13: Language and inclusivity section, Polaris

3.7 Conclusions

After reviewing existing UX writing guidelines from other technology companies' design systems, the most important sections to include in creating the initial version of Ubiwhere's design system became clear.

A **voice and tone** section is clearly necessary in order to convey the company's way of positioning and communicating with its users, clients and stakeholders.

A **grammar and mechanics** section is essential in order to define the style of the writing and to prevent writing errors or misuse of words in certain contexts.

A section for **writing for components** must be included to provide in-depth information on good and bad practices when writing for user interface elements (including illustrative examples where possible).

A section on **language and inclusivity**, as it is important to consider all potential users of our products and services.

A **glossary of terms** is important because there are some terms that can be misused and misunderstood.

Chapter 4

Methodology and work plan

In this chapter, we describe the methodological approach for the project. The methodology for the project discussing data gathering, testing, and work process is presented, as well as its main objectives described in more depth than in the introduction. A work plan for the academic year is also presented, including the estimated time used for each task to be carried out.

4.1 Methodology

Writing UX copy is a complete and robust process. Several methodologies can be adopted, depending on the project and team. For this particular project and due to its need for reformulation at the beginning of the second semester, the methodology was divided over the two semesters.

4.1.1 First semester

In the first semester, the thesis topic proposal only involved the creation of UX writing guidelines for Ubiwhere. Therefore, this whole semester was dedicated to understanding the relevance of the project, understanding the concept of UX writing and the areas in which this discipline is embedded, conducting an analysis of Ubiwhere's brand, its goals, mission, and target audience, and conducting an analysis of existing content guidelines in other relevant companies in the technology industry.

In the first stage, an internal survey for Ubiwhere's team was carried out, to better understand if the proposal of the thesis topic really came from a problem, what the relevance of the project was, and also to carry out a preliminary study of how the internal members of the company perceived the company's communication.

All the research on the topic of UX writing, the areas in which this discipline is embedded, and other relevant topics to the project led to the development of the State of the Art chapter.

To conduct the research regarding the company, its brand, objectives, mission, and target audience, information was gathered through meetings with the company's communication team and through the analysis of relevant documents.

The analysis of existing content guidelines in other relevant companies in the technology sector led to the development of the third chapter: Analysis of existing company content guidelines.

All these topics provided support for the practical work.

4.1.2 Second semester

The second semester consisted of conducting typographic study, creation of UX writing guidelines and creation of components, to be integrated into Ubiwhere's design system. All these sections were then documented in the ZeroHeight platform. In addition, the testing of the guidelines and the development of a user flow with the components and content developed for the design system were also tasks performed in this practical part of the project.

With this project restructuring at the beginning of the second semester and the addition of new tasks to develop, it was crucial to use the agile Scrum methodology to organize the tasks and the time each one would take to develop.

Scrum as an Agile methodology is already applied in several work teams at Ubiwhere, and the design team - where I am integrated as an intern - is one of them. Therefore, it was easier to apply this methodology to the project.

Understanding Agile methodologies and Scrum

According to John C. Goodpasture, Agile means "small teams, working collectively and collaboratively, with the mission to deliver frequent, incremental releases of innovative functions and features, prioritized for need and affordability; evolved iteratively from a vision according to user reflection and feedback; produced at the best possible value" [Goodpasture, 2016]. The Scrum Agile methodology is a framework used for project management and development, especially used in the software area. It is based on an iterative and incremental short-duration process, where teams work in cycles to deliver functional increments of a specific product.

The Scrum methodology values transparency, collaboration, and adaptation to change, allowing projects to be flexible and adjusted according to needs and feedback throughout development, and is used all over the world to promote continuous delivery of value to customers and effective engagement of team members. "Properly implemented, Scrum will increase the speed of development, align individual and corporate objectives, create a culture driven by performance, support shareholder value creation, achieve stable and consistent communication of performance at all levels, and enhance individual development and quality of life" [Sutherland, 2010].

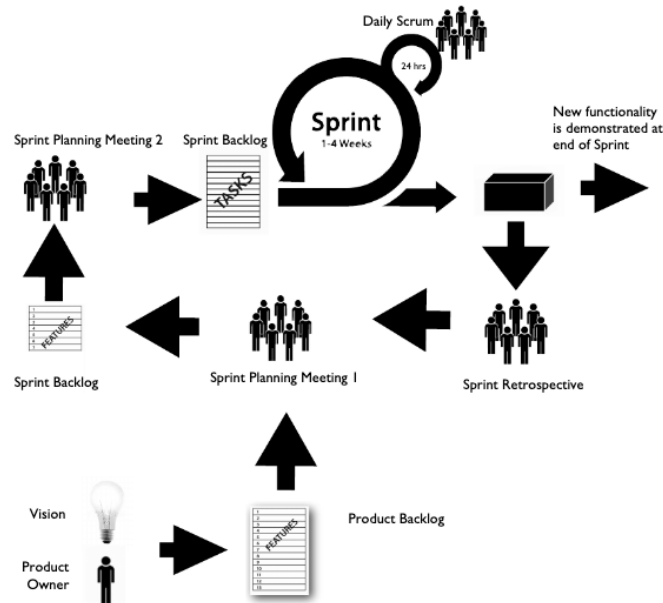


Figure 4.1: Scrum methodology representation, in Jeff Sutherland's Scrum Handbook, p.11

Scrum organizes product development into short-time work cycles known as sprints. These sprints are iterative periods of work typically lasting between one to four weeks. Regardless of whether the work is completed or not, the sprints have fixed durations and conclude on a predetermined date, with no extensions allowed.

Application of the Scrum methodology to the project

Given the project's particular characteristics, and because it is not a development project as usual in the implementation of the Agile Scrum methodology, the approach will be as follows:

The team that will be monitoring the project will be Ubiwhere's design team.

Once the project's objectives have been outlined, what we can call the "product backlog" is the definition of the tasks and functionalities that will be developed throughout the project, until its final version. This includes the sections to be integrated relative to the content, typographical study and creation of components for Ubiwhere's design system, documentation on the Zero Height platform, tests and the creation of a design flow that applies the study carried out.

The design team's daily meetings will be also used as daily stand-up meetings to review progress, identify any obstacles, and make any necessary adjustments to the project.

At the beginning of each sprint, sprint planning meetings will be held to review the backlog, assign tasks, and set goals for the next sprint. These tasks and objectives will already be established but may need revision.

Sprint review and retrospective meetings will also be held at the end of each completed sprint to review completed tasks, gather feedback, make adjustments to the backlog as needed, reflect on the previous sprint, and identify ways to improve the process for the next sprint.

Testing will be conducted on the writing guidelines in order to later iterate on them, based on feedback and test results.

At the end of the completed sprints, a final review of the work will be conducted, feedback gathered, and any final adjustments made before publication, in this case on the platform where the documentation is created.

4.2 Work plan

To map out all of the work to be done during this dissertation, a work plan was elaborated considering the project's needs and the methodology used.

As mentioned earlier, the first semester concerned research on the concept of UX writing and related areas, which led to the development of the State of the Art chapter, research on Ubiwhere, target audience and areas of operation, which was part of the first phase of the practical work and served as the basis for the creation of Ubiwhere's voice and tone guidelines, and research on content guidelines embedded in design systems from other renowned companies, which led to the development of the third chapter. These tasks were timed so that the research and writing of the document could be concluded by the intermediate delivery in January.

In the second semester, each task was divided into sprints lasting from one to two weeks.

For research and development of the typography, which included the choice of typefaces to be used, definition of font sizes for desktop and mobile, font weights, line heights, line length, margins, text formatting and good usage practices, a duration of three weeks was defined.

For the definition of the tone of voice guidelines, since research had already been done about Ubiwhere, target audience, mission and goals, a one-week duration was defined, and included the definition of the voice characteristics, tone variations and approval by the company's communication team.

For the language and grammar section a duration of two weeks was set, in order to cover as many topics as possible in this section, to ensure good writing practices, and the prevention of errors in the way we write and in the way we address users.

For the sections on writing for components and language and inclusivity, a duration of two weeks was also set, in which I should try to cover the most relevant information within these topics. The writing for components section covered how to write for error messages and success messages, since their writing is crucial in how users perceive our messages, and for the onboarding and empty

state screens, which are also of great content importance in the user experience. The language and inclusivity section tried to cover the most relevant aspects in these areas, talking about how to write inclusive UX writing, how to write about people, writing for ease of reading and writing with visuals.

The glossary of terms ended up lasting less than a week, as it did not consist in the definition of concrete terms to be used or not, but rather in the provision of a list with terms and concepts related to Ubiwhere's products and areas of activity, previously created by company employees, with their detailed explanation, so that they know when they should or should not use them.

For the documentation of these sections in the ZeroHeight platform, no short sprints were defined, since it is a progressive process that had to be carried out as the research and development of the sections was being completed. The time definition for this task was about two months.

For content testing, a week was planned for its completion. For the development of a user flow that applied the visual elements and content guidelines developed for the design system, a duration of two weeks was planned.

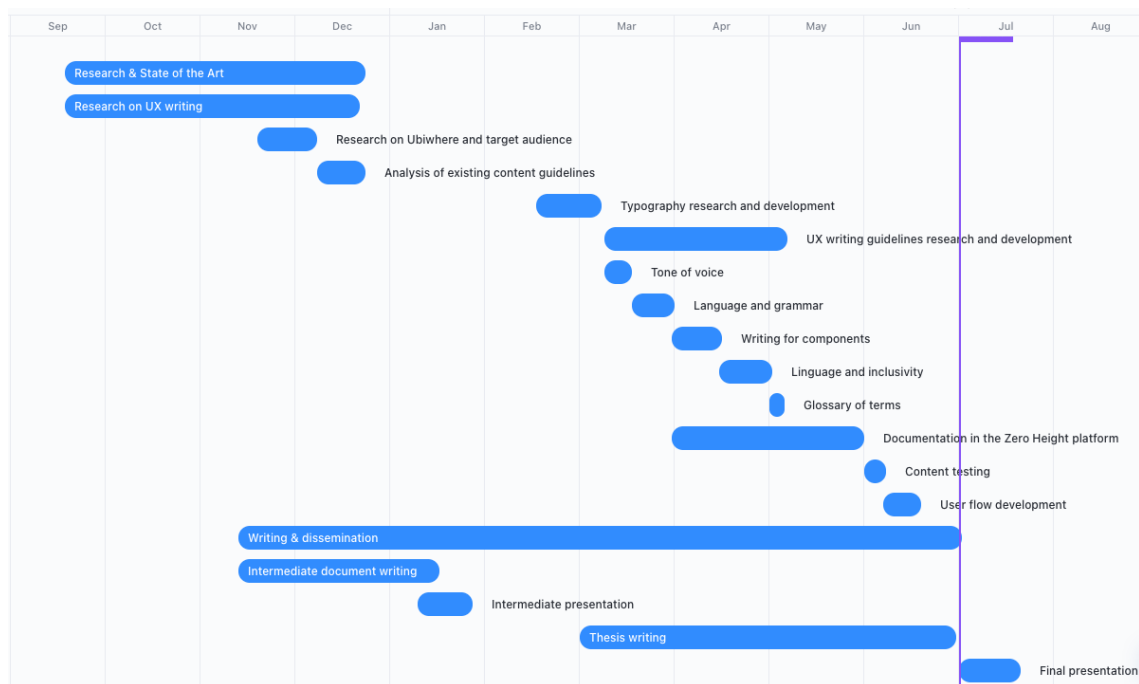


Figure 4.2: Work plan for the academic year

Chapter 5

Work process and documentation

In the first semester, as mentioned in the methodology chapter, an important part of the practical work took place. This phase is the first topic covered in this section and deals with the presentation of questions and results from the execution of a survey, which had the main objective of realizing the relevance of the topic suggested for this thesis.

Once the research and formulation of the State of the Art were concluded, and the reformulation of the work thought out, the practical development of Ubiwhere's design system began, in particular the part that corresponds to the typographic study, UX Writing guidelines, and development of the five graphic components. This process was divided into four stages.

In the first stage, I started the typographic study in order to develop the typography part of the design system — it included typefaces choice, sizes to be used on mobile and desktop, margins, line height and length, and text formatting.

In the next stage, all the content-related part of the design system (UX writing) was done, having developed the sections about the company's tone of voice, language and grammar, writing for components, language and inclusiveness, and glossary of terms.

Next, I started developing some components that use the writing guidelines — tooltips, snackbars, toasts, messages, and modals.

All this work was then documented in the Zero Height platform — a code-free platform used to document design systems. It should be noted that this documentation was made in Portuguese, because of the greater mastery of the language and to be able to give examples of correct use cases. In a more advanced version of the design system, its translation into English may be considered, as there are some international projects in the company and the guidelines may have to be adapted.

Finally, in order to understand if the work developed would bring advantages to the development of prototypes in the company, it was necessary to perform a round of tests on content and a user flow was created using the design system, based on a management platform for one of Ubiwhere's products.

5.1 Survey to understand the relevance of the project

To begin the exploratory phase in the first semester an internal survey for the Ubiwhere team was carried out, to better understand if the proposal of the thesis topic — UX writing for Ubiwhere — really came from a problem, what the relevance of the project was, and also to carry out a preliminary study of how the internal members of the company perceived the company's communication. The survey was conducted on the Maze platform, and the questions and their answers can be found at the following link <https://app.maze.co/report/Questionrio-interno-UX-Writing-na-Ubiwhere/1223yi19r67tnb/intro/embed>.

Twenty answers were collected in this survey and some relevant conclusions were made. After a brief introduction to the concept of UX writing and the project to be developed, the following questions were raised:

"Have you ever, when having to write these "micro-texts" felt it difficult to know exactly what to write / how to approach the user?"

85 percent of the respondents answered yes and 15 percent said it was not applicable (they never had to write this type of content), which concludes that all respondents who have ever had to write microcopy have experienced challenges in what to write and how to approach the user.

"On a scale of 0 to 10, please rate the utility of creating UX writing guidelines within Ubiwhere"

35 percent of the respondents answered 10; 30 percent answered 8; 15 percent answered 9; 5 percent answered 2, 5, 6, and 7 (one rating each). This shows that the majority of the respondents believe that the development of this project is quite relevant for the company.

"Using between 1 to 3 adjectives, if Ubiwhere was a person, how would you describe it?"

45 percent of the respondents answered youthful; 40 percent answered innovative; 15 percent answered creative, dynamic, and welcoming (each). This proposal was then validated in more depth, together with the company's communication team, in order to arrive at the four main "personality traits" of the company (See Ubiwhere's tone of voice section of this chapter).

"Would you rather have access to this guide as a pdf, a web page, or in another format? (if you select another, please specify which)"

80 percent of the respondents answered web page; 10 percent answered pdf; 10 percent answered other. This question helped to define the display format for the guide to be created.

In addition to these questions, an open question was asked so that employees could leave some suggestions regarding the project.

From these answers, I would like to highlight two quotes, the first being "We should take into account accessibility issues (such as vision impairment) and dig-

ital literacy (or lack thereof) of some potential users/customers" and the second "I think there is an important dimension to discuss in this work. That is, taking into consideration that we mostly work on the sophistication of IoT, Smart Cities or Telco solutions our purpose is storytelling or ensuring that the screens narrate the user along the right path. Sometimes, I think we have solutions that are too over-engineered (on the engineering side) and they get too much of that stamp and there is no clear translation to the value that that functionality brings. As I cannot put it any clearer, I use the words of this gentleman: 'Developing software that delivers true business value is not the same thing as developing ordinary business software. Software that delivers true business value aligns with the business strategic initiatives and bears solutions with clearly identifiable competitive advantage-software that is not about technology, but about the business.' - Vaughn Vernon, *Implementing Domain-Driven Design*. In other words, if we want to have a competitive advantage our tone of voice has to be different from the other competitors we have. In a sense, we must be a sophistication and simplification of complex concepts". These two quotes are indeed two matters that I will have to take into account when developing UX writing guidelines.

5.2 Typographic Study

For the typographic study, research was conducted regarding best practices of typography for digital products, as well as an analysis of several platforms developed by Ubiwhere.

The typography section was divided into five distinct subsections: the general section, font sizes for desktop, font sizes for mobile, text formatting, margins, line height, and line length. This section with its subsections can be found at the following link <https://zeroheight.com/9d51779a9/p/484560-tipografia>.

5.2.1 General

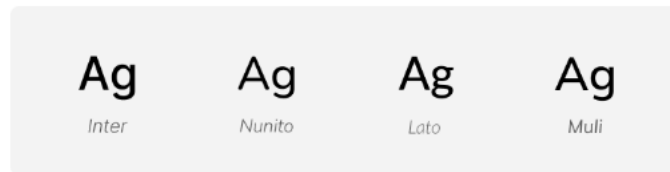
This subsection presents the different typefaces used by Ubiwhere (font stack), the different text types with examples, and good practices for using typography, with examples of what to do and what not to do.

Font stack

Regarding the font stack — the different typefaces to be used by Ubiwhere — it was decided, in this initial version of the design system, to keep the fonts that are already used for the different means of communication of the company, namely Inter, Nunito, Lato and Muli. All these fonts are non-serif, which is usually appropriate for body text. However, in the future, some serified fonts could be selected that could be combined with these in smaller text such as headings, to help with contrast and visual hierarchy.

Font stack

As fontes utilizadas pela Ubiwhere são a Inter, a Nunito, a Lato e a Muli.



Font stack da Ubiwhere

Figure 5.1: Ubiwhere's font stack documentation

For this first version of the design system, we also decided to use the Inter font as a base for the choice of sizes, weights, and line heights, which can later be adapted to other typefaces. The choice of this typeface has to do with the fact that it is one of the most used typeface in ongoing projects at the company, and because it is "a variable font family carefully crafted and designed for computer screens" [Fonts]. The font "has a high x-height for easier reading of uppercase and lowercase text", and "various OpenType features are also provided, such as contextual toggles that adjust punctuation depending on the shape of the surrounding glyphs, slashed zero for when it is necessary to distinguish the number zero from the letter 'O', tabular numbers, etc" [Fonts], which makes it a typeface suitable for application in digital products and that promotes readability.

Text types

Research on the text types used in Ubiwhere's products was initially performed. We realized that we would have to define font sizes, weights and line height for headings, body text, labels, buttons, links, and also for uppercase text. These different text types are used to create the typographical hierarchy and divide up the content in a logical and organized way.

Headings are used to create various levels of typographic hierarchies.

Tipos de texto

Títulos (*headings*)

Os títulos são utilizados para criar vários níveis de hierarquia tipográfica.



Hello world

Exemplo de título

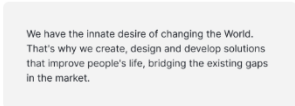
Figure 5.2: Text types — headings documentation

Body text is used mainly for blocks of text, and for some components. At smaller sizes, it can be used, for example, for captions. To ensure readability the minimum size of body text should be 11px (desktop), and it should only be used to represent numbers or symbols.

Corpo de texto (*body*)

O corpo de texto é utilizado principalmente para blocos de texto, e para alguns componentes. Em tamanhos mais pequenos pode ser utilizado, por exemplo, para legendas.

Para garantir a legibilidade o tamanho mínimo do corpo de texto deve ser de 11px, e deve ser apenas utilizado para representar números ou símbolos.



We have the innate desire of changing the World.
That's why we create, design and develop solutions
that improve people's life, bridging the existing gaps
in the market.

Exemplo de corpo de texto

Figure 5.3: Text types — body text documentation

The uppercase is used for extra information or smaller items in relation to the text hierarchy. It can, in certain places, also be used for labels, although it must have a limit of up to three words so that it doesn't affect readability.

Uppercase

O *uppercase* é utilizado para informação extra ou itens mais pequenos em relação à hierarquia textual. Pode, em certos locais, ser também utilizado para algumas *labels*, embora tenha que ter um limite até três palavras, para que não prejudique a *readability*.



CATEGORY
Road accidents

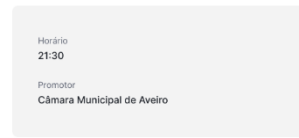
Exemplo de texto em uppercase

Figure 5.4: Text types — uppercase documentation

Labels are used as the text that the user cannot edit, which can appear in various places, such as form fields, headings or subheadings, and menu items, for example.

Labels

As *labels* são utilizadas como textos que o utilizador não pode editar, que podem aparecer em vários locais.



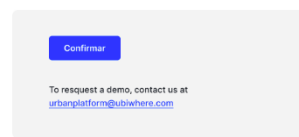
Exemplo de labels

Figure 5.5: Text types — labels documentation

Text for buttons and links is used specifically for these types of components.

Botões e links

O texto para botões e links é utilizado especificamente para este tipo de componentes.



Exemplo de texto em botões e em links

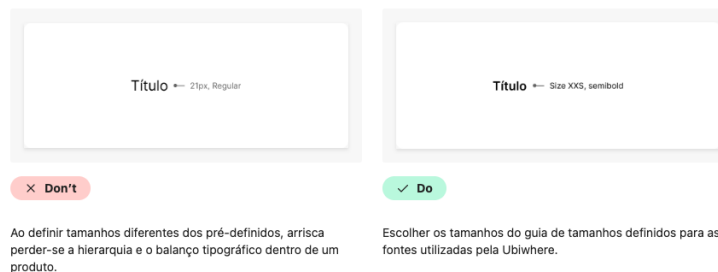
Figure 5.6: Text types — buttons and links documentation

Good practices for using typography

This subsection presents some do's and don'ts regarding the use of typography for digital products. These rules were based on Spectrum, Adobe's design system and the examples were applied to the specific case of Ubiwhere.

The rules chosen and presented are as follows:

1. **Choose the sizes from the size guide** defined for the fonts used by Ubiwhere. By setting different sizes than the predefined ones, you risk losing the typographic hierarchy and balance within a product.



2. **Adapt the font sizes from desktop to mobile.** When using size S medium for desktop, use also size S medium for mobile. Some texts do not require larger sizes on mobile. For example, a larger title on desktop may become a smaller title on mobile. In these cases, the sizes can be adapted by others from the size table, maintaining harmony and typographical hierarchy.

× Don't
Ao adaptar tamanhos de desktop para mobile, devemos ter sempre em conta a hierarquia tipográfica e manter a harmonia entre tamanhos.

✓ Do
Ao utilizar size S medium para desktop, utilizar também size S medium para mobile. Alguns textos não exigem tamanhos maiores em mobile. Por exemplo, um título maior em desktop pode transformar-se num título mais pequeno em mobile. Nestes casos, os tamanhos podem ser adaptados por outros da tabela de tamanhos, mantendo a harmonia e hierarquia tipográfica.

3. Use underlining only for links, not for highlighting words or phrases in a text.

× Don't
Não utilizar o sublinhado para destacar palavras ou frases num texto.

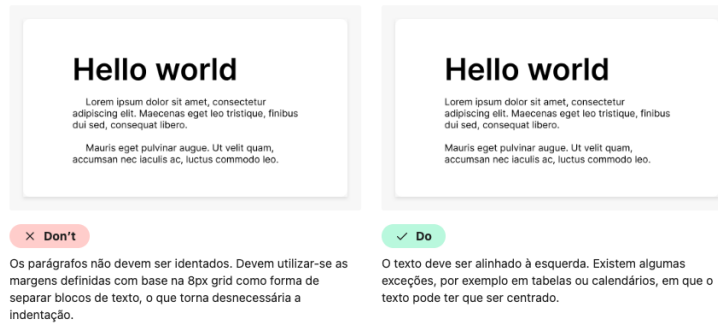
✓ Do
Utilizar o sublinhado para links.

4. In general, all UX content should use sentence case. Lowercase, uppercase, or title case should not be used unless necessary. For more details on capitalization, check Content > Language and Grammar > Capitalization.

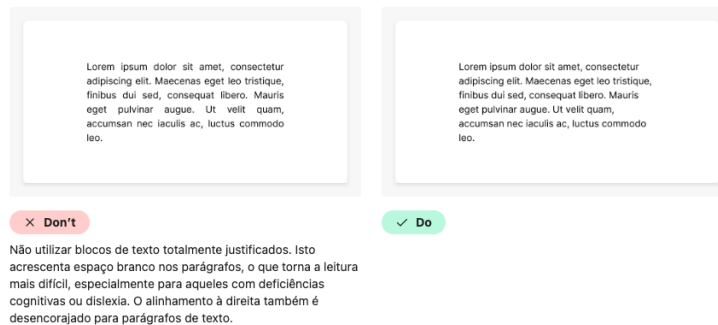
× Don't
Não utilizar lowercase, uppercase ou title case, a menos que seja necessário. Para mais pormenores sobre capitalização, consultar: Conteúdo > Linguagem e gramática > Capitalização.

✓ Do
De um modo geral, todo o conteúdo de UX deve utilizar sentence case. Para mais pormenores sobre capitalização, consultar: Conteúdo > Linguagem e gramática > Capitalização.

5. Paragraphs should not be indented. The paragraph spacing defined based on the 8px grid should be used as a way to separate blocks of text, which makes indentation unnecessary.



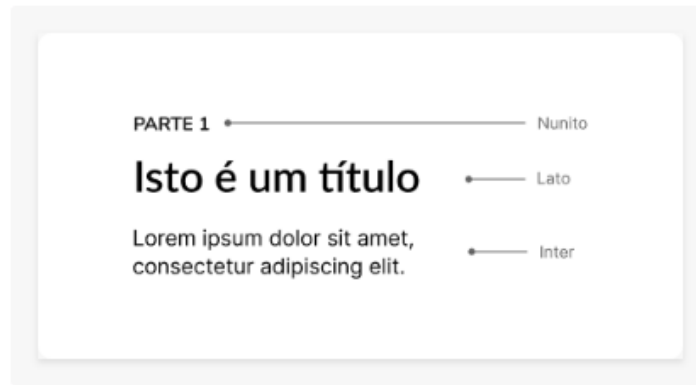
6. **Do not use fully justified blocks of text.** This adds white space in paragraphs, which makes reading more difficult, especially for those with cognitive disabilities or dyslexia. The text should be left-aligned. There are some exceptions, for example in tables or calendars, where the text may have to be centered. Right alignment is also discouraged for paragraphs of text.



7. We must take into account the relevance of the content of each type of text and **combine the sizes to create harmony and hierarchy.** Titles, body text and uppercase text can be combined to create balanced relationships while enforcing content hierarchy. By default, this can be done by using these typographic components at the same size.



8. **Although the typefaces used by Ubiwhere can be combined with each other, only a maximum of two should be selected for a product or service to be developed.** This will prevent the organization of information from becoming difficult or confusing to read.



! Caution

Apesar das fontes utilizadas pela Ubiwhere poderem ser combinadas entre si, devem ser selecionadas apenas duas, no máximo, para um produto ou serviço a desenvolver. Isto vai evitar que a organização de informação se torne difícil ou confusa de ler.

5.2.2 Font sizes

Regarding the sizes, line heights and weights of the typography to be used on desktop and mobile, Adobe Spectrum and Google Material Design design systems were mainly consulted to understand how they organize font sizes and their nomenclatures.

Further analysis of the Urban Platform and Citizen App, Ubiwhere's products, was performed in order to understand what sizes should be used on desktop and mobile.

The Urban Platform provides municipalities with a comprehensive and integrated view of their cities, presenting data from various domains such as traffic, air quality, and waste collection. This information, presented in a single dashboard, enables municipalities to obtain the data needed for informed and targeted management. In this way, they can ensure that decisions taken are well-informed and provide empirical reports on their impact.

Users can customize their dashboards, choosing information from any available source and combining it across different domains, such as mobility and environment, with the ultimate goal of reducing operational costs, decreasing greenhouse gas emissions, and, consequently, improving the quality of life of their citizens.

This platform was chosen since it contains a lot of information and typography ends up having a great importance in structuring the page and organizing the information.

