University of Pardubice

Faculty of Economics and Administration

Institute of System Engineering and Informatics

PERSONAS IDENTIFICATION FOR THE USERS OF THE INFORMATION SYSTEM

Tihitina Zergaw

Master Thesis

2023

Univerzita Pardubice
Fakulta ekonomicko-správní
Akademický rok: 2022/2023

ZADÁNÍ DIPLOMOVÉ PRÁCE

(projektu, uměleckého díla, uměleckého výkonu)

Jméno a příjmení:	**Tihitina Hailu Zergaw**
Osobní číslo:	**E21867**
Studijní program:	**N0688A140008 Informatics and System Engineering**
Specializace:	**Informatics in Public Administration**
Téma práce:	**Personas Identification for the Users of the Information System**
Zadávající katedra:	**Ústav systémového inženýrství a informatiky**

Zásady pro vypracování

The aim of the work is to determine suitable methods for defining the representative type of user, with a focus on information system users. The identification of basic items will be aimed at university students. A comprehensive study of sources will be the essential content of the work.

Outlines:
- Basic concepts related to processed issues.
- Comprehensive study of sources.
- User type identification methods.

Rozsah pracovní zprávy: **cca 50 stran**
Rozsah grafických prací:
Forma zpracování diplomové práce: **tištěná/elektronická**
Jazyk zpracování: **Angličtina**

Seznam doporučené literatury:

CLEMMENSEN, Torkil. *Human work interaction design: A platform for theory and action*. Springer, 2021. ISBN 978-3-030-71795-7. Available online <https://link.springer.com/book/10.1007/978-3-030--71796-4#affiliations>.
NIELSEN, Lene. (2019). *Personas – User focused design*. Springer, 2019. ISBN 978-1-4471-7426-4. Available online <https://link.springer.com/book/10.1007/978-1-4471-7427-1>.
RAUTERBERG, Matthias. Culture and Computing. *HCII 2020 Conference Proceedings*. Springer, 2020. Available online <https://link.springer.com/content/pdf/10.1007/978-3-030-50267-6.pdf>.
RUIZ, Pablo, et al. Human-computer interaction. *HCI-COLLAB 2021 Conference Proceedings*. Springer, 2021. Available online <https://link.springer.com/ book/10.1007/978-3-030-92325-9>.

Vedoucí diplomové práce: **doc. Ing. Stanislava Šimonová, Ph.D.**
Ústav systémového inženýrství a informatiky

Datum zadání diplomové práce: **1. září 2022**
Termín odevzdání diplomové práce: **30. dubna 2023**

L.S.

prof. Ing. Jan Stejskal, Ph.D. v.r.
děkan

RNDr. Ing. Oldřich Horák, Ph.D. v.r.
vedoucí ústavu

V Pardubicích dne 1. září 2022

AUTHOR'S STATEMENT

I declare:

I developed the work entitled **Personas Identification for the Users of Information System** on my own.
All literary sources and information that I used in my work are listed in the list of used literature.

I have been made aware that my work is subject to the rights and obligations arising from Act No. 121/2000 Coll., on copyright, on rights related to copyright and on the amendment of certain laws (the Copyright Act), as amended, in particular the fact that the University of Pardubice has the right to conclude a license agreement for the use of this work as a school work according to § 60, paragraph 1 of the Copyright Act, and that if the use of this work by me or a license to use it will be granted to another subject, the University of Pardubice is entitled to demand from me a reasonable contribution to cover the costs incurred to create the work, up to their actual amount, depending on the circumstances.

I acknowledge that in accordance with § 47b of Act No. 111/1998 Coll., on universities and on the amendment and addition of other laws (the Act on Universities), as amended, and the University of Pardubice Directive No. 7/2019 Rules for submission, publication, and formal editing of final theses, as amended, the thesis will be published through the Digital Library of the University of Pardubice.

In Pardubice, 31.12.2023 Tihitina Hailu Zergaw (b.o.h)

ACKNOWLEDGEMENT

First, I am grateful to God, who has been present since the beginning and will always be present. His wisdom and guidance made this thesis a reality.

My heartfelt gratitude goes to my thesis Supervisor, Doc. Ing. Stanislava Šimonová, Ph.D. for her unwavering support, advice, and expertise throughout the study process. Her helpful suggestions and encouragement have helped shape the path of this project.

I would like to express my sincere appreciation to my valued lecturers, whose invaluable guidance and solid support have played a pivotal role in shaping my academic understanding. I am truly grateful for the inspiration and knowledge they have shared, which have been contributory in the completion of this thesis.

My deepest appreciation goes to my family and friends for their constant support and understanding during the challenging stages of my academic path. Their emotional support has been my anchor, inspiring me to keep going in the face of hardship. Especially Grace Addo-Donkoh, your belief in my abilities has been a constant source of inspiration for me. Thank you for your unchanging encouragement and support.

Finally, I would like to thank all the research participants who kindly offered their time and insights for this study. This study would not have been possible without their collaboration.

ABSTRACT

This thesis delves in persona identification by focusing on foreign student users of information systems at the University of Pardubice. The primary objective is to identify the most suitable method for defining the main target group of users, with a particular emphasis on understanding the expectations and challenges faced by this specific user group. The research journey involved exploring three different approaches to persona development: qualitative, quantitative, and mixed approach. Given the convenience of data collection and analysis, the qualitative approach was adopted, utilizing surveys as the chosen method to develop the persona. Whereby the analysis used mixed methodology since there is a bit of statistical part and qualitative part.

To ensure the relevance and effectiveness of the survey questionnaire, criteria for a good information system were established. Three main criteria, each with three sub-criteria, were used to measure the goodness of the system. The questionnaire was distributed to eighteen foreign students and three Czech students, the latter serving as a comparative group. The research questions guided the exploration into key expectations, requirements, challenges, and the design of an effective persona identification system tailored for foreign student users at Pardubice University.

The study revealed that foreign student users faced challenges related to language barriers, a lack of assistance in navigating the system, difficulties in course registration, and a perception of the system as complex and unclear. The qualitative approach, although valuable, presented limitations due to issues of confidentiality, resulting in a manual data collection process with a small number of participants and manual data analysis.

In conclusion, this research underscores the importance of selecting an appropriate method for persona creation in the context of information systems. The developed persona provides valuable insights into the unique needs and challenges faced by foreign student users at Pardubice University, offering a foundation for future enhancements to the information system's user experience.

KEYWORDS

persona, persona identification, user persona, user profiling, information system

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF GRAPHS

LIST OF ACRONYMS

INTRODUCTION

Persona identification refers to understanding, distinguishing, and creating a person's identity in a specific context. Several definitions have been given to persona; some researchers strictly distinguish between segments and persona, while others acknowledge several types of personas characterized by the methods used to create them (Annika et al.).

However, most researchers agreed on the following definition. Personas are fictional characters established based on research to symbolize different user types that will use a service, product, site, or brand in a similar way (Rikke & Teo, 2022). Pruitt and Adlin define Personas as an archetypical "representation[s] of an actual segment of customers presented as an imaginary person" (Annika et al.).

Personas will be created based on research to represent different user types that might use a given service; it involves capturing who the person is and their personality, interests, and values so that the marketer can create targeted messages and marketing efforts for them. Creating personas will help to understand users' needs, experiences, behaviours, and goals.

Creating personas can help designers step out of their perspective and understand user needs and requirements. Persona identification uses data from various sources to build an identity - it could be data from surveys, interviews or even observation. The collected data is then analysed holistically to gain insights into users' needs and interests to understand their behaviour better. It helps to recognize that different people have different needs and expectations, and it can also help to identify users' needs for the design.

Personas simplify the design work at hand and direct ideation processes and can assist in achieving the aim of producing a positive user experience for your target user group.

Persona is a user-centred design approach in which personas are fictional characters representative of actual users of a system. Personas help shape and inform product/system design decisions by providing an image of users that can be referred to during the design process (Cooper, 2019). By creating these fictitious personas, designers can obtain an insight into the needs, wants, and experiences of various people who may use the system. The goal is to create designs that match

real user needs and wants while avoiding any potential problems they may encounter while using the system.

Persona identification is critical as it helps marketers understand target user groups and how they interact with their products or services. Through persona identification, marketers can create communication channels custom-tailored to each segment identified (e.g., ads on the radio). Moreover, persona identification allows marketers to customize content based on user needs. Marketers can tailor offerings by knowing who the user is – their cultural background, age, demographic, or lifestyle. This will increase user satisfaction as campaigns remain relevant to user interests and needs.

Overall, persona identification offers excellent benefits for marketers who tailor communications based on users' wants or needs. Marketers can create more effective campaigns targeting the right audiences with appropriate messages and offerings by looking at various factors such as demographics, location, or lifestyle information.

This thesis review examines the history, goal, strength, and use of personas in creating a better customer experience.

CHAPTER ONE: HISTORY OF PERSONA

1.1 Persona History

The word persona was first used by Alan Cooper in his book The Inmates Are Running the Asylum in 1998 (Alan, 2003). Cooper introduced persona as a practical interaction design tool. However, the concept is known before Cooper.

Early experiments with automated personal identification systems were conducted as early as the 1920s when researchers used ink-stained paper and photographed fingerprints to determine the identity of individuals. During World War II, researchers developed more sophisticated methods for identifying people automatically, such as magnetic drum cards, optical scanning technology, and biometric technologies, such as retinal scans.

During the 1950s and 1960s, automatic identification applications became increasingly important for security and privacy concerns. Different governments use automated methods to identify their citizens, including driver's licenses and social security numbers that contain an individual's name, date of birth, and other information. (Alan, 2003)

RFID chips are also a recent application for tracking people in real-time from a remote location by implementing radio frequency signals. It applies electromagnetic areas to recognize and trace RFID tags. These chips can be implanted close to the skin or embedded in jewelry or clothing items to track the intended personas.

Overall, improvements made over time in personal identification technologies now make it possible to identify one's identity accurately in a short time.

Personas can be used for communicating information about the users within teams, aligning preconceptions with reality, and better understanding user needs for requirements engineering.

The critical goal of personas is to create reliable and realistic representations of significant audience portions for the source. These statements should be based on qualitative and quantitative user research and web analytics. Pre-development of personas and good research are required.

Additionally, Personas will help with decisions by adding a real-world consideration for the design and development of a system.

1.2 Strength and Benefits of Persona

Personas will help to overcome several problems for both the designers and users. According to (Tomasz & Kenneth, 2011), persona has several benefits for product design.

Determine – It helps to determine what a product should do and how it should behave.

Correspond with participants, developers, and other designers. Personas provide a common language to communicate design decisions and help observe the design targeted users at each stage in the development. (Tomasz, Kenneth, 2011)

Build harmony and commitment to design. With a similar language comes a common understanding. Personas reduce the need to create diagrammatic models.

Measure the construct effectiveness. During development, designs can be tested on a persona like they can be shown to a real user. (Tomasz, Kenneth, 2011)

Improved user experience: Persona identification can help the user to understand better how the information system works and use it more effectively. This will progress the whole user practice, alleviating any confusion around the system's operation.

Better data gathering: Persona identification allows for more accurate collection and analysis of user data that can be used further to improve users' experience within the information system and tailor content for specific personas. (Jansen, Jim & Jung, Soon-Gyo & Salminen, Joni & Guan, Kathleen & Nielsen, Lene. (2021).

More targeted marketing: An identified person allows marketing teams to mark their products and services concerning a specific group of customers they already know and want to reach out to. Marketers can create campaigns tailored explicitly to these personas and better track their efforts' results.

Improved customer retention: Understanding customers will help to provide support that speaks directly to their needs. It will help personalize customer interaction and help gain higher customer retention rates.

1.3 Types of Personas

In an article titled Interaction Design, Lene Nielsen classifies Personas into four types (Lene, n.d).

Goal-directed Personas

It concentrates on what the user intends to do with the product. User goals act as a lens through which designers must assess a product's functionalities (Cooper & Reimann, n.d.). A goal-directed persona examines the method and workflow your customers would prefer to follow to attain their goals while dealing with a specific product or service (Rikke & Teo, 2022).

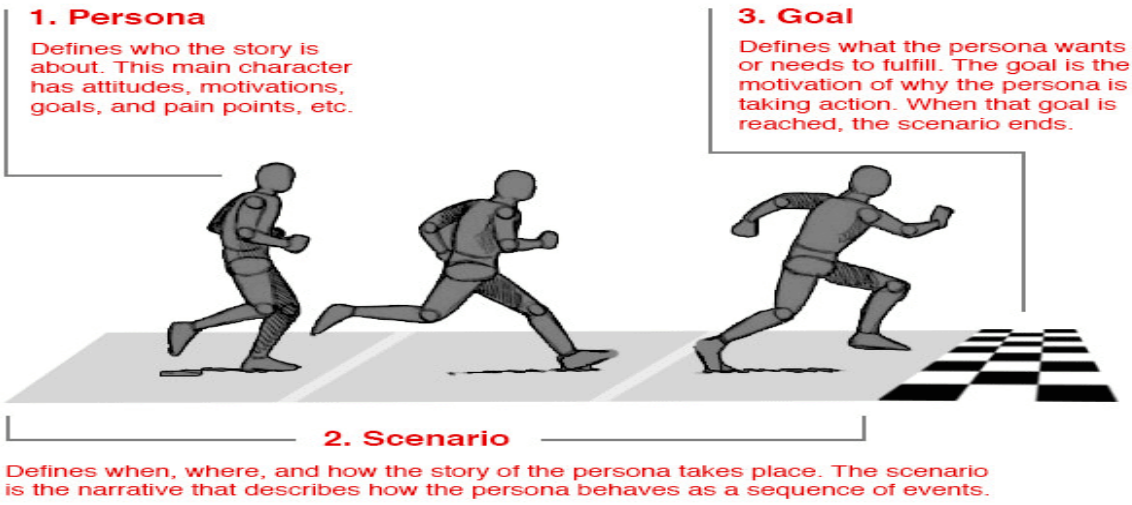


Figure 1: Goal-directed Personas

Source: Rikke & Teo, 2022

Role-Based Personas

The role-based perspective is also goal-oriented and behavioural. The role-based perspectives' personas are heavily data-driven, using information from both qualitative and quantitative sources. The role-based perspective is concerned with the user's position within the company. In some circumstances, our designs must consider our users' role in their organizations or lives. Examining our users' roles in real life might help inform better product design decisions. What will the product be used for? What is the purpose of this role? What are the business objectives of this role? Who

else is affected by the responsibilities of this position? What functions does this job perform? (Rikke and Teo 2022).

Engaging Personas

Engaging personas can include both goal-directed and role-directed personas, in addition to the more standard-rounded personas. These engaging personas are created for the designers to utilize to become more involved with them. The goal is to employ personas to produce a 3D depiction of a user. The more people interact with the persona and regard them as 'real,' the more probable it is that they will be included during the process of design and that they will want to serve them with the most excellent product. These personas investigate the user's emotions, psychology, and history, making them relevant to the work. The viewpoint emphasizes the power of stories to engage and bring personas to life. (Rikke & Teo, 2022).

Fictional Personas

The fictitious persona does not arise from user research (unlike the other personas) but rather from the UX design team's experience. The team must create assumptions based on previous contacts with the user base and products to provide a picture of what average users could look like. There is no denying that these personalities can be highly faulty (with continuous disputes about how flawed). You can utilize them as a rough sketch of user requirements. They enable early user input in the UX design process, but they should not be relied on as a guide for creating products or services. (Rikke & Teo, 2022).

1.4 Persona Creation

According to a study titled Helping Professionals Select Persona Interview Questions Using Natural Language Processing, personal creation includes qualitative, quantitative (including algorithmic or data-driven personas), and mixed methods. Most often, personas are created using qualitative methods. In such cases, the data is collected via ethnographic means, field studies, or interviews. Out of all of these, interviews are often preferred because they can be easily implemented (Joni et al., 2021).