Text Style	Example	Font Type and Size/Line Height
Headline 1	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Semibold - 36/44
Headline 2	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Semibold - 32/44
Headline 3	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Semibold - 28/36
Headline 4	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Semibold - 22/30
Headline 5	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Medium - 20/28
Body 1 - Regular	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Regular - 18/28
Body 1 - Medium	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Medium - 18/28
Body 1 - Semibold	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Semibold - 18/28
Body 2 - Regular	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Regular - 16/24
Body 2 - Medium	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Medium - 16/24
Body 2 - Semibold	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Semibold - 16/24
Body 3 - Light	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Regular - 14/20
Body 3 - Regular	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Regular - 14/20
Body 3 - Medium	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Medium - 14/20
Body 3 - Semibold	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Semibold - 14/20
Body 4 - Regular	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Regular - 12/18
Body 4 - Medium	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Medium - 12/18
Body 4 - Semibold	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Semibold - 12/18
Button Large	Button Large	Medium - 16/24
Button Small	Button Small	Medium - 14/20
Subtitles	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod	Regular - 12/16

Figure 5.8: Text styles used in Citizen App (mobile app)

By analyzing the text types used, we can see from the start that there are font sizes that make it difficult to read, for example, the 10px size for a website.

Places have also been identified on this platform that use even smaller sizes than those defined in this table, which should not exist as they are too small to read.

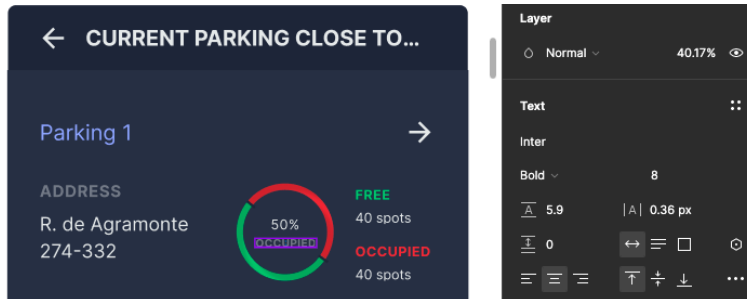


Figure 5.9: Example of 8px text in Urban Platform

After analyzing these problems, the sizes for headings, body text, labels, buttons, links, and uppercase text, as well as the line heights and weights, were then defined.

For the creation of the text sizes in Figma and the organization of the respective folders, the following nomenclatures were assigned: screen size (where d corresponds to desktop and m to mobile) - text type - font size - font-weight. For the organization of the sizes, we decided to use sizes such as "XS", "S", "M", "L", normally associated with t-shirt sizes, in order to make it more intuitive and understandable to distinguish between the various text sizes.

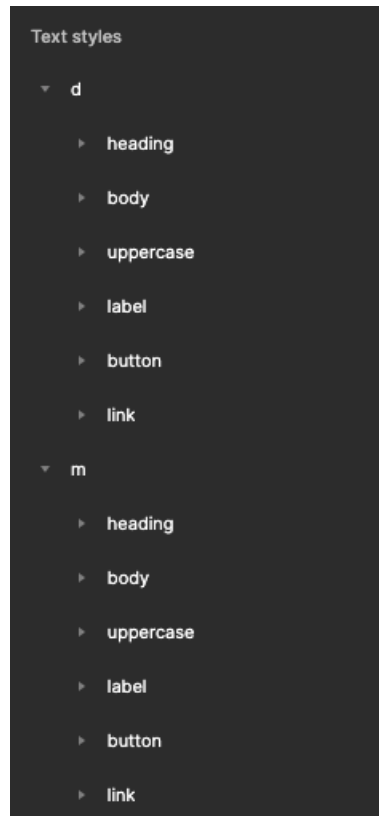


Figure 5.10: Text styles, Figma

Font sizes for desktop

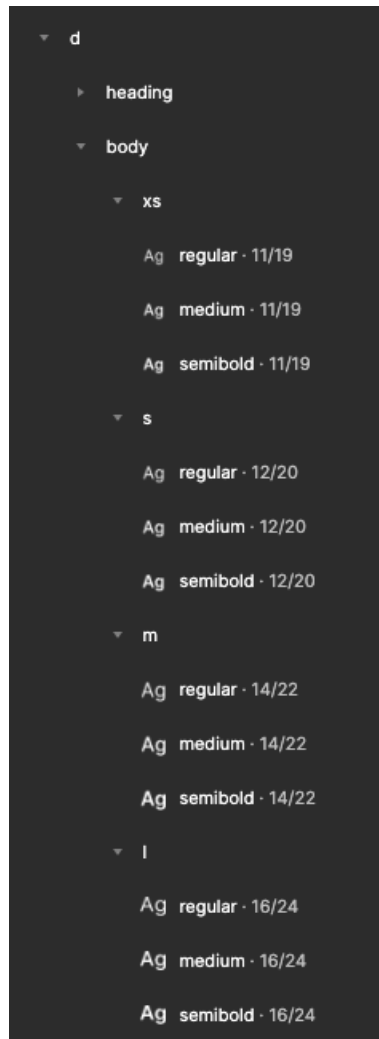


Figure 5.11: Text styles for desktop example, Figma

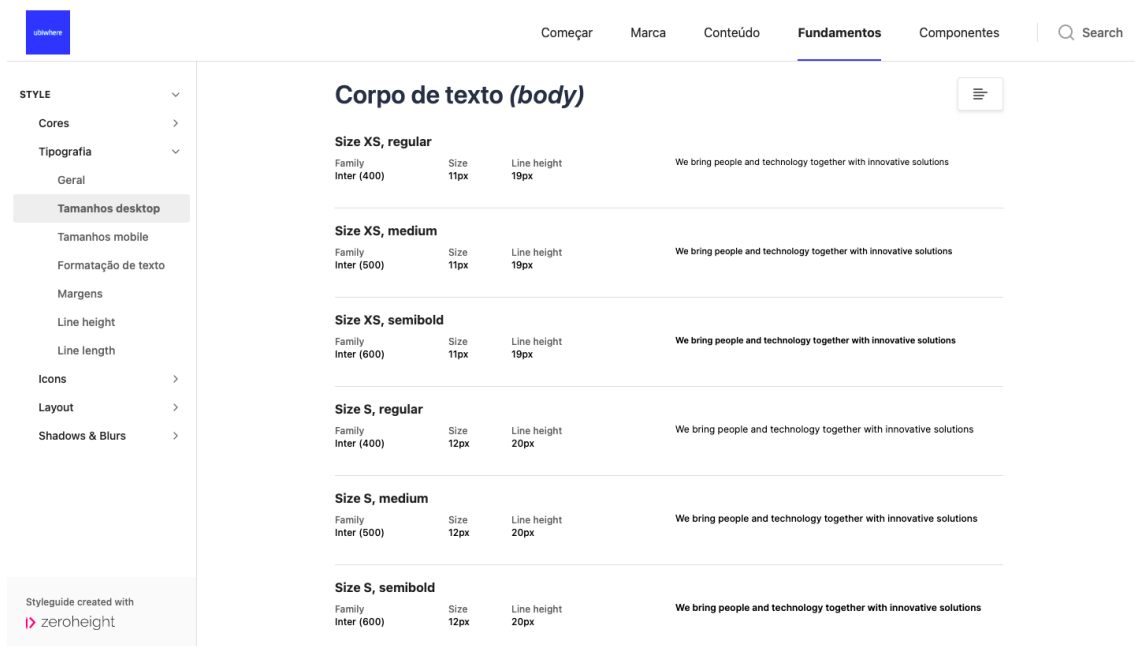


Figure 5.12: Text styles for desktop documentation example, ZeroHeight

Font sizes for mobile

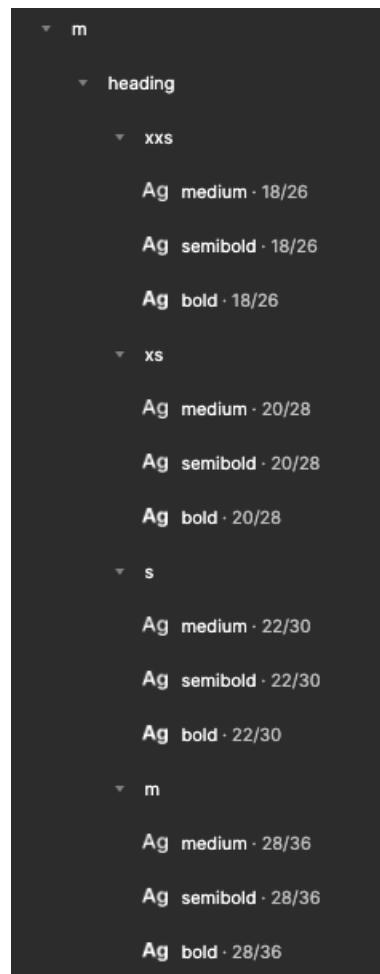


Figure 5.13: Text styles for mobile example, Figma

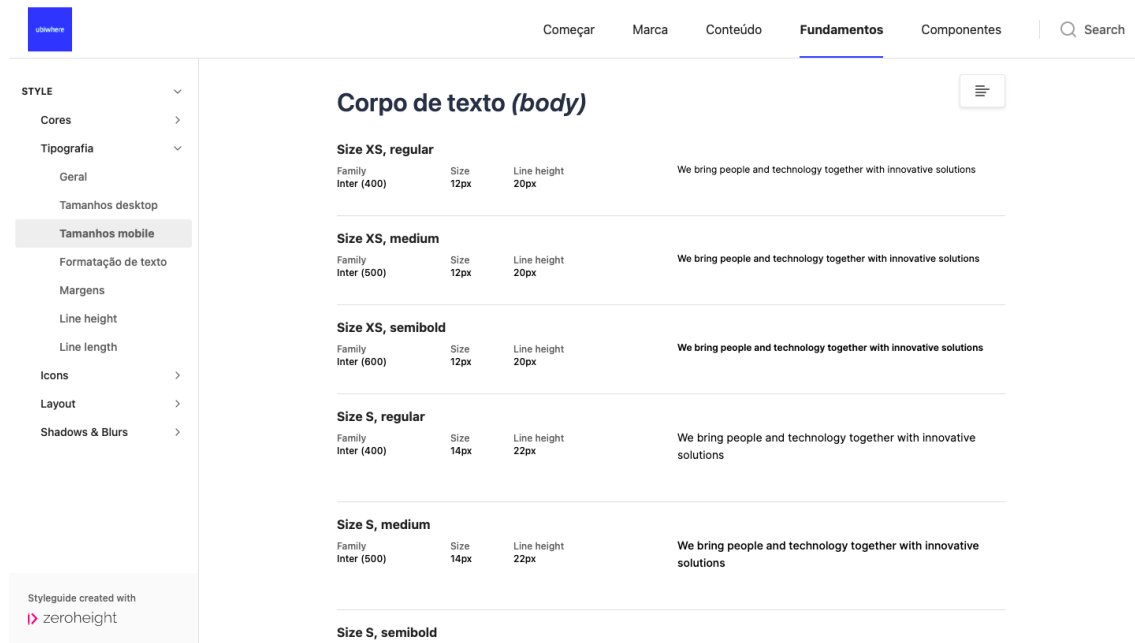


Figure 5.14: Text styles for mobile documentation example, ZeroHeight

The font weights set for the text types were the same as those already used on this platform, as they allow a wide variety of options and can contribute to the typographic hierarchy. For titles, buttons, and links, weights of medium, semibold, and bold were defined. For body text and labels, regular, medium, and semibold. For uppercase text, regular, medium, semibold, and bold.

"There's no secret formula for setting the "right" line height for type. It'll depend on the font, the size it's set at, the length of the line, and the overall reading context—which will include the amount of whitespace around the block of text, or between elements on a page" [Stocks]. The line-heights defined for this first version of the design system were the same as those used for the products presented above. However, in the future, there should be an investment in researching and testing these line heights, since the proportions between font size and line height may not be appropriate for longer texts.

All these factors may have to change if the typeface used is not Inter.

5.2.3 Text formatting

Text formatting can be used to add visual clarity and adjust the voice or meaning of the text.

Bold

Bold text is used to add hierarchy to text or to draw attention, for example in components such as buttons.

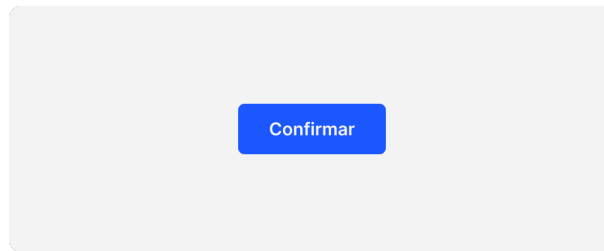


Figure 5.15: Example of bold text

Italic

Italic text is only used for quotes or for words that have not been adapted to the language we are using.

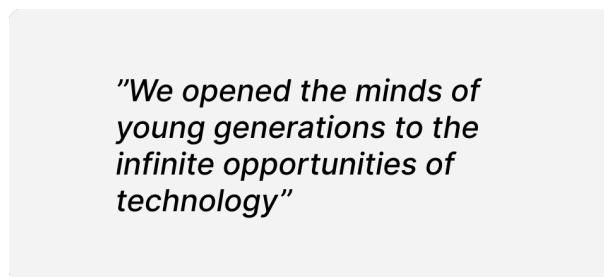


Figure 5.16: Example of italic text

Underlined

Underlined text is used only for links (either in the hover state or in the default state, depending on the type of link), and should never be used to emphasize text.



Figure 5.17: Example of underlined text

5.2.4 Vertical space

Ubiwhere uses an 8px grid system to lay out content in its graphical interfaces, in order to ensure even and whole-number spacing. This ensures that the interface is visually appealing and easy to use, as well as aligned with general design principles. This grid should be used to separate different types of text.

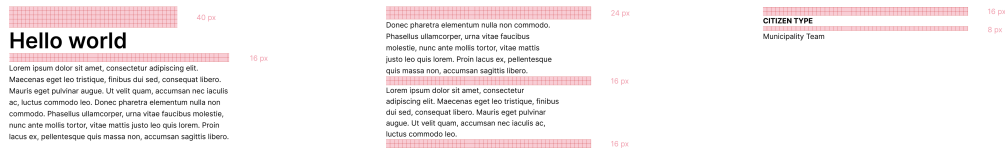


Figure 5.18: Examples of vertical spacing for text separation, based on the 8px grid

5.2.5 Line height

The line heights predefined in the sections on font sizes for desktop and mobile should be used in order to ensure good readability of the texts.

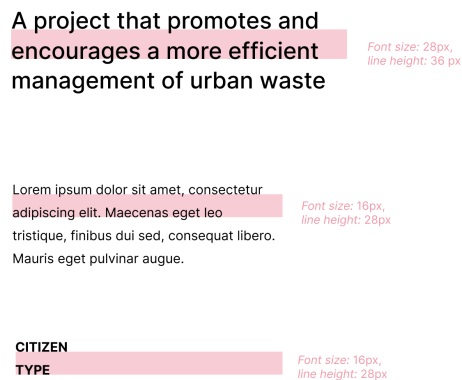
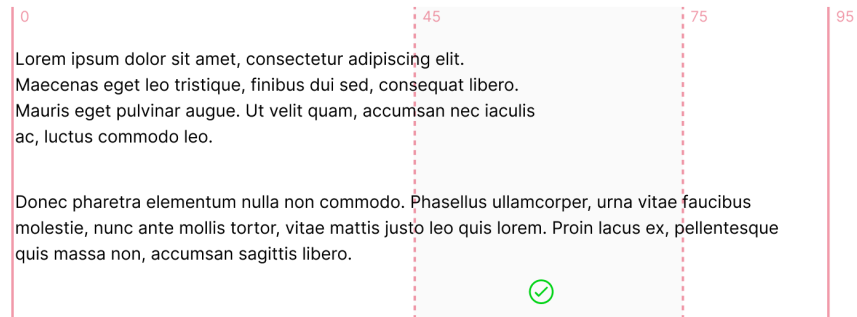


Figure 5.19: Examples of the predefined line height applied to different text types

5.2.6 Line length

To define the line length, some fonts with good practices for web typography were consulted. "According to John Kane's Manual of Typography, the line width for a paragraph should be between 45 and 75 characters; 66 characters is about the ideal number of characters for comfortable reading on screen" [Bobo, 2022]. Generally speaking, the ideal line length, agreed to by many sources, is between 45 and 75 characters. However, the length of the paragraph, typeface design, letter spacing (tracking), font weight and stroke thickness, whether the fonts are serif or sans-serif typefaces, and the context in which the text is written can all influence these values. Although we can define this line length as ideal, it is important to perform tests such as usability tests to make sure that we are using the correct line length for a certain text.

We have to keep in mind that the number of characters per line can contribute to user fatigue. For larger blocks of text, a width between 45-75 characters per line should be used, although this may have to be adjusted depending on factors such as the typeface we are using.



The typography guidelines presented in this section promote consistency, hierarchy, legibility, accessibility, and efficiency. They provide a foundation for designers to create digital experiences that are visually appealing, easy to use, and in keeping with the brand. However, we must keep in mind that different choices of typefaces may involve adaptations to the guidelines created, so testing interfaces already with text is an important step before launching a product.

5.3 Content - UX Writing

5.3.1 Research on Ubiwhere’s brand, values, mission, and target audience

In the first semester, relevant research was conducted about the company, its mission and goals, and its target audience. This research was very important for the definition of the company’s tone of voice guidelines.

Ubiwhere’s mission is to create innovative solutions that improve people’s quality of life. To be an international reference in Smart Cities, to be a national reference in innovation and technological development, and to always be successful in applying technology to solve customers’ needs is its vision of market positioning. Its values are ambition in defining objectives and creating value, responsibility towards society, employees, customers, and partners, sustainable development, and respect for the environment.

Ubiwhere’s products and services are marketed to:

Public Administration and to other entities subject to public law regulations (e.g. public procurement). This includes customers such as the Government, Direct and Indirect State Administration, City Councils, Intermunicipal Communities, Metropolitan Areas, Agencies providing public services (e.g. waste companies), municipal or county associations, municipal companies, and other organizations subject to public law or political decision. Commonly associated with the B2G business model.

Companies, associations, and organizations of private law. Clients that pursue their own private ends (profit), and are governed by market rules and regulatory

frameworks for their own activity. It includes companies, business associations, and other organizations that purchase services and products from Ubiwhere for their own purposes. Commonly associated with the B2B business model.

5.3.2 Questionnaire

The consultation of the internal public (Ubiwhere's employees) and external (stakeholders) was made through a questionnaire survey addressed to a sample of 28 elements, seeking to represent the stakeholders in the communication of Ubiwhere. Over a period of 1 month, 27 responses were received.

In the case of the internal audience, the questionnaire was addressed to departments whose activity is interdependent on communication and marketing activities and who understand their impacts at strategic and operational levels, as well as junior employees and recent hires, with the aim of measuring the impact of communication among employees who do not think strategically in their day-to-day.

In the case of the external audience, we sought to cover all types of stakeholders that gravitate around Ubiwhere, in particular, customers of public and private nature, clusters and alliances, SCT entities and business partners.

Through this questionnaire that aimed to validate the company's communication proposal, Ubiwhere was able to obtain answers that allowed validation on: - Ubiwhere's purpose is generically understood. Respondents generally agree with expressions such as "company that prepares for the future", and "provides solutions needed for future challenges". - Ubiwhere's positioning is strongly understood, with the vast majority of respondents strongly agreeing with factors such as "rigor and credibility in delivery", "effective and personalized response", "quality and innovative product" and "interoperable product". - Respondents seem to agree that Ubiwhere's work "has a positive impact on people" and that the company's solutions "are innovative and research-based".

5.3.3 Ubiwhere's Tone of Voice

The section on Ubiwhere's Tone of Voice has been divided into two separate subsections: one about brand personality, and one about the tone of voice. This section with its subsections can be found at the following link <https://zeroheight.com/9d51779a9/p/12ba2b-tom-e-voz>.

Brand personality

As stated in the State of the Art chapter, the voice should reflect the brand personality, be unique, and make written and verbal communication as recognizable as visual language. Consistency in brand Voice constitutes authenticity in the products and the way the company communicates and is an essential part of building trusting relationships with its customers.

Through the analysis of the communication strategy document carried out by Ubiwhere's communication team, it was possible to understand what the company's mission and values are, what its goal is in terms of market positioning, and who its main customers and stakeholders are. In addition, the document presents responses to questionnaires conducted both internally and externally on how the company itself and its communication are perceived by customers.

Through the analysis of this data, it was possible to extract four words that define the brand personality, which were validated by the company's communication team, and that will be the basis for the principles of tone of voice — how this personality should vary given different contexts:

- **Bold:** Ubiwhere is looking for opportunities that will make it grow towards its mission - to create innovative solutions that improve the quality of people's lives - through the provision of technology solutions for public interest purposes. Ubiwhere's slogan - "Suiting the Future" - demonstrates that the company works in the present to prepare for the future. They have a proactive vision of building the future and take it on. Whenever possible, Ubiwhere must convey this bold tone in its messages, while ensuring that the language is simple and concise, so as to avoid a sense of confusion among users.
- **Innovative:** The sophisticated, connectivity, and *avant-garde* character of the company is represented in its innovative spirit. Ubiwhere wants its products to stand out from the rest of the market in the same areas of activity. The communication should reflect the way the company stands out in its environment.
- **Cordial:** Given the wide variety of users, customers and stakeholders of Ubiwhere's products and services, it is necessary to have more cordial communication, without ever being conservative, strict, or predictable. Although cordiality and seriousness are requirements in the way we communicate the messages in its products, the company cannot forget that they want to keep an innovative, bold, and *avant-garde* side.
- **Optimistic:** The enthusiasm and joviality that, despite the company's growth, still has a place in its communication is translated into optimism. Ubiwhere is friendly and empathetic. They recognize the complexity of their solutions and acknowledge the learning process involved, striving to facilitate it by inspiring customers and guiding them towards the best path.

Tone of voice

Once these Ubiwhere personality traits were defined, the tone of voice principles were defined. Tone dictates how Voice characteristics should vary in different contexts. There are times when communication should be more serious and direct, and times when messages can be conveyed in a more relaxed way, times when one should motivate the user, or show the irreverence of the company. In order to define the company's tone of voice principles, I took the characteristics

of the brand personality (voice) and thought about how, when, and where they should vary, taking into account the different types of emotions the users may feel and how different components, screens or interactions can help them. For example, in the case of optimism, when should we be more optimistic, and when should we be less optimistic? This results in eight principles, derived from the four characteristics of the Voice. Ubiwhere's Tone of Voice principles are as follows:

1. **Support in decision making:** We should use a bolder tone when we want to provide learning opportunities and guide users' actions. We should educate them and give our input on what our recommendations are for the next steps, supporting and facilitating decision-making.

We should use this principle for example in first impressions or modals, when the user is experiencing trust, interest, and anticipation.



2. **Be clear and concise:** There are times that leave little room to be bold, where we need to explain to users what they need to know at the moment and nothing more.

We need to realize when a user is new or confused and tone down the boldness by being more descriptive, informing people where they are in their journey and what they are looking for in the product.

We should use this principle for example in error, warning, or informative messages when the user is feeling apprehension, confusion, or aversion.



3. **Stimulate by showing prominence:** Sometimes we should convey how our products/services are innovative, how they stand out from those already on the market, and how they can change and improve the quality of life for their users. This can help catch the users' attention and make them curious enough to use or continue using a product.

We should use this principle for example in first impressions, new features (updates) or onboardings when the user is feeling curiosity, interest, or expectation.



4. **Simplify to achieve understanding:** There are times when innovation can create some confusion or even aversion in users since there are conventions that users are already familiar with and should use.

We must be careful to write in such a way that any user understands what is going on, and what they should do next. We should not use complex terms or terms that exclude any type of users, as this may cause them not to continue using a product.

We should use this principle for example in error, warning, or informative messages when the user is feeling apprehension, confusion, or aversion, as well as in the principle about being clear and concise.



5. **Pleasing and meeting expectations:** In general, we want to send a cordial message. We know the differences between different types of customers and we want to reach all of them.

We should speak in a serious and direct tone, but without exaggeration, without using terms that are too complex or difficult to understand.

We should use this principle for example in informative messages, error messages, or empty states when the user is feeling all kinds of emotions, since this is a principle that should be used in most of the content developed for our products and services.



6. **Encourage progress:** Although cordiality never ceases to be used throughout navigation in our products, there are some moments that give us the opportunity to be a little less serious, and where we can convey a more relaxed character, while still being careful how we address users.

This principle should be used for example in success messages or onboarding, when the user is feeling success, joy, pride, or relief.



7. **Motivate to create engagement:** If we want our products to be used on a daily basis, we have to create enjoyable experiences.

At times, encouraging users and showing the benefits of the products themselves or certain actions they are taking, can lead to greater user engagement and willingness to continue using the product.

We should use this principle for example in success messages or onboards, as well as in the principle about encouraging progress when the user is feeling ambition, inspiration, or admiration.



8. **Informing and guiding to the best path:** We should always be optimistic when conveying messages. However, there are times when, despite being optimistic, messages should take on a more encouraging, supportive, and guiding character for the user.

We should focus on providing solutions and guiding the user, and not on mentioning the problems or using words or expressions that may create further confusion or frustration.

We should use this principle for example in error, warning, or informative messages when the user is feeling unsupported, confused, uncertain, or frustrated.



5.3.4 Language and grammar

After these characteristics were defined, we moved on to the section on language and grammar, where I documented some good practices of writing for products, in the Portuguese language, sometimes combined with practical examples.

The section on language and grammar documents writing guidelines, with examples presented of what to do and what not to do. This has been divided into the following subsections: active and passive voice, capitalization, pronouns, punctuation, and abbreviations. The division by these subsections guarantees a solid basis for the creation of textual content for products and services and prevents errors in, for example, the way we address the user. Although these seem like fairly simple rules, applying them to products is essential if we are to create user experiences that are appropriate for our target audience and promote their overall understanding and satisfaction. This section with its subsections can be found at the following link <https://zeroheight.com/9d51779a9/p/252871-linguagem-e-gramatica>.

To develop the guidelines, some of the design systems mentioned in the State of the Art chapter were analyzed, mainly Adobe's Spectrum. From the guidelines presented in this design system, those that would make sense for Ubiwhere's documentation have been selected and adapted to its needs.

Active and passive voice

The active voice should be used in most cases and the passive voice used more sparingly. With the use of active voice, sentences are more simplified, shorter, clearer, and more communicative. By using the passive voice you can soften messages in specific situations.

In an active sentence, the subject is the agent responsible for the action expressed by the verb. For example, we should say "Select your interests" and not "Your interests should be selected".

Voz ativa

Numa frase ativa, o sujeito é o agente responsável pela ação expressa pelo verbo.

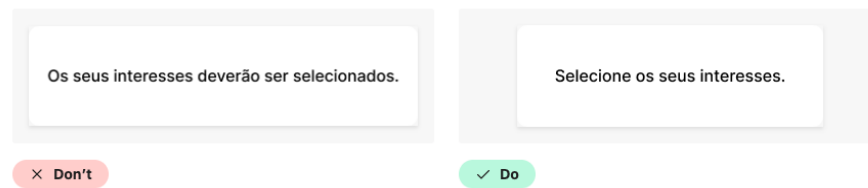


Figure 5.20: Active voice example documentation

In a passive sentence, the subject undergoes the action expressed by the verb. Sometimes the active voice can convey too much aggressiveness. In these cases, the passive voice should be used. This separates the subject from the action enough to soften a sentence. For example, we should not say "We refused your payment" but rather "Your payment was refused".

Voz passiva

Numa frase passiva, o sujeito sofre a ação expressa pelo verbo.

Por vezes, a voz ativa pode transmitir demasiada agressividade. Nestes casos, deve utilizar-se a voz passiva. Isto separa o sujeito da ação o suficiente para suavizar uma frase.

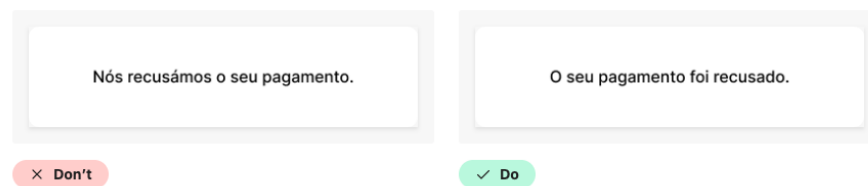


Figure 5.21: Passive voice example documentation

Sometimes it is possible to avoid the passive voice by performing a sentence restructuring in order to focus more on the object or action. For example, instead of saying "We couldn't find any active filters" we can just say "No active filters".

Evitar a voz passiva reestruturando frases

Por vezes é possível evitar a voz passiva, realizando uma reestruturação frásica, de maneira a focar mais no objeto ou ação.

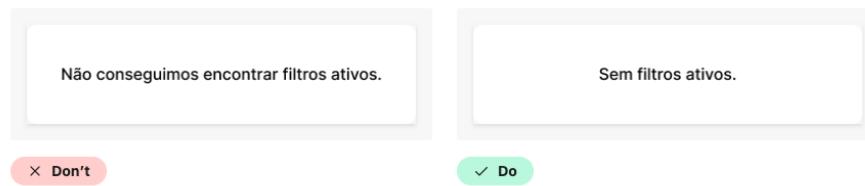
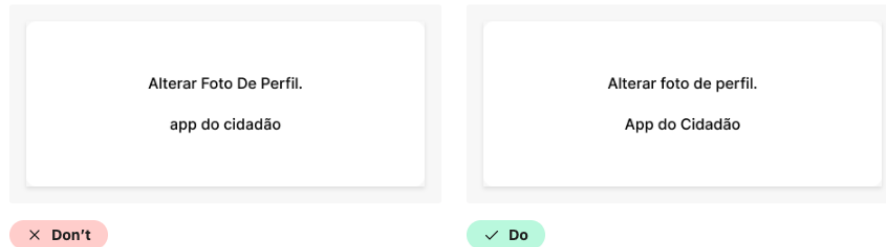


Figure 5.22: Avoiding passive voice example documentation

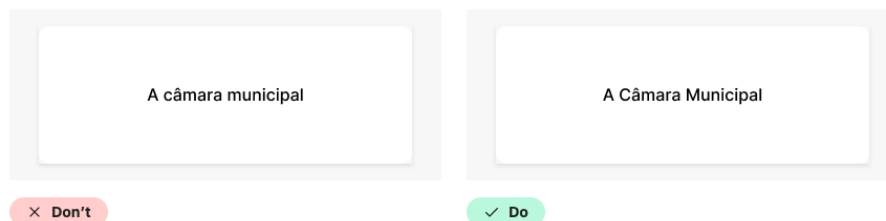
Capitalization

In terms of capitalization, the guidelines show in which situations the sentence case, the title case, or the uppercase should be used.

The sentence case should be used in most product experience designs, including titles and interface components such as tooltips, tabs, buttons, etc. Sentence case writing is easier for users to read and understand sounds more friendly and less formal, and helps better identify proper nouns and terms that need to be capitalized.



Correct capitalization should be used when we are talking about a specific and official entity (such as a title or name).



The uppercase should be used for writing abbreviations or acronyms. It can also be used for labels, and other text that has less relevance in the typographical hierarchy, with a maximum of two to three words. However, it should be used carefully and not too much, to avoid problems in readability.

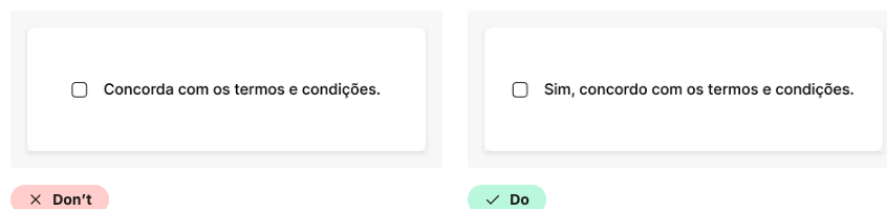
Pronouns

Pronouns help with how to communicate with different users. In almost every situation in user experience design, we aim to speak to the user. Any exceptions depend on situational needs for sensitivity and clarity.

In Ubiwhere's case, we must mostly use the third person singular to communicate our messages. This is due to the fact that most of Ubiwhere's products and services are marketed to public administration and other entities subject to public law regulations, and to companies, associations, and organizations of private law.



In specific cases, the first person singular may make sense, for example when someone answers the interface or responds directly to a question asked to them, or when there is a legal need to use the first person to ask for consent (e.g. "I agree to these terms and conditions").



On rare occasions, it may be appropriate to use the term "we" to mention Ubiwhere, for example, "we're sorry" (in case of an error) or "help us improve this feature" (asking for feedback).

Punctuation

Punctuation marks are an essential part of language and extend beyond plain text. In this section, some conventions for punctuation in different contexts are laid out, with practical examples. Punctuation marks must follow these conventions so that there is consistency throughout the company's products.

The punctuation rules defined were as follows:

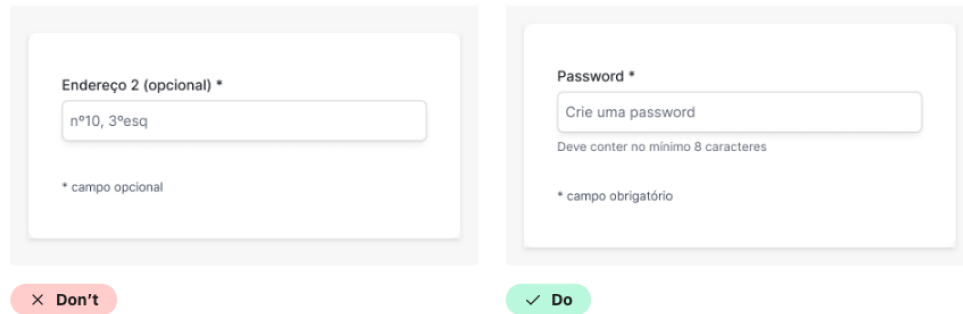
- Do not use apostrophes (') instead of quotation marks (");
- Do not use the at symbol (@) in place of the words "at" or "on";

- Use asterisks (*) or "(required)" to establish required fields on a form as necessary. Do not use asterisks to designate anything as optional. Do not use asterisks in running text or labels, when parentheses or a tooltip will suffice;
- Do not use backslashes and do not use slashes (/) to combine words or ideas. This gives the impression of lack of commitment and affects comprehension and clarity. Instead, we should use the words "and" or "or", not using "and/or";
- Complex sentences should always try to be simplified into several sentences. However, if this is not possible, you should use a colon (:). A colon is useful for introducing lists of items or steps in a workflow. Do not use a colon at the end of a label for a form fill-in field. This design component should already communicate the relationship between the label and the input;
- Use dashes (—) to separate distinct but related thoughts, including spaces before and after the dash. Use hyphens (-) for intervals of numbers and time periods, or between two words, with no spaces before or after the hyphen. When it is necessary to show gaps in a table's data, we must use a hyphen (-) to represent null, unavailable, or inapplicable values;
- Do not use square brackets ([]) in the text of an interface or in running sentences. Instead, use parentheses (());
- We should not use exclamation marks (!), as they are difficult to locate and easy to overuse. According to specific contexts, we may consider using this punctuation mark, but generally, it should be avoided;
- When writing titles, question marks (?) are the only acceptable punctuation mark to include. Avoid using question marks to ask rhetorical questions;
- As a general rule, we should include a period at the end of a complete sentence. However, if the text is a short, direct sentence — whether it stands alone or appears in a UI component — we should avoid using the period. For bulleted or numbered lists, we should avoid using periods or other punctuation marks at the end of most items. Only if a list item forms a complete sentence should it end with a period (or question mark). In such cases, use periods at the end of all list items. Avoid using periods at the end of headings or buttons;
- Commas should be used with care and only in specific situations, such as enumerating items in a list, for example. If we are using too many commas in a sentence, we should consider splitting the sentence with periods or dashes.

Asterisco

Utilizar asteriscos (*) ou "(obrigatório)" para estabelecer os campos obrigatórios num formulário, conforme necessário. Não utilizar asteriscos para designar nada como opcional.

Não utilizar asteriscos em texto corrido ou *labels*, quando parênteses ou uma *tooltip* forem suficientes.



Hífens e travessões

Utilizar travessões (—) para separar pensamentos distintos mas relacionados, incluindo espaços antes e depois do travessão.

Utilizar hífen (-) para intervalos de números e períodos de tempo, ou entre duas palavras, sem espaços antes ou depois do hífen.

Quando for necessário mostrar lacunas nos dados de uma tabela, devemos utilizar um hífen (-) para representar valores nulos, indisponíveis ou não aplicáveis.

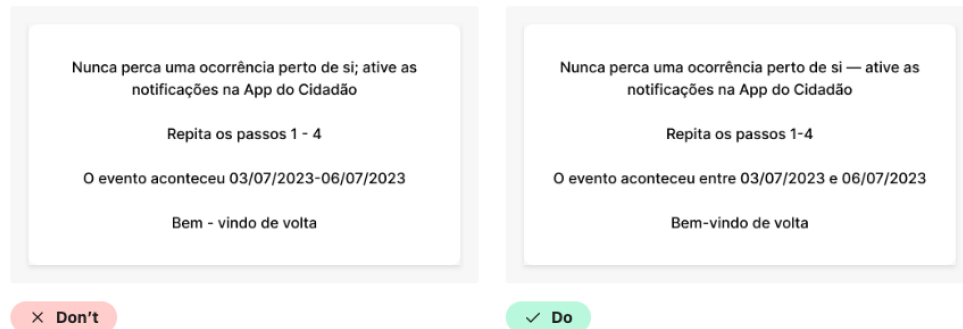


Figure 5.23: Examples of punctuation documentation

Abbreviations

Abbreviations should be used consistently throughout the experience to help with predictability and usability.

Whenever possible, the full word should be spelled out so that the content can be properly localized and so that users read the actual word rather than spelling out the abbreviation.

Months: Use Jan, Fev, Mar, Abr, Mai, Jun, Jul, Ago, Set, Out, Nov, Dez (without periods) to abbreviate the months of the year.

Days: Use Dom, Seg, Ter, Qua, Qui, Sex, Sáb (without periods) to abbreviate the days of the week. Abbreviations with only one letter (D, S, T, Q, S, S) should be avoided because they make it difficult for the user to read. If it is necessary to use

these abbreviations, for example in calendars to select specific dates, there should always be descriptive text describing the day that is selected by the user.

Time: Use *seg*, *min*, *h* as singular, without periods, without commas, and with a space between the number and the unit of time (for example, 1 h 21 min). Describe the time in 24 hours and separate the hours from the minutes with a colon. For example, 09:00 corresponds to 9 o'clock in the morning and 21:00 to 9 o'clock in the evening.

These abbreviations are used in Portuguese and must be adapted to different languages if they are to be used.

5.3.5 Writing for components

In this section, there is a further elaboration on conventions to be used in certain types of components and screens, namely onboardings, empty states, error messages, and success messages. These components and screens are characterized by containing some text, and sometimes even images, that help the user understand what is going on and what steps they can take next.

There must be extra care when writing the text for these components and screens, as the tone and the way the message is written can affect the entire user experience. This section and its subsections can be found at the following link <https://zeroheight.com/9d51779a9/p/007584-escrita-para-componentes>.

Empty states

An empty state screen refers to a user interface (UI) screen or page that is displayed when there is no content or data to be shown. This can happen when a user opens an application or website for the first time, performs a search that returns no results, or completes a task.

The empty state can be considered a way to communicate with the user about something useful. For example, an empty search result can display a message that no results were found, as well as suggestions for alternative search words so that the user can continue interacting with the interface.

"Empty states are a great opportunity to encourage people to interact more with our products. Although optional, they are a good way to educate people on where they can go next or motivate them to explore" [Atlassian, 2023a]. However, empty states must be designed with care, since "a well-designed empty state should guide the user and provide a clear path forward, while a poorly designed empty state can be confusing or frustrating" [Minhas, 2023].

Some common types of empty states include:

- **Initial empty state:** This empty state is displayed when a user opens an application for the first time, and there is no content to show yet.

- **Empty search results:** "This is the interface state when a user performs a search and no results are found" [Minhas, 2023].
- **No data available:** This state can happen when the user has not yet entered any data into the application, or when there is a problem with the data source.
- **No internet connection:** "This scenario occurs when the user has no Internet connection and cannot access the content" [Minhas, 2023].

Some of the best writing practices for empty states include:

Clear and concise messages: We should use short, direct messages that clearly communicate the reason for the empty status and guide users on what to do next [Atlassian, 2023a], avoiding the use of jargon or technical terms.

Engaging and positive tone: We must maintain a positive and encouraging tone in the messages to empty states in order to motivate users and make them feel empowered, using language that instigates curiosity, suggests actions, or offers useful suggestions.

Include actionable call-to-action (CTAs): We can and must, when possible, include clear and actionable CTAs that prompts users to take a specific action. "CTA buttons should always complement the empty state title" [Atlassian, 2023a]. These CTAs must be descriptive, inviting, and aligned with the goal of the empty state. This encourages users to move forward and interact with the application or platform. However, "we should be mindful of the number of call-to-action buttons on a page, as we don't want to overwhelm users with too many options" [Atlassian, 2023a]. When designing our CTAs, we must also be careful and not use vague terms, but be clear about the action the user can take.

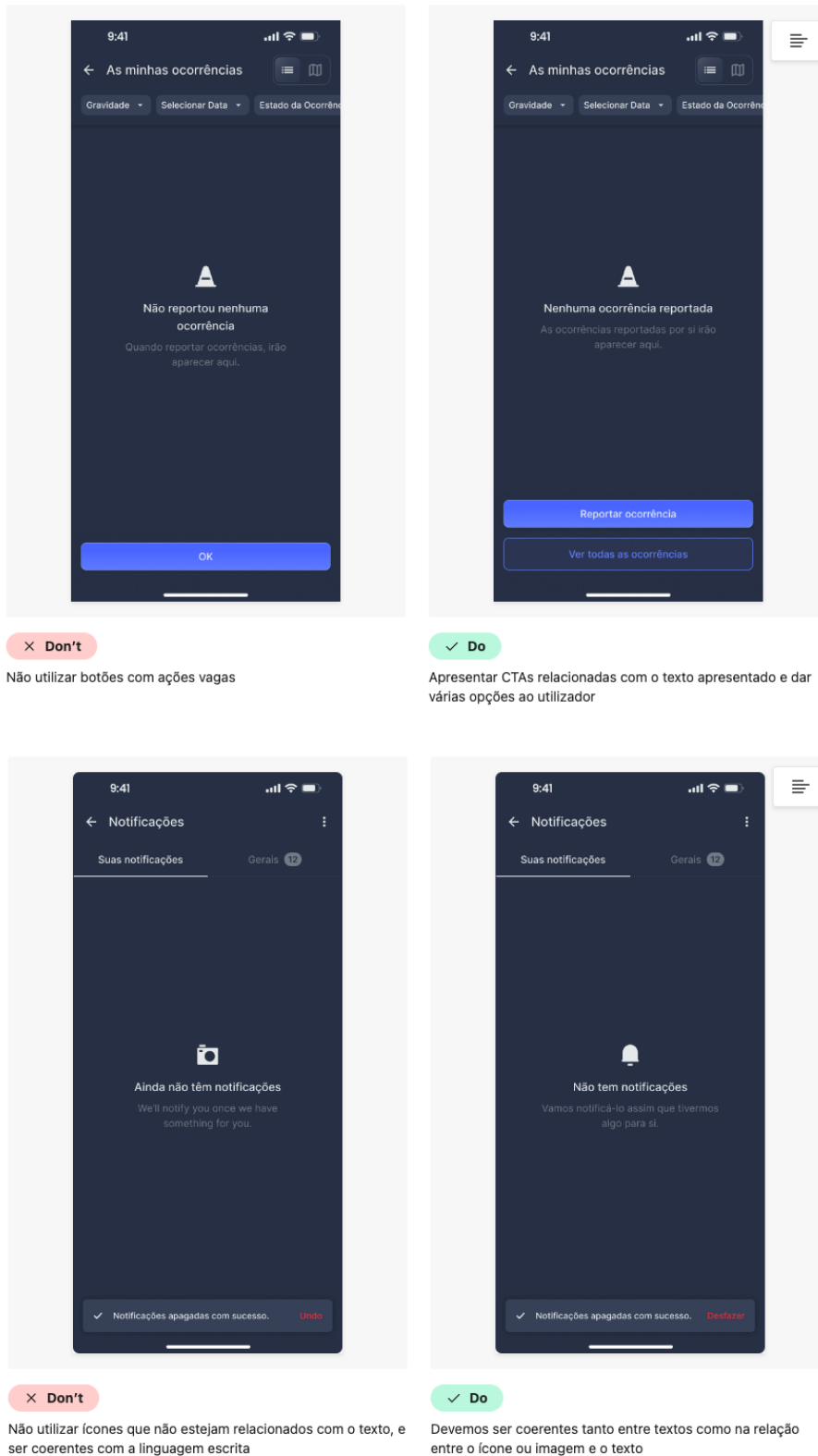


Figure 5.24: Best practices for empty states documentation

Onboarding

In the context of digital products, "onboardings" refer to the processes, experiences, or features designed to guide and familiarize users with a digital product, service, or specific feature. The goal of an onboarding process is to help users understand how to use the product effectively, explore its features, and maximize its value.

Onboardings can take various forms depending on the nature of the digital product, but they generally aim to provide a smooth and engaging introduction for users. Some types of onboardings include tutorials and walkthroughs, user interface guidance, welcome screens, videos, or interactive tours.

The purpose of onboarding is to minimize user confusion, reduce the learning curve, and ensure users can use the digital product with confidence. Well-designed onboarding experiences can improve user adoption, engagement, and overall satisfaction.

Spectrum, Adobe's design system, presents some best practices for writing for these screens [Spectrum, 2022c], among which we can highlight:

Remember why users are there: "Onboarding should be a part of a user's broader goals and experience, so we should keep in mind what these goals are and how we can help the user achieve them" [Spectrum, 2022c]. This can be done by providing clear instructions, making the content contextually relevant, emphasizing core features, incorporating interactive learning, offering feedback or through progress indicators, for example.

Sequence topics: "We should break down the educational content into a logical order, guiding the user through various steps that will help them master a subject" [Spectrum, 2022c]. We can do this by sequencing the information in a logical order, chunking it into smaller sections, and using clear headings and subheadings to organize the content. This approach helps users navigate through the information effectively and facilitates their understanding and retention of the material.

Do not overload users with steps: Overloading users with a large number of steps during onboarding can overwhelm their cognitive capacity, leading to user fatigue, frustration, reduced comprehension, and lower retention of information. Keeping the number of steps manageable allows users to focus and understand each step more effectively, promoting a positive onboarding experience. It is also important is the option to "skip" onboarding, respecting user autonomy, and allowing them to choose whether to go through the onboarding process or not. It acknowledges that some users may already be familiar with the product or prefer to explore it independently.

Set exact expectations: At the beginning of onboarding, "we should clarify information such as what will be covered, how many steps are required, or what the person will come out knowing how to do, clearly stating objectives as to why the user is following those steps" [Spectrum, 2022c]. Clear expectations help users understand what they can expect from the onboarding process, reducing ambi-

guity and uncertainty. It allows users to plan their time effectively and manage their expectations, leading to a smoother onboarding experience.



✓ Do

Ser conciso e direto no que o utilizador pode fazer. Apresentar poucos passos e dar a opção de "saltar" o onboarding.

Figure 5.25: Onboarding design example

Error messages

Error messages are notifications or alerts that inform users about issues, errors, or exceptional conditions that have occurred during their interaction with the product. These messages serve to communicate relevant information about the problem and provide guidance on how to resolve or mitigate it. Error messages are crucial for enhancing user experience by assisting users in troubleshooting and understanding the system's status.

"These messages often bring frustrating news and can be highly visible and memorable, so they need to be relevant, useful, and clear. We show users error messages to let them know what happened, what the cause of the error was, and what (if anything) they can do to resolve it" [Spectrum, 2022b]. Well-designed error messages can minimize user frustration, provide clarity, and contribute to a positive overall user experience.

Spectrum presents a large list of best practices for writing error messages [Spectrum, 2022b], among which we can highlight:

Avoid showing a message whenever possible: Frequent error messages can lead to user frustration, discouragement, and a sense of overload, as it "disrupts the user experience and can prevent the user from performing their task" [Spectrum, 2022b]. By proactively designing interfaces that minimize the potential for user errors through clear instructions and intuitive design, we can create a workflow that enhances user satisfaction and efficiency. "Ways should be found to avoid the

error altogether, for example by using visual clues and disabled states to guide users" [Spectrum, 2022b].

Choosing the message first, then the component: A short and direct sentence can be presented in a toast or snackbar, but longer text should be presented in a message or modal, for example. By focusing on crafting clear and specific messages, we can ensure that users understand the issue before we think about what component we are presenting it on. Once the message is defined, we can then select the appropriate component and help users navigate and resolve the encountered issues more efficiently.

Writing about what happened: "If the error message contains a title, we should ensure that it effectively communicates what the general outcome of the error is" [Spectrum, 2022b] in a way that helps users understand the nature of the problem they have encountered. By providing clear and specific details about what has occurred, "without using complex words or codes that might make it difficult for the user to understand" [Spectrum, 2022b], users can make informed decisions about how to proceed or seek further assistance.

Explain the cause of the error: "It is useful to have an explanation of why an error happens if there is room to include it" [Spectrum, 2022b]. Explaining the cause of the error in error can help users understand why the error occurred, enables effective problem resolution, and also builds user trust.

Giving options for resolving the error: By offering clear guidance on what users can do to address the issue, we empower them to take immediate action and move towards resolving the error. This can include recommending specific troubleshooting steps, providing alternative options, or directing users to relevant resources or support channels.

Use simple language and avoid jargon: The use of simple language and avoiding jargon ensures that error messages are easily understood by a diverse user base. It creates an inclusive and accessible experience for users, enabling them to quickly grasp the message and take appropriate actions to resolve the error.

Do not blame the user, even if the error is his fault: Blaming the user can undermine their trust and confidence in the system or application. It may lead to negative emotions, frustration, or defensiveness. Instead, taking a user-focused approach that emphasizes understanding, assistance, and problem-solving helps maintain a positive user experience. Error messages should be empathetic, provide clear instructions or suggestions for resolution, and avoid assigning blame to the user.

We should not apologize unless it is justified: Apologizing for errors may mislead users into thinking that the error is more significant than it actually is. "We should use "sorry" for serious errors: when there is data loss or something that requires the user to take an important action to fix the problem" [Spectrum, 2022b]. Error messages should focus on providing clear information and actionable guidance to help users resolve the issue. By avoiding unjustified apologies, the message can remain focused, concise, and effective in assisting users in resolving the error.

These best practices have been documented and practical examples adapted to Ubiwhere.

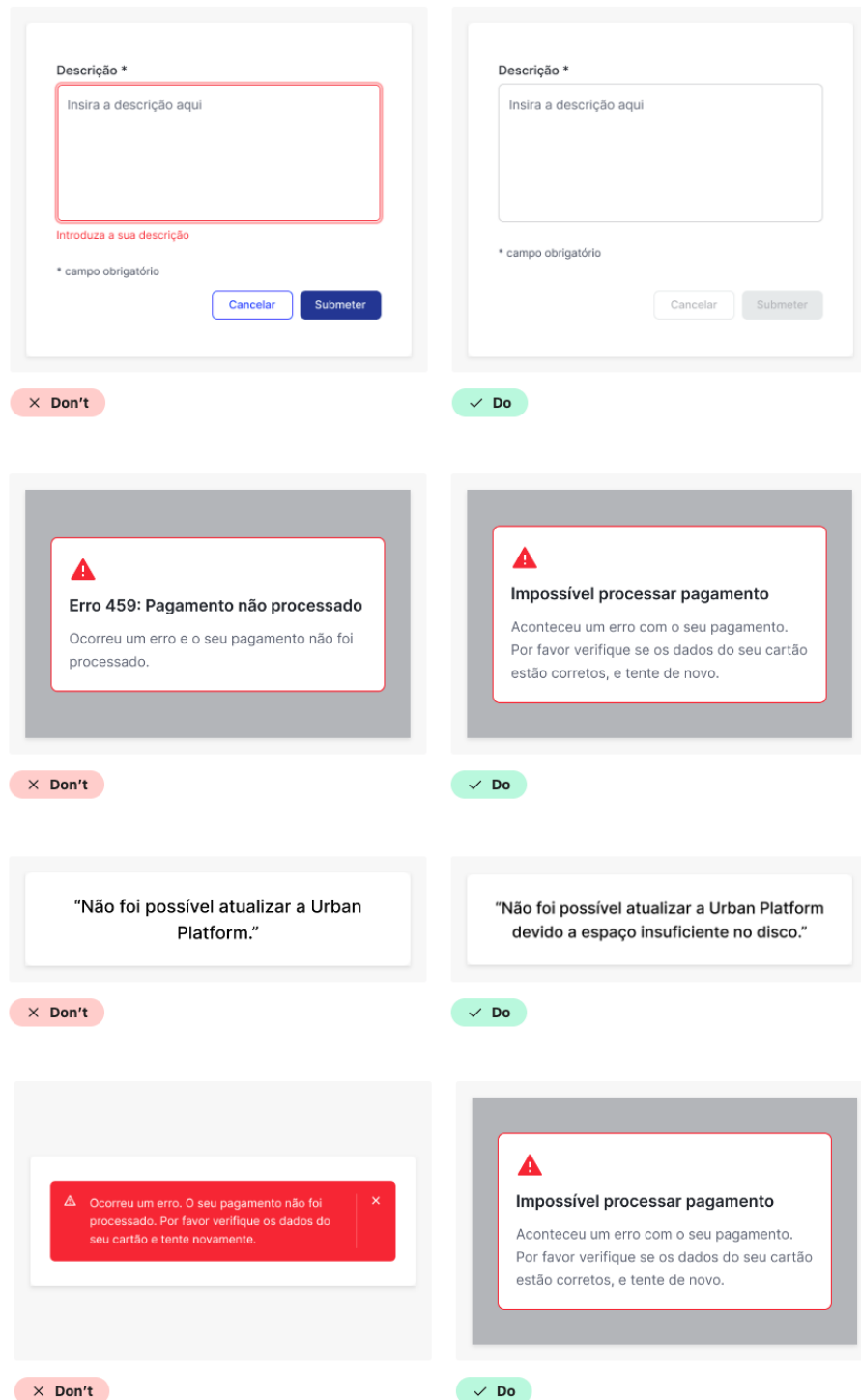


Figure 5.26: Some of the documented best practices for error messages

Success messages

Success messages are notifications or positive feedback displayed to users after the successful completion of an action or task. These messages are intended to inform users that the action has been successfully completed and provide a sense of accomplishment and confidence.

Well-designed and appropriate success messages provide positive feedback to users, increase trust in the platform or product, and contribute to a more pleasant overall experience. They play an important role in communicating effectively with users and help promote a fluid and satisfying interaction with the digital interface.

according to Atlassian's design system [Atlassian, 2023b], include:

Some of the best writing practices for success messages can be considered:

Using clear, concise, and positive language: We should use clear, concise, and positive language to convey the successful completion of a task or action, be specific in describing the outcome, making sure that the message is in line with the user's expectations. "Although this may vary depending on the component, titles should be limited to three or four words wherever possible, excluding words such as 'a', 'the' or 'the'" [Atlassian, 2023b]. The use of exclamations can be used in celebration of a task completed by the user, but we must be careful not to sound too enthusiastic [Atlassian, 2023b].

Confirmation of success: We must clearly indicate that the action was successful, using affirmative language to assure and instill confidence in the user that the intended result has been achieved. Also, "if someone has created something, it is important to give them the opportunity to view it" [Atlassian, 2023b].

Usefulness and guidance: We should consider providing additional information or guidance that may be useful to the user after the successful action. This could include suggestions for the next steps, relevant links, or options for exploring further features or related content. "When a successful message requires a choice, we should use imperative verbs like 'Save', 'Remove', or 'Create' in the CTA to describe the action people will take, rather than vague terms like 'OK'" [Atlassian, 2023b].



Figure 5.27: Documented best practices for success messages

5.3.6 Language and inclusivity

"As designers, we have the power and responsibility to make sure that everyone has access to what we create regardless of ability, context, or situation. (...) making our work accessible (...) brings a better experience to everyone" [Stanley, 2018]. For the development of this section, a study was conducted on how we can make digital products accessible in order to reach as many potential users as possible. The WCAG (Web Content Accessibility Guidelines) were mainly consulted. In addition to these guidelines, there was a further analysis of guidelines for accessible content in design systems such as Spectrum, Atlassian's design system, and Material Design.

The section was divided into the subsections inclusivity in UX writing, writing about people, writing for readability, and writing with visuals. This organization is the same as in Spectrum, as these sections are general, but end up addressing all the most important aspects of accessibility for digital products, at least at this early stage. This section with its subsections can be found at the following link <https://zeroheight.com/9d51779a9/p/952959-linguagem-e-inclusividade>.