After the persona creators have decided on their methodological approach (e.g., qualitative) and data collection means (e.g., interviews), they typically consider what information the persona profile contains. This selection process is called persona information design, defined as the selection of information elements (attributes, characteristics) that the finalized persona profiles will communicate to their users. Ideally, the persona information design process is driven by the information needs of the eventual persona users, such as software developers, designers, and business managers (Joni et al., 2021).

Persona information design deals with the fundamental question of what information personas should contain. As personas are often created based on user interviews, practitioners frequently ask for a comprehensive list of persona interview questions.

There are six steps in creating a persona using an interview. (Joni, Kamal, Soon-gyo, & Bernard, 2021).

They are -

Use case definition - gives motivation and explains why personas are needed.

Persona information design – what do we want to know about the people the personas portray? (e.g., employee pain points, life situation, decision-making).

- Interview question selection
- Conducting interview
- Analysing the results
- Creating the persona profile

1.5 Elements of a Persona

Mainly Personas generally include seven or more critical information. That information can be categorized into three main categories: Image, Descriptive, and User Story. The seven Sub-Categories are Picture, Demographics, Other Basic Information, Psychographics Goals, Skills, Personal, and Other Attributes (Jim, 2021).

According to the (Jim, 2021) article titled “Elements of a persona profile”, he specific components of each category is listed here:

Image

Picture

Descriptive - This is fundamental background information about your addresses.

The information that we like to gather involves fundamental personal information. It helps to bring personas to life.

Demographics

Name

Age

Location

Salary

Relationship Status

Other Basic Information

Quotes

Bio

Job Title

Education

Years of Experience

User Story

Psychographics Goals

Motivation

Influencers

Pain Points

Personal Values

Personality

Defining Traits

Archetype

Skills

Specific Skills

Areas of Expertise

Technology

Personal

Fav App/ Preferred Channels

Preferred Brands

Trusted Resources

Other Attributes Work Experience

Relationship with Company

Collaborators

Event Attendance Attributes

Example of Persona

The Receptionist

Figure 2: Receptionist

Source: Jessica Wells, 2022

Facility/Operations Manager Fred

Figure 3: Facility/Operations Manager

Source: Jessica Wells, 2022

The Record Store Manager

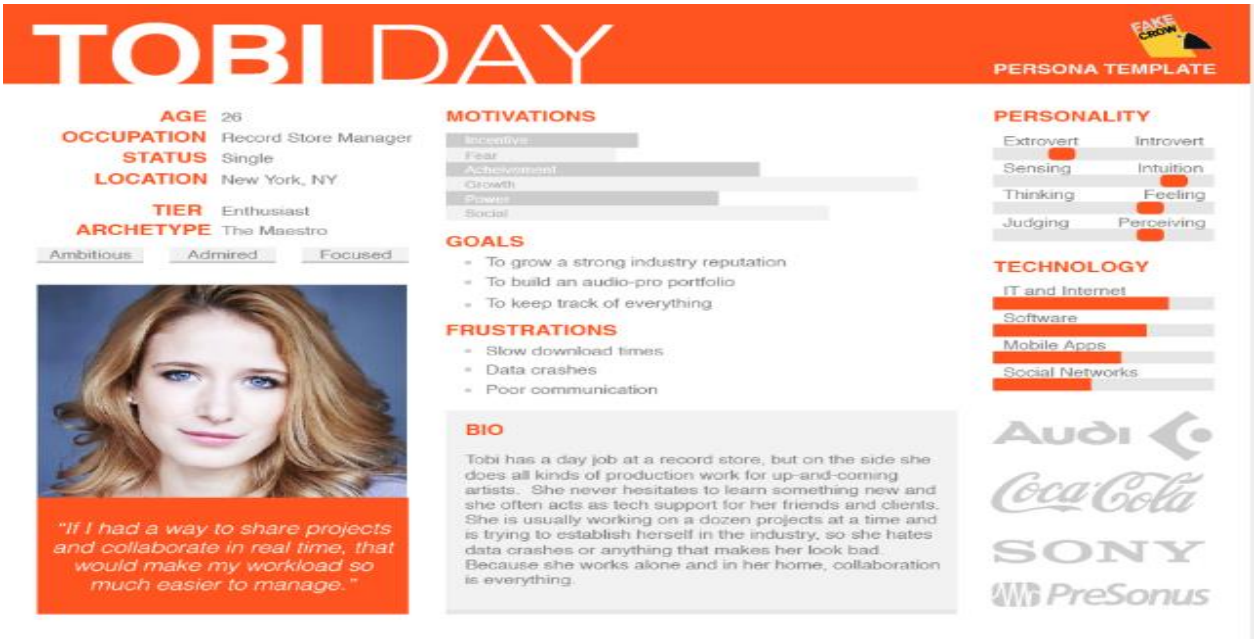


Figure 4: Record Store Manager

Source: Jessica Wells, 2022

1.6 Evaluation of persona

Despite the wide use of persona, its evaluation is complex due to the need for a validated measuring instrument. The following eight criteria will be used for evaluation (Henrique et al., 2021).

Credibility: How realistic is the persona?

Consistency: The information in the description is consistent.

Completeness: Captures essential information about the described users.

Clarity: Information is presented clearly.

Likability: How nice the persona seems to be.

Empathy: How much does the respondent empathize with the persona?

Similarity: How much does the persona look like the respondent?

Willingness: Measures the respondent's respondent to respondents to learn more about the persona.

1.7 Target Group Vs Personas

Target groups describe a selection of people with similar characteristics. For example, "female, upper" middle class, 35–45 years old." Whereas "ones describe a fictional user, along with their needs and goals in a particular context. A short story supplements this fictional character to make it tangible. Primarily, both target group and personas are used interchangeably. (Jan 2016)

1.7.1 Characteristics of the target group of users

According to (Hannah, 2021), the following characteristics are mainly used on target group users.

Age: The target user's age is different with a different system.

Gender

Technical Ability: Users may have varying levels of technical ability, which could affect how they use and interact with an information system.

Interests or hobbies

Occupation

Culture/Geography: The culture and geographic location of users can also impact how they interact with information systems, as well as its look, feel, and design, which should be user-friendly for that demographic.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Definition of Marketing

Every business must have marketing since it involves the actions and tactics used to encourage purchasing or selling goods or services. It comprises several components: selling, buying, and delivering goods to clients or other firms. In essence, marketing offers a medium for businesses to interact with clients and provide value to them (Alexandra, 2023). It encompasses diverse practices, such as market research, market segmentation, product development, pricing strategies, branding, and promotion. By performing market examination and discovering client requirements and preferences, companies can tailor their products or services to meet customer demands (Henry, 2020). To reflect this, companies develop a market segmentation strategy, which can also be called market persona identification.

2.2 Persona Identification in Marketing

Persona identification is of great use in marketing. It refers to creating fictional representations of the different types of customers a business may have. One strategy marketer use to deliver their products to potential customers is segmentation, which can also be called persona identification. Market segmentation is a marketing name that describes classifying prospective buyers into segments based on their everyday needs and similar responses to marketing actions. This allows corporations to target different groups of customers who realize the inclusive significance of specific products and services in another way from one another. (Evan Tarver, 2023)

To better meet the specific needs of consumers, marketers adopted persona identification. This process divides the total potential market into smaller, homogeneous segments consisting of customers with similar characteristics. Once these groups are identified, marketers can design products and devise marketing strategies catering to their needs.

Each persona has a different market, and segmentation aims to recognize personas within the general market that are adequately alike in appearances and reactions to guarantee divided behaviour. Consequently, to competently meet consumer needs, marketers must divide consumers into different groups according to everyday needs, attitudes, or characteristics.

In marketing research, personas are used based on the concept of a community of individuals introduced by Jenkinson. He pointed out that a group denotes a community of individuals with something in common. He specified the difference between "segment" and "grouping. " In contrast, segmenting is splitting a population into groups based on parameters such as age, gender, interests, and so on; grouping entails combining people to form a class of consumers who share standard features and benefit from specialized solutions. (Evan Tarver, 2023)

Jenkinson proposed implementing an enriched segmentation model, which companies must communicate to their staff and senior management by converting the community segments into real living people using day-in-the-life archetype descriptions as Customer Prints or personas.

Many businesses use buyer personas in their marketing strategies to gain deeper insight into their target audience and communicate with them more effectively. This involves analysing available data, such as demographics, behaviour patterns, interests, and needs of the target audience. Marketing personas are the foundation for a company's marketing strategy by accurately identifying desirable customer characteristics. This enables marketers to tailor their approach and reach their ideal customers more effectively.

2.3 Importance of Persona Identification in Marketing

A well-crafted person helps to clarify a customer's behaviour, interests, needs, and disposition. This information is valuable in developing targeted content to inspire customers to consider a brand. (David Tainsh, 2023)

By creating a persona representing diverse demographics and preferences, businesses can enhance their communication strategy and successfully communicate with their target user, ensuring focused and engaging promotions and campaigns. As such, personas have become vital for marketers to comprehend their audience better and customize their marketing messages to cater to consumer preferences.

According to (David Tainsh, 2023), here are some of the main benefits of persona identification in Marketing:

Better hypothetical customer representation: Personas give businesses a detailed and realistic picture of their theoretical customers. Unlike generic or broad demographics, personas offer a concentrated and precise view of specific groups of customers, allowing businesses to tailor their

strategies and present to meet their requirements and preferences appropriately. (David Tainsh, 2023)

Help to be more customer-focused: The use of personas can improve a product's navigation and content by making them more customer-focused. Personas offer valuable insights about customer needs, preferences, and pain points, which inform product development decisions and create more customer-centric products. (David Tainsh, 2023)

Better-personalized experiences: By comprehending different personas' distinct needs and desires, businesses can provide personalized experiences that satisfy customer expectations, ultimately leading to an enhanced customer experience.

Better conversation: The increase in conversion rates is dependent on the implementation. The approach emphasizes a focus on customer journeys and user task completion, and as such, creating more engaging content assets that appeal to different types of purchasers is essential. This will increase engagement, and targeted marketing that addresses individual customer needs may lead to higher conversions. (Tendo Team, 2021)

Better improvements: Persona helps to improve marketing based on research lead assumptions.

A better strategy: Persona helps to create a practical and strategic advertising strategy—aids in developing targeted marketing campaigns and messages that can efficiently generate leads and increase sales.

Better competitive advantage: Identifying personas helps a given business to have a more competitive advantage over its niches and helps the company avoid product pitfalls.

2.4 Approaches Used to Create Persona in Marketing

Marketing persona development requires real-world data and strategic goals. To achieve this, marketers use several approaches. Here are some of the methods:

Customer Research

This is a critical phase in creating a Persona. It includes researching the potential target customer. It mainly aims to understand and answer customer desires, needs, behaviour patterns, and preferences. This can be done using surveys and interviews. (Arthur, 2023)

Using customer interviews, the following data can be obtained. Age, Location, Language, Spending power and patterns, Interests, Challenges, Stage of life, needs, and, in the case of B2B, the size of businesses and who makes purchasing decisions.

Analytics

In the case of digital marketing, using several analytical tools provided by social media outlets and other means is one essential approach. Critical information like keywords, popular pages, and traffic sources will be used to understand the visitors frequently checking a given company product. (Aaron, 2023)

They examine customer feedback and reviews from social media, online communities, and customer service channels for insights into what customers think about a product or service.

Market research to identify trends, preferences, and market gaps.

They are looking into competitor personas to understand their target audience.

Creating customer journey maps to see potential customers, touchpoints, and goals. (Anush, 2023)

These approaches can help marketers create accurate and detailed personas that can be used to guide their marketing strategies, improve brand engagement, and increase conversion rates.

2.5 Creating Persona

Marketing personas use four steps to create Persona. These are Qualitative analysis, quantitative analysis, drafting Persona and socializing Persona. (Aaron,2023)

2.5.1 Qualitative analysis

Qualitative data gathered through customer research should be carefully analysed to understand a marketing persona better. This analysis primarily includes demographic information of the person under consideration, such as age, gender, race, needs, preferences, and other qualitative data. By using this qualitative data, businesses can gain accurate insights into their target audience's behaviours, challenges, and motivations. (Aaron,2023)

2.5.2 Quantitative analysis

After conducting qualitative analysis to determine customer preferences and needs, marketers can use quantitative data such as income, revenue, and other crucial metrics to analyse their target persona further. Quantitative analysis allows marketers to gain a more objective, measurable view of their Persona, which can help them make more informed and effective marketing decisions. (Aaron,2023)

2.5.3 Drafting persona

The information gathered from two analyses - market research and customer segmentation - is used to draft a marketing persona. These analyses help better understand the target market's needs,

preferences, behaviours, and pain points. Using this information, a draft persona can be developed for the ideal customer. This Persona includes a use case scenario and demographic information such as age, gender, income, education, etc., as well as benefits, buying triggers, choice factors, and other relevant information about the customer. This process helps businesses create a clear and accurate image of their potential customer, making it easier to tailor their marketing strategies to fit their needs and preferences. (Aaron,2023)

2.5.4 Socializing persona

Once a marketing persona has been created, it is essential to reflect the target audience accurately. One way to achieve this is by socializing the Persona within the marketing team or with stakeholders involved in creating content for that audience.

This socialization process involves delivering the Persona to its intended users, such as sales teams, content creators, and advertisers, to ensure they clearly understand the Persona's characteristics and needs. Feedback from these users can be used to refine or adjust the Persona, if necessary, to make it more effective. (Aaron,2023)

2.6 Buyer persona

A buyer persona is a partially fictional character representing a company's ideal buyer. It is based on real-world data and research. Creating a buyer persona helps businesses better understand their potential customers, meet the expectations of their ideal buyers, and address their customers' pain points. (Aya Sabry, 2021)

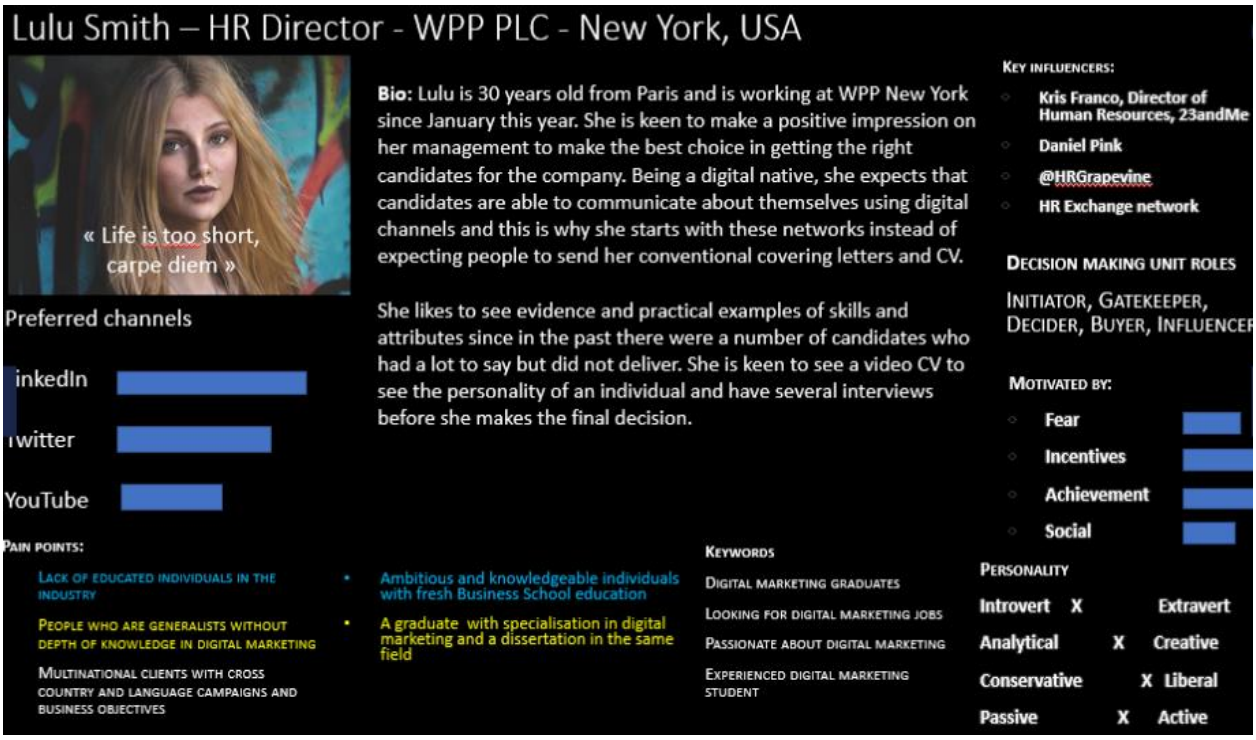


Figure 5: Example of Buyer Persona

Source: Fenton A, Heinze A, Osborne M, Ahmed W, 2022

2.7 Persona Identification in System Engineering and Information Systems

2.7.1 Definition of System Engineering

In several areas such as computer science, computer networking, communication, web development, and research, system engineering refers to a process that must be carried out to successfully develop the required type of system. System engineering is a multidisciplinary field that focuses on designing, developing, and executing large and complex systems. NASA defines system engineering as a multi-disciplinary approach carried out for the design, realization, technical management, operations, and retirement of a system (NASA, n.d.).