Inclusivity in UX writing

The effective use of language plays an important role in promoting inclusion. As our designed products aim to reach a diverse audience, it becomes imperative to acknowledge the value of establishing meaningful connections with each individual. However, our perceptions and behaviors may inadvertently be influenced by social biases. It is crucial that we continually prioritize designs that suit all types of potential users, including different abilities, backgrounds, and situations, rather than just the "typical" or "standard" user, and not limit the inclusion of our products [Spectrum, 2022a].

"Many organizations are waking up to the fact that embracing accessibility leads to multiple benefits — reducing legal risks, strengthening brand presence, improving customer experience and colleague productivity" [WAI, 2018]. The Web Content Accessibility Guidelines (WCAG) provide several guidelines for writing

to ensure accessibility [WCAG, 2022a]. Of these, those that we can highlight as key principles are:

Using clear and concise language (WCAG 3.1.5): There are people with reading difficulties, such as dyslexia, who may not understand content that is not written clearly. "Clear, direct writing benefits everyone, not just people with dyslexia" [WCAG, 2022b]. For content that may be more complex, we should prioritize using shorter sentences and less complex words, as well as adding additional explanatory content, for example in videos, symbols, or graphics. We should not write paragraphs with too many sentences, or that cover too many topics. Instead, we should separate the topics we want to cover into different paragraphs. We should also write in simple language and in the active voice.

Providing meaningful text alternatives (WCAG 1.1.1): We must ensure that all non-text content, such as images, icons, and multimedia, have appropriate alternative text (alt text) or descriptive captions. This allows users who rely on screen readers or cannot view the visual content to understand the context and purpose.

Creating descriptive links (WCAG 2.4.4): We should make sure that hyperlinked text is descriptive and meaningful when read out of context, avoiding the use of generic or ambiguous terms like "click here" or "read more." Instead, we must use concise and descriptive text that provides an understanding of the linked content.

Using headings and structure (WCAG 2.4.6): We should organize the content with proper heading hierarchy to facilitate navigation and comprehension and use heading tags (H1, H2, etc.) appropriately to create a clear and logical structure. Headings help users navigate through the content more efficiently, especially when using assistive technologies.

These are just some of the guidelines we may follow to ensure that the content of our products and services takes accessibility into account. This section should be updated as often as possible, in order to cover as many topics as possible, and potentially include an explanation of how these types of assistive technologies work and how we can include their use in our design. For now, only a few topics are covered, and useful links are also provided for the team to refer to if needed.



Figure 5.28: Inclusivity in UX writing, ZeroHeight

Writing about people

The goal of UX writing is to ensure clarity and understanding for all and to accommodate the diverse ways people interact with products. When writing content for product experiences, it is essential to take an inclusive and respectful approach. An effort should be made to understand the perspectives of under-represented groups and avoid writing in a way that portrays or treats someone as fundamentally different from us.

Before writing content we should think about issues such as whether it is necessary to refer to personal characteristics such as gender, religion, racial group, disability, or age. If it is necessary to refer to any of these characteristics, we need to think about how we can be inclusive without offending or putting certain people off. The use of inclusive language must be "carefully constructed in ways that treat all people with respect and impartiality" [Atlassian, 2023c].

In general, when **writing about people**, we must keep some general guidelines in mind, such as:

- Avoid emphasizing differences between groups of people, stereotypes or generalizations, whether positive or negative. We must be aware of unconscious biases and avoid using language that perpetuates discrimination or exclusion. We should use neutral terms when referring to individuals or groups, and be aware of the impact the language can have on different audiences.
- Mention disabilities only when relevant and avoid suggesting victimization.
- Use gender-neutral language, not using language that privileges men and

makes women inferior, and vice versa. Avoid mentioning the person's gender unless necessary.

- Avoid phrases that belittle or trivialize any group of people, not being offensive and discriminatory.
- Avoid any stereotyping or connotation that a particular age group is more or less able.
- Treat all people fairly, regardless of their socioeconomic status or what they do.

These are some general rules to keep in mind when writing about people. Further research should be conducted on the diversity of Ubiwhere's target audience and concrete examples of the application of these guidelines in the company's products and services should be presented.

The screenshot shows a web application interface with a navigation menu on the left and a main content area. The navigation menu includes a search bar and several menu items: 'CONTEÚDO', 'Tom e Voz', 'Linguagem e gramática', 'Escrita para compo...', 'Linguagem e Inclusiv...', 'Inclusividade em UX ...', 'Escrever sobre pess...', 'Escrever para facilitar ...', 'Escrever com visuais', and 'Glossário de termos'. The main content area is titled 'Inclusividade em UX Writing' and contains the following text:

O objetivo da *UX writing* é garantir clareza e compreensão para todos e acomodar as diversas formas como as pessoas interagem com os produtos. Ao escrever conteúdos para experiências de produtos, é essencial adotar uma abordagem inclusiva e respeitosa, centrando-se na pessoa a quem nos estamos a dirigir ou a debater. Deve ser feito um esforço para compreender as perspectivas dos grupos sub-representados e evitar escrever de uma forma que retrate ou trate alguém como fundamentalmente diferente de nós.

Antes de escrever conteúdo, devemos refletir sobre questões como a necessidade de fazer referência a características pessoais como o género, a religião, o grupo racial, a deficiência ou a idade. Se for necessário fazer referência a qualquer uma destas características, temos de pensar como podemos ser inclusivos sem ofender ou desmotivar certas pessoas. A utilização de linguagem inclusiva deve ser cuidadosamente construída de forma a tratar todas as pessoas com respeito e imparcialidade.

Em geral, quando escrevemos sobre pessoas, devemos ter em conta várias questões, e devemos:

- Evitar enfatizar as diferenças entre grupos de pessoas, estereótipos ou generalizações, sejam elas positivas ou negativas. Devemos estar conscientes dos preconceitos inconscientes e evitar utilizar uma linguagem que perpetue a discriminação ou a exclusão. Devemos utilizar termos neutros quando nos referimos a indivíduos ou grupos e estar conscientes do impacto que a nossa linguagem pode ter em diferentes públicos.
- Mencionar deficiências apenas quando relevante e evitar sugerir vitimização.
- Utilizar uma linguagem neutra em termos de género, não utilizando uma linguagem que privilegie os homens e inferiorize as mulheres, e vice-versa. Evitar mencionar o género da pessoa, a não ser que seja necessário.
- Evitar frases que menosprezem ou banalizem qualquer grupo de pessoas, não sendo ofensivas e discriminatórias.
- Evitar qualquer estereótipo ou conotação de que um determinado grupo etário é mais ou menos capaz.
- Tratar todas as pessoas de forma justa, independentemente do seu estatuto socioeconómico ou do que fazem.

Figure 5.29: Writing about people, ZeroHeight

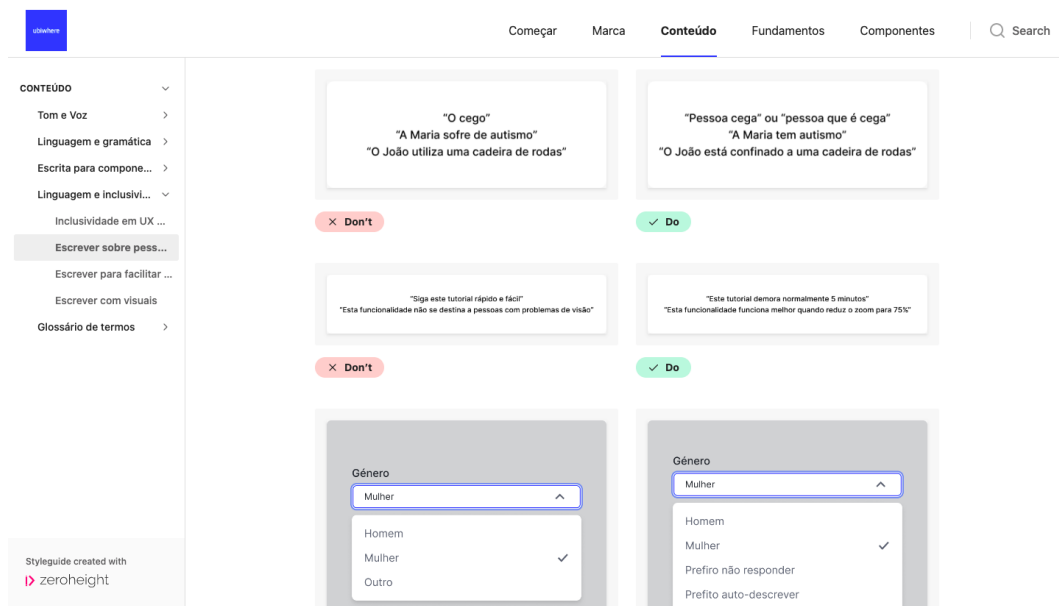


Figure 5.30: Writing about people examples, ZeroHeight

Writing for readability

Readability is of great importance in creating UX writing guidelines as it enables clear and accessible communication. "Tone of voice and great content are crucial for communicating on the Internet. Nevertheless, the best copywriting is for nothing if users don't read the text" [Nielsen, 2015].

Readability refers to the ease with which written content can be read and understood by the intended audience. When writing for readability we should follow the principles [Nielsen, 2015]:

- Using simple words, avoid fancy words, and avoid the use of jargon.
- Avoid using complicated sentence structures, which overload users' short-term memory.
- Writing mostly in the active voice. As mentioned in the section on language and grammar, the passive voice can be used in specific contexts, but should generally be avoided.

According to Yale University, other principles we can follow to write with readability in mind include the proper use of headings, paying attention to the "read level" of our users, and text formatting [Yale, 2023].

The proper use of headings is essential for content organization and information hierarchy. It allows users to understand the organization and structure of the content without much effort, creating a logical flow and making it easier to locate specific sections. This makes it easier to read and more efficient to navigate through the content. In addition, we ensure that by scanning the page, users can quickly assess the relevance of the content and where they should focus their attention, saving time and effort in this search. Headings also visually separate the

text, which makes the content less overwhelming. They also play a crucial role in accessibility for users who use assistive technologies such as screen readers. Clear and properly structured headings provide meaningful context and ensure that users with visual impairments or reading difficulties can access and understand information effectively.

We need to know our target audience and understand what "reading level" we should use in our writing so that all users understand what we are communicating. It is advisable to write at a high school level whenever possible and appropriate, as it makes it easier to read not only for people with cognitive or visual impairments but for all users in general [Yale, 2023].

Effective text formatting improves the readability of the content. Using appropriate font sizes, line spacing, and margins ensures that the text is readable and comfortable to read. In addition, aspects such as paying attention to the contrast between text color and background color, use of bold text or alignment, for example, should also be taken into consideration. These aspects of text formatting reduce eyestrain and improve comprehension, creating a visually pleasing reading experience.

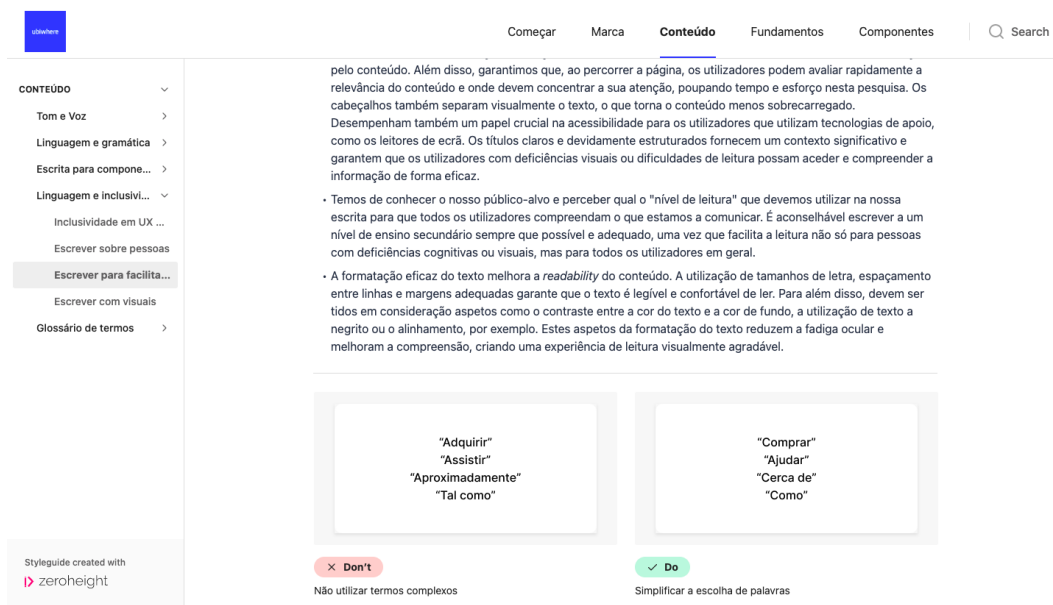


Figure 5.31: Writing for readability, ZeroHeight

Writing with visuals

UX writing never stands alone, and we should think about how different people with different perceptions can understand a message. We should not rely on images, icons, colors, or other visual elements as the only way to communicate a concept. Furthermore, we should think about what we are portraying with visual elements like images, always trying to portray different types of people and not just what we consider "typical" for us.

Spectrum, Adobe's design system, presents a set of important rules to keep in

mind about writing through visual elements [Spectrum, 2022d]. The rules presented were extracted from Spectrum with examples adapted to the specific case of Ubiwhere. Some good practices we can follow for writing with visuals are:

Avoiding directional language: We should avoid the use of directional language to describe how to accomplish a task. This promotes inclusivity and prevents confusion or misinterpretation among users. It helps create a user experience that is accessible and clear for a diverse range of individuals.

Preventing mistakes before correcting them: "We should help people avoid and correct mistakes by writing predictably and consistently and making screens look and behave the way people expect" [Spectrum, 2022d]. By preventing errors we can minimize user frustration, improve efficiency and productivity, and reduce the learning curve associated with navigation and interface interaction.

Don't rely on colors or icons alone: By using colors or icons as the sole means of conveying information or functionality, we exclude users who may have difficulty perceiving or interpreting them. To ensure accessibility and inclusivity, it is essential to use alternative methods such as labels, text, or other visual cues in conjunction with colors or icons to provide clear and meaningful information to all users. "Screen readers usually tell the reader if a word is a link, so the words "click here" or "link" are a barrier" [Spectrum, 2022d].

Don't use only visuals to communicate: "The visual metaphors of emojis and icons can have a wide range of interpretations, especially across cultures" [Spectrum, 2022d]. We should describe the interface in terms of actions and tasks, for example, saying "the red button" instead of "the cancel button" is not a good choice, as not all people perceive color in the same way.

Provide alternative text (alt text): "Alternative text — short texts that describe the function of interface elements and describe images — improves comprehension and clarity for all users of a product, not just for people using assistive technology" [Spectrum, 2022d]. For example, if we hover the mouse over the "search" magnifying glass icon on Ubiwhere's website, and display the alternative text "Search ubiwhere.com", we are able to provide more context about the available action. Alt text is mainly important because it ensures accessibility for users who are visually impaired or rely on screen readers. Alt text is a textual description of images that is read aloud or displayed in place of the image. By including alt text, users who cannot see the images can still understand the context, purpose, and meaning of the visuals. It allows for equal access to information and ensures an inclusive user experience for all users, regardless of their visual abilities.

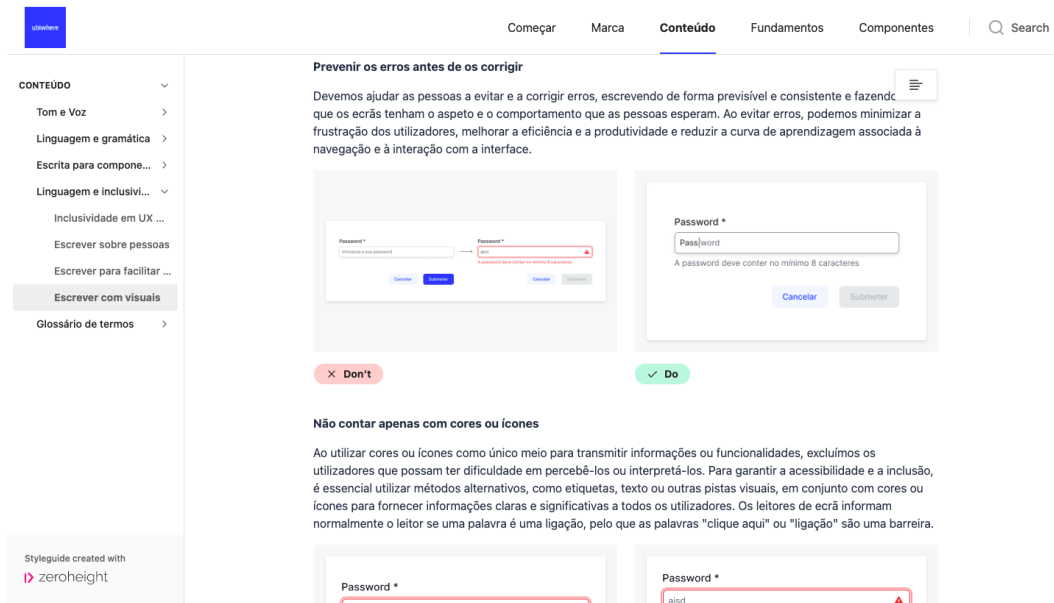


Figure 5.32: Writing with visuals, ZeroHeight

5.3.7 Glossary of terms

The glossary of terms ended up not including terms to use or avoid, as initially planned. Instead, the glossary of terms includes a link to a list, previously developed by some of the company's employees, of some terms and concepts related to the company's products and area of activity, with their explanation and external links to more details about them. By analyzing this document, the team can decide when they should or should not use these terms and concepts, depending on context.

In the future, it may be important to do this more in-depth research on what terms should and should not be used on Ubiwhere's platforms, with illustrative examples if possible.

Terms/Concepts

3G, 4G, 5G

3rd, 4th, and 5th generation cellular technologies, respectively. In simple terms, 3G represents the introduction of the smartphone along with their mobile web browsers; 4G, the current generation cellular technology, delivers true broadband internet access to mobile devices; the coming 5G cellular technologies will deliver massive bandwidth and reduced latency to cellular systems, supporting a range of devices from smartphones to autonomous vehicles and large-scale IoT. Edge computing at the infrastructure edge is considered a key building block for 5G. See also: [Infrastructure Edge](#)

Access Edge Layer

The sub-layer of infrastructure edge closest to the end user or device, zero or one hops from the last mile network. For example, an edge data center deployed at a cellular network site. The Access Edge Layer functions as the front line of the infrastructure edge and may connect to an aggregation edge layer higher in the hierarchy. See also: [Aggregation Edge Layer](#)

Access Network

A network that connects subscribers and devices to their local service provider. It is contrasted with the core network which connects service providers to one another. The access network connects directly to the infrastructure edge. See also: [Infrastructure Edge](#)

Aggregation Edge Layer

The layer of infrastructure edge one hop away from the access edge layer. Can exist as either a medium-scale data center in a single location or may be formed from multiple interconnected micro data centers to form a hierarchical topology with the access edge to allow for greater collaboration, workload failover and scalability than access edge alone. See also: [Access Layer Edge](#)

Figure 5.33: Example of terms and concepts included in the glossary

5.4 Component development and documentation

After completing the content sections and the typographic study, I started building the components for which I was responsible, and where I could apply some of the content guidelines developed. These components include tooltips, toasts, snackbars, modals, and messages. All these components were developed in the Figma platform, and approved by the design team. After they were built in Figma, they were documented in the ZeroHeight platform, including issues like anatomy, usage, behavior, do's, and dont's.

For documentation and usage guidelines, the Material Design design system was mainly consulted, since it has in-depth documentation about these components and their behavior, which are rules applicable to Ubiwhere's design system. Although these design systems were consulted, the specific case of using these components in Ubiwhere's products and services was studied and both the style and the guidelines for using the components were adapted to these needs.

It should be emphasized that for this initial version of the design system, the components have been responsively designed for use on desktop and mobile screens, as well as for light mode. The components may later need to be adapted for dark mode platforms, or with other features that require this adaptation.

5.4.1 Tooltips

Tooltips are informational labels that appear when the user hovers the mouse cursor over an element (mouse hover) [Material Design, a]. They "identify an element when they are activated, and should contain a short help text about their function" [Material Design, a]. In the specific case of tooltips identifying maps, they can also contain an icon or an image.

Two types of tooltips have been developed in the context of the project. Through an analysis of the Ubiwhere platforms and products, it was possible to understand that besides the most basic version of a tooltip, which supports only text, it was necessary to develop tooltips identifying maps, which require icons, different colors, images, and different types of text. Documentation for this component can be found at the following link <https://zeroheight.com/9d51779a9/p/57d333-tooltips>.

Default tooltip

The default tooltip represents a tooltip that contains only text, which should be used to display auxiliary information in an interface. For example, a visual element such as an icon may need a tooltip with text to describe what the icon represents, since its interpretation can be ambiguous and vary from user to user.

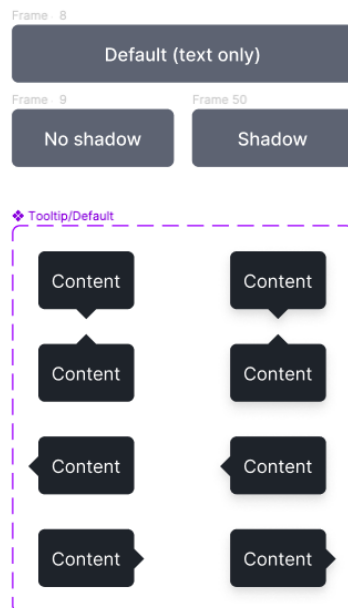


Figure 5.34: Default tooltip variants, Figma

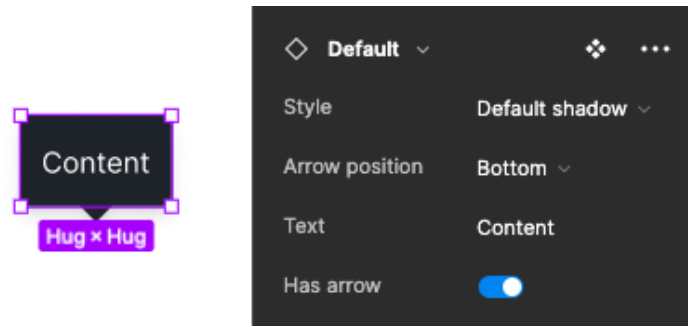


Figure 5.35: Default tooltip properties example

Map tooltip

Although tooltips with icons or images are not common, there was a need on Ubiwhere's side to create this type of variant, since the use of maps in their products and services is frequent, and it was necessary to represent the different parking lots, events, and services on these maps.

In this case, the tooltips with a blue background correspond to services, and those with a purple background correspond to events. The remaining colors correspond to the occupancy status of a parking lot — these tooltips are activated when the user hovers over a parking lot on a map, where red corresponds to the total occupied capacity, green corresponds to the park with plenty of free places, etc. Gray means that there is no data about the park status, or that the sensor is broken.



Figure 5.36: Map tooltip variants

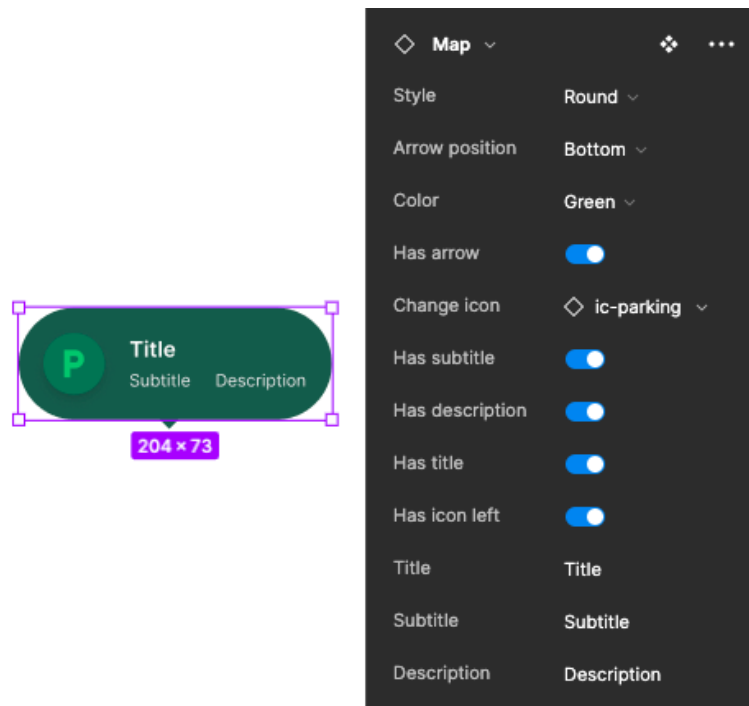


Figure 5.37: Map tooltip properties example

Introduction and anatomy

The **default tooltip** only contains text and is intended to identify visual elements or give additional information about some interface element. This component can also contain a directional arrow to indicate where the element it refers to is. It may or may not contain shading, to stand out from the background if necessary.

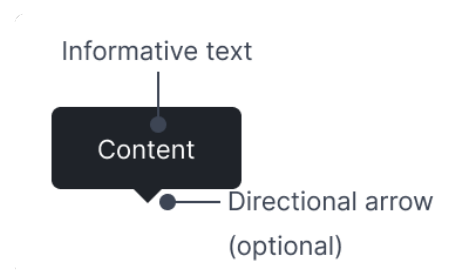


Figure 5.38: Default tooltip anatomy

The **map tooltip** also includes an icon associated with the type of tooltip (parking, event, or service) and a background color associated with the type of tooltip, or in the case of parking, with the parking occupancy status. This background color includes transparency so that users can see the map underneath.

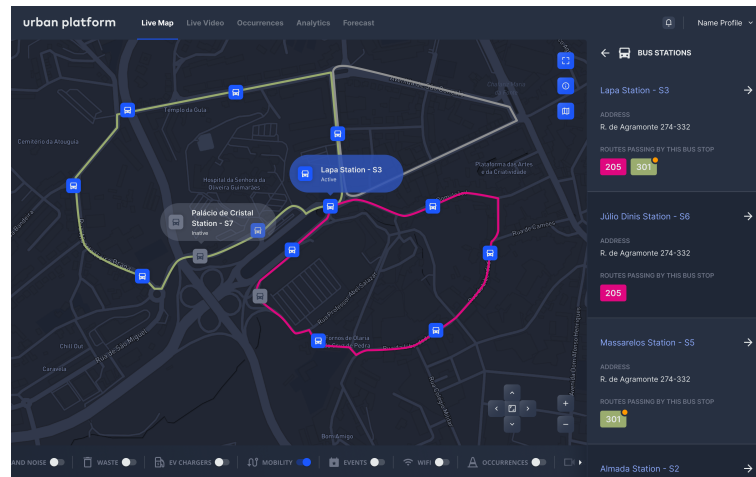


Figure 5.39: Example of map tooltip with icon in Urban Platform, a product from Ubiwhere

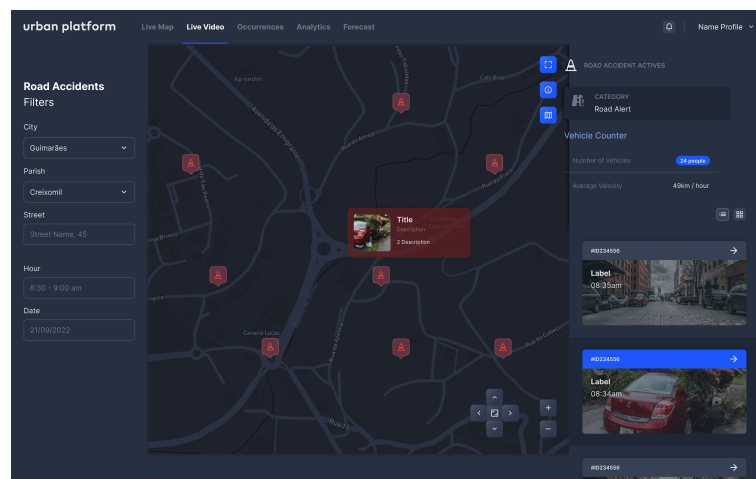


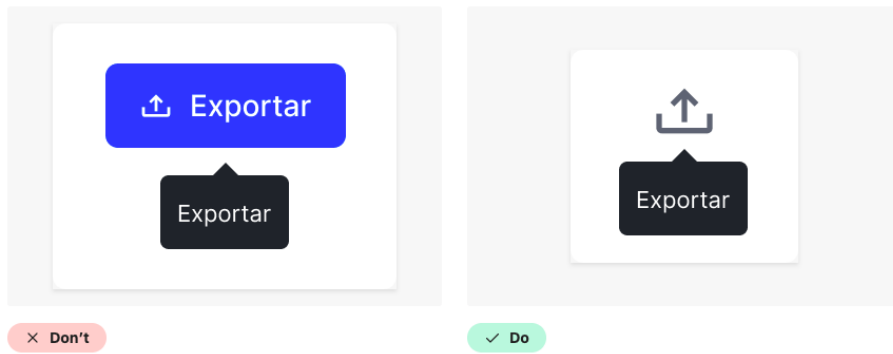
Figure 5.40: Example of map tooltip with image in Urban Platform, a product from Ubiwhere

Usage

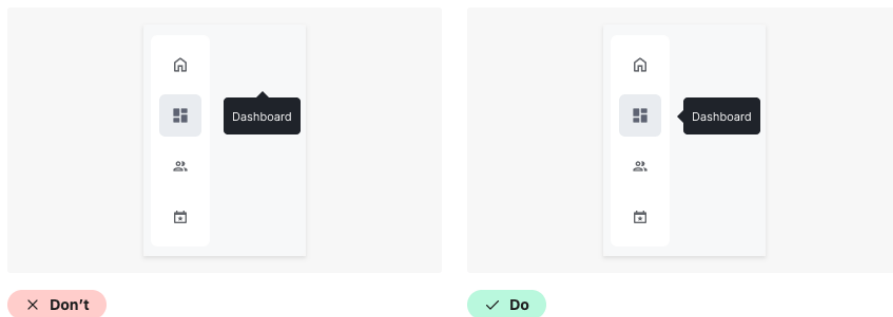
Regarding behavior, tooltips are components that are activated when the user hovers over an interface element and must be deactivated when the cursor moves to another location on the page.

Some best practices for using these components include:

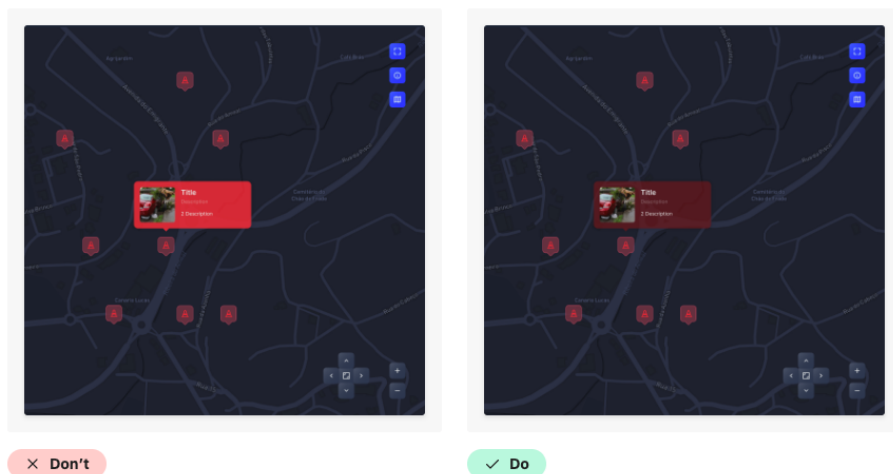
- **Use the default tooltip for visual elements such as images or icons.** Tooltips should be used to identify images or icons, which require a written explanation of their meaning. They should not be used for elements that already contain text associated with the visual element.



- **Use the directional arrow to indicate the element.** Tooltips should be used to identify images or icons, which require a written explanation of their meaning. They should not be used for elements that already contain text associated with the visual element.



- **The map tooltip must be transparent, and not obscure map information.** The transparency in the background color of the map tooltips must not be changed and made opaque, as this makes it impossible to see the map data displayed underneath.



Variants

The default tooltip represents a tooltip that contains only text, which should be used to display auxiliary information in an interface. For example, a visual el-

element such as an icon may need a tooltip with text to describe what the icon represents, since its interpretation can be ambiguous and different from user to user. Its variants include the four versions with the directional arrows, one to the left, one to the right, one up, and one down, as well as having or not having shadow included.

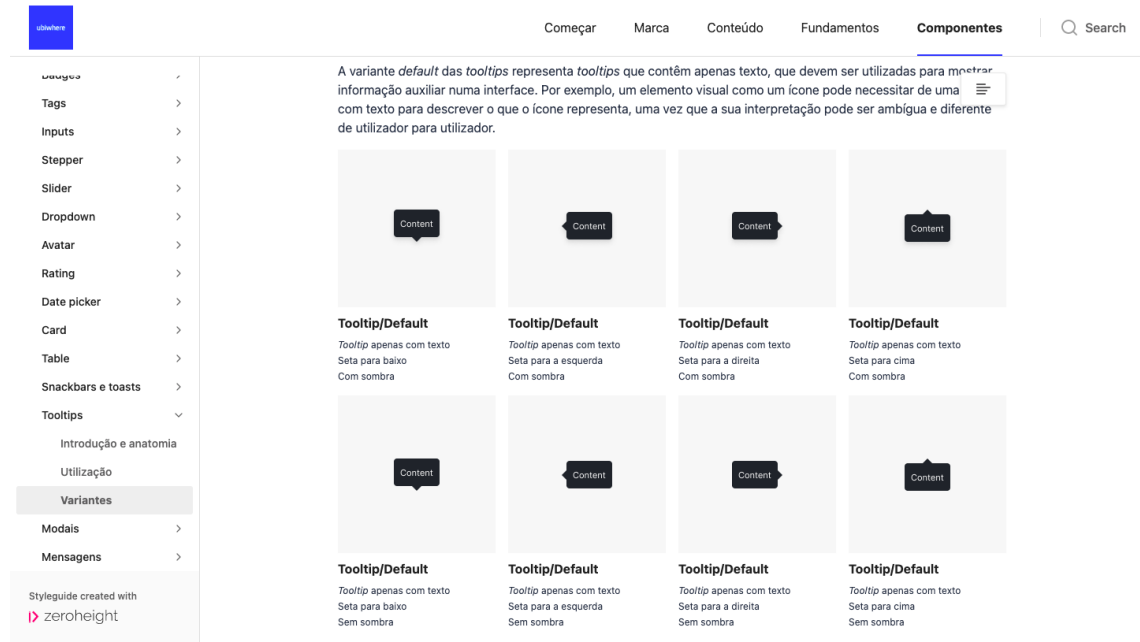


Figure 5.41: Documentation of the default tooltip variants, Zeroheight

Although tooltips with icons or images are not common, there was a need on Ubiwhere's part to create this type of variant, since the use of maps in their products and services is frequent, and it was necessary to represent the different parking lots, events, services, etc. on these maps.

In this case, the tooltips with a blue background correspond to services, and those with a purple background correspond to events. The remaining colors correspond to the occupancy status of a parking lot - these tooltips are activated when the user hovers over a parking lot on a map, and red corresponds to full capacity. Gray means that there is no data about the park status, or when the sensor is broken.

The round, square and square with image variants can be used depending on the data the map represents, as shown in figures 5.38 and 5.39.

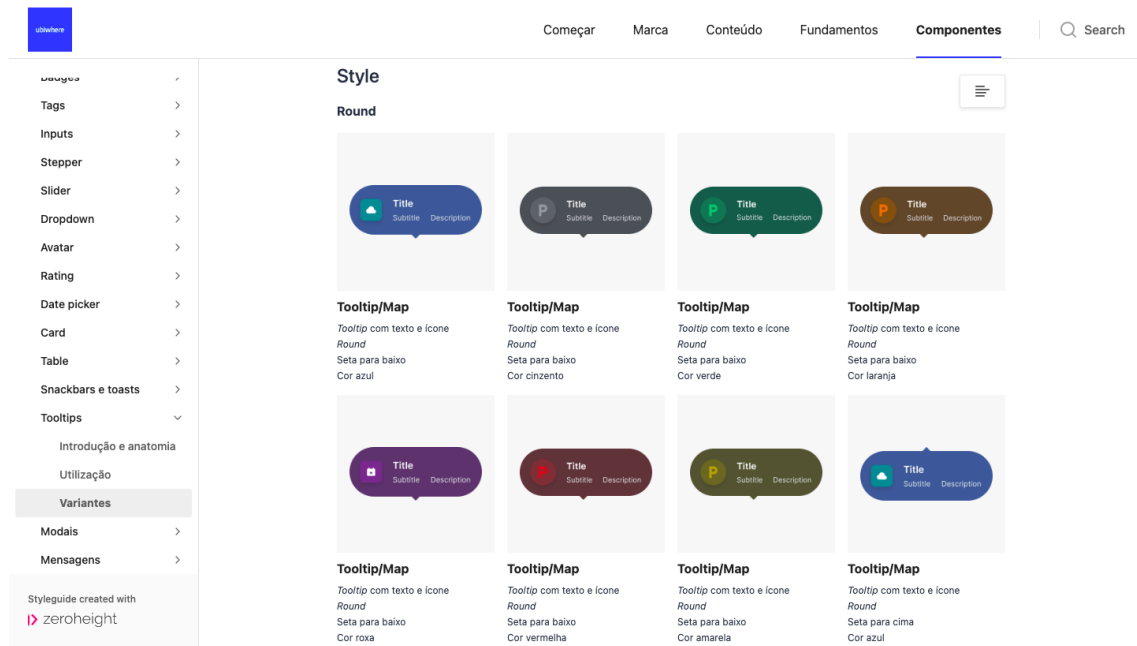


Figure 5.42: Documentation of the map tooltip round variant, Zeroheight

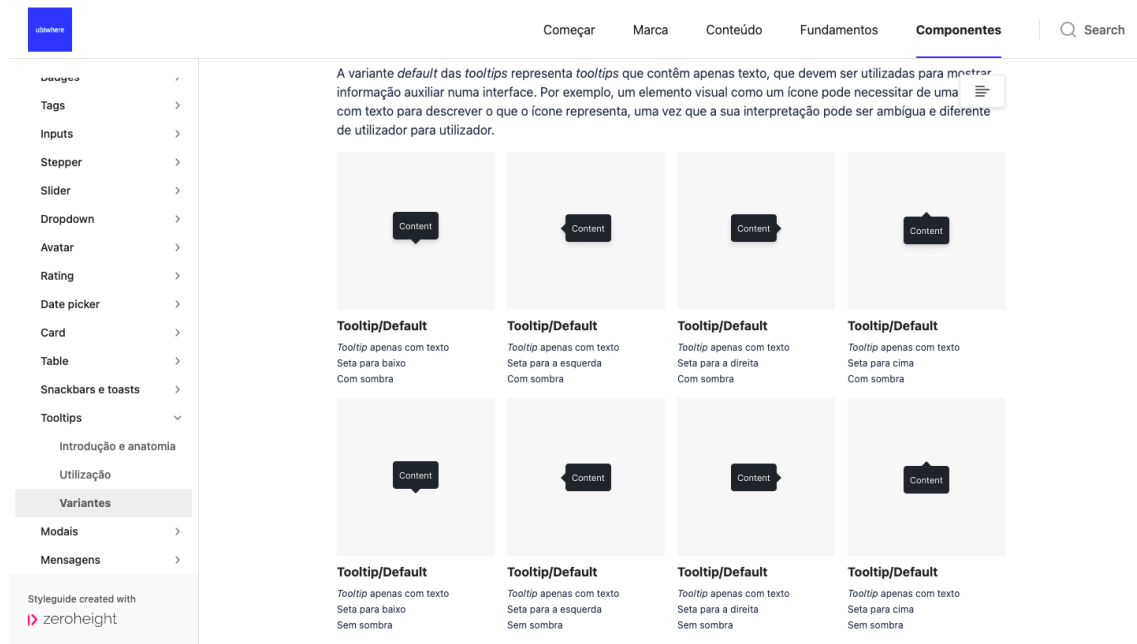


Figure 5.43: Documentation of the map tooltip square variant, Zeroheight

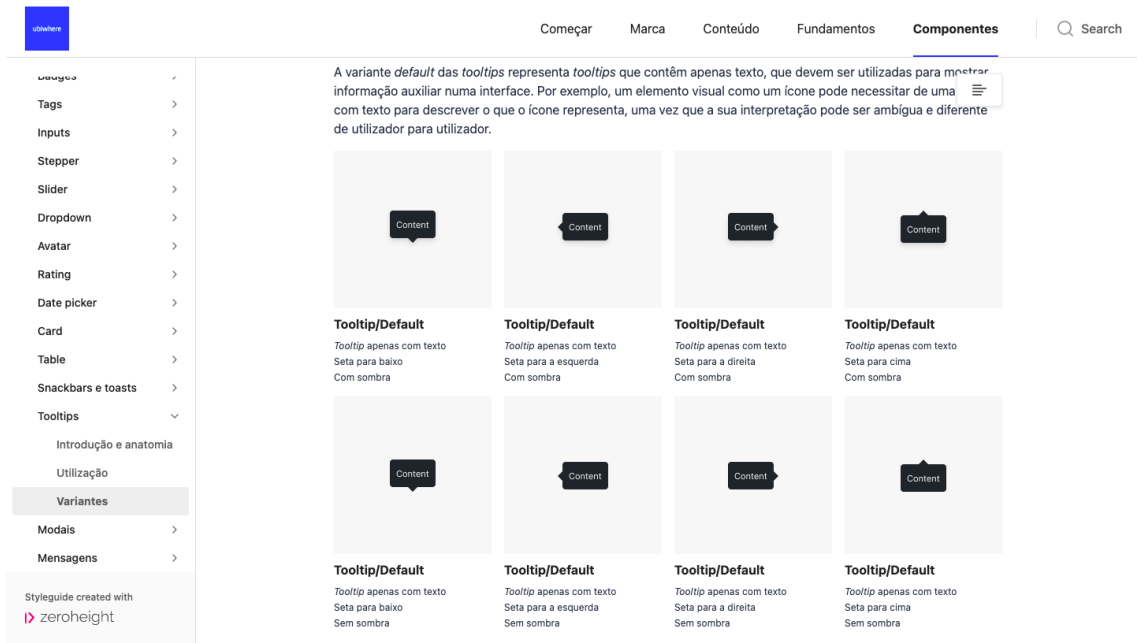


Figure 5.44: Documentation of the map tooltip square with image variant, Zeroheight

5.4.2 Toasts and snackbars

Documentation for these components can be found at the following link <https://zeroheight.com/9d51779a9/p/86aab4-snackbars-e-toasts>.

Introduction and anatomy

Toasts are used mainly for system messages [Material Design, b]. They are displayed at the bottom of the screen, and may or may not contain a close button — they can disappear from the screen after a while. Toasts can contain icons, a close button, and an action button. They contain text and a background color associated with the type of message, with blue corresponding to an informative message, green to a success message, red to an error message, and gray to a neutral tone message, such as "Link copied".

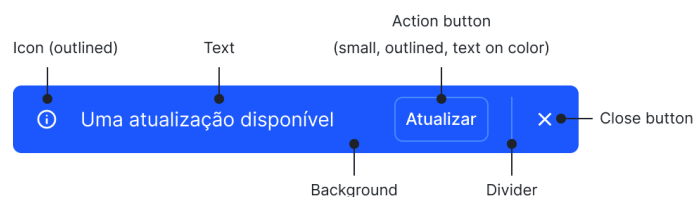


Figure 5.45: Toast anatomy

Snackbars contain a single line of text directly related to an operation the user performs [Material Design, b]. "They may contain an action button, but no icons" [Material Design, b], and usually no close button either, disappearing from the screen after a while. Its background color is neutral and the color of the action button, if any, corresponds to the type of message, just as it does in toasts.



Figure 5.46: Snackbar anatomy

Usage

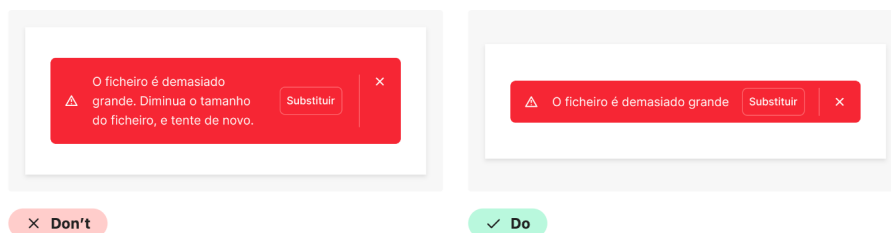
Only one snackbar or toast should be displayed at a time on the screen [Material Design, b].

As far as location is concerned, snackbars and toasts "appear above most elements on the screen" [Material Design, b]. However, their elevation is lower than that of elements such as modals or messages.

Regarding behavior, when appearing on the screen, snackbars and toasts "animate upward from the bottom edge of the screen. When they appear, they do not block inputs" [Material Design, b] that are included on the screen. They disappear from the screen either automatically after a timeout (if they do not contain a close button), or through user interaction, either by selecting the close button or selecting the action button that directs them elsewhere [Material Design, b].

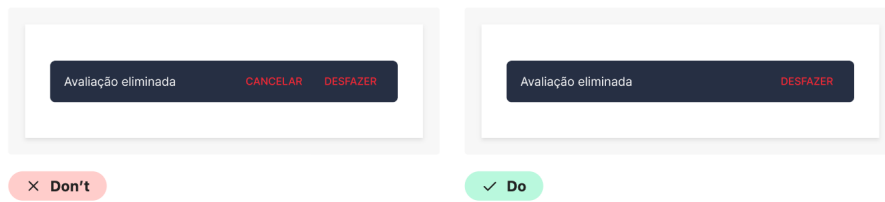
Some best practices for using these components include:

- **Writing very short text lines.** According to Material Design, snackbars and toasts must contain a single line of text [Material Design, b]. In the case of snackbars, they should be directly related to the operation performed, and contain no icons. Longer text implies the use of other components, such as modals.

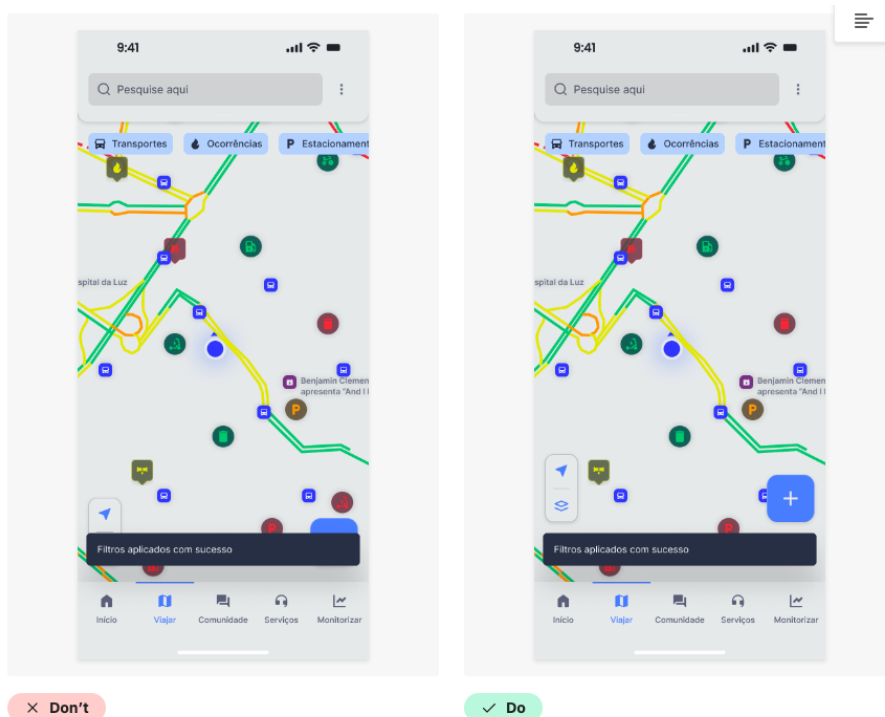


- **Use only 0 to 1 action, other than cancel.** Snackbars and toasts should contain a maximum of one action, always related to the text displayed. If

the described action is important enough to block the use of the screen, or if it is necessary to add more than one action, modals should be used [Material Design, b].



- **Don't block existing actionable elements on the page.** When creating the animation of a snackbar or toast, we have to move the elements that are vertically actionable in order to accommodate the height of the component [Material Design, b].



Toasts

Toasts should include text to communicate a message. The text should be written as concisely as possible while making clear what has happened or is happening.

The **neutral toast** is the default variant. Its background is gray and contains no icon. It is used when the message has a neutral tone or when its semantics do not fit into any of the other variants.

The **informative toast** uses the informative color (blue) and has an information icon, to help people with color blindness perceive the tone of the message. This should be used when the message should draw more attention than the neutral variant.

The **success toast** uses the success color (green) and has a checkmark icon, to help people with color blindness understand the tone of the message. It is used to inform of a successful action or the completion of a task.

The **error toast** uses the error color (red) and has a warning icon, to help people with visual impairments understand the tone of the message. It is used to indicate an error or a failure.

A toast can contain at most one action: a button outlined, with white text. The button text should be concise, and the button should only be used when there is a direct action available that is related to the toast text.

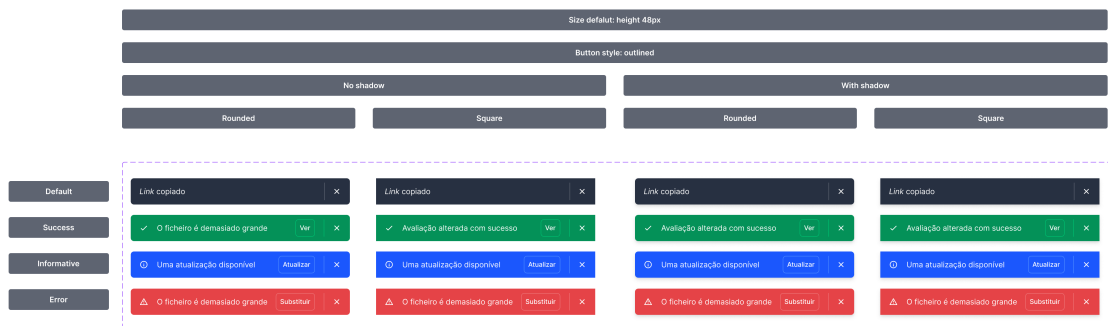


Figure 5.47: Toasts variants, Figma



Figure 5.48: Toast properties example

Snackbars

Like toasts, snackbars should include text to communicate a message, which should be written as concisely as possible while making clear what has happened or is happening.

The **neutral snackbar** is the default variant. Its background is gray and it does not contain an action. It is used when the message has a neutral tone or when its semantics do not fit into any of the other variants.

The **informative snackbar** uses the informative color (blue) in the text of the action button. This should be used when the message should draw more attention than the neutral variant, and when it is possible to perform an action associated with the text that appears in the snackbar message.

The **success snackbar** uses the success color (green) in the text of the action button. It is used to inform about a successful action or the completion of a task.

The **error snackbar** uses the error color (red) in the text of the action button. It is normally used to indicate that the performed action can be undone.

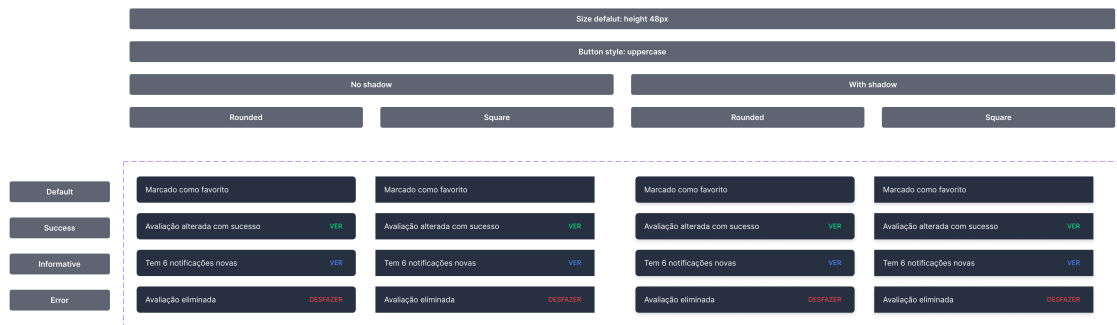


Figure 5.49: Snackbars variants, Figma

5.4.3 Modals

Documentation for this component can be found at the following link <https://zeroheight.com/9d51779a9/p/27e352-modais>.

Introduction and anatomy

A modal is an interface element that is presented as a pop-up and disables the other content presented on the page. To return to the main content, the user must interact with the modal by closing it or completing an action. Modals serve to draw attention and inform or question users about information or tasks.

Modals can contain several types of content, some of which are simpler and some of which are more complex.

A **simpler modal** contains a title and supporting text, as well as actions that the user can take related to the message. They can also contain a close button and an icon related to the content of the message. The divider can be used to separate content from actions, but is a component generally more used for more complex modals.

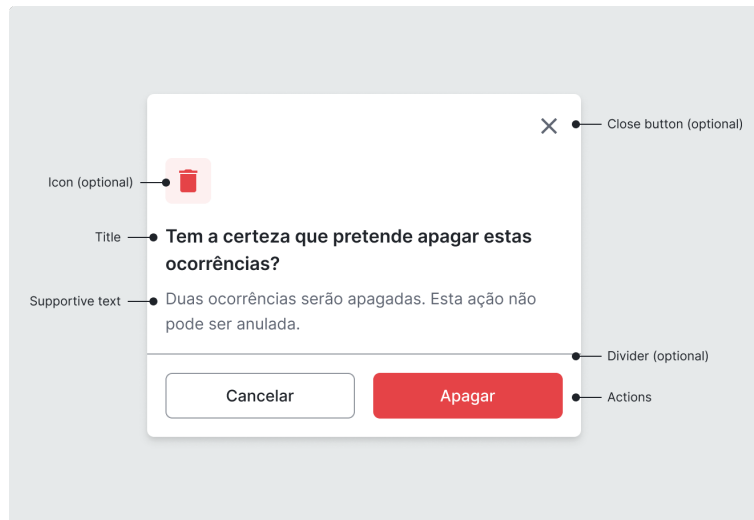


Figure 5.50: Simpler modal anatomy

A more **complex modal** can also contain a body message that can contain, for example, a form. It may also contain more actions to perform than a simple modal.