The International Council on Systems Engineering (INCOSE) also defines Systems Engineering as a transdisciplinary and integrative approach that uses systems principles and concepts, as well as scientific, technological, and management methods, to engineer systems (INCOSE, 2019).

To achieve its intended goals, systems engineering integrates several components, subsystems, and processes them together. It is used in many industries, such as web development, mobile app

development, automotive or healthcare. It's the art and science of developing operable systems that fulfill the requirements. Additionally, it helps to create a system that meets the requirements proposed by the main users of the system within their budget capabilities and time frame (Diana, 2011).

To achieve this, it includes several stakeholders, including developers, users, and service providers. It also includes products, services, information, and natural elements (Coursera, 2023).

2.7.2 Importance of System Engineering

System engineering helps to ensure that a given project is completed based on its requirements and that the project is done within a budget and with the required level of quality. System engineers assist from the beginning of a specific system development till the end phase of development. It helps in designing and developing complex systems.

While helping develop a complex system, it also ensures the implemented system satisfies the requirements of the key stakeholders and ensures the project stays within the budget, cost and schedule. It ensures that all components of a system function together efficiently and effectively (Wee & Peggy, 2014).

It helps to create a reliable and effective system using a structured, systematic approach to solve the problem. Also, reduce costs by solving potential risks in the early stage.

Additionally, system engineering ensures high-quality results. System engineers focus on defining the problem, describing it, and determining the customers' requirements. After analysing the information, they will come up with a perfect solution.

Additionally, the following benefits can be obtained from system engineering:

Improved stakeholder participation

Shorter project cycles

More adaptable and resilient systems

Verified functionality and fewer defects.

Better documentation

2.7.3 Definition of Information Systems

Information systems are interrelated components to collect, process, and distribute information. The aim is to decide, control, visualization in an organization. Each element has a role to play. (David, 2019).

2.7.4 Components of Information Systems

The following five components of information systems work interrelatedly to make the system function. (Erik, 2018)

Hardware

Computers, servers, networking devices, storage devices, and peripheral devices such as printers and scanners are examples of physical equipment utilized in an information system. (Erik, 2018)

Software

A set of instructions that allows hardware to do specified functions is software. Operating systems, application software, and middleware are all part of it. Operating systems govern hardware and offer a platform for software applications. In contrast, application software consists of programs for specific tasks, such as word processors, databases, and web browsers. (Erik, 2018)

Data

Data is a collection of basic facts and numbers that have been processed and organized to make information. It is a critical information system component and can be stored in databases or files. Data management entails data collection, storage, retrieval, and processing. (Erik, 2018)

People

People are an essential part of every IS. It is a person who interacts with the system. Those who need to run the system. This includes system users, IT experts in development and maintenance, and other stakeholders. User education and participation are critical for the effective use of information systems. Their knowledge can be used for the future. (Erik, 2018)

Telecommunications

Networks enable communication and data sharing among many components of an information system. Physical (wired) and wireless communication infrastructure are both included. It is a way of sharing information from one computer to another. Users can access resources and share information over networks. (Erik, 2018)

This research focuses on an information system called IS STAG. STAG is one of the information systems used by the University of Pardubice students. It is the central information system that the students use to interact with the university.

2.7.5 Persona Identification in System Engineering and Information Systems

In system engineering and information systems, a persona is a fictional representation of the user and is used to guide the design and development of a system or product. Engineers use this fictional representative user to understand the actual system users' needs, goals, behaviours, and preferences (Wee & Peggy, 2014).

However, a persona is not a purely fictional character; instead, it is created based on research and analysis of real-world users. It includes detailed descriptions, scenarios, and user needs. This information provides deep insights into how the system is used and what features and functions are essential to different types of users (Jane et al., nd).

2.7.6 Importance of Persona Identification in System Engineering and Information Systems

Persona identification is essential in system engineering and information systems as it helps to: (Jansen, Jim & Jung, Soon-Gyo & Salminen, Joni & Guan, Kathleen & Nielsen, Lene. (2021).

Understand individual system user's needs, preferences, behaviours, and characteristics.

Meet system requirements by tailoring system design and functionality for different personas.

Increase users' engagement and satisfaction.

Predict usability issues of the system before it is deployed; this saves time and resources in the long run.

2.7.7 Example of persona

Here are two examples of fictional representations of a user in system engineering and information systems that help the development team better understand the user's needs and requirements from the system:

1. Khalid: Khalid is a 25-year-old tour guide who works for his own hiking and camping organizing company. He wants a system to interact with its worldwide users through websites. He wants the system to allow users to book, plan, pay prepayment, and check trip plans and schedules. He wants a simple, user-friendly interface that is easy to navigate, whatever background the user has. He also wants the system to be acceptable on PC and mobile devices.

2. Tsion: Tsion is a 25-year-old civil engineer who works for a government agency. She is responsible for inspecting bridges and roadways. Tsion is detail-oriented, safety-conscious, and meticulous. She needs a system to help her collect data, visualize information, identify potential risks, and generate maintenance recommendations. Tsion prefers a customizable interface with advanced features and analytics that she can access from a tablet or laptop.

2.7.8 Application of Persona

Personas in information systems are used to identify user needs and provide a more personalized user experience. It helps to transform data into a realistic character with wants, needs, motivations, and frustrations. (Maha, James, 2015)

Personas allow businesses to integrate customer data from various sources into one unified customer profile. Companies can then create custom customer experiences based on specific needs and preferences. Companies can develop an automated response system targeting the correct customer segment or persona group with the right message and information by understanding a customer's needs. (Jansen, Jim & Jung, Soon-Gyo & Salminen, Joni & Guan, Kathleen & Nielsen, 2021).

Personas are extremely helpful when developing, maintaining, evaluating, or improving an information system. The use of personas enables developers to have a deep understanding of their audience before coding a single line of code. This empowers them to create a better product that resonates with its technical specifications and target markets' requirements, interests, and aspirations. (Wee & Peggy, 2014)

Furthermore, personas allow developers to role-play different usage scenarios when testing their products or services. It helps them understand how the system would work in the real-world environment, thus allowing them to make improvements where needed.

In conclusion, using personas in an information system is essential for developing practical solutions that meet the needs of all stakeholders involved: users (end-users), designers (UX designers and software engineers) and companies (owners). It increases efficiency by helping avoid feature bloat, facilitates collaborative product development, provides improved visibility into targeted markets, reduces development time, and allows developers to tailor experiences according to user requirements at every stage of development.

CHAPTER THREE: RESEARCH METHODOLOGY

This thesis aims to determine the suitable method for defining the target group of users. In the case of this thesis, the leading target group of users are foreign student users of information systems at Pardubice University.

While numerous information system users exist at Pardubice University, this research concentrates explicitly on international students.

After extensive research, the appropriate method for developing foreign student users of the University of Pardubice's information systems will be selected.

By defining the foreign student users of the University of Pardubice's information systems. The researcher will develop a persona for information systems users of Pardubice University.

The developed persona can be used to understand the expectations of the foreign student users of information systems at Pardubice University.

3.1 Objectives

1. To ascertain the expectations and necessities of foreign student users of the University of Pardubice's information systems.

2. To pinpoint the challenges foreign student users encounter in the University of Pardubice's information systems.

3. To design a user persona identification system tailored for foreign student users of the University of Pardubice's information systems.

3.2 Research Questions

1. What are foreign student users' key expectations and requirements of the University of Pardubice's information systems?

2. What are the critical challenges faced by the foreign student users of the University of Pardubice's information systems?

3. How can we design an effective persona identification for the foreign student users of the University of Pardubice's information systems?

The design of the methodology, selection method, implementation, and data collection will be included in the rest of the chapter. Chapter five will include an analysis and discussion of the result of implementing the selected method. Chapter six will include recommendations and conclusions.

3.3 Research Design

The research design of this thesis shall follow the steps as shown in the image below.

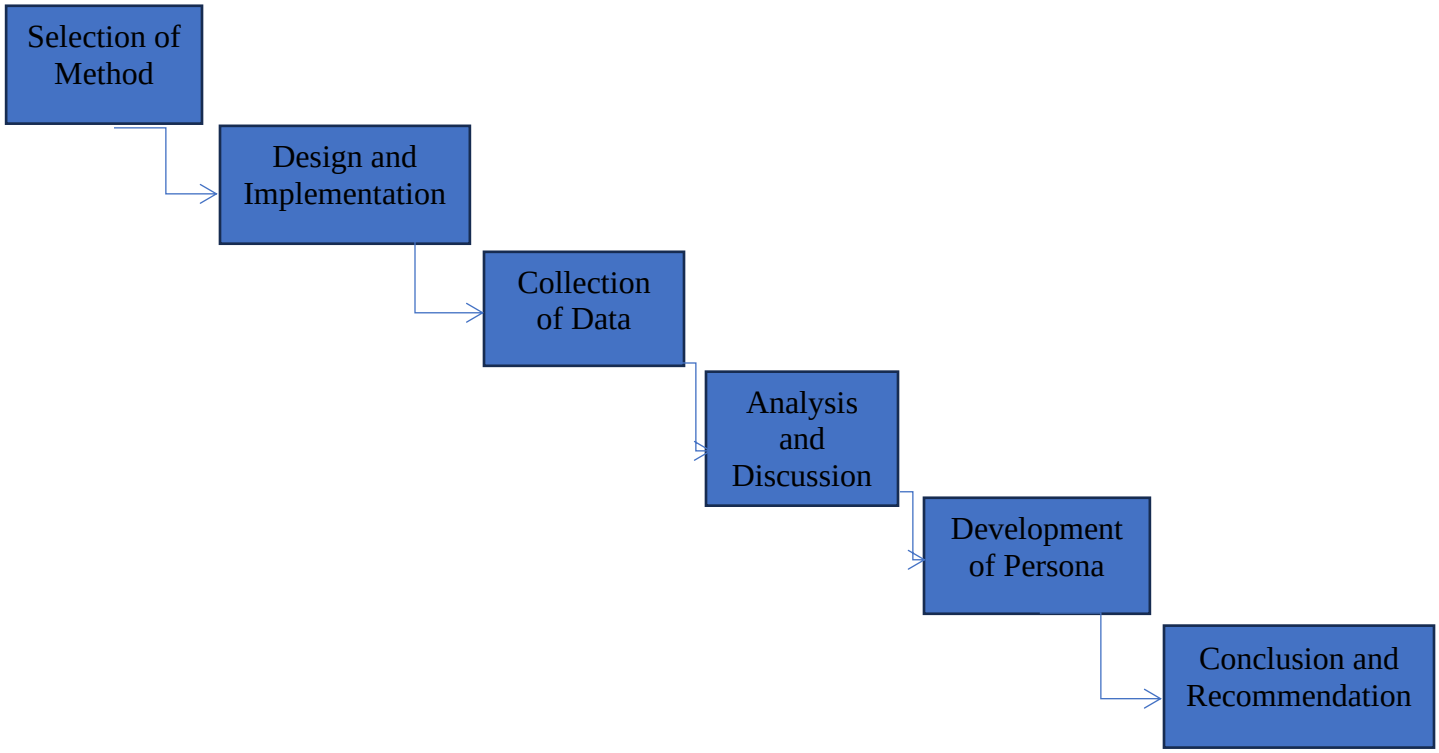


Figure 6: Research Design

Source: Author's own creation

3.4 Selection of Method

Based on various research, there are three persona creation methods. Qualitative persona creation, quantitative persona creation, and mixed methods approach. (Jansen, Jim & Jung, Soon-Gyo & Salminen, Joni & Guan, Kathleen & Nielsen, Lene, 2021)

3.4.1 Qualitative Approach

The qualitative persona creation method is called a traditional method. It involves the data to be collected and analyzed manually. The data collection method could be interviews, surveys, observations, and focus groups. The data analysis process applies a methodology of conventional qualitative approaches—for example, grounded theory. Grounded theory is a method in which the writer will drive theories out of the collected data after collecting the data. It is not when the researcher has a theory that needs to be shown or shown to be false so the researcher will collect data to fulfil the aim. Theories are derived from real-world data. Data collection and analysis occur iteratively. (Bernard, Soon-Gyo, Lene, Kathleen, Joni Salminen, 2022).

3.4.2 Quantitative Approach

The quantitative persona creation method involves automatic data collection. The data can be collected, for example, from purchases, likes, shares, and views. There should be a pre-existing data collection that explains the user behavior. The data could be gathered from customer relationships management, surveys (big sample size data), and online platforms, for example, YouTube, Facebook, and Google Analytics. (Joni, Soon-Goy, and Bernard, 2019) The quantitative approach uses a computational approach to analyze the data. With the help of machine learning algorithms, the pre-existing user data will be changed to a persona. (Jansen, Jim & Jung, Soon-Gyo & Salminen, Joni & Guan, Kathleen & Nielsen, 2021).

3.4.3 Mixed-method Approach

A mixed-method approach is an approach that can link the two methods. The two methods can be used jointly to produce more accurate personas. This method uses automatic means to collect the data. After identifying the data, it will adopt the qualitative approach to fill the data gaps. The mixed-method method uses qualitative and quantitative data analysis methods to analyze the user data. (Bernard, Soon-Gyo, Lene, Kathleen, Joni Salminen, 2022).

Different researchers use different methods for the creation of a persona. We cannot say one way is better than the other. It all depends on the objective of the work, the context, and the scenarios.

In the case of this paper, the researcher chooses the qualitative approach as the most suitable approach. The main reason for choosing the qualitative method is the availability of students to

gather the data. On the other hand, it is not possible to use pre-existing data of the students because the researcher is not allowed access due to confidentiality issues.

As per the researcher's knowledge, there is no pre-existing work that covers the exact work this research will cover, or even if there is, the data was collected from a different group of participants than the researcher is planning on researching.

The qualitative approach uses different methods to collect data—for example, interviews, focus groups, surveys, and observations.

The interview is goal-oriented communication between two or more people. The interviewer has the role of paying questions while the interviewee is responsible for answering the question that the interviewer has asked. (Jaber, 2012)

A Focus group is a qualitative research method that involves a small group of people and includes a group discussion on a specific topic facilitated by a skilled group moderator. (Sim, J., Waterfield, J, 2019)

A survey is a data collection of systematic methods undertaken with a required analysis and detailed description. (Raymon, 2021). The key aim of a survey is to answer the research question. The survey has numerous advantages. It is cost-effective; it reduces data entry errors; the absence of an interviewer also diminishes the impact of social desirability bias.

(Callegaro, 2015). Efficient surveys concentrate exclusively on essential questions that address crucial information, avoiding inquiries that are merely of secondary interest. (David, Story, Alan, Tait, 2019).