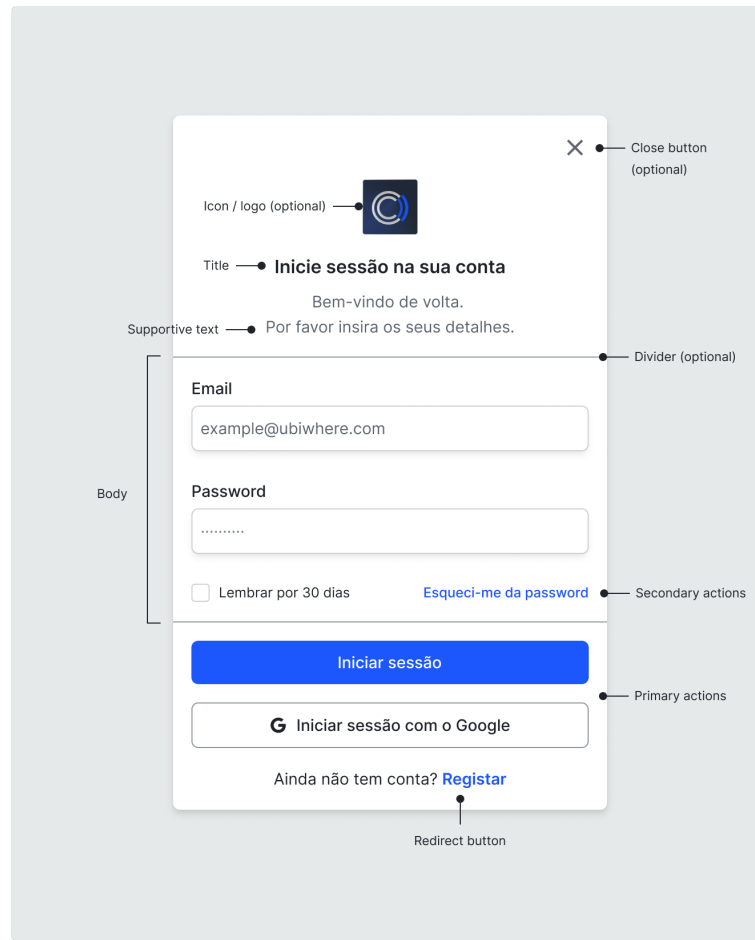


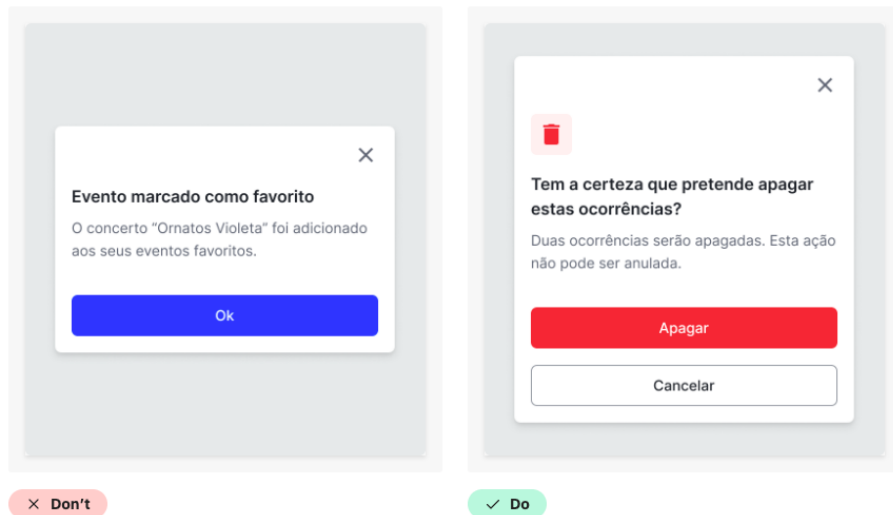
Figure 5.51: Complex modal anatomy

Usage

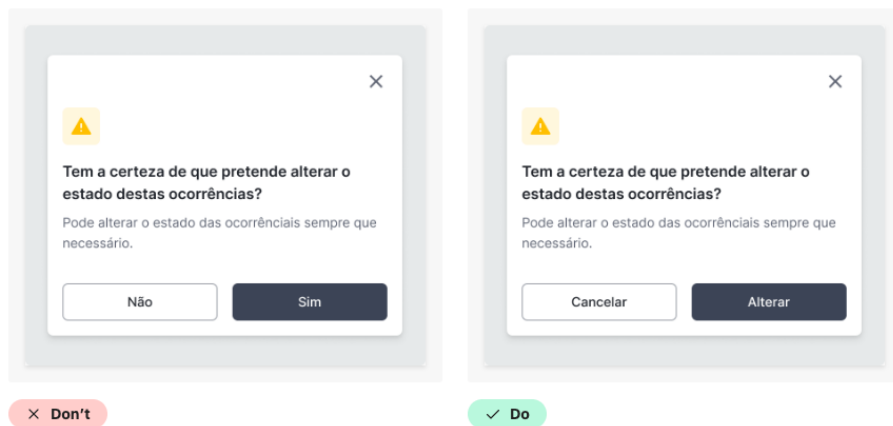
Regarding behavior, modals inform users about a specific task and may contain critical information, require decisions, or involve multiple tasks. We should use modals sparingly, since they are interruptive. Their sudden appearance forces users to interrupt their current task and focus on the content of the modal. Not every option, setting or detail justifies the interruption. Alternatives to modals include menus or toasts, for example. Modals should never be covered up by other elements or appear partially on the screen. This component maintains focus until it is dismissed or a necessary action is taken, such as choosing a setting.

Some best practices for this component include:

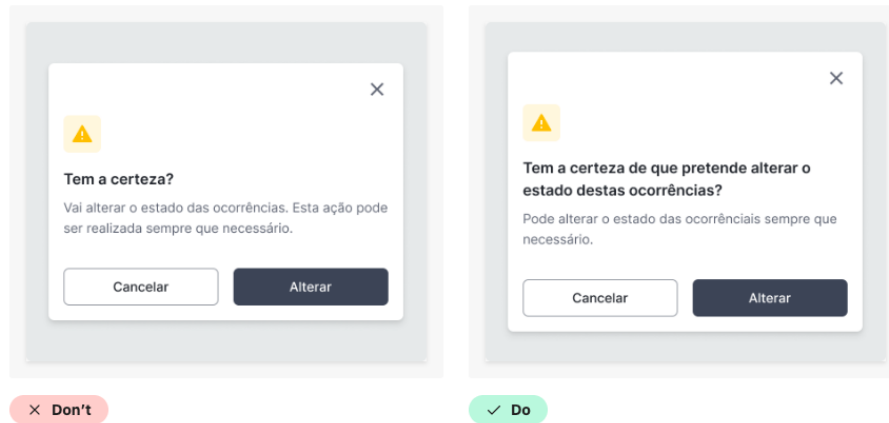
- Using modals for more relevant notices:** Modals should be used for warnings that block normal operation of the interface and for critical information that requires a specific task, decision, or confirmation from the user. We should not use modals for low or medium priority information. Instead, use a toast (which can be closed) or a snackbar (which disappears automatically).



- **Using clear and straightforward action buttons:** The buttons that are part of the modals should include clear and effective information about the action the user can perform and what the consequences are. We should avoid using ambiguous terms such as "ok", "no" or "yes".



- **Using titles that concisely and directly describe the action associated with the message:** The titles and action buttons of the modals should be sufficient for the user to understand the action that is related to the message and what they can do, with the auxiliary text just being a way to add relevant information. The title should be clear, direct and concise.



Variants

A modal is a component that appears on the screen as a pop-up window and usually requires the user to interact with it before returning to the main interface. Modals can differ in types of content, including forms, notifications, alerts, or confirmation messages.

In the specific context of the project, only the default, alert and error message variants, as well as login and registration forms, were developed.

The **default variant** corresponds to a neutral tone message, which normally contains no associated icon, and can be, for example, an access request from the application to the user.

The **destructive/error variant** and **warning variant** correspond to error or warning messages that usually concern an important action that the user is going to take and can serve as confirmation for that action and to give further relevant information.

The **login variant** corresponds to a login form.

The **register variant** corresponds to a registration form.

For the creation of the modals, four types of components were developed in the first phase — close action, divider, modal header, and modal actions. The combination of these components form the different types of modals.

The **modal header** refers to the header of a modal, which contains a title and supporting text and may also contain an icon associated with the message.

The **modal actions** concerns the actions that appear in a modal.

The **close action** corresponds to the action of closing a modal. It may or may not belong to the modal, since there are other ways to close these messages.

The **divider** refers to a line that divides the content of the modal, in case it is too long, which improves readability and organization of content.

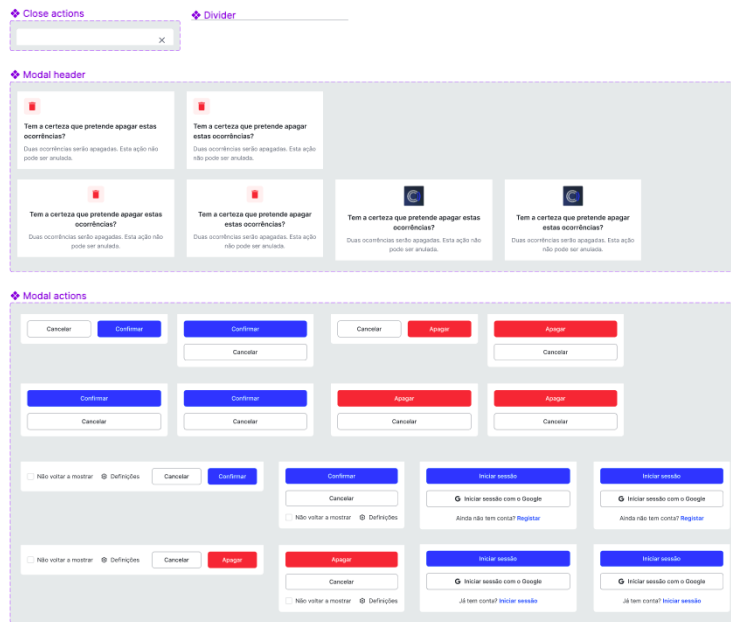


Figure 5.52: Components used to build the modals, Figma

The variants mentioned above have been divided into two different types: left-aligned and centered, with the default, warning and error variants being able to be used both ways, while the login and log variants are only centered. These variants were developed for both desktop size and mobile size.

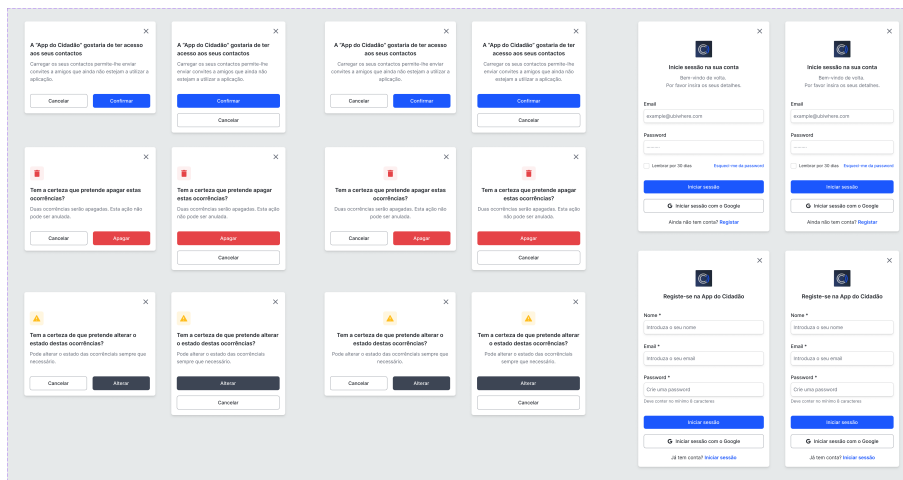


Figure 5.53: Modal variants, Figma

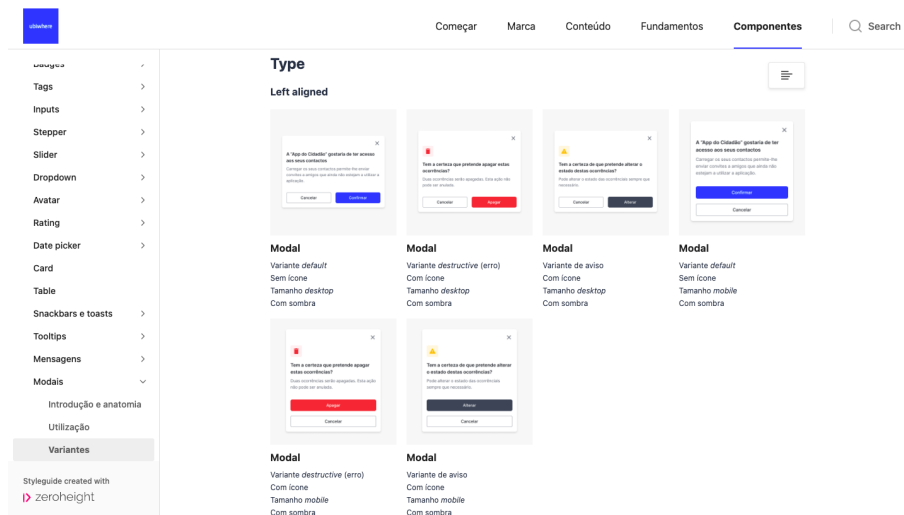


Figure 5.54: Left-aligned modal variants, ZeroHeight

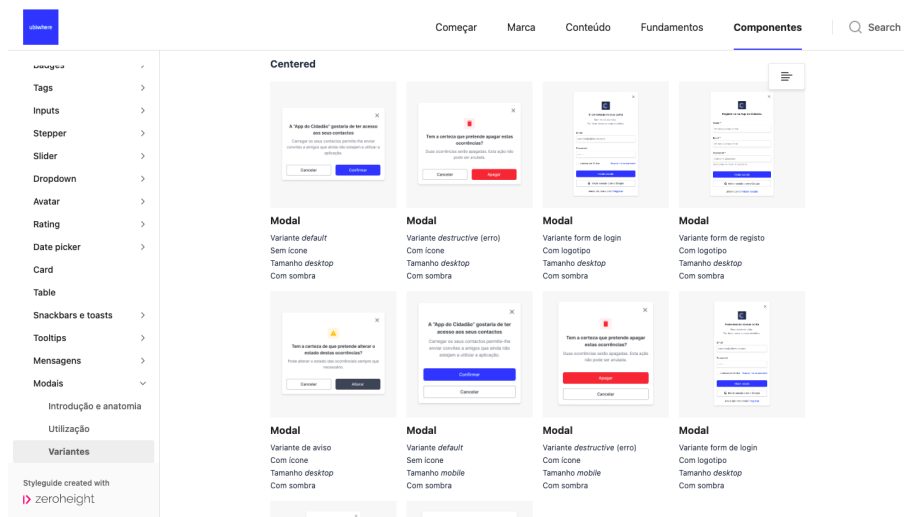


Figure 5.55: Centered modal variants, ZeroHeight

5.4.4 Messages

Documentation for this component can be found at the following link <https://zeroheight.com/9d51779a9/p/43e886-mensagens>.

Introduction and anatomy

Like modals, messages are interface elements that are presented as pop-ups and disable the other content presented on the page. Messages, however, do not require the user to perform an action and can be closed by pressing the close button, or by disappearing from the screen after a while. Messages are used to draw attention and inform users of relevant information.

A message is composed of a title and supportive text. It may contain an icon

related to the message content and a close button. Some messages can also be outlined with a color related to the message type, so that they stand out from the background, if necessary.

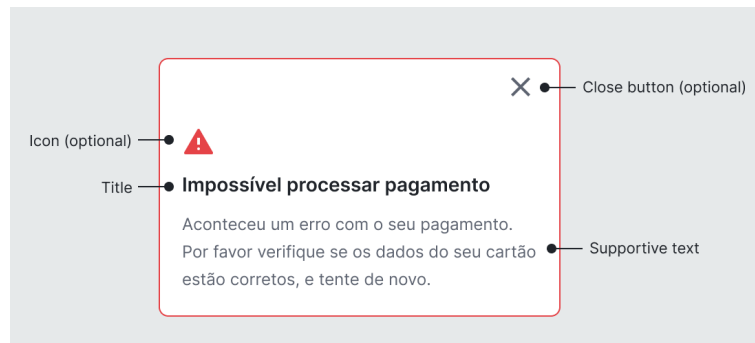


Figure 5.56: Message anatomy

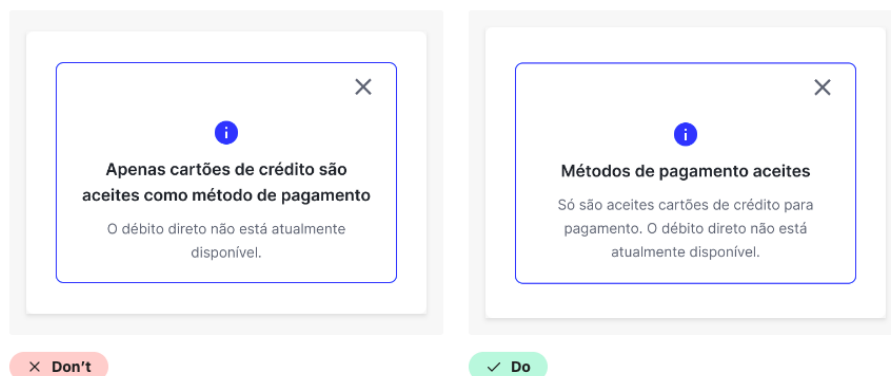
Usage

Regarding behavior, messages inform users about relevant information. They can represent information about actions the user should take, information about the product or service, success, warning or error messages. Messages usually appear as alerts after the user performs an action, unlike modals that appear before.

Messages can disappear after a few seconds or be closed using the button for that purpose.

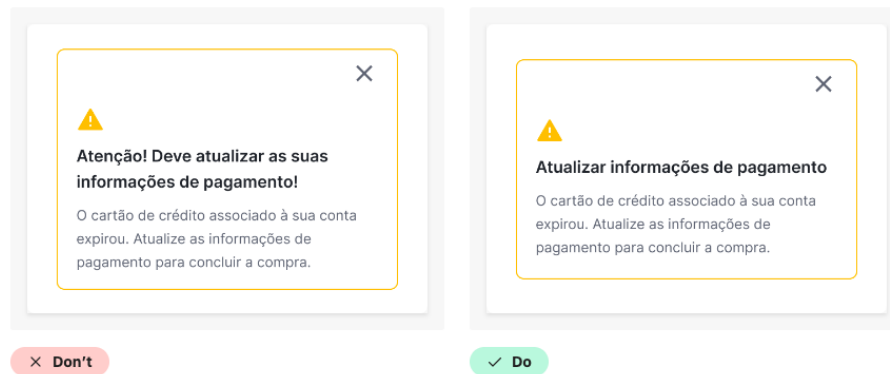
Some best practices for this component include:

- **Use concise and direct titles:** Messages are components that generally remain on the screen for a short period of time, so their titles should be as concise and to the point as possible. The title should give the reason why the message is appearing on the user's screen, while the supporting text should contain additional information.



- **Avoid the use of unnecessary exclamations:** Using exclamations in warning and error messages can give the message an overly aggressive tone and

be misinterpreted by the user. In general, we should avoid using this punctuation mark unless it is justified, for example in a success message to celebrate the completion of a task.



More rules regarding error messages and success messages can be found in the section on content, in the subsection on writing for components.

Variants

The **default variant** corresponds to a neutral tone message, which usually contains no associated icon, and which usually corresponds to useful information that does not fit into any of the other variants.

The **informative variant** corresponds to an informative message and should contain the information icon with the informative color blue.

The **success variant** corresponds to a success message and should contain the success icon (check) with success color green.

The **success variant** corresponds to a success message and should contain the success icon (check) with success color green.

The **warning variant** corresponds to a warning message and should contain the warning icon with warning color yellow.

The **error variant** corresponds to an error message and should contain the error icon and error color red.

The outlined versions of these variants can be used to highlight the background message using the colors for the different message types.

For the creation of the messages, two types of components were developed in the first phase — close action and message body. The combination of these components form the different types of messages.

The **message body** refers to the body of a message, which contains a title and supporting text and may also contain an icon associated with the message.

The **close action** corresponds to the action of closing a message. It may or may not belong to the message, since there are other ways to close these component.

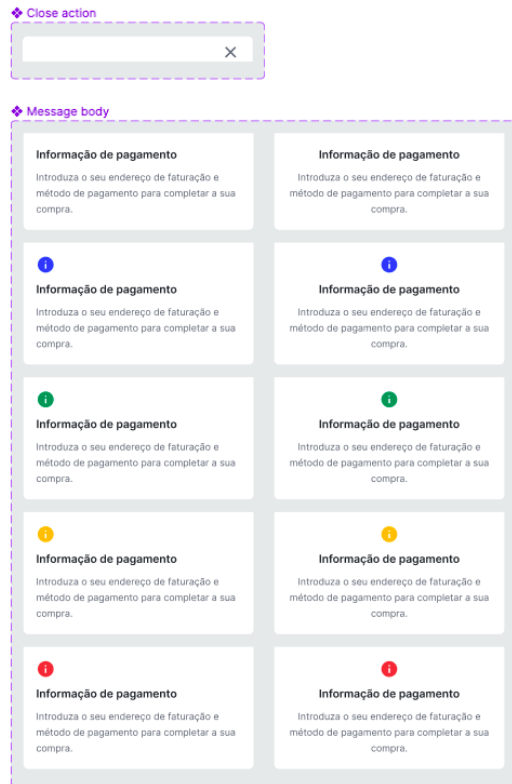


Figure 5.57: Components used to build the messages, Figma

The variants mentioned above have been divided into two different types: left-aligned and centered. For both types of messages, components with and without outline have been developed.

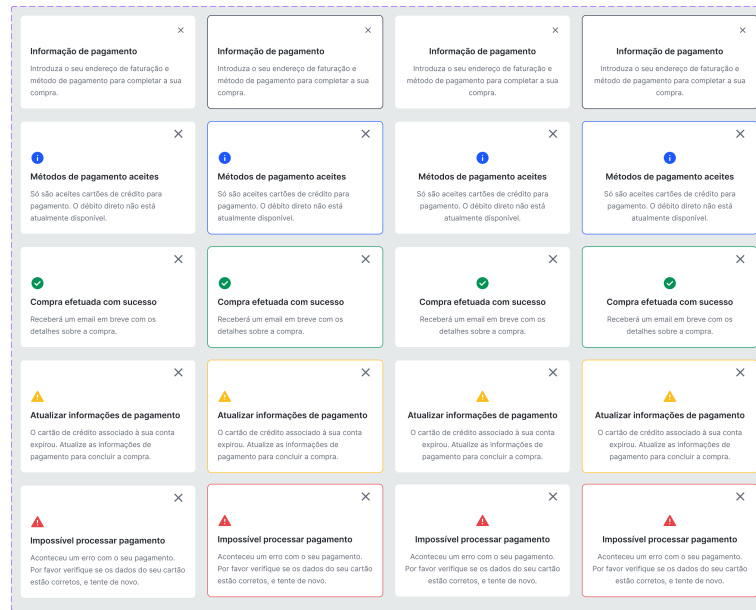


Figure 5.58: Message variants, Figma

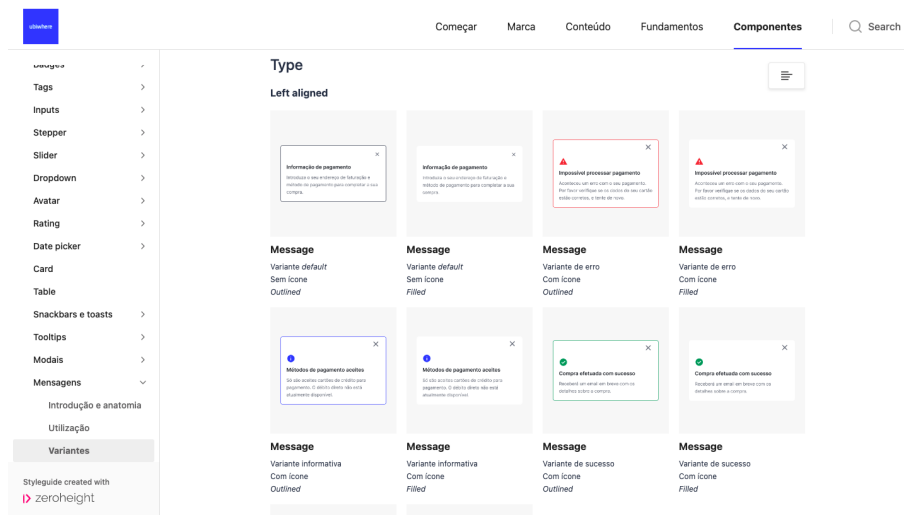


Figure 5.59: Left-aligned message variants, ZeroHeight

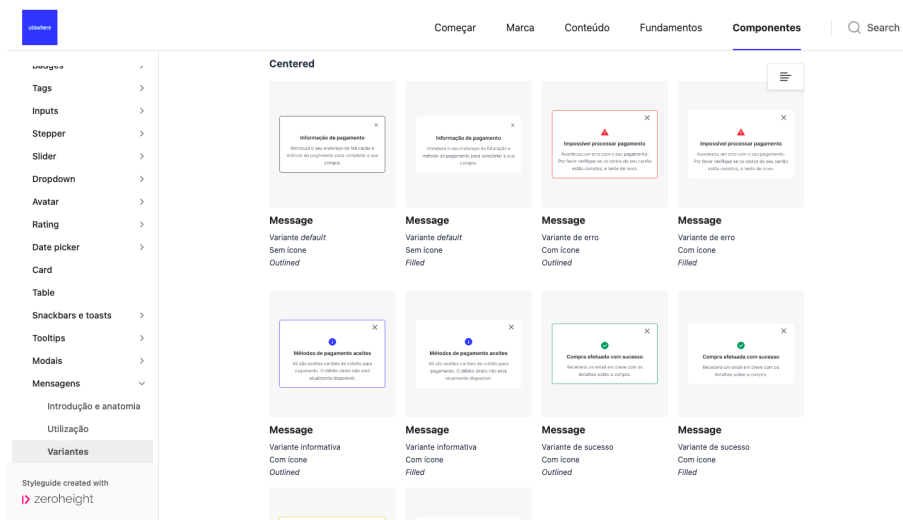


Figure 5.60: Centered message variants, ZeroHeight

5.5 Conclusions

As mentioned several times during the chapter, all the work developed has room to undergo iterations, changes, and improvements until it becomes more complete and ready-to-use material.

The typographic study can be enhanced, in order to survey all the fonts used in various Ubiwhere products and services, analyze whether it makes sense to add more or change existing ones, and define a more comprehensive font stack. Also, issues such as the definitions of concrete line heights and line lengths need further study. Overall, however, I was able to cover important general issues that can help designers and programmers implement best practices when it comes to product development.

Regarding the section on UX writing applied to Ubiwhere, a good foundation has been studied and grounded regarding the principles of UX tone of voice for Ubiwhere, which perhaps needs more practical examples to be illustrated. As far as language and grammar are concerned, a solid foundation has also been created that allows us to overcome some problems that already existed in the interface design, such as punctuation problems or in the way we address users. In general, the sections on writing for components and writing for accessibility could be greatly improved, especially the latter. Further research on this topic could allow for an overall improvement in user experiences with Ubiwhere's products, as well as user acquisition and retention. Finally, the glossary of terms could benefit from a survey of terms used in Ubiwhere's products and services that may be confusing or misunderstood, and including them in this section.

Finally, the development of the components to be included in the design system has been completed, as well as their documentation. These components were developed with responsiveness in mind and based on those already in use at Ubiwhere. However, as products are developed based on these components of the design system it may be necessary to make some changes to the components.

The objectives of the practical work have been met, however there are still topics that could benefit from further research, and more complete documentation. This is the importance of iterating on a design system, in order to cover as much detail as possible, always keeping in mind the user's satisfaction as the main goal.

Chapter 6

Content testing and user flow

This chapter begins by addressing some methods for evaluating UX writing and which ones will be used in the context of the project. After that, the testing of the content guidelines and the expected and obtained results will be presented. Finally, the creation of the user flow based on a management platform of one of Ubiwhere's products is presented, with the use of components and content guidelines created for its design system.

6.1 Methods for evaluating UX writing

6.1.1 Cloze tests

"The word cloze is derived from closure in Gestalt theory — where the brain tries to fill in missing pieces — and applies it to written text" [Colter, 2010]. The Cloze deletion method, which can be described as a "fill in the gap" type of test, is a commonly used test to assess the understanding or evaluate specific words in a text. The method is to blank out every n th word, where n varies depending on context.

"During the test, the users are asked to read the text, silently, and fill in the blank spaces to the best of their ability. In some cases, the method can be used to test the users, as is sometimes the case during second language education. In this case, the words filled in by the users are compared to the pre-existing content, to evaluate specific words the users feel confident about or already have in their vocabulary. The percentage of correctly restored words form a metric to measure success, where 60 percent or above are considered successful" [Nielsen, 2011].

Cloze test example:

If you want to _____ out whether your site _____ understand your content, you _____ test it with them.

Figure 6.1: Cloze test example by T. Falmann, 2018

By analyzing the responses to cloze tests, designers can determine if the language used in the interface is clear and understandable, and make adjustments as needed. Cloze tests can also be used to evaluate the overall usability of the interface and to identify potential areas of confusion or difficulty for users.

6.1.2 Highlighter tests

"The highlighter test consists of users highlighting sections in written content that confirm or does not confirm their perception of the content and the overall product. The users are asked to read a text and highlight, in two different colors, parts of the text that confirms or denies their values. The chosen values are set up in pairs and should be opposites against one another. One task includes the user being asked to highlight everything in the text that makes them trust the service in green, and highlight everything that does not make them trust the service in red. These value pairs can be exchanged, depending on what is relevant and interesting to look for" [Holm, 2019]. By analyzing the highlighted areas, we can determine if the language used in the interface is effectively communicating the most important information, and make adjustments as needed.

Highlighter tests can be used to evaluate the overall findability of the interface, and, similar to cloze tests, identify potential areas of confusion or difficulty for users.

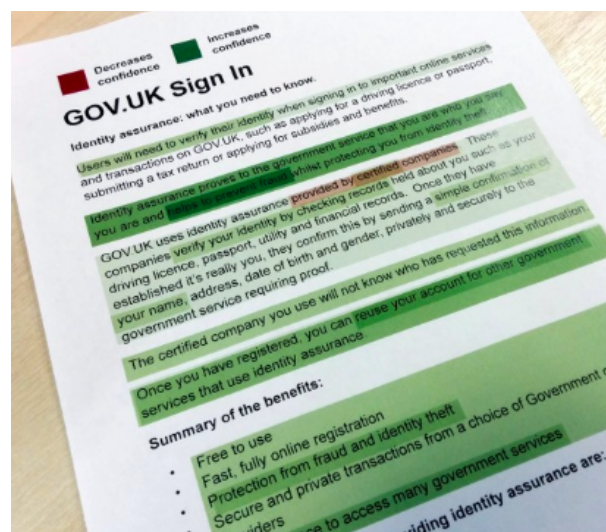


Figure 6.2: Highlighter test example, by P. Gale, 2014

6.1.3 A/B tests

A/B testing is a method of comparing two versions of a user interface (A and B) to determine which one performs better. It is commonly used in the development of UX writing guidelines to evaluate the effectiveness of different language choices, wording, instructions, and labels. In A/B testing, two versions of the interface are created, each with a different language or wording, and then shown to a group of users. The performance of each version is then compared, and the one that performs better is chosen as the final design.

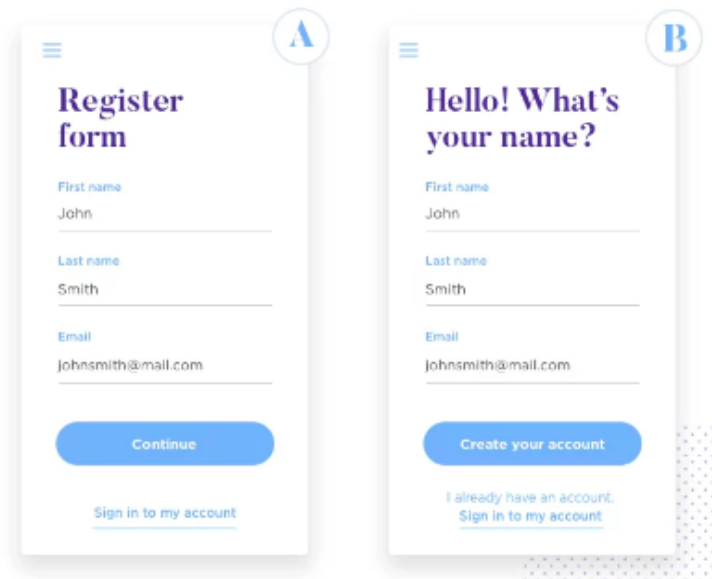


Figure 6.3: A/B test example, by R. Cosra, 2019

6.1.4 Usability tests

Although there are more and more methodologies adapted to the UX Writing area, usability tests (very frequent in the UX area) are still the most used to test content.

Behzod Sirjani, founder of Yet Another Studio and former Head of Research and Analytics Operations at Slack, explains that "Good usability testing takes a holistic look at the potential audience that you can serve and the ranges of intended and unintended uses of a product to understand how you're enabling people to do what they want with your product while preventing misuse" [Kavdia, 2023].

A usability test is a research method used to evaluate the usability and user experience of a product, website, or application. It involves observing users as they interact with the product and collecting qualitative and quantitative data to identify usability problems, areas for improvement, and insights into user behavior. During a usability test, participants are given specific tasks to perform using the product, while researchers or observers closely observe their actions, behaviors, and feedback.

Usability testing is a crucial component of user-centered design because it provides important information about how users interact with a product, their weaknesses, and areas for improvement. "For the UX writer, usability tests are a chance to test the copy they've created for a product flow. With these tests, you receive immediate feedback and understand if the words are doing their job. It's an opportunity to understand what the users' mental model is and it helps UX writers to incorporate not only the users' words and other nuances of language but also their desires, motivations, fears, etc" [Quintino, 2020].

By incorporating user feedback and solving usability problems, organizations can create more user-friendly and successful products.



Figure 6.4: Flow of information in a Usability test, Nielsen Norman Group

6.1.5 Content testing in the scope of the project

While all of these tests are beneficial for validating UX writing guidelines, not all of them are appropriate for the scope of the project. Cloze tests and highlighter tests are used for testing larger blocks of text. Considering that the development of these content guidelines apply to Ubiwhere products and services, which do not usually contain such long texts, it will not make sense to perform these types of tests.

A/B testing, besides being useful for testing content, also allows it to be tested already within the developed components, which is beneficial for the project. In addition, they are very straightforward tests that don't require much time to answer, which can make it easier to get answers.

Usability tests are highly recommended to test the copy already inserted into the design of a high-fidelity interface. They would be suitable tests to test the user

flow created. However, because it takes time to create the user flow, prepare the tests, get users to test, run the tests and analyze the results, it was not used. However, it will be important, to understand if the design system really improves the usability of the platform, to perform these type of tests.

6.2 Content testing

In order to develop tests on content, I decided to use an A/B test to validate some of the content guidelines developed, since it is a quick and direct way to evaluate the content already using the components developed.

The test was performed on the Maze platform. There were a few limitations in conducting these tests because I'm using a free version of the platform, which limits the number of projects to create, the number of questions I can ask, and the number of answers I can get.

The questions and answers to this test can be found at the following link <https://app.maze.co/report/Teste-AB-Anlise-de-contedo/hsw5ilj439d37/intro/embed>.

6.2.1 Defining the participants

Although it would be beneficial to test the content with real customers, I did not have that opportunity, so I chose among the company's employees who could contribute most significantly to achieving results.

The tests were conducted with different company employees, including people from the design team, communication team, project managers, developers, and human resources team.

6.2.2 Defining the test

To perform the content-related test, an A/B test was performed. Due to platform limitations, only four options were tested, consisting of showing two different text variations applied to the same component given a context scenario. After this selection of which one of the options seems more appropriate for a Ubiwhere product — option A, option B, or both seem suitable —, an open-response question is asked to understand the justification and motivation of the participants in choosing the option.

6.2.3 Test

First question

"Imagine you are navigating a Ubiwhere product, and you come across an error message. Which option seems more appropriate to you?"

Option A consists of an error message with the title "Unable to process payment" and auxiliary text "An error has happened with your payment. Please check that your card details are correct, and try again."

Option B consists of an error message titled "Oops! An error occurred and we were unable to process your payment" and ancillary text "To complete the payment, please verify that your card details are correct, and try again."

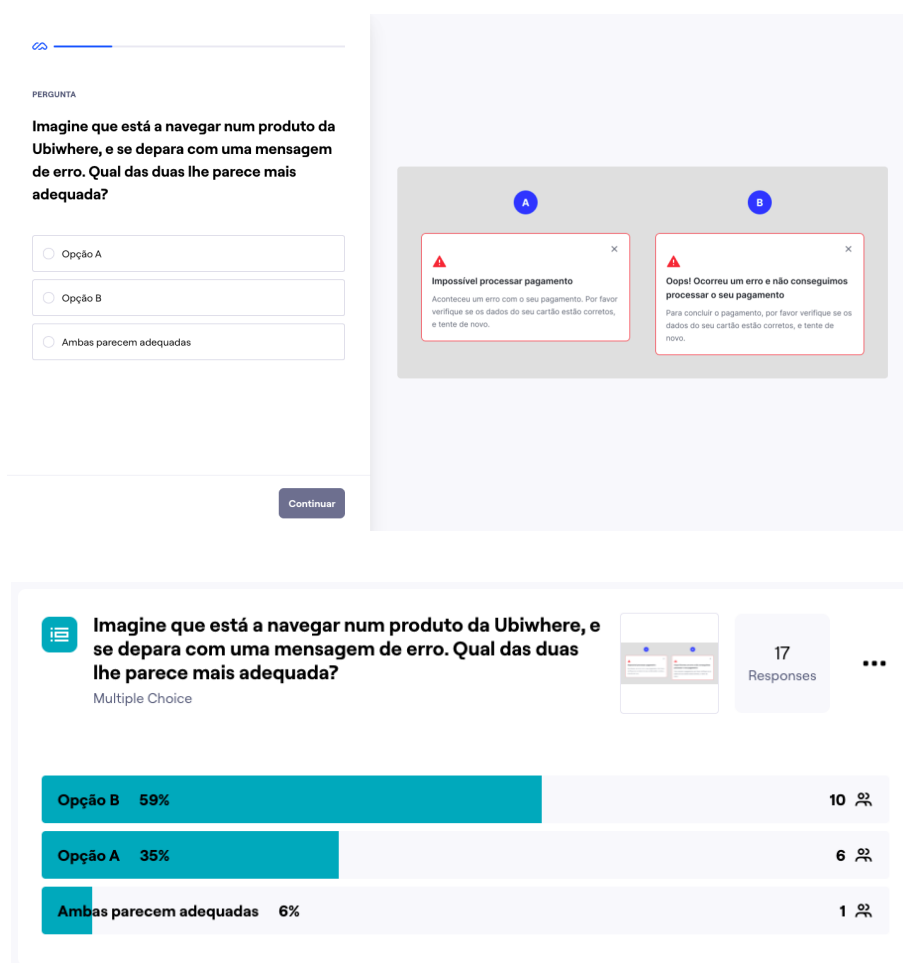


Figure 6.5: First question test results

This question is intended to evaluate the guidelines created regarding the creation of content for error messages, described in the section on content and the sub-section on writing for components.

The principle "We should not apologize unless justified" explains that apologizing for minor errors or when the system is not at fault seems insincere and can distract the user from the really important parts of a message, and that we should use

"sorry" for serious errors: when there is a loss of data or something that requires the user to take an important action to fix the problem.

In version A of the message, we are apologizing for an error that occurred through no fault of our own, but probably through incorrect data entry by the user, and whose consequence is not of high severity. Also, the title includes an unnecessary exclamation mark and is not as concise and direct in conveying the information about why the error message is appearing on the screen as option B.

For these reasons, the expected results would be option A having more votes for content more suitable for a Ubiwhere product.

Second question

"Imagine you are browsing a Ubiwhere product, and you come across a success message after completing a task. Which option seems more appropriate to you?"

Option A consists of a success message with the title "Congratulations! You have successfully completed your purchase!" and auxiliary text "Details about the purchase will be sent to your email shortly."

Option B consists of a success message titled "Successful purchase" and ancillary text "You will receive an email shortly with details about the purchase."

The image shows a survey interface on the left and two success message options, A and B, on the right.

Survey Question:

PERGUNTA

Imagine que está a navegar num produto da Ubiwhere, e se depara com uma mensagem de sucesso, depois de concluir uma tarefa. Qual das duas lhe parece mais adequada?

Options:

- Opção A
- Opção B
- Ambas parecem adequadas

Option A:

Parabéns! Concluiu a sua compra com sucesso!
Os detalhes sobre a compra serão enviados em breve para o seu email.

Option B:

Compra efetuada com sucesso
Receberá um email em breve com os detalhes sobre a compra.

A "Continuar" button is located at the bottom right of the survey form.

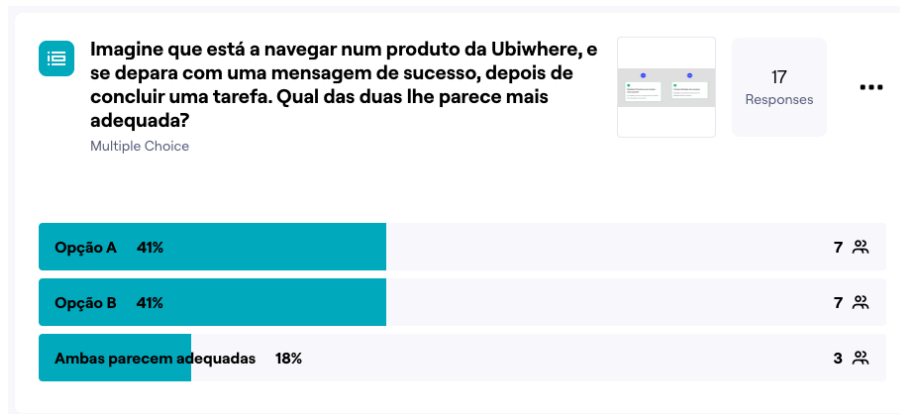


Figure 6.6: Second question test results

This option allows you to evaluate the content guidelines regarding writing for success messages, described in the section on content and the sub-section on writing for components.

According to these guidelines, titles should be informative, clear and concise, and allow the user to understand what is happening just by reading them, which is the case in the two options presented. Other principles about the title mention that it should contain between three and four words, although this depends on the component we are using, so option A has a bit too much text. The use of exclamations to celebrate the completion of a task can be used, so option A may be preferred. As far as the body text is concerned, option B may be better suited by the use of the active voice, as opposed to option A which is in the passive voice.

Both versions could work according to the guidelines presented, and the choice will ultimately land on the preference of the test participants. This is why it would be important to take into account the opinions of real customers and also more participants, to understand which of the two would actually be the preferred one to choose for use in a Ubiwhere product.

Third question

"When logging into a Ubiwhere application, which of the two welcome texts seems more appropriate to you?"

Option A of a modal with a login form with the title "Welcome back to the Citizen App!" and supportive text "We're glad you're here. To log in, please enter your details."

Option B consists of a modal with a login form titled "Log into your account" and supportive text "Welcome back. Please enter your details."

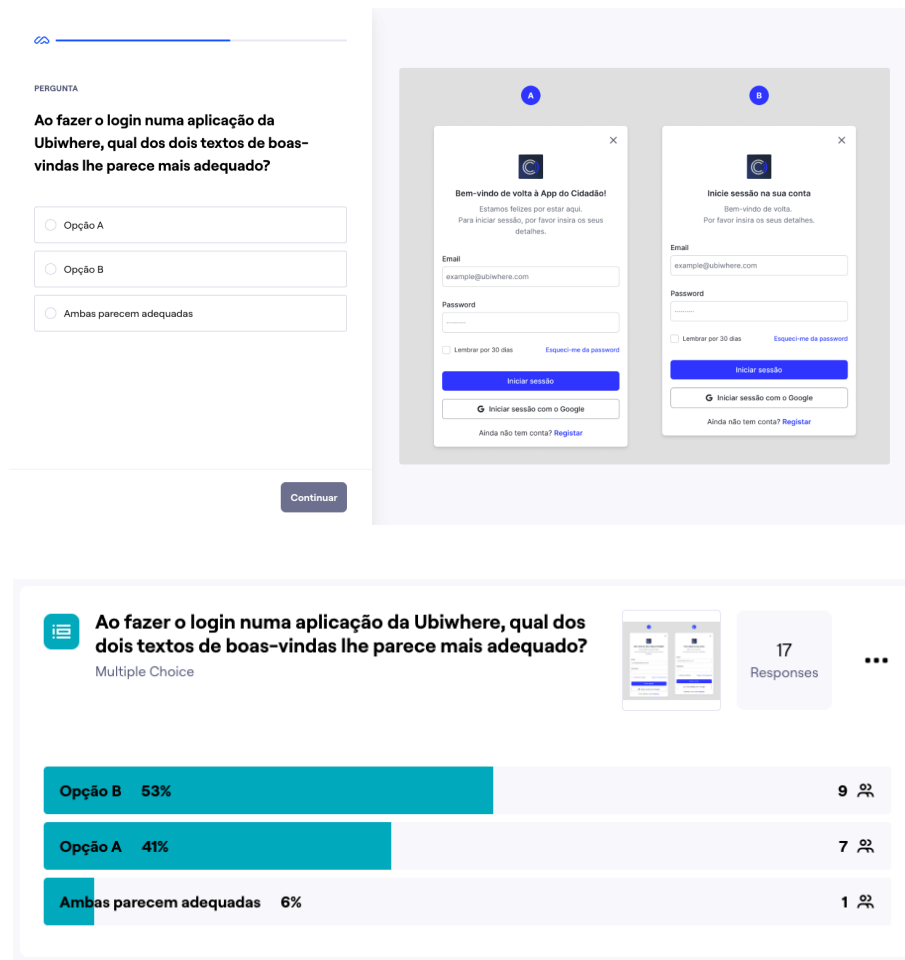


Figure 6.7: Third question test results

This question aims to analyze the way the test participants think we should address our customers.

According to the tone of voice guidelines, there are times when we should be more cordial and other times when we can show a more relaxed tone. Both options are viable, although the second is clearer, more concise and to the point. Option A contains a lot of supportive text, which can cause more visual impact, perhaps unnecessarily. Also, the exclamation is not really necessary and may make the message show too much enthusiasm. The language and grammar guidelines explain that we should use the exclamation point sparingly. Therefore, it was expected that option B would get more votes than option A.

Fourth question

"Imagine you decide to delete data from your account within an application, and the following message appears. Look at the text and its actions. Which option seems most appropriate to you?"

Option A of a disruptive modal with the title "Are you sure you intend to delete these occurrences?", supportive text "Two occurrences will be deleted. This action cannot be undone." and action buttons "Delete" and "Cancel".

Option B of a disruptive modal with the title "Are you sure you want to confirm this action?", supportive text "Attention! Two occurrences will be deleted and this action is irreversible." and action buttons "Confirm" and "Cancel".

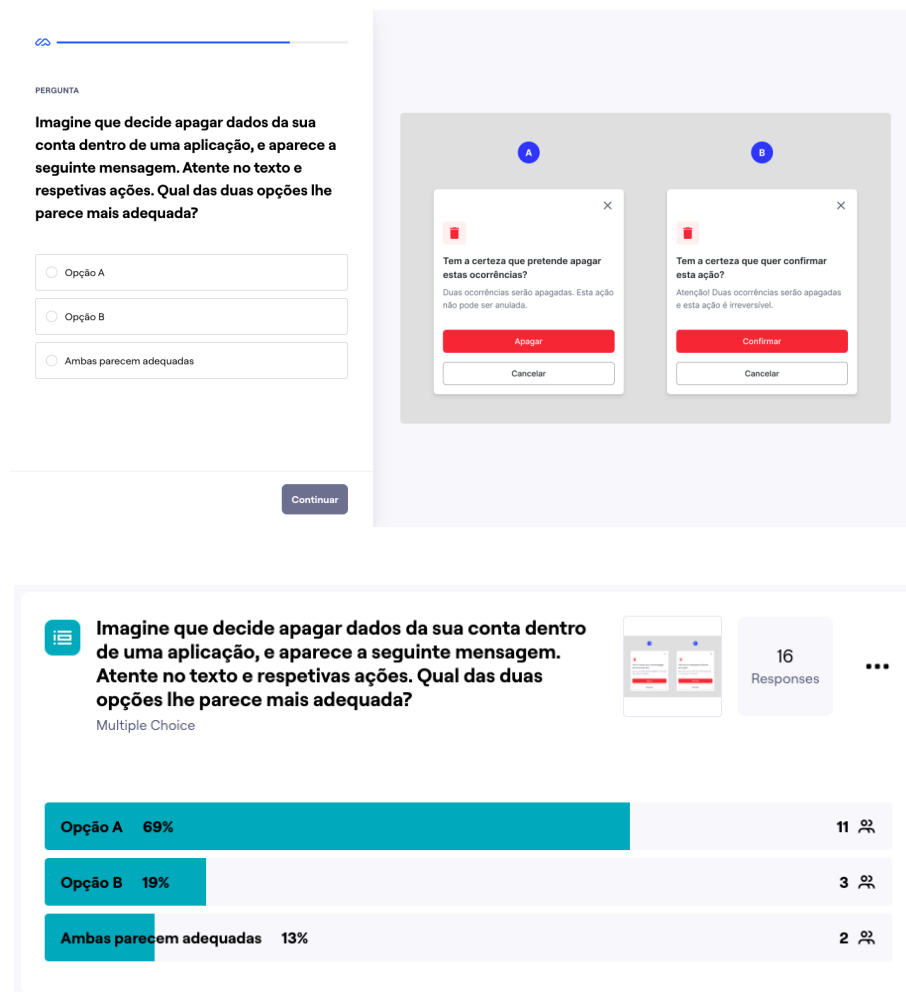


Figure 6.8: Fourth question test results

This question aims to evaluate the good practice guidelines for modal usage.

The good practice guidelines for using modals include "Use clear and straightforward action buttons", avoiding the use of ambiguous terms. Another best practice is to "Use titles that concisely and directly describe the action associated with the message," since the titles and action buttons of modals should be sufficient for the user to understand what action is related to the message and what they can do, with auxiliary text just being a way to add relevant information. The title should be clear, direct and concise.

In option A, through the title, supportive text and respective action buttons we are able to understand in a clear and direct way that the action we are going to take is to delete the occurrences, and what the consequence is. In option B, the title and the action buttons don't talk about the action we're going to take, but only the supportive text, which should serve to add auxiliary information and not for the user to understand what action he's going to take, since he should be able to understand this only by reading the title and through the action buttons.

Furthermore, the interjection "Attention!" in the supportive text adds unnecessary burden to the message, since the error color and icon already suggest the tone of the message. Thus, option A should be the ideal option.

6.2.4 Analysis of test results

It was only possible to collect 17 responses, which allows us to discover the most common problems understood by the participants, and collect accurate results. However, we would need above 30 responses, including responses from real customers, to get an ideal result regarding what works best for a Ubiwhere product. In the future, it is relevant to repeat the tests with end users of a given product and possibly with more options to choose from.

First question

Contrary to expectations, option B ended up getting more votes than option A in this error message.

Some justifications given for voting for option B were: "It seems more personal"; "More tailored communication"; "Option B informs the problem better. And is less "dry""; "Option B states that an error has occurred, so there is a possibility of a fix. In addition, it has a slightly friendlier register"; "Although I think the "Oops" gives an informal tone, the rest of the message has a more formal tone and seemed more appropriate to those who are using the solution and encounter the problem, not being so alarmed by the problem that arose"; "It seems less assertive from the point of view of user failure, it is nicer"; "The interjection creates empathy, that is why I chose option B"; "Option A is not appropriate because of the text "an error occurred". It seems to put the responsibility on the user"; "The communication seems closer to the user".

Some justifications given for voting for option A were: "More concise and less visual pollution"; "The text looks more professional"; "More direct"; "I think the most correct would be a mix of the two answers, the first one is more to the point, but too harsh, "We could not process the payment" (no Oops!) seems to me the most correct option".

Overall, option A was taken as too harsh and unfriendly. It was also mentioned that the message has a tone that seems to blame the user, and this is another principle of good practice for error messages "Do not blame the user, even if the error is their fault." It is then concluded that getting more responses could refine which of the two options would be more suitable, however, perhaps neither would be ideal for a Ubiwhere product, but rather a junction of the wording of the two, taking into consideration the feedback received.

Second question

As stated earlier, both success messages could be adequate according to the content guidelines created for writing success messages. The results obtained reflect just that, as there was a tie in votes between option A or option B, and some responses in "both seem adequate."

The justifications given for "both seem adequate" were: "I think that, whether we are working in B2G or B2B models, we should adapt the formality to the use case. Besides, the client in cities, especially, may have their own language and/or other apps that already speak a certain way. Any of them works, as long as they are adapted to the use case"; "Both are immediate"; "I don't see much difference between them, I think they both communicate in the right way".

Some justifications given for voting for option A were: "It seems more like a message written by a person, and not so much by a "robot""; "It's more personal"; "More relational communication"; "It has a more appropriate and lighter register"; "The fact that it has the word "Congratulations" that captivates the reader's attention"; "Since it's not an error message, I don't mind reading a bit more (and the praise for the user is always a positive response)".

Some justifications given for voting for option B were: "More concise and less visual pollution"; "More to the point and brief"; "More concise and direct".

We can conclude that the choices end up reflecting a little bit the personal taste of each participant. Testing with real users would be really beneficial to understand which of the two messages they think would be more suitable for Ubiwhere's communication.

Third question

As expected, although the difference in votes is not significant, option B turned out to be the favorite among the participants.

Some justifications for choosing option B were: "Less is more"; "More professional text"; "Shorter, less text on the screen. Less appealing to emotions"; "Option A this time seems a bit over the top. Too much emotion!"; "Although option B has the masculine gender and a formal tone, option A is too informal and "happy" (if you can say something like that)"; "Option A seems like it's too forced the "we are happy", I think it's good to create proximity with the user but moderated".

Some justifications for choosing option A were: "It has a more personal feel"; "Friendly register. It presents a more interactive and "human" form of communication"; "Option A seems closer to human and further from the machine".

Overall, although proximity to the user is important, message A conveyed too much enthusiasm and seemed overdone in the way it communicates. Option B turns out to be more precise, professional and adequate to Ubiwhere's communication, although it should be changed due to problems mentioned, namely inclusiveness.

Fourth question

As expected, option A got the most votes and was given as the most appropriate in terms of content and action buttons presented.

Some justifications for choosing option A were: "More direct to the actual action without confusing the user"; "Using the "Delete" option, it is clearer that we are confirming that we want to delete"; "Delete in the red box, instead of confirming (confirming negative actions is sometimes confusing), has "Delete occurrences" in bold, being more explicit"; "Clearer message. Delete button better informs the action that will be performed"; "Displays the main message of the warning in the title. Knowing that it is an action with irreversible repercussions, it is convenient to highlight the information"; "Although more redundant, it has the action well explained and its impact is also clear"; "Option A alerts more to the "Delete" action and makes more aware of what is about to happen"; "More direct".

Justifications for choosing option B were "Easier to implement and clearer text for the user. The word irreversible is stronger"; "Simpler and less confusing message"; "Message with more explicit meaning".

We can conclude that option A having more votes, as well as the justifications for these votes, are in line with what was expected for the answers to this question.

6.2.5 Test conclusions

Overall, the test results corresponded with the expectations for the answers given. Through the analysis of some justifications, we can also conclude that there could be a reevaluation or joining of writing options, in order to be able to find solutions even more adequate than those presented.

Finally, as mentioned before, having a larger sample and representation of end customers as participants would give another relevance to the tests and more flaws could be highlighted, so that they could be corrected and more suitable to the communication of Ubiwhere in their products. These tests can be important to perform in the development of new products, seeking answers from the target audience of these products, in order to refine the communication and, consequently, the content guidelines and components created for the design system.

6.3 User flow

To apply the work done, namely the content guidelines and the components developed for Ubiwhere's design system, in the design of an interface, a user flow was developed based on a Ubiwhere product management platform. This platform was chosen because it is used by real customers and there are often complaints about its usability.

6.3.1 SmartPAYT Admin platform

SmartPAYT

SmartPAYT is a Ubiwhere solution that digitizes waste management operations, with web support. Based on intelligent equipment, this solution allows controlled access to waste containers to digitize the amount of waste produced. Through radio-frequency identification devices (RFID), it allows the management of access to containers with one of two objectives: encouraging citizens to reduce the amount of waste produced with the PAYT (Pay-As-You-Throw) charging system or rewarding citizens for separating their waste with the RAYT (Receive-As-You-Throw) incentive system. The web platform is responsible for managing the devices that perform access control, data visualization, and reporting.

Administration Portal

This system is used by users in charge of tasks such as validating end users of the system (citizens) and providing support to these users, managing containers, managing events, and monitoring the alarm system. Thus, the main functionalities available are the creation/editing of containers and system users, as well as the monitoring of events, among others.

Being an area of restricted access to administrators, the Administration Portal allows the configuration of different access levels for each user. In this way, it is possible to restrict the data that is shown to different users according to their roles in the organization, being able to view, for example, only data related to containers located in a more restricted geographical area, or to see only certain metrics such as the number of collections, but not the number of deposits or information related to customers.

6.3.2 Choosing the flow

The choice of screens on this platform to be redesigned by applying the content guidelines and components created for the Ubiwhere design system were the login screen, the initial dashboard of the administration portal, the containers page within waste management, and the add new container page.

The choice of these screens is not only because it is a user flow that makes sense, but also because it allows the use of various UX writing components and guidelines. These components include toasts, modals, tooltips, tables, input fields, among others. Several problems were also detected with these pages, which are described below.

6.3.3 Problems identified

In order to identify some existing problems with the platform, feedback was gathered from a Ubiwhere project manager who works with both the platform and the customers that use it, in order to understand what were the problems mostly identified in the use of the platform. In addition, some employees of the design team helped to understand what could be improved in the platform, in order to improve its usability.

Login screen

The form presented on the login page does not present options such as the user forgetting their password, wanting to sign in using Google or other third-party providers, or registering if they don't have an account yet, for example. These features are important because they offer more flexibility to users, making the login process more convenient, secure, and accessible.