Observation is a method used for unique cases that requires the researcher to be present and identify the needs by visualizing the situation and listening to the participants' experiences or having direct incidents with the events. ((Lee, Kim, Rhiu & Yun, 2021)

The article "A Persona-Based Strategy for Detecting Accessibility Challenges in the Interaction of Elderly and Disabled Users with Household Appliances" employed focus groups, interviews, and observations to construct four personas representing eight specific user groups. Since the article caters to elderly and disabled users aiming to recognize accessible products, the authors needed to

conduct focus groups, one-on-one interviews, and direct observations, which are particularly effective for capturing the unique needs and frustration of individuals in these user groups. The combination of the three methods is time-consuming. (Lee, Kim, Rhiu & Yun, 2021)

The article "Creating Value with Proto-Research Persona Development" also used interviewing one-on-one interviews. The paper proposes a persona development process for creating value in an organization. As it was for Fortune 500 companies, choosing representatives carefully to do interviews and assessments was necessary. Though the article stated that they effectively and efficiently achieved their goal, one-on-one is time-consuming and demands availability. (Jain, P., Djamasbi, S., Wyatt & J, 2019).

In addition, an article, "Understanding the Transit Market: A Persona-Based Approach for Preferences Quantification", used a survey method to determine current and potential user expectations and preferences. The report is written to estimate the willingness of the users to pay for service improvements. The article used an online survey method to identify the current and potential users' needs and expectations. Although there were incomplete responses, out of 5,781, 5,238 were successfully responded to and used to analyze the data. The answer was quick and effective, and the research aim was achieved. (Eldeeb, Gamal, & Moataz ,2020)

Although there are several methods to collect data, the researcher used the survey as a data collection method. The choice of a survey aligns with considerations of cost-effectiveness, time efficiency, convenience, and availability for the researcher and selected participants for the survey.

3.5 Design and Implementation

3.5.1 Selection of Participants for The Survey

In selecting participants for the survey, 18 international students and 3 Czech students were randomly employed according to availability and convenience. The research focuses on international students, but 3 Czech students participated. Their response has been used to compare the results.

The term "random selection" indicates the procedure researchers use to select participants for a study. In employing this approach, each member of a population has an identical likelihood of being chosen as a subject.

One notable advantage of employing random sampling lies in the simplicity of constructing the sample. Additionally, it is considered an unbiased method for choosing a piece from a given population, as each member is given an equal chance of being selected. (Gaganpreet Sharma, 2017)

3.5.2 Design of Questions for Survey

The designed questions have two categories. The first part is demographic information or persona-related questions where the respondent will be asked to introduce themself. The second part is information systems-related questions. Since the thesis focuses on information systems users, the researcher gathers ideas from previous articles. Many factors are used to measure an information system. After effective research, the researcher decided to use three factors as criteria to design the questions for the second part of the questionnaire, which is information systems-related questions. The second part of the questionnaire has 15 questions. Under each criterion, five questions cover the definition of the specific criteria. The questions consist of multiple choice, checkboxes, short answers, scales, and open-ended. The survey was sent to the chosen participants via Microsoft Teams.

3.6 Criteria of Good Information Systems

The information systems of the University of Pardubice have numerous purposes. For the students, it is a system that helps them interact with the university. Although there are many criteria to measure a good information system, the researcher chose to classify it into three main groups.

Usability: This is a user-friendly aspect of the system. It is a measurement to determine how achievable the system reaches a given goal. It also includes the **learnability** of the design, its **efficiency**, and **memorability**. (Allison, Hayes, McNulty, Young, 2019). How fast the user can get what a user is looking for, as well as whether users have the freedom and authority to shape their actions and navigate their physical space in the present moment, can also be classified as a factor influencing user satisfaction. (Bairamzadeh & Bolhari, 2010).

Content: is the data, image, information, video, media, and databases stored in the system. Content includes the **completeness**, **accuracy**, and **relevance** of the information stored in the system. (Allison, Hayes, McNulty, Young, 2019).

Functionality: the name functionality seems straightforward. Systems have different functions to do a given task. If a user asks the system to show their grades, the system will not display the year's schedule instead of the grades. It includes the **speed** to get the responses, such as load time, response time, and how **compatible** the system is with the other devices. (Allison, Hayes, McNulty, Young, 2019). Functionality encompasses the way **features** operate to deliver the intended outcomes. Features serve as the operational components within a system, acting as the tools employed to accomplish a specific set of tasks or actions. (Vincent, 2017).

This is summarized in the diagram below.

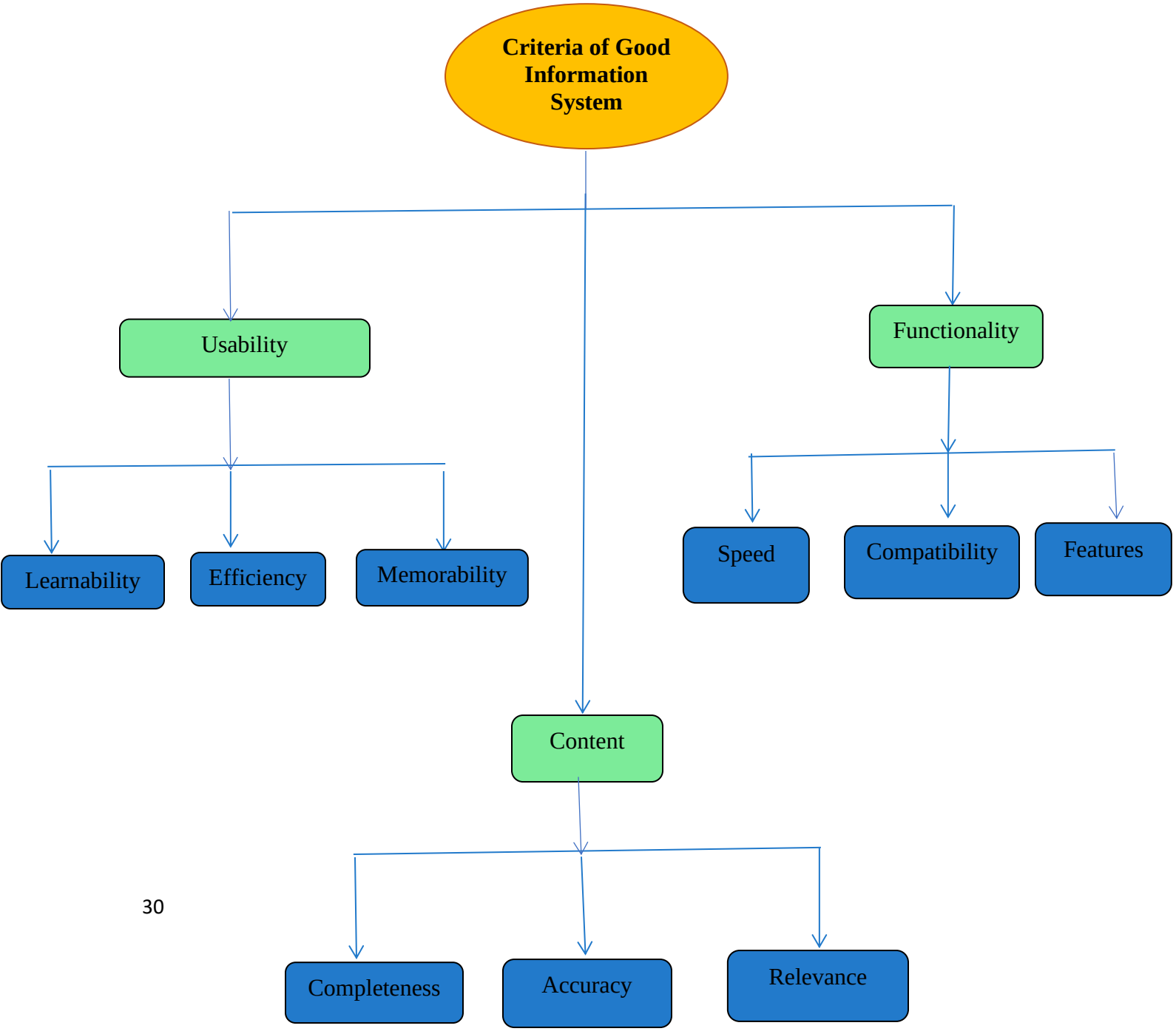


Figure 7: A relationship diagram showing the criteria and sub-criteria of a good information system.

Source: Autor’s own creation

3.7 Collection of Data

The responses were collected through the researcher's personal email after disseminating the survey to selected participants via Microsoft Teams. The survey questions were designed on Google Forms, so it was also possible to see the responses and analytics on Google Forms. However, proper analysis was done using Microsoft Power BI and Excel to understand the variation within the data before creating the persona. Clear instructions were provided to encourage participation. Throughout the survey, ethical considerations were prioritized. Participants were given informed consent material, which assured them confidentiality and emphasized their willingness to participate.

CHAPTER FOUR: ANALYSIS AND DISCUSSION

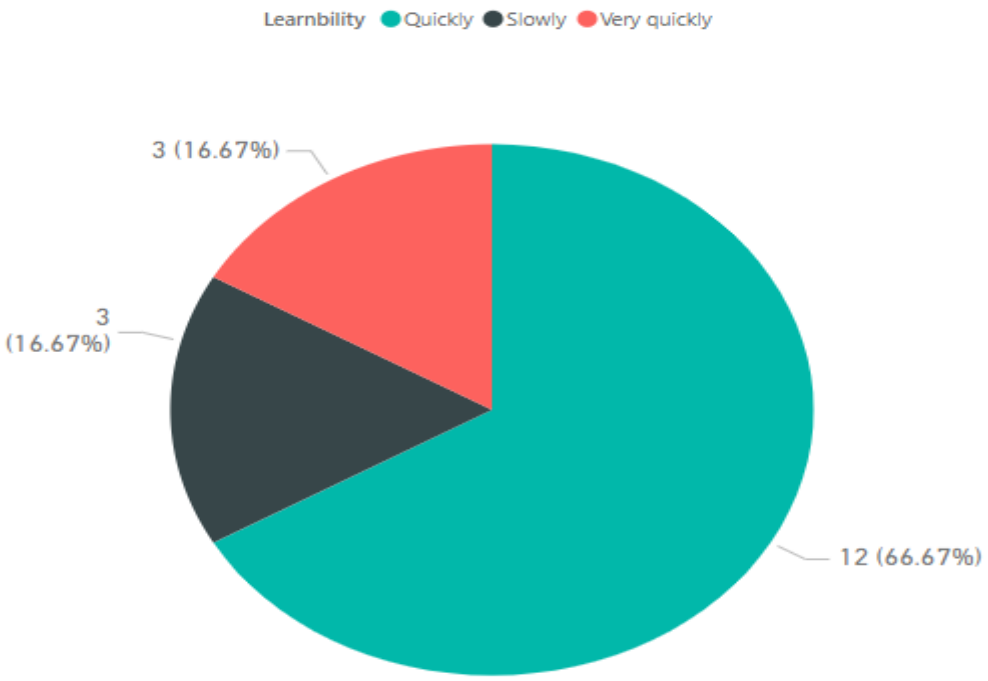
Chapter four will analyze the data that has been collected. As mentioned above, according to the researcher, the questions have been designed based on the criteria of a good information system; three sub-criteria are under each criterion. The survey questions tackled those questions to get the response and answer the research questions.

4.1 Usability

As mentioned earlier in Chapter Three, usability can be defined as learnability, efficiency, and memorability. In information systems, usability refers to how simply and successfully a system may be utilized by its intended users to achieve their goals. It is an integral part of user experience that entails designing and implementing systems in a way that makes them user-friendly and efficient. Usability is especially critical in information systems, where users interact with software, websites, and other digital tools to access, manipulate, and analyze data. (Bairamzadeh & Bolhari, 2010)

4.1.1 Learnability

The ease with which users may grasp and become proficient in utilizing a new system or software is referred to as learnability. It is an essential feature of user experience design that reduces the learning curve for people interacting with a particular information system. (Bairamzadeh & Bolhari, 2010).



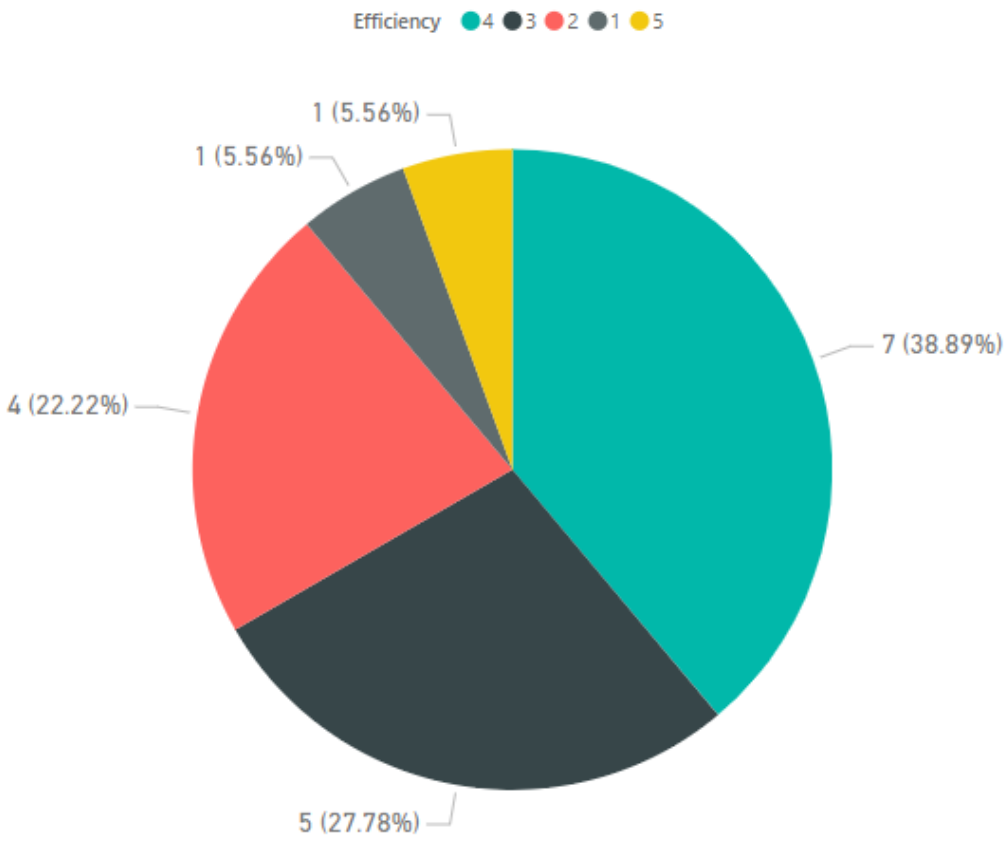
Graph 1: Pie Chart Showing Learnability of IS STAG

Source: Author's own creation

The figure above shows the participants' responses. Out of 18 students, three students (16.67%) said they could understand the system very quickly. The other 12 students (66.67%) said they were not very quick but not slow; they agreed on quick. The other three students (16.67%) said they could not understand the system. More students (66.67% of participants) rated the learnability as quick to learn.

4.1.2 Efficiency

The ability of the system to complete activities and procedures in a timely and resource-effective manner is referred to as efficiency. It entails maximizing resource utilization, avoiding waste, and enhancing performance to obtain the intended results.