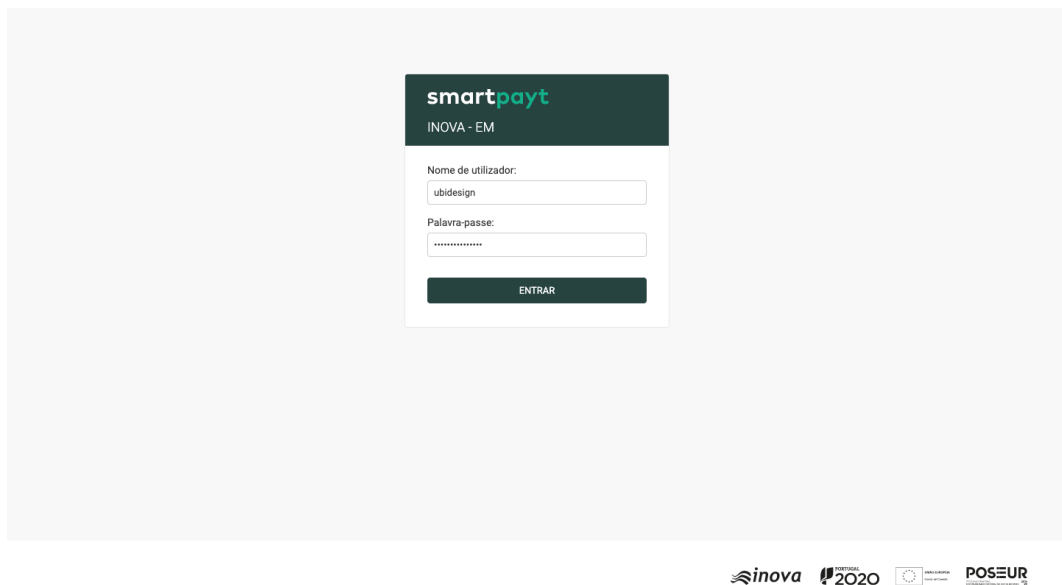


Figure 6.9: Login screen, SmartPAYT Admin Portal

Initial dashboard

The biggest problems identified on this screen were problems related to typographical hierarchy, the lack of a scroll bar on the page indicating to the user that scrolling will lead to finding more information, the overall design of the menu in the top bar, and the unclear table of recent actions performed by the user.

All these elements contribute to a lack of clarity for the user, and the functionalities of the page are not presented in a simple and direct way.

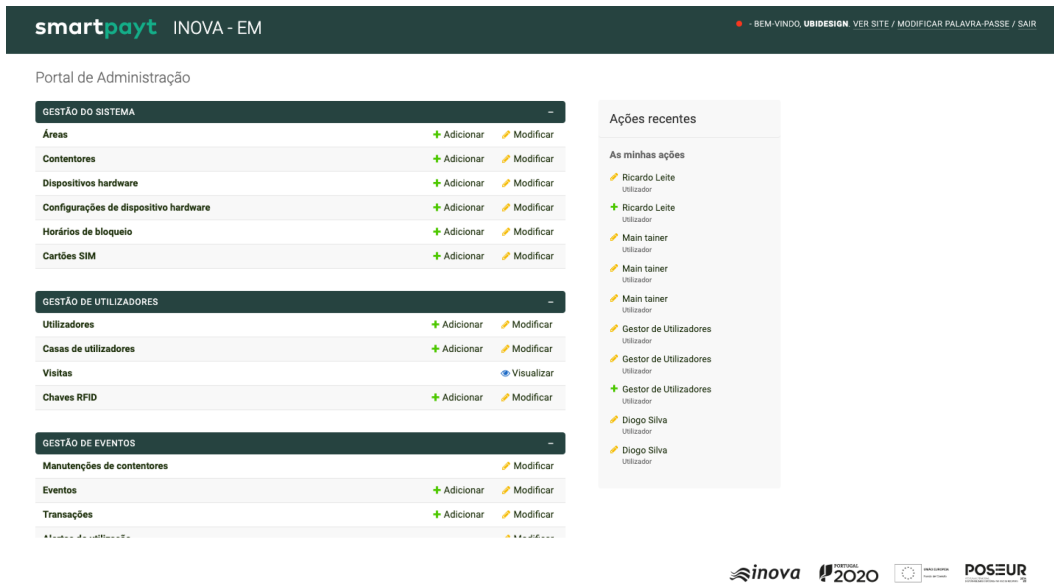


Figure 6.10: Initial dashboard, SmartPAYT Admin Portal

Containers

The biggest problems encountered with this page were that the page title did not match the page indicated in the breadcrumb, the presentation of the filters relative to the table, and the organization and content of the action buttons. Again, there are also no scrollbars indicating that the table has more elements both vertically and horizontally. In addition, the pagination of the table is unclear regarding elements per page and how many pages there are, and there is no option for the user to advance to the next page without scrolling to the bottom of the table.

Again, these issues contribute to problems in the user experience, and the actions presented are unclear and unintuitive.

The screenshot shows the 'smartpayt INOVA - EM' admin portal. The header includes the logo and navigation links: '- BEM-VINDO, UBIDESIGN. VER SITE / MODIFICAR PALAVRA-PASSE / SAIR'. The breadcrumb trail is 'Início > Gestão de resíduos > Contentores'. The main heading is 'Selecione Contentor para modificar'. There are buttons for 'IMPORTAR', 'EXPORTAR', and 'ADICIONAR CONTENTOR +'. Below the heading is a search bar and a selection count '0 de 100 selecionados'. A table lists 34 containers with columns for ID, UUID, DISPOSITIVO HARDWARE, NÚMERO DE PORTA DE GRUPO, NOME, and ÁREA. A sidebar on the right contains a 'FILTRO' section with three filters: 'Por Tipo', 'Por Estado de instalação', and 'Por nome do contentor'. The footer features logos for 'inova', 'PORTAL 2020', and 'POSEUR'.

ID	UUID	DISPOSITIVO HARDWARE	NÚMERO DE PORTA DE GRUPO	NOME	ÁREA
1	001/21	Dispositivo hardware - device1	1	Contentor 1	Área #1
2	002/21	Dispositivo hardware - device2	1	Contentor 2	Área #1
5	005/21	Dispositivo hardware - device5	1	Contentor 5	Área #1
6	006/21	Dispositivo hardware - device6	1	Contentor 6	Área #1
8	008/21	Dispositivo hardware - device8	1	Contentor 8	Área #1
9	009/21	Dispositivo hardware - device9	1	Contentor 9	Área #1
13	013/21	Dispositivo hardware - device13	1	Contentor 13	Área #1
16	016/21	Dispositivo hardware - device16	1	Contentor 16	Área #1
21	021/21	Dispositivo hardware - device21	1	Contentor 21	Área #1
24	024/21	Dispositivo hardware - device24	1	Contentor 24	Área #1
25	025/21	Dispositivo hardware - device25	1	Contentor 25	Área #1
28	028/21	Dispositivo hardware - device28	1	Contentor 28	Área #1
32	032/21	Dispositivo hardware - device32	1	Contentor 32	Área #1
34	034/21	Dispositivo hardware - device34	1	Contentor 34	Área #1

Figure 6.11: Waste management > Containers, SmartPAYT Admin Portal

Add container

The structure of this page does not present the best organization, there are hierarchical problems and unnecessary text. In addition, there are required fields that are not mentioned until the user tries to proceed without filling them in.

smartpayt
- BEM-VINDO, UBIDESIGN VER SITE / MODIFICAR PALAVRA-PASSE / SAIR

Início > Gestão de resíduos > Contentores > Adicionar Contentor

» Adicionar Contentor

Organização

Número de porta de grupo:
Porta que é usada para identificação entre contentores associados a um mesmo dispositivo hardware

Identificação

UUID:
ID único que identifica o contentor

Nome:
Nome que identifica o contentor


Dispositivo hardware: + x ↻
Dispositivo hardware associado ao contentor

Localização

Área: + x ↻
Área onde o contentor pertence

Localização esperada: Editar coordenadas Usar a minha localização atual Escolher um ponto no mapa ✖

Raio de tolerância de alarmística: 1000 m



Instruções do mapa

Localização esperada:
Arraste o marcador verde para definir a localização esperada.
O círculo em redor do marcador verde representa o raio aceitável dentro do qual a localização real deve estar.
Se a localização real estiver fora desse raio, um alarme do sistema será acionado.

Localização real:
O marcador vermelho exibe a localização real de um contentor fornecida pelo GPS do dispositivo de hardware associado.
Não pode ser arrastado e representa a localização real.

Medição de distância:
Uma linha é exibida entre os marcadores verde e vermelho, indicando a distância entre eles.
Ajuda a entender a proximidade entre a localização esperada e a localização real.

Informação adicional:
O raio aceitável para a localização esperada é baseado na configuração de raio.
Certifique-se de que o marcador de localização esperada está colocado corretamente para monitorização adequada.
Qualquer desvio além do raio aceitável pode desencadear um alerta de sistema.

Configuração do contentor

Capacidade:
Capacidade do contentor

Tipo:
Tipo de resíduo do contentor

Nível de enchimento (%):
Nível atual de enchimento do contentor

Estado de instalação:
Estado de instalação

Gravar e adicionar outro
Gravar e continuar a editar
GRAVAR

Figure 6.12: Add container, SmartPAYT Admin Portal

smartpayt INOVA - EM

- BEM-VINDO, UBIDESIGN. VER SITE / MODIFICAR PALAVRA-PASSE / SAIR

Início > Gestão de resíduos > Contenedores > Adicionar Contendor

» Adicionar Contendor

Por favor corrija os erros abaixo.

Organização

Número de porta de grupo:

Porta que é usada para identificação entre contenedores associados a um mesmo dispositivo hardware

Identificação

Este campo é obrigatório.

UUID:

ID Único que identifica o contendor

Nome:

Nome que identifica o contendor

Dispositivo hardware:

Dispositivo hardware associado ao contendor

Localização

Área:

Área onde o contendor pertence

inova PORTAL 2020 POSEUR

Figure 6.13: Add container required fields error, SmartPAYT Admin Portal

In general, all these screens focus only on functionality, with little attention to what the user experience is. Since this is a management platform where important tasks have to be performed for the good management of the SmartPAYT platform, changes should be made in order to improve its usability, and where the components and content guidelines developed for Ubiwhere's design system can contribute to this goal.

6.3.4 User flow

In order to fill the usability gaps presented above, a user flow was created using the components and content guidelines developed throughout the project. This user flow can be seen at the following link <https://www.figma.com/proto/Qu9wF00BzzjIyKA15vjKhv/Carlota-%E2%80%94User-flow%2C-Portal-Admin-SmartPAYT?type=design&node-id=1-20980&t=Ay4oiICc4zKgJBUA-1&scaling=min-zoom&page-id=0%3A1&starting-point-node-id=1%3A19285&mode=design>.

This user flow presents some functionalities of the platform already redesigned, as well as the application of several components developed for the design system, including tooltips, snackbars, and modals, and it aims to address the issues presented above. Although there was no possibility to perform usability tests on the user flow to validate it, it can be considered as important future work, in order to understand if the use of the design system components and the application of the content guidelines really improve the user experience.

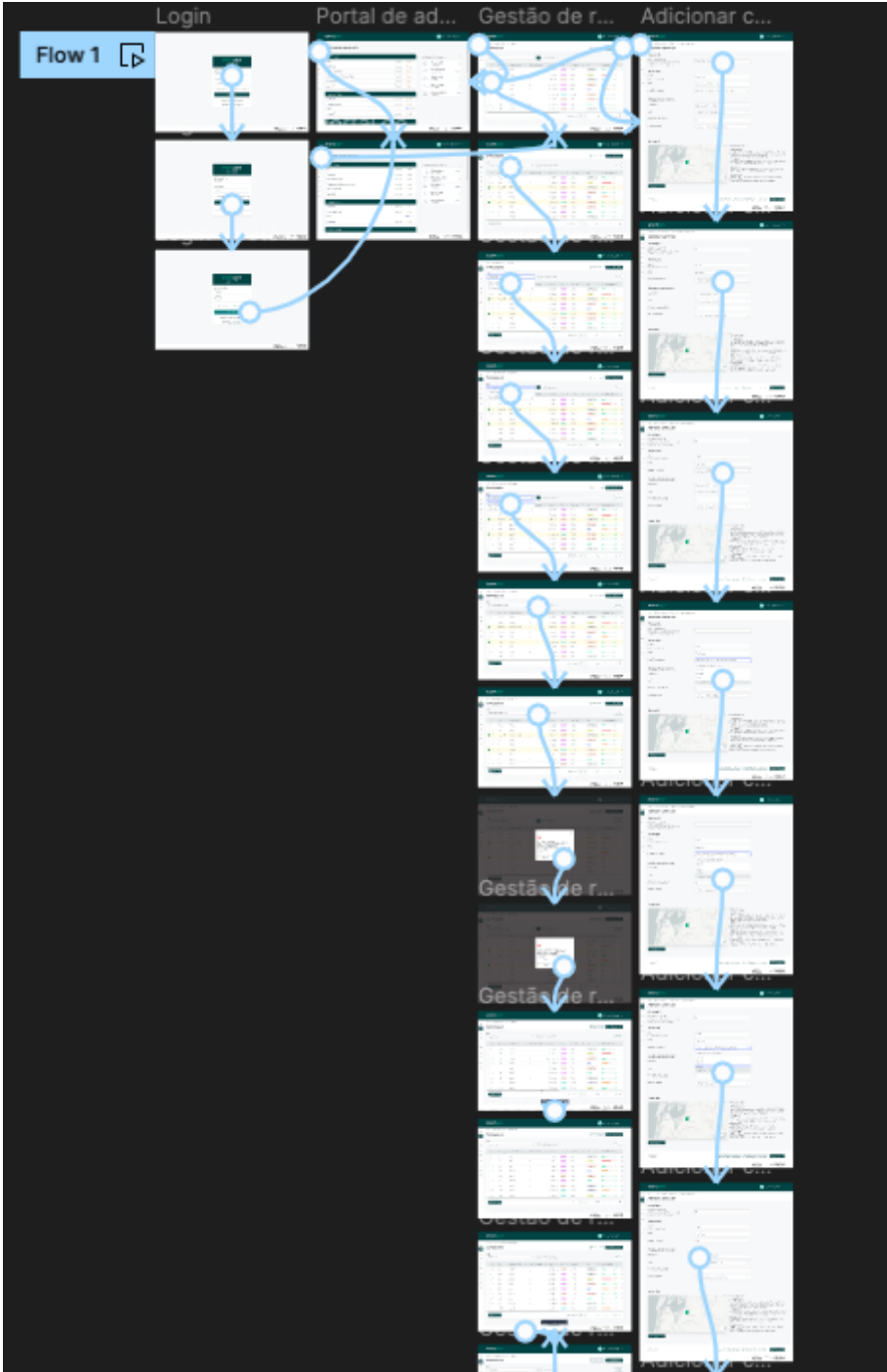


Figure 6.14: User flow, Figma

6.4 Conclusions

Through the analysis of the content tests, it was possible to conclude that, in general, the content guidelines are adequate. However, a larger sample of test participants, more tests with different options, and the participation of real customers in the tests could improve the results and make us realize where the biggest weaknesses are and what should be changed or improved.

The components created for the design system, as well as the content guidelines, seem to work well and be suitable for high-fidelity prototyping. However, it is important that usability tests are conducted in the future to understand if the work done actually improves the quality of the user experience.

Testing the use of the components and UX writing guidelines in the design system is relevant to ensure the effectiveness, usability and consistency of the components and written content of the system. Testing can help validate functionality, assess usability, identify and resolve issues, gather user feedback, improve the user experience, and maintain consistency in design and messaging. While it was not possible to perform as much testing as necessary for this validation, it should be something to consider for future work.

Chapter 7

Conclusions and future work

As mentioned earlier, a design system is an iterative process. Even once completed, it is necessary to constantly re-evaluate the needs of the company, the different types of customers, and the suitability of the design system for the design process. Although the sections proposed in the context of this thesis are completed, this is its first version that has room for several future improvements and should be adapted over time.

The work developed consists of the basis for using typography and developing content directed to Ubiwhere's target audience. The developed components and their documentation are ready to be used in the design of new interfaces but may have to undergo some changes over time. It is important to have product development based on this work, as well as usability testing, in order to find weaknesses, what can be improved, or what is missing. Certainly, over time there will be various weaknesses and changes to be made to what has been developed, so that the design system is iterated upon and improved.

In order for the guidelines to become more consolidated, more tests should be performed on the content, as well as usability tests on the developed user flow and on new products based in these guidelines, so that we can understand if the use of the design system components, as well as the application of the content guidelines, effectively improves the quality of the user experience.

It is possible to conclude that the objectives established for the project were met, and I was able to create a solid base for some improvement regarding product development within Ubiwhere. During this time, I was able to apply concepts that I learned during my degree and also acquire new knowledge throughout the process of creating this dissertation. These have helped me create a project that will certainly help Ubiwhere's employees by allowing them to communicate more effectively and maintain a higher level of quality and consistency in their design deliverables.

In terms of personal reflection, I think there were two major difficulties in the development of the project. On the one hand, since the project was part of another larger project divided between myself and another intern from the company, there is always a dependency on the work of another person that can delay

or hinder the execution of some tasks. On the other hand, the fact that my part of the project was reworked at the beginning of the second semester, the amount of tasks and research to be done, as well as the restructuring and writing of the thesis document, made it complicated to focus on completing the different objectives with great attention to quality and detail.

However, in general, my experience was positive and I am happy with what I was able to accomplish, as well as with the knowledge I acquired, since from my point of view it will be useful for my future in the working environment. Although I would not like to focus solely on UX writing, I would like to work in the area of UI/UX writing, which addresses several of the areas that were part of the research and development of the project, and into which UX writing and component development can also be integrated.

References

- Oct 2006. URL <https://ia.net/topics/the-web-is-all-about-typography-period>.
- May 2014. URL <https://www.usability.gov/what-and-why/user-interface-design.html>.
- Chadia Abras, Diane Maloney-Krichmar, and Jenny Preece. User-centered design, Jun 2014. URL https://www.academia.edu/1012299/User_centered_design.
- Ernest Alilovic. Accessibility in ux writing, Nov 2022. URL <https://uxwritinghub.com/accessibility-in-ux-writing/>.
- Atlassian. Writing guidelines - empty state - content, 2023a. URL <https://atlassian.design/content/writing-guidelines/empty-state/>.
- Atlassian. Writing guidelines - success message - content, 2023b. URL <https://atlassian.design/content/writing-guidelines/writing-a-success-message>.
- Atlassian. Inclusive language - content, 2023c. URL <https://atlassian.design/content/inclusive-writing/>.
- Diana Bobo. Typography: A basic guide to its use in digital design, Apr 2022. URL <https://www.plainconcepts.com/typography-guide/>.
- Graham Bunt. The who, what, and why of ux design, Nov 2019. URL <https://uxdesign.cc/the-who-what-and-why-of-ux-design-fe95b406cbbc>.
- Matthew Butterick. Line spacing: Butterick’s practical typography. URL <https://practicaltypography.com/line-spacing.html>.
- Angela Colter. Testing content, Dec 2010. URL <https://alistapart.com/article/testing-content/>.
- Kevin Dabrowski. Ux writing – why you should define your product’s tone of voice (and how), Sep 2021. URL <https://www.pgs-soft.com/blog/ux-writing-tone-of-voice/>.
- Tongrang Fan and Yanzhao Chen. A scheme of data management in the internet of things. pages 110 – 114, 10 2010. doi: 10.1109/ICNIDC.2010.5657908.

- Therese Fessenden. Design systems 101, Apr 2021. URL <https://www.nngroup.com/articles/design-systems-101/>.
- Google Fonts. Inter. URL <https://fonts.google.com/specimen/Inter/about>.
- Susan Gasson. Human-centered vs. user-centered approaches to information system design. *Journal of Information Technology Theory and Application (JITTA)*, 5: 29–46, 01 2003.
- Sarah Gibbons. Ux vs. service design, Aug 2021. URL <https://www.nngroup.com/articles/ux-vs-service-design/>.
- John C. Goodpasture. *An Introduction to the Book*, page 3. J. Ross Publishing, 2 edition, 2016.
- Google, 2023. URL <https://m3.material.io/>.
- R. Hall, B. Bowerman, Joseph Braverman, J. Taylor, Helen Todosow, and U. Wimmersperg. The vision of a smart city. *2nd Int. Life .*, page 1, Jan 2000.
- Linnea Holm. Improving task performance in user experience writing : a validation of two methods in digital and in-person user contexts. 2019.
- Yinghui Huang and Guanyu Li. A semantic analysis for internet of things. In *2010 International Conference on Intelligent Computation Technology and Automation*, volume 1, pages 336–339, 2010a. doi: 10.1109/ICICTA.2010.73.
- Yinghui Huang and Guanyu Li. Descriptive models for internet of things. pages 483 – 486, 09 2010b. doi: 10.1109/ICICIP.2010.5564232.
- UX Design Institute. 7 fundamental ux design principles all designers should know, Jun 2022. URL <https://www.uxdesigninstitute.com/blog/ux-design-principles/>.
- Anita Jacob-Puchalska. Emotional design: How to improve products with emotions, Apr 2023. URL <https://uxdesign.cc/emotional-design-how-to-improve-products-with-emotions-1bbdc879ddfb>.
- Alita Joyce. Tooltip guidelines, Jan 2019. URL <https://www.nngroup.com/articles/tooltip-guidelines/>.
- Alita Joyce. Mobile-app onboarding: An analysis of components and techniques, Jun 2020. URL <https://www.nngroup.com/articles/mobile-app-onboarding/>.
- Priya Kavdia. What is usability testing with use cases?: Yellow slice - ui/ux design studio in india, Mar 2023. URL <https://www.yellowslice.in/bed/what-is-usability-testing/>.
- Ellen Lupton. *Web Hierarchy*, page 99. Princeton Architectural Press, first edition, 2004a.
- Ellen Lupton. *Web Accessibility*, page 100. Princeton Architectural Press, first edition, 2004b.

- Birgit Mager. Service design as an emerging field. *Miettinen amp; Koivisto (Eds.): Designing Services with Innovative Methods*, page 28–42, 2009.
- Mailchimp, 2022. URL <https://styleguide.mailchimp.com/>.
- Google Material Design. Tooltips - components, a. URL <https://m1.material.io/components/tooltips.html#tooltips-usage>.
- Google Material Design. Snackbars amp; toasts - components, b. URL <https://m1.material.io/components/snackbars-toasts.html>.
- Saadia Minhas. Best practices for designing empty state in applications, Jan 2023. URL <https://uxplanet.org/best-practices-for-designing-empty-state-in-applications-3dbdfb91093c>.
- Kate Moran. The four dimensions of tone of voice, Jul 2016. URL <https://www.nngroup.com/articles/tone-of-voice-dimensions/>.
- Stefan Moritz. 2005. URL https://issuu.com/st_moritz/docs/pa2servicedesign.
- Lindsay Munro. Ux writing guidelines amp; best practices: Adobe xd ideas, Jan 2020. URL <https://xd.adobe.com/ideas/process/information-architecture/ux-writing-guidelines/>.
- Jacob Nielsen. F-shaped pattern for reading web content (original eyetracking research), Apr 2006. URL <https://www.nngroup.com/articles/f-shaped-pattern-reading-web-content-discovered/>.
- Jacob Nielsen. Cloze test for reading comprehension, Feb 2011. URL <https://www.nngroup.com/articles/cloze-test-reading-comprehension/>.
- Jakob Nielsen. How little do users read?, May 2008. URL <https://www.nngroup.com/articles/how-little-do-users-read/>.
- Jakob Nielsen. Legibility, readability, and comprehension: Making users read your words, Nov 2015. URL <https://www.nngroup.com/articles/legibility-readability-comprehension/>.
- D. Norman. *The Design of Everyday Things: Revised and Expanded Edition*. Basic Books, 2013. ISBN 9780465050659. URL <https://books.google.pt/books?id=qBfRDQAAQBAJ>.
- D.A. Norman. *The Invisible Computer: Why Good Products Can Fail, the Personal Computer is So Complex, and Information Appliances are the Solution*. Mit Press. MIT Press, 1999. ISBN 9780262640411. URL <https://books.google.pt/books?id=DVHZX56MuasC>.
- Don Norman and Jakob Nielsen. The definition of user experience (ux). URL <https://www.nngroup.com/articles/definition-user-experience/>.
- Lukas Oppermann. 11 benefits of design systems for designers, developers, product owners, and teams, Dec 2022. URL <https://builtin.com/design-ux/11-benefits-design-systems>.

Torrey Podmajersky. *Imagine and Test Solutions*, page 318. O'Reilly Media, 2019a.

Torrey Podmajersky. *Imagine and Test Solutions*, page 170. O'Reilly Media, 2019b.

Torrey Podmajersky. *Imagine and Test Solutions*, page 114. O'Reilly Media, 2019c.

Pedro Quintino. *Ux writing foundations*, 2020.

Ben Shneiderman, Catherine Plaisant, Maxine Cohen, Steven M. Jacobs, and Niklas Elmqvist. *Designing the user interface: Strategies for effective human-computer interaction*. Pearson, sixth edition, 2018.

Adobe Spectrum. Spectrum, adobe's design system, 2022a. URL <https://spectrum.adobe.com/page/inclusive-ux-writing/>.

Adobe Spectrum. Spectrum, adobe's design system, 2022b. URL <https://spectrum.adobe.com/page/writing-for-errors/>.

Adobe Spectrum. Spectrum, adobe's design system, 2022c. URL <https://spectrum.adobe.com/page/writing-for-onboarding/>.

Adobe Spectrum. Spectrum, adobe's design system, 2022d. URL <https://spectrum.adobe.com/page/writing-with-visuals/>.

Pablo Stanley. Designing for accessibility is not that hard, Jun 2018. URL <https://uxdesign.cc/designing-for-accessibility-is-not-that-hard-c04cc4779d94>.

Elliot Jay Stocks. Choosing a suitable line height – fonts knowledge. URL https://fonts.google.com/knowledge/using_type/choosing_a_suitable_line_height.

Marco Suarez. *Introducing Design Systems*, page 13. Invision, 2019.

Jeff Sutherland. *Jeff Sutherland's Scrum Handbook*. Jan 2010.

UXPin. The difference between design systems, pattern libraries, style guides amp; component libraries, Jul 2022. URL <https://www.uxpin.com/studio/blog/design-systems-vs-pattern-libraries-vs-style-guides-whats-difference/>.

WAI. The business case for digital accessibility, Nov 2018. URL <https://www.w3.org/WAI/business-case/#groups>.

WCAG. Web content accessibility guideline: Writing resources for authors, Jun 2022a. URL <https://wcag.com/authors/>.

WCAG. 3.1.5 reading level (level aaa), Jan 2022b. URL <https://wcag.com/un categorized/3-1-5-reading-level/>.

The Website Architect. Does text alignment matter for accessibility and usability?, Sep 2020. URL <https://thewebsitearchitect.com/does-center-aligned-text-matter-for-accessibility/>.

- Bobbie Wood. What is ux writing? URL <https://uxcontent.com/what-is-ux-writing/>.
- University Yale. Readability, 2023. URL <https://usability.yale.edu/web-accessibility/articles/readability>.
- Kinneret Yifrah. page 157. Nemala, 1st edition, 2017a.
- Kinneret Yifrah. page 22. Nemala, 1st edition, 2017b.
- Kinneret Yifrah. page 127. Nemala, 1st edition, 2017c.
- Kinneret Yifrah. page 107. Nemala, 1st edition, 2017d.
- Rory J Zauner. Design systems: An overview, Sep 2021. URL <https://uxplanet.org/design-systems-an-overview-243b07534b64>.
- Jun Zheng, David Simplot-Ryl, Chatschik Bisdikian, and Hussein T. Mouftah. The internet of things [guest editorial]. *IEEE Communications Magazine*, 49(11): 30–31, 2011. URL <http://dblp.uni-trier.de/db/journals/cm/cm49.html#ZhengSBM11>.
- Armantas Zvirgzdas. The importance of ux writing in product design, Aug 2021. URL <https://bootcamp.uxdesign.cc/the-importance-of-ux-writing-in-product-design-5fb60469dc75>.