Graph 2: Pie Chart Showing Efficiency of IS STAG

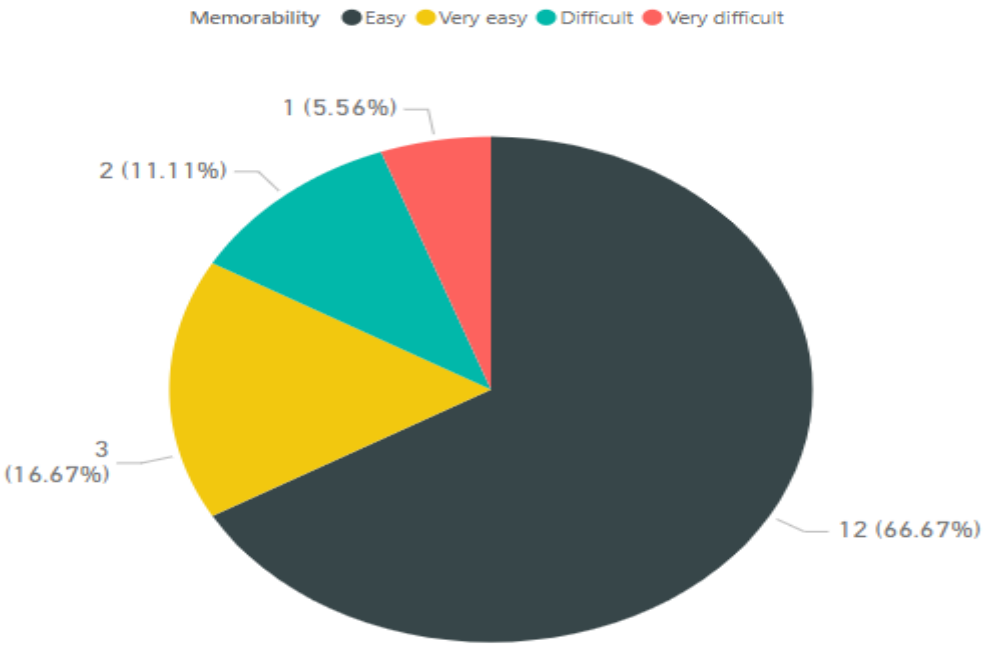
Source: Author's own creation

The above figure shows the participants' responses. They were asked to indicate, as users, how efficient the system is, from very low to very fast. Out of 18 participants, only one student (5.6%) identified the system as very low. Four students (22.2%) said it is not very low, but it is low. Another 5(students 27.8) said it is not law or fast. It is instead somewhere in between(intermediate). Most students, 7 (38.9%), said it is a fast system. The other students (5.6%) identified the system's efficiency as fast. Both extremes (very low and very fast) had one participant. 38.9% of the participants agreed that the system is fast, which means efficient, and that is the highest percentage. Next to fast, intermediate comes with an average of (27.8%).

4.1.3 Memorability

Memorability refers to the ease with which users can remember and recall information related to the system, such as passwords, user interfaces, commands, and processes. It is a crucial aspect of

user experience and system usability. An easily memorable system is likely to be more user-friendly and efficient.



Graph 3: Pie Chart Showing Memorability of IS STAG

Source: Author's own creation

The above figure shows the system's memorability. The participants were asked to tell how easy it was to remember specific actions after some time of non-use. Three out of 18 students (16.7%) said it was very easy to remember. Twelve students (66.7%) identified the system as easy to remember. 2 students (11.1) students said that the system is difficult to remember, and the other one student (5.6%) responded that the system is very difficult to remember after some time of non-use. The highest number of responses agreed on the system's easy memorability.

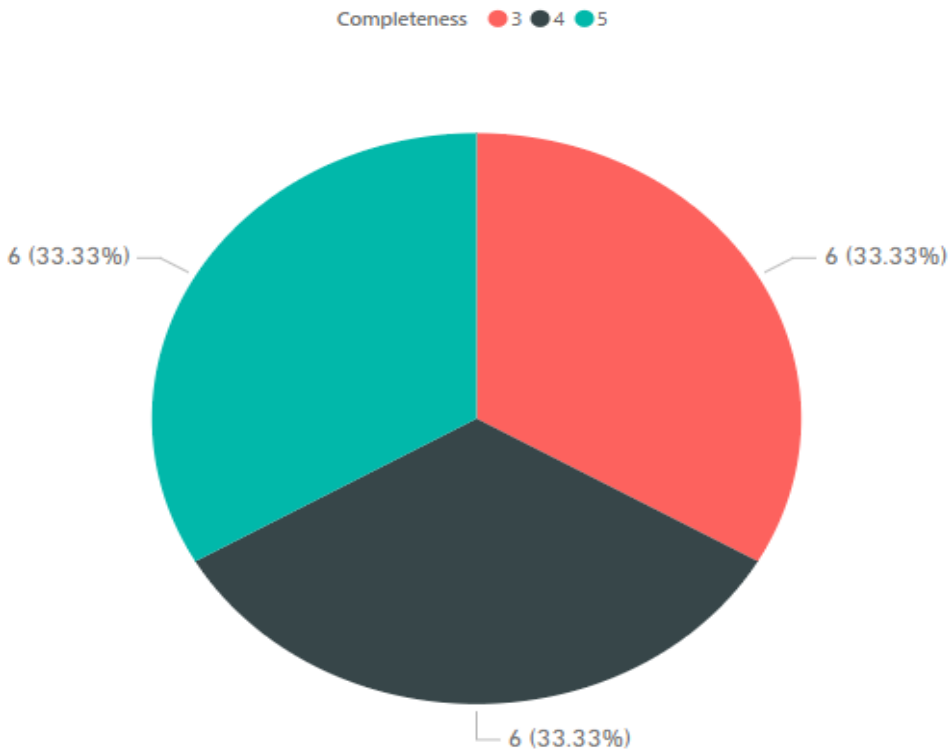
4.2 Content

As the previous chapter explains, according to (Allison, Hayes, McNulty, and Young, 2019), content can be described as completeness, accuracy, and relevance. It refers to the data, information, and media created, stored, processed, and transmitted within the system. (Allison, Hayes, McNulty, Young, 2019). Content can take different forms, including text, images, videos,

audio, etc. The management and utilization of content are essential components of an information system, and they play a crucial role in achieving the system's objectives, according to content explained as completeness, accuracy, and relevance.

4.2.1Completeness

The data or information within the system is comprehensive and covers all necessary aspects or elements. It is a data quality metric that assesses whether the information stored in a system is whole and lacks any missing or incomplete components.



Graph 4: Pie Chart Showing Completeness of IS STAG

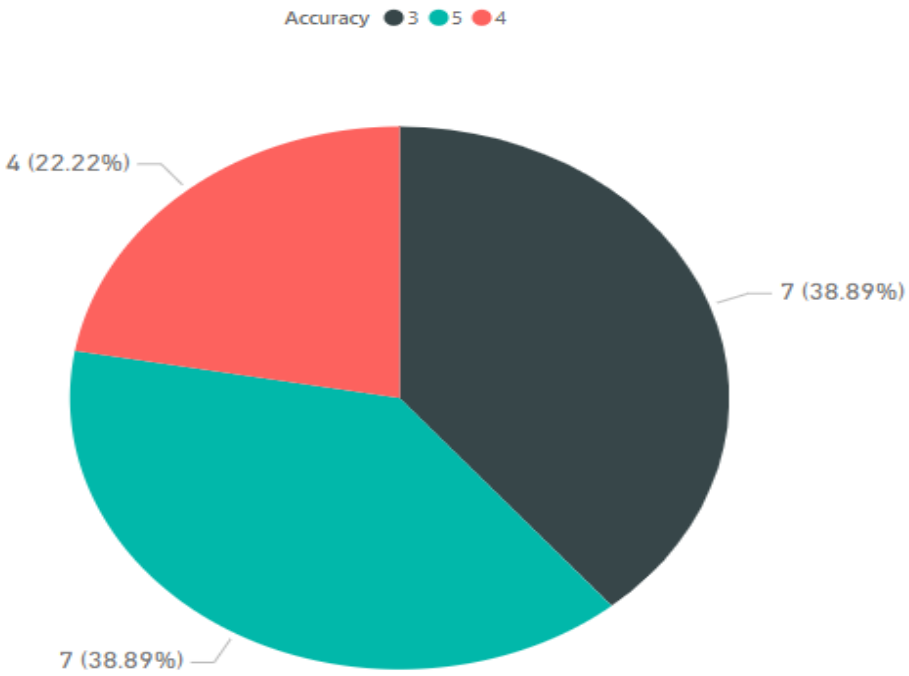
Source: Author’s own creation

The figure above shows participants' responses to related questions about the completeness of the system. The participants were asked to answer if the system is complete in their experience as a user. Even though they were asked to choose from 0-5, which was stated as not complete to very complete, respectively. No participant chose the first option from 0-2. The rest of the choices were

chosen equally. 6students (33.3%) chose mostly complete, the same number of students, 6 of them (33.3%) said the system is complete, and the rest of 6 students (33.3%) agreed that the system is complete.

4.2.2 Accuracy

The degree of correctness or precision in the system's data and information processed or generated. It is crucial because it indicates how well the system's output can align with the actual or expected values. It starts with the input data. If the input data is inaccurate, it can lead to the production being incorrect or wrong.



Graph 5: Pie Chart Showing Accuracy of IS STAG

Source: Author's own creation

The above figure shows participants' responses to a question about the system's accuracy and their satisfaction with its accuracy and quality. They were asked to choose 0-5, from unsatisfied to very satisfied. Any participant did not choose choses from 0-2. Seven students (38.9%) of the

participants chose three, which means that they are partially satisfied. The other four students (22.2%) said they were satisfied, while the rest of the participants, 7students (38.9%) responded very satisfied with the system's accuracy.

4.2.3 Relevance

The phrase relevance relates to the importance and applicability of information or data in a specific scenario, task, or decision-making process. Relevance is essential in ensuring that information systems give users valuable and meaningful output.

9. Have you ever experienced frustration due to a system displaying irrelevant information instead of the specific task or data you requested? If yes, please explain your experience.
No
None
No
No
No
No
No
No
No
Yes, multiple instances which I can't vividly remember.
No, everything's fine
No
No
Yes, sometimes the system displyed notification only in czech language
No
No
No
No

Table 1: Table Showing Relevance of IS STAG

Source: Author's own creation

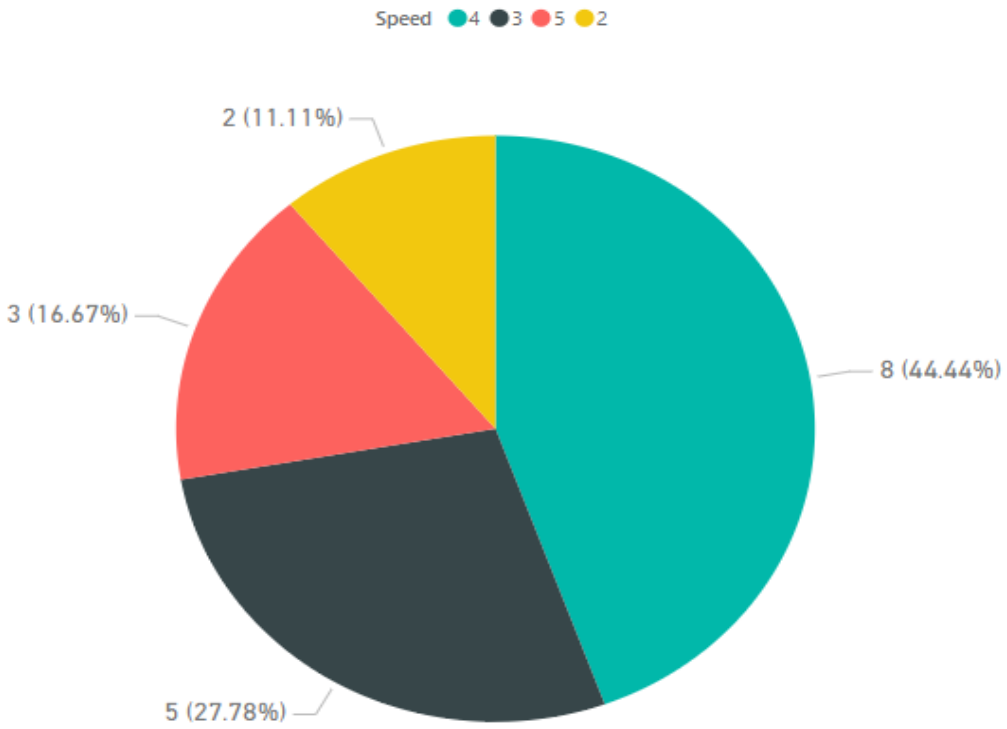
The table above shows participants' responses to a question related to the relevance of the information in the system. Out of 18 participants, 16 (88.8%) said they did not encounter any irrelevant information while using the system. One of the participants (5.6%) stated that it had happened, but the person could not remember the exact occurrence. The last student (5.6%) said that sometimes the system notifies things only in the Czech language, which is irrelevant to a user.

4.3 Functionality

As mentioned earlier in Chapter 3, according to (Allison, Hayes, McNulty, and Young, 2019), functionality can be defined as speed, compatibility, and features. The variety of activities and capabilities that a software application or system may use to suit the needs of its users is referred to as functionality. It includes the features, tasks, and services the system intends to provide. (Vincent, 2017). An information system's functionality is critical in evaluating its effectiveness in supporting business operations, attaining corporate goals, and meeting user expectations.

4.3.1 Speed

Speed is the rate at which data or information is processed, sent, or accessed. It is a vital performance parameter that directly impacts an information system's efficiency and responsiveness.



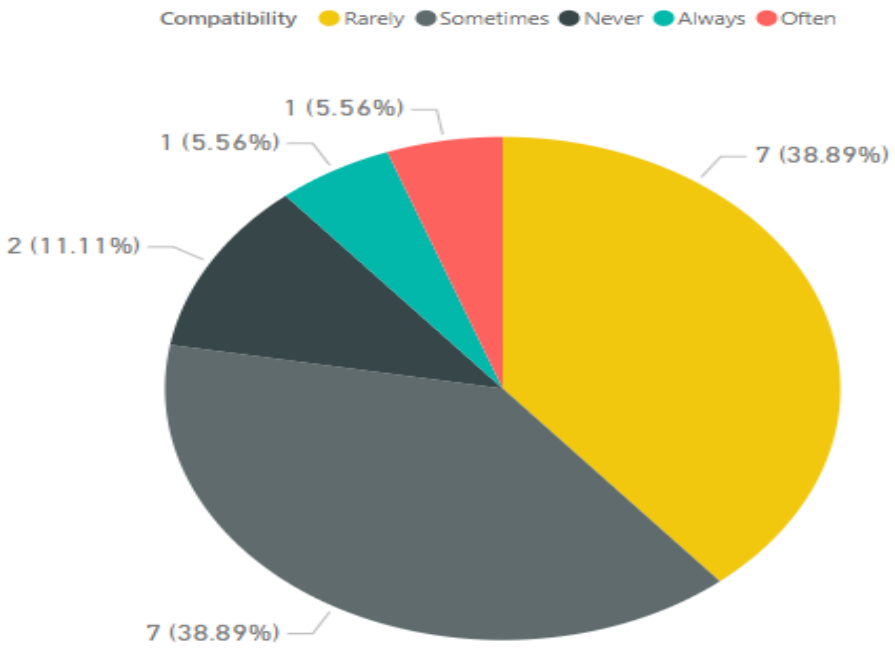
Graph 6: Pie Chart Showing Speed of IS STAG

Source: Author's own creation

The figure above shows respondents' responses to a question related to the speed of the system and their satisfaction with it. They were asked to choose from 0-5, not satisfied-very satisfied. No Participant has chosen 0 and one. 2 students (11.1%) said they were a little satisfied with the system's response time. Five students (27.8%) responded that they were partially satisfied with the system's speed. Eight students (44.4%) agreed they were satisfied with the system's speed. The other three students (16.6%) were very satisfied with the system's response time. The option satisfied has the highest percentage out of all options.

4.3.2 Compatibility

Diverse hardware, software, or systems can coexist agreeably and successfully. It guarantees that the many components of an information system communicate smoothly, share data, and fulfil their intended roles without error. Building and maintaining a well-functioning and integrated information technology environment requires compatibility. (Allison, Hayes, McNulty, Young, 2019).



Graph 7: Pie Chart Showing Compatibility of IS STAG

Source: Author's own creation

The above figure indicates how often the participants encounter compatibility issues using the system. Out of 18 participants, one participant (5.6%) said often. The other two participants (11.1%) said they never encountered any issues. Seven participants (38.9%) responded, saying rarely. The other 7 participants (38.9%) said they encounter compatibility issues sometimes, and one participant said they always do. The two alternatives have the highest rate, which is rarely and sometimes.

4.3.3 Features

Specific functionalities or characteristics that a software application, platform, or system possesses. These features are designed to meet specific requirements, address user needs, and enhance the overall performance of the information system. (Vincent, 2017).

Under the features criteria, the participants were asked two questions. One was about the current system. The second question was about the challenges they have faced using the features. The second question was to state the feature they wish to see in the system as a feature as an international student. It helps the researcher to identify the participants' expectations as international students and users of the information system of Pardubice University.

Participants Responses

5. Did you encounter any challenges in accessing or using certain features of the system? If yes, please explain the challenges.
No
Language barrier as I stated above
No
No
No
No i havent faced any challenges
No
Difficult to access other thesis work as a reference material
No
Yes, how to upload my final thesis for instance was not easy, for which I had to get help from the coordinator to complete.
No
No
No
No
No
Some transitions and links are not loading in English.
No
No

Table 2: Table Showing Challenges of the Features of IS STAG

Source: Author's own creation

The table above shows the challenges that the users of information systems face in Pardubice University international students. Of 18 participants, 14 (77.78%) responded, saying they faced no challenges using the information system features. The other two participants (11.11%) mentioned finding some data using the features was difficult. Both mentioned the thesis as an example; one said that it was challenging to upload my thesis using the feature, so I had to ask for help from my coordinator, and the other said it was difficult to find other thesis materials to use as a reference. The other two students (11.11%) said it was challenging because of the language barrier.

Participants Responses

15. Are there any specific features or functionalities you would like to see implemented to better manage the system's content as a foreign student?
No
All content should be such that it change change to English.
No
Self-registration option for courses
No
Not that i thought of
Boost the speed when accessing the system
Change the interface to properly organized dashboards
Notification setup and chatbot
Yes, an option to chat a live person or AI.
I don't think so
No
No, it fits to me very well
Permanet language setup option
Notification or Reminder
Yes, these are some of the features: multilingual support, simple and clear navigation, and integration of a chatbot.
Guide of use for students
No

Table 3: Table Showing Recommendations of Features of IS STAG

Source: Author's own creation

The table above shows the recommendations of international students at Pardubice University for users of information systems. These are some of their expectations or features that they wish to see in the information system. Out of 18 participants, 8 (44.45%) responded that they had no recommendations. The remaining 10 participants (55.55%) mentioned different features they

wished to see in the information system—for example, permanent language set-up, self-registration for courses, chatbot, and simple and straightforward navigation.

Issue of language translation

For an international student, language is crucial. Although IS STAG has an English language setup, some words remain Czech when it is changed to English. Also, some notifications pop up in Czech, making it difficult to make decisions quickly. Language setup makes the system more usable.

Interface of IS STAG

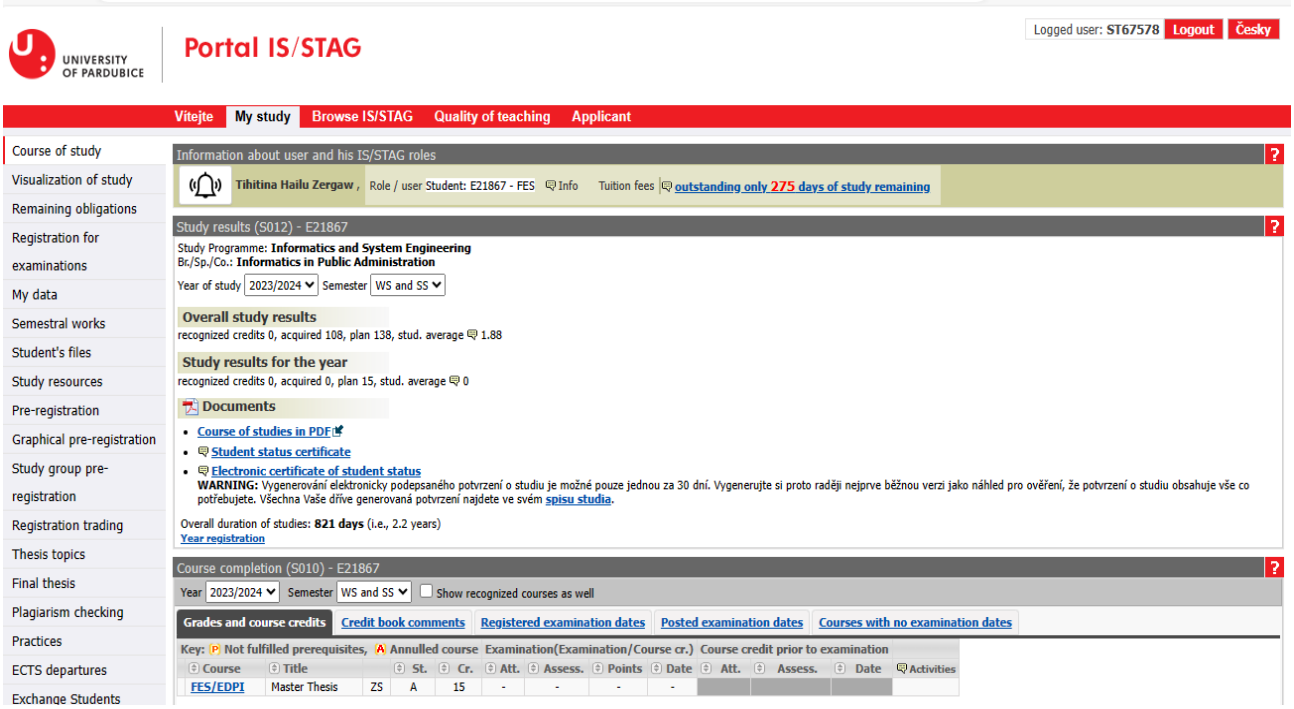


Figure 8:IS STAG Interface

Source: https://portal.upce.cz/portal/studium/moje-studium

The figure above shows the IS STAG interface. Under the 'My Study' feature, there is a feature called 'Course of study'. The information is displayed under the "course of the study". The information under 'WARNING' remains in Czech, while the rest is in English. The features mentioned are crucial for the system based on the three described good information system criteria.

Issue of self-registration of courses

The Czech version IS STAG has features to register for the semestral courses. The system allows the students to choose the courses they would like to take and the dates and times that are convenient for them. Whereas in the English version of the system, the feature is not visible. International students cannot register by themselves; going to an international office is necessary. The responsible person will post the schedule for the year.

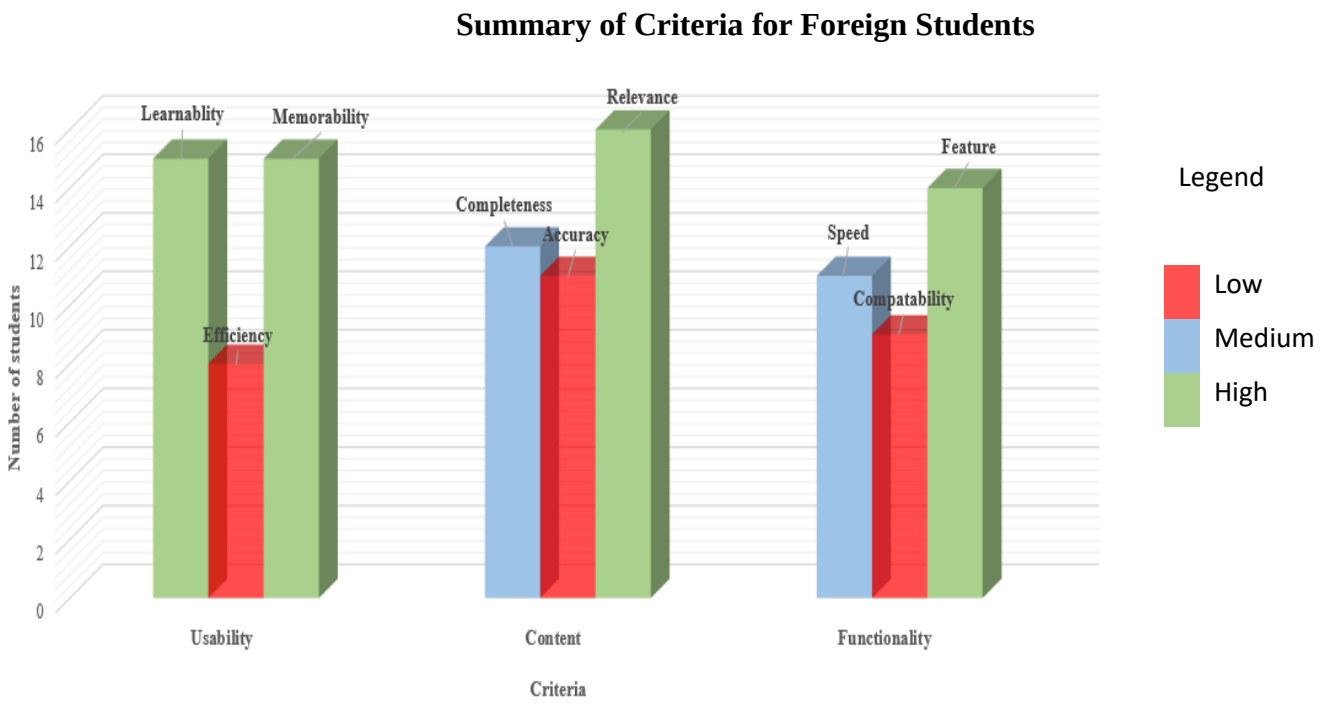
Lack of assistant

International students have different levels of knowledge and experience with information technology. Getting what a student is explicitly looking for might take time and effort.

Two of the participants mentioned their suffering when they were trying to submit their thesis. They even said that they could not do it by themselves, so they had to ask for help from their coordinator. Another raised example was that getting thesis materials to use as references was very difficult. Lack of assistance makes the system non-user friendly.

Issue of simple and straightforward navigation

As stated above, international students have different knowledge levels regarding information systems. For those familiar with technology, using IS STAG is a bit difficult, especially students from some parts of Africa (high school graduates from Africa, admitted into bachelor level) who are not too familiar with certain levels of technology IS STAG.

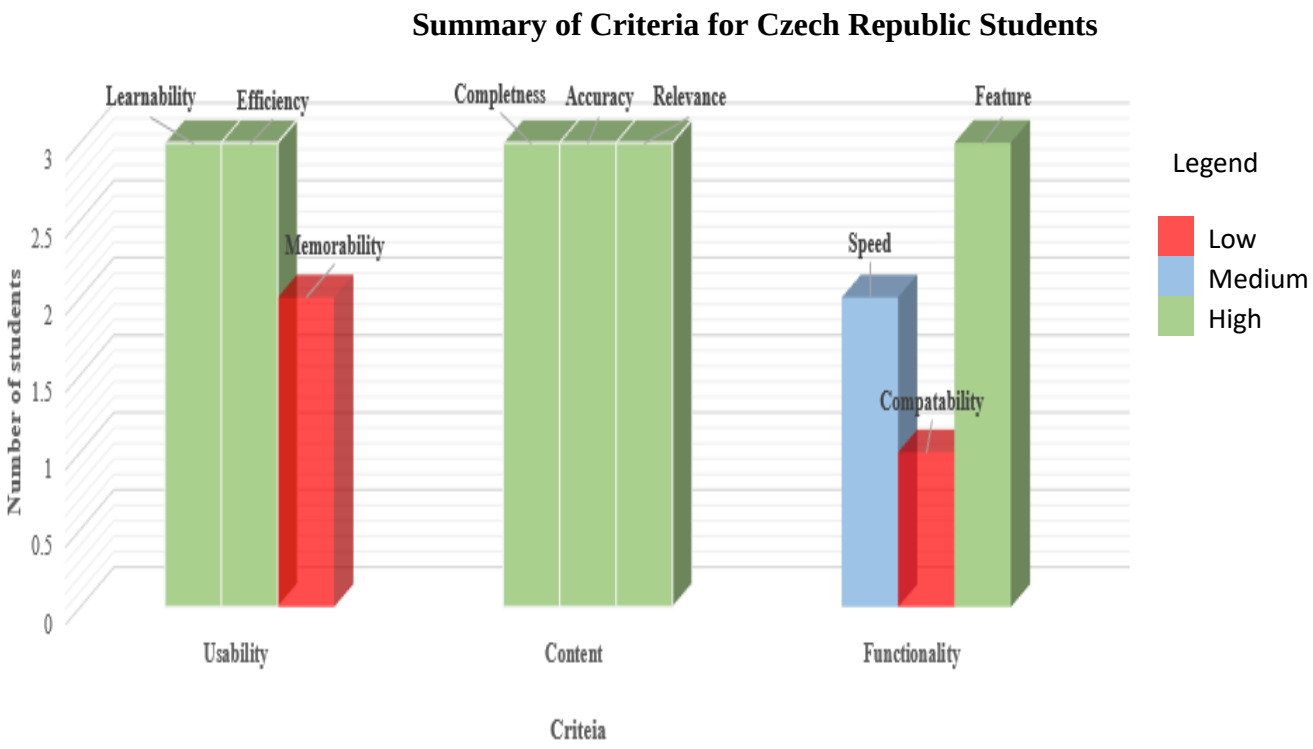


Graph 8: Column Chart Showing Comparison of Criteria Based on Their Sub-Criteria of the Responses of Foreign Students

Source: Author's own creation

As the above figure shows, the content sub-criteria, which is relevant, has the highest number of positive responses. However, as a summary of the three criteria, the sub-criterion of usability has a higher number of strong positive responses. Therefore, the selected international students at Pardubice University, users of information systems, see the IS STAG as more usable because of the strong positive responses to the system's learnability and memorability rather than content and functionality.

Although this paper focuses on international students at Pardubice University, the questionnaire was sent to three Czech students for comparison purposes. The figure below demonstrates the strongly positive responses of the three randomly selected Czech students. The same questions were sent to the international students and Czech students. Their responses compared how they see the system as a user and how the international students see it as a user.



Graph 9: Column Chart Showing Comparison of Criteria Based on Their Sub-Criteria of the Responses of Czech Students

Source: Author's own creation

The figure above shows three Czech student users of Pardubice University information system responses in terms of three criteria and three sub-criteria each. As the chart demonstrates, out of the three criteria, content has the highest number of strong positive responses than the other criteria.

Based on Figure 16 and Figure 17, international students at Pardubice University are users of information systems, and Czech students at Pardubice University users of information system has different user experiences regarding the Pardubice University information system STAG. Per the participants' strong positive responses, international students at Pardubice University, users of the information system, identified the system as more usable. In contrast, Czech students at Pardubice University, users of the information system, chose the criteria content out of the three. But when we compare it generally, according to the responses, the information system of Pardubice University IS STAG is more favourable for Czech students than it is for international students.

It was also possible to observe the Czech version of the system regarding how students register for courses. It allows students to pick their courses, convenient dates, and times. This functionality is separate from the English version. The international students are obligated to follow the schedule sent to them.

CHAPTER FIVE: DEVELOPMENT OF PERSONA AND RECOMMENDATION TO IDENTIFIED ISSUES

Personas are fictitious representations of user segments based on actual data reflecting their behavior. They aim to put those in charge of making company decisions in the customer's shoes. (Jennifer, 2021). The development of persona was the main aim of this paper. The persona was developed for foreign student users of information systems at Pardubice University. Since they are the user of the Pardubice University information system, the paper focuses on international students. To design the persona, the users have been classified into three groups. Those are bachelor's students, Master's students, and Doctoral students. The randomly selected participants for data gathering were nine master's students, six bachelor's students, three doctoral students, and 18 international students. Analyzing their data made it possible to find their pain points, expectations, demographics, and the information necessary to develop a persona. The pictures and names in the generated persona below are AI-generated. However, the expectations and pain points are based on actual data.

5.1 Persona of a Bachelor Student

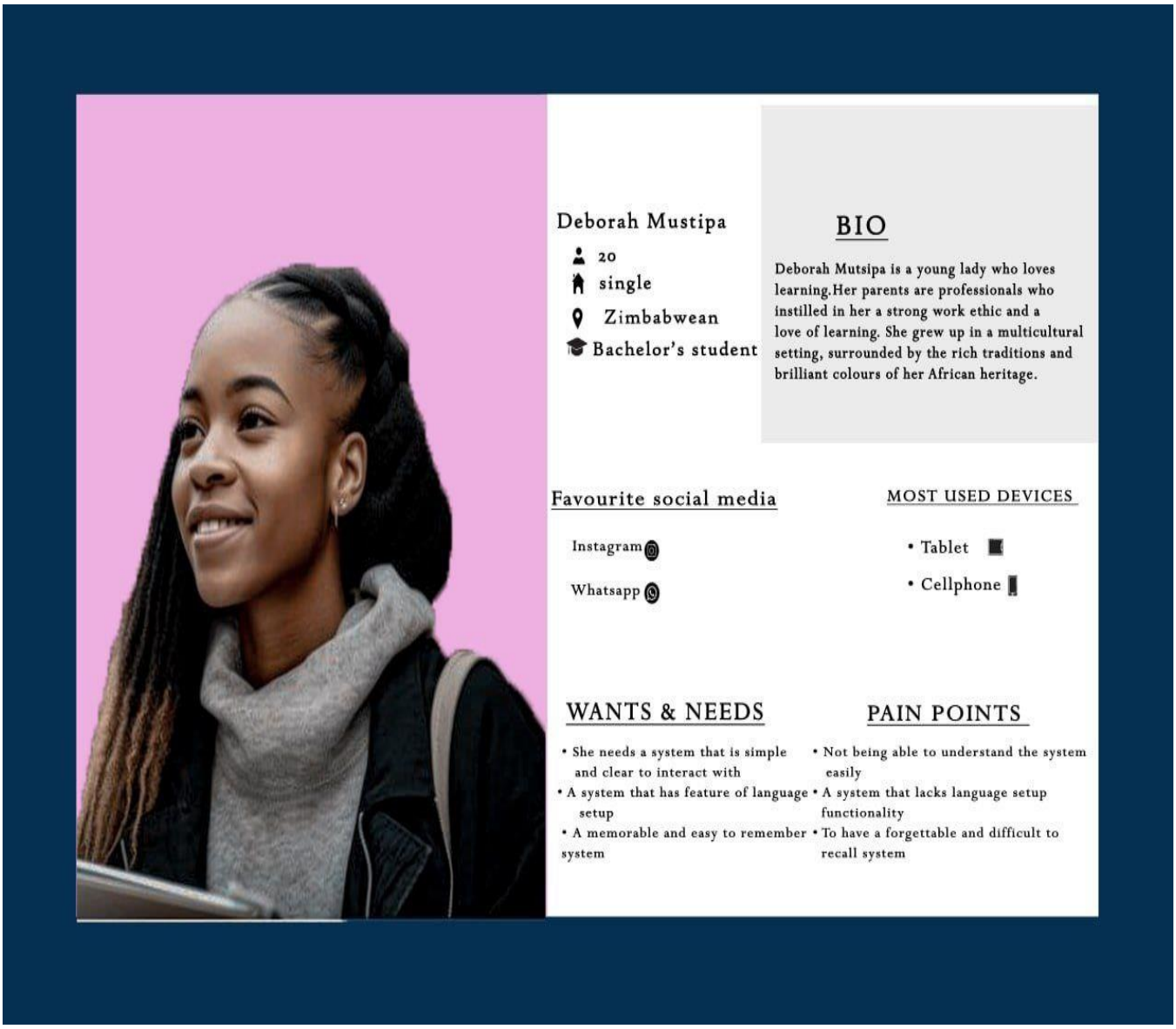


Figure 9: Persona of Foreign Student User of Information Systems at the University of Pardubice

Source: Author's own creation

The figure above demonstrates the background, bio, favorite social media, most used devices, wants and needs, and pain points of the University of Pardubice fictitious information system user, a bachelor's student.

5.2 Persona of a Master Student

Figure 10: Persona of Foreign Student User of Information Systems at the University of Pardubice

Source: Author's own creation

The figure above depicts the background, bio, favorite social media, most used devices, wants and needs, and pain points of a fictitious University of Pardubice information system user, a master's student.

5.3 Persona of a Doctoral Student

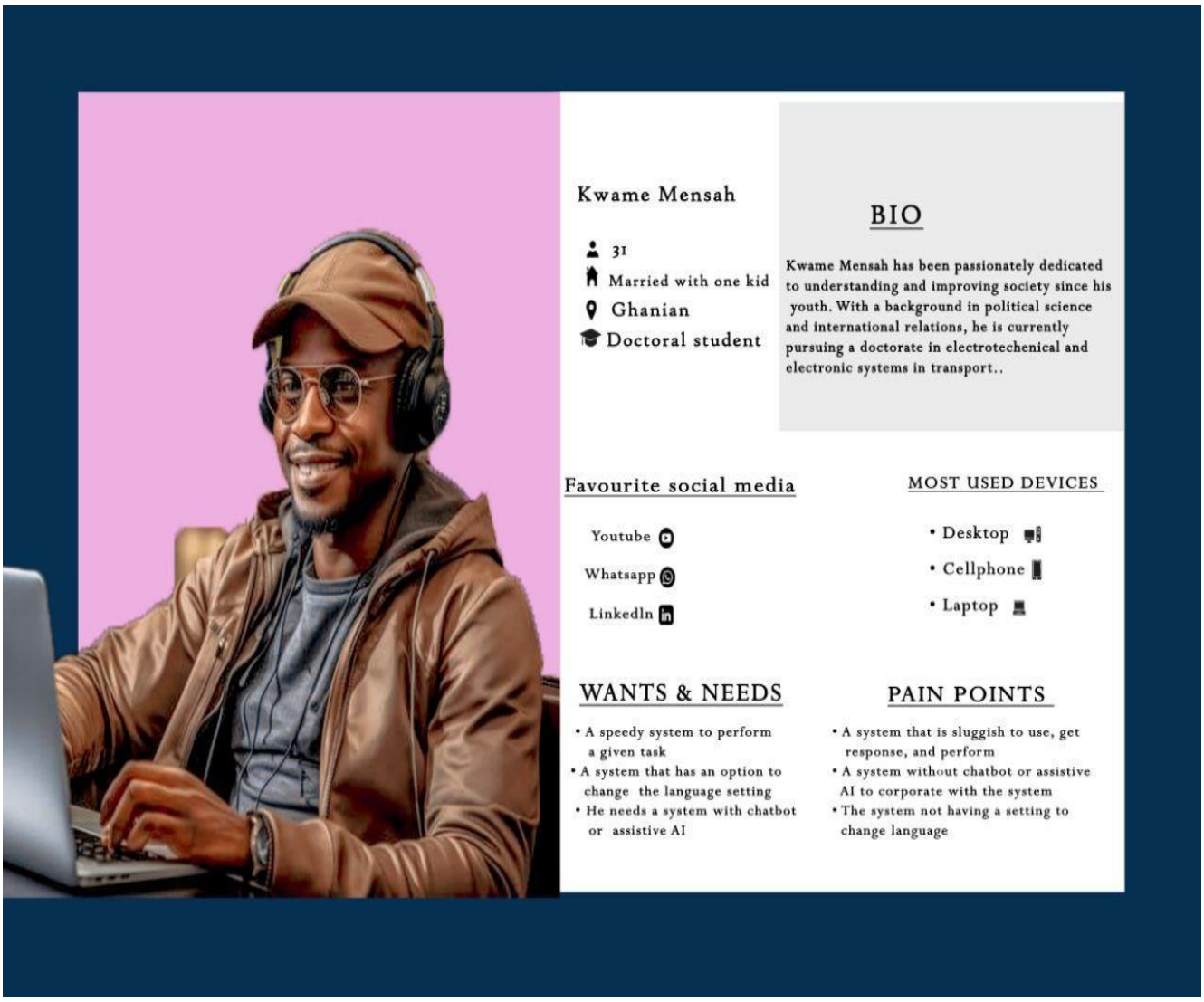


Figure 11: Persona of Foreign Student Users of Information Systems at the University of Pardubice

Source: Author's own creation

The figure above represents the background, bio, favorite social media, most used devices, wants and needs, and pain points of a fictitious information system user, a doctoral student at the University of Pardubice. The generated personas help to understand their expectation as international students at the University of Pardubice users of information systems. Although the images and names are AI-generated, the data is actual and has been collected from current system

users. Persona is used to identify their expectations and requirements, know their pain points, and make it user centered.

Summary of the Developed Personas

Personas help in putting the organization in the shoes of the user. It is possible to determine which user requires what based on the patterns. The user groups in this thesis are separated into three by developing personas based on actual data. It was possible to follow and obtain the pattern by using the responses. Because most of the responders are from Africa, the similarities are striking. As a result, it was decided to create a persona by grouping the users by academic level. Bachelors, Masters, and Doctoral students are at the levels stated above.

It helps the responsible person consider addressing the student's expectations and frustrations because it focuses on information systems. They have different expectations, as illustrated in Figures 8, 9, and 10. Nonetheless, all three levels share a common expectation: a linguistic arrangement in which they can adjust the language and every piece of information can change to the chosen language. Another expectation shared by Master's and Doctoral students is a chatbot-assisted system. As stated in the persona, a bachelor student wants to have a simple system to interact with and a system that is memorable and easy to recall.

The master's student is happy about the fact that the system is compatible with many devices however, He wants a system that enables him to register for the courses by himself. The doctoral student desires a fast and efficient system. They all have shared and distinct expectations. The generated persona helps to meet their requirements by identifying and stating their expectations and frustrations.

5.4 Suggested Solutions to Identified Issues of the System

For the upgrade of the system IS STAG, it is recommended to consider these challenges and recommendations identified by international student users of the information system as a requirement of the system. These recommendations were defined as a cause of most problems that international student users of the information system of Pardubice University have faced.

Language setup

- The authorities should ensure it is completely changed to English when English is selected.

Registering for courses

- It is suggested that the appropriate authority includes registering courses by oneself to the English version of the system.

Chatbot or assistive AI

- It is suggested that adding a chatbot feature would benefit international students by assisting them in interacting with the system quickly.

Simple and clear navigation

- It is recommended that the authorities responsible for the system enhance it to be more uncomplicated and more straightforward to navigate. A more explicit interface and an easy-to-navigate system would help the students understand the system efficiently.

5.5 Limitation of the Study and Recommendation to the Limitation

- The limitation of the study was the issue of confidentiality. Due to the issue of confidentiality the researcher was not given access to the information of students that exists within the information system of the school. As a result, the research conducted the survey to obtain primary data for analysis.
- Most of the participants (90%) were Africans.
- This paper assigned the qualitative method as the most suitable method for identifying a persona for international student users of information systems of Pardubice University. This method is usable manually with a smaller number of participants.

  Recommendation to the limitations

- For future related works, I suggest adopting the other methods, quantitative and mixed approach, based on the availability of the data and access to analysing the data automatically.
- I recommend that different nationalities should be included in future study to ensure more balanced approach.

CONCLUSION

Persona is a user-centered design. The main characters of this paper are international student users of information systems at the University of Pardubice. In the pursuit of identifying the most suitable method for defining the main target group of users, mainly focusing on international student users of information systems at Pardubice University, this thesis embarked on a comprehensive research journey. The primary objective was to develop a persona that could serve as a valuable tool for understanding the expectations and challenges faced by this specific user group.

Numerous articles have been written about three approaches to developing a persona in a different scenario. Those are qualitative, quantitative, and mixed approaches. This paper adopted the qualitative approach because of the convenient data collection and analysis method. A survey was the chosen method to collect the data. The reason was the availability of the participants and the researcher. To design the survey questionnaire, it was crucial to set criteria. Criteria of good information system. Three criteria were chosen to measure the goodness of the system. There were three sub-criteria under each criterion. The questionnaire was sent to eighteen international students and three Czech students. The Czech student's participation was needed only to compare the results.

The research questions guided the exploration of the fundamental expectations and requirements, critical challenges, and designing an effective persona identification system tailored for international student users of Pardubice University's information systems. As the research unfolded, it became evident that selecting an appropriate method for persona creation was vital to the study's success. Based on the actual data analysis, the persona was developed for international student users of information systems of the University of Pardubice.

Therefore, the research finds that the international student users of Pardubice University's information systems faced language barriers, lack of assistance navigating the system, inability to register for the courses by themselves, and the system needing to be seen as simple and straightforward to navigate.

Reference

1. Allison, R., Hayes, C., McNulty, C., & Young, V. (2019). A Comprehensive Framework to Evaluate Websites: Literature Review and Development of GoodWeb. JMIR Form Res, 3(4), e14372. https://doi.org/10.2196/14372
2. Ardito, C., Lanzilotti, R., Malizia, A., Petrie, H., Piccinno, A., Desolda, G., & Inkpen, K. (Eds.). (2021). Human-Computer Interaction–INTERACT 2021: 18th IFIP TC 13 International Conference, Bari, Italy, August 30–September 3, 2021, Proceedings, Part II (Vol. 12933). Springer Nature.
3. Ari, D. (2019). How to Use Systems Engineering to Build a Successful Web App. Retrieved from https://www.freecodecamp.org/news/how-to-use-systems-engineering-to-build-a-successful-web-app-6f8bda2f7fc4/
4. Billestrup, J., Stage, J., Bruun, A., Nielsen, L., & Nielsen, K. S. (2014). Creating and using personas in software development: Experiences from practice. Journal of Usability Studies, 9(3), 119-139. https://uxpajournal.org/using-personas-in-software-development-experiences-from-practice/
5. Bourgeois, D. T., Smith, J. L., Wang, S., & Mortati, J. (2019). Information Systems for Business and Beyond. Open Textbooks. https://digitalcommons.biola.edu/open-textbooks/1
6. Buyer persona vs. target group: what's what? | DMEXCO. (n.d.).
7. Classification System in Nazi Concentration Camps. Retrieved from https://encyclopedia.ushmm.org/content/en/article/classification-system-in-nazi-concentration-camps.
8. Cooper, A. (2003, August 1). The Origin of Personas. Retrieved from http://www.cooper.com/journal/2003/08/the_origin_of_personas.html.
9. Coursera. (2023). What Is a Systems Engineer (and How Do I Become One)? Retrieved from https://www.coursera.org/articles/systems-engineer.
10. Dam, R. F., & Siang, T. Y. (2022). Personas – A Simple Introduction. Retrieved from https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them.

11. David, A. S., & Tait, A. R. (2019). Survey Research. Anesthesiology, 130, 192–202. https://doi.org/10.1097/ALN.0000000000002436
12. Doing-projects.org. (n.d.). Benefits of Systems Engineering. Retrieved from http://wiki.doing-projects.org/index.php/Benefits_of_systems_engineering.
13. Dori, D., Griego, R., Jackson, S., Krob, D., Martin, J., McKinney, D., … Sillitto, H. (2019). Systems Engineering and System Definitions. INCOSE.
14. Elastic Path Team. (2022). Customer Personas: What Are They and Why You Should Care About Them. Retrieved from https://www.elasticpath.com/blog/customer-personas-101.
15. Eldeeb, G., & Mohamed, M. (2020). Understanding the Transit Market: A Persona-Based Approach for Preferences Quantification. Sustainability, 12(9), 3863. https://doi.org/10.3390/su12093863
16. Faller, P. (2019). Putting Personas to Work in UX Design: What They Are and Why They're Important. Retrieved from https://xd.adobe.com/ideas/process/user-research/putting-personas-to-work-in-ux-design/.
17. Forum One. (2019). The elements of a persona. https://www.forumone.com/insights/blog/elements-persona/
18. Francis, W. (n.d.). Purpose and benefit of using personas. Digital Marketing Institute. https://digitalmarketinginstitute.com/resources/lessons/content-marketing_purpose-and-benefit-of-using-personas
19. Getting to know your customers… target groups vs. personas. | by ITR8 Berlin | ITR8 Life | Medium.
20. Gregersen, E. (2018, March 19). 5 Components of Information Systems. Encyclopedia Britannica. https://www.britannica.com/story/5-components-of-information-systems
21. Hao Tan, Shenglan Peng, Jia-Xin Liu, Chun-Peng Zhu & Fan Zhou. (2022) Generating Personas for Products on social media: A Mixed Method to Analyze Online Users. *International Journal of Human–Computer Interaction* 38:13, pages 1255-1266.
22. How to Create Personas: Three Persona Creation Methodologies with Implications for Practical Employment. Bernard J. Jansen, Soon-Gyo Jung, Lene Nielsen, Kathleen W. Guan, Joni Salminen.

23. Interaction Design Foundation. (n.d.). Personas. Retrieved from https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/personas#heading_Four_different_perspectives.
24. Interaction Design Foundation. (n.d.). What is interaction design? https://www.interaction-design.org/literature/topics/interaction-design
25. Jain, P., Djambi, S., & Wyatt, J. (2019). Creating Value with Proto-Research Persona Development. In: Nah, FH., Siau, K. (eds) HCI in Business, Government and Organizations. Information Systems and Analytics. HCII 2019. Lecture Notes in Computer Science (), vol 11589. Springer, Cham. https://doi.org/10.1007/978-3-030-22338-0_6
26. Jandros've, D. (2023). 10 Best Persona Examples and How to Create Your Own. Retrieved from https://marketsplash.com/persona-examples/.
27. Jansen, B. J., Salminen, J. O., & Jung, S. G. (2020). Data-driven personas for enhanced user understanding: Combining empathy with rationality for better insights to analytics. Data and Information Management, 4(1), 1-17.
28. Jansen, J. (2021, March 13). Elements of a persona profile. Qatari Computing Research Institute. https://persona.qcri.org/blog/elements-of-a-persona-profile/
29. Jansen, J., Jung, S. G., Salminen, J., Guan, K., & Nielsen, L. (2021). Strengths and Weaknesses of Persona Creation Methods: Guidelines and Opportunities for Digital Innovations.
30. Lee, J. H., Kim, Y. M., Rhiu, I., & Yun, M. H. (2021). A Persona-Based Approach for Identifying Accessibility Issues in Elderly and Disabled Users' Interaction with Home Appliances. Applied Sciences, 11(1), 368. https://doi.org/10.3390/app11010368
31. Market Segmentation: Definition, Example, Types, Benefits. Evan Traver. (2023, October 31).
32. NASA. (n.d.). 2.0 Fundamentals of Systems Engineering. Retrieved from https://www.nasa.gov/seh/2-fundamentals.
33. Nielsen, L. (2013). Personas-user focused design (Vol. 1373). London: Springer.
34. O'Connor, K. (2011). Personas: The Foundation of a Great User Experience. Retrieved from https://uxmag.com/articles/personas-the-foundation-of-a-great-user-experience.

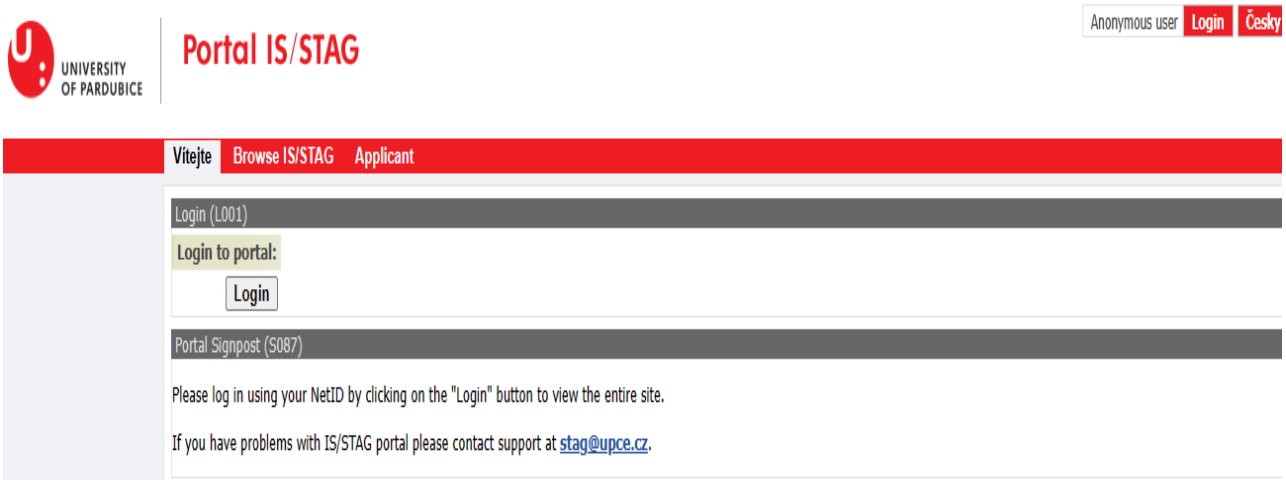
35. N. Tu et al., "Combine Qualitative and Quantitative Methods to Create Persona," 2010 3rd International Conference on Information Management, Innovation Management and Industrial Engineering, Kunming, China, 2010, pp. 597-603, doi: 10.1109/ICIII.2010.463.
36. Personas. (n.d.). Retrieved from https://www.usability.gov/how-to-and-tools/methods/personas.html.
37. Pontius, N. (2023). What are RFID tags? Learn how RFID tags work, what they're used for, and some of the disadvantages of RFID technology. Camcode. https://www.camcode.com/blog/what-are-rfid-tags/
38. Rauterberg, M. (Ed.). (2021). Culture and Computing. Design Thinking and Cultural Computing: 9th International Conference, C&C 2021, Held as Part of the 23rd HCI International Conference, HCII 2021, Virtual Event, July 24–29, 2021, Proceedings, Part II (Vol. 12795). Springer Nature.
39. Retinal Scanning. (n.d.). Retrieved from https://www.innovatrics.com/glossary/iris-retinal-scanning/.
40. Ruiz, P. H., Agredo-Delgado, V., & Kawamoto, A. L. S. (2011). Human-computer interaction.
41. Salminen J, Santos J, Jung S and Jansen B. (2023). How does an imaginary persona's attractiveness affect designers' perceptions and IT solutions? An experimental study on users' remote working needs. Information Technology & People. 10.1108/ITP-09-2022-0729. 36:8. (196-225). Online publication date: 18-Dec-2023.
42. S. Bairamzadeh and A. Bolhari, "Investigating factors affecting students' satisfaction of university websites," 2010 3rd International Conference on Computer Science and Information Technology, Chengdu, China, 2010, pp. 469-473, doi: 10.1109/ICCSIT.2010.5565050.
43. Sim, J., Waterfield, J. (2019). Focus group methodology: some ethical challenges. Qual Quant 53, 3003–3022. https://doi.org/10.1007/s11135-019-00914-5
44. Sim, W. W., & Brouse, P. S. (2014). Empowering Requirements Engineering Activities with Personas.
45. Smart Insights. (n.d.). Marketing Personas. Retrieved from https://www.smartinsights.com/persuasion-marketing/marketing-personas/.

46. Solomon, J. (2023). 5 easy ways to identify your buyer persona among the crowd. Charge bee. https://www.chargebee.com/blog/5-easy-ways-identify-buyer-persona-crowd/
47. TCRP. (2011). Understanding the What, why, and Benefits of Systems Engineering. Retrieved from http://tcrp-teap.pbworks.com/w/page/1976.
48. Tomasz Miaskiewicz, Kenneth A. Kozar. (2011). Personas and user-centered design: How can personas benefit product design processes? Design Studies, 32(5), 417-430. https://doi.org/10.1016/j.destud.2011.03.003.
49. U.S. Department of Agriculture's (USDA) Economic Research Service (ERS). (n.d.). Personas. Retrieved from https://www.usability.gov/how-to-and-tools/methods/personas.html.
50. User personas: What are they and why they matter in UX design. Kylie Goldstein.
51. Wells, J. (2022). 5 Persona examples you can use in any industry [+ Free Persona Template]. Brafton. https://www.brafton.com/blog/strategy/persona-examples-from-around-the-web-and-why-they-work/

Appendix

Appendix A: IS/STAG of Czech and English Interface

Source: https://portal.upce.cz/portal/studium/index.html?pc_lang=cs



Source: https://portal.upce.cz/portal/studium/index.html?pc_lang=en

Appendix B: Questionnaire For Participants

Survey questions

Dear participants,

Thank you for taking the time to participate in the Persona Identification for Information System User Survey paper. Your insights are invaluable to me, and I greatly appreciate your contribution. Please read each question carefully and provide your most honest and thoughtful responses. This survey aims to understand the usage pattern, challenges, and suggestions for improvement to develop a persona.

Section1: Persona related questions

1, What is your nationality?

2, How old are you?

3, What is your gender identity?

4, What is your level of proficiency in English?

5, What is your current educational level (e.g., undergraduate, graduate)?

6, What social media platforms do you use regularly for communication and information-sharing?

7, How often do you visit the University of Pardubice information systems?

8, Why do you use the university of Pardubice information systems mostly?

9, How satisfied are you with the current information systems available for foreign students?

10, Are there any specific challenges you face when using information systems as a foreign student?

Section2: IS STAG related questions

1, How would you rate the completeness of the content stored in the system?

2, How satisfied are you with the overall quality of the content within the system?

3, To what extent does the accuracy of the content impact your decision-making process within the system?

4, Do you feel that the system provides sufficient context and background information along with the content?

5, Are there any specific features or functionalities you would like to see implemented to better manage the system's content?

6, How satisfied are you with the response time of systems when you request information or perform a task?

7, How often do you encounter issues with the compatibility of a system with other devices when trying to access or share information?

8, To what extent does the speed of a system's response, including load time, impact your overall user experience?

9, Have you ever experienced frustration due to a system displaying irrelevant information instead of the specific task or data you requested?

10, How likely are you to recommend a system to others based on its functionality, including how well it performs tasks and its compatibility with different devices?

11, How quickly were you able to understand how to use the system?

12, How easy was it for you to remember how to perform specific actions within the system after 1some time of non-use?

13, Rate the speed at which you could find what you were looking for within the system?

14, How satisfied are you with the overall usability of the system?

15, Did you encounter any challenges in accessing or using certain features of the system?

All responses will be kept confidential, and your personal information will not be shared or disclosed. The data collected will be used only for the purposes outlined in this survey.

Source: Author's own creation

Appendix C: Responses Of Participants

1. How old are you?	2. What is your gender identity?	3. What is your nationality?	4. What is your level of proficiency in English?	5. What is your educational level that you are currently undertaking?
24-29	Male	Ghanaian	A1-A2	Master's degree
30-35	Male	Nigeria	C1-C2	Master's degree
24-29	Male	Ghanaian	A1-A2	Master's degree
30-35	Male	Ghanaian	C1-C2	Master's degree
18-23	Female	Ghanaian	C1-C2	Bachelor's degree
24-29	Male	Zimbabwean	C1-C2	Bachelor's degree
30-35	Male	Ghanaian	B1-B2	Bachelor's degree
24-29	Female	Ghanaian	C1-C2	Master's degree
30-35	Female	Georgian	C1-C2	Doctoral degree
24-29	Female	Ghanaian	C1-C2	Master's degree
18-23	Female	Zimbabwean	B1-B2	Bachelor's degree
18-23	Female	Nigeria	B1-B2	Bachelor's degree
24-29	Male	Ethiopian	B1-B2	Master's degree
30-35	Male	Ethiopian	B1-B2	Doctoral degree
30-35	Female	Ghanaian	B1-B2	Master's degree
30-35	Male	Ethiopian	C1-C2	Doctoral degree
24-29	Female	Angolan	C1-C2	Bachelor's degree
24-29	Male	Ethiopian	B1-B2	Master's degree

6. What social media platforms do you use regularly for communication and information-sharing?	7. How often do you visit the University of Pardubice information systems?
Instagram	Sometimes
Whatsapp	Very often
Whatsapp	Sometimes
Whatsapp	Very often
Youtube	Often
Instagram	Very often
Whatsapp	Sometimes
Whatsapp	Sometimes
Facebook	Very often
Whatsapp	Sometimes
Instagram	Often
Instagram	Sometimes
Facebook	Sometimes
Whatsapp	Sometimes
Facebook	Often
Whatsapp	Often
Instagram	Very often
Whatsapp	Often

8. Why do you use the university of Pardubice information systems mostly?	9. How satisfied are you with the current information systems available for foreign students?
For academic purposes	3
For academic purposes	3
For academic purposes	3
For academic purposes	4
For academic purposes	5
For academic purposes	3
For academic purposes	3
For academic purposes	4
For academic purposes	5
For academic purposes	4
For academic purposes	1
For general information about the university	3
For general information about the university	4
For academic purposes	3
For academic purposes	4
For academic purposes	4
For academic purposes	4
For academic purposes	3

10. Are there any specific challenges you face when using information systems as a foreign student?
Yes
Language barrier, some things doesn't change to English from Czech, and it is uncomfortable
Language barrier
No
No
No
No
The interface does not look user friendly
No
Yes, some information are spread out across different navigation. Others are too difficult to locate and makes it too complicated.
I don't think so
No
No
Language barrier
No
Some headings and contents are available only in Česky
Lack of clear information and help for foreigners
As an international student, In English language mode some informations are displayed in Czech, and that is what I find it challenging.

1. How quickly were you able to understand how to use the system?	2. How easy was it for you to remember how to perform specific actions within the system after some time of non-u
Quickly	Easy
Quickly	Easy
Slowly	Easy
Very quickly	Very easy
Quickly	Easy
Quickly	Difficult
Very quickly	Very easy
Quickly	Easy
Very quickly	Easy
Slowly	Very difficult
Quickly	Easy
Quickly	Difficult
Quickly	Easy
Quickly	Easy
Quickly	Easy
Slowly	Easy
Quickly	Very easy
Quickly	Easy

3. Rate the speed at which you could find what you were looking for within the system?	4. How satisfied are you with the overall usability of the system?
2	3
3	3
3	2
4	4
4	5
2	3
5	5
4	3
4	5
2	2
2	3
3	3
3	4
1	1
3	3
4	4
4	4
4	3

5. Did you encounter any challenges in accessing or using certain features of the system? If yes, please explain the challenges.
No
Language barrier as I stated above
No
No
No
No i havent faced any challenges
No
Difficult to access other thesis work as a reference material
No
Yes, how to upload my final thesis for instance was not easy, for which I had to get help from the coordinator to complete.
No
No
No
No
No
Some transitions and links are not loading in English.
No
No

6. How satisfied are you with the response time of systems when you request information or perform a task?	7. How often do you encounter issues with the compatibility of a system with other devices rather than personal
4	Never
3	Sometimes
4	Sometimes
4	Rarely
5	Rarely
2	Sometimes
5	Never
4	Rarely
4	Sometimes
3	Always
3	Sometimes
2	Rarely
4	Often
4	Rarely
3	Sometimes
4	Sometimes
3	Rarely
5	Rarely

8. To what extent does the speed of a system's response, including load time, impact your overall user experience?	9. Have you ever experienced frustration due to a system displaying irrelevant information instead of the s
Moderately important	No
Moderately important	None
Extremely important	No
Moderately important	No
Moderately important	No
Slightly important	No
Neutral	No
Extremely important	No
Moderately important	No
Extremely important	Yes, multiple instances which I can't vividly remember.
Neutral	No, everything's fine
Neutral	No
Neutral	No
Moderately important	Yes, sometimes the system displyed notification only in czech language
Slightly important	No
Extremely important	No
Neutral	No
Am not sure about the answer	No

10. , How likely are you to recommend a system to others based on its functionality, including how well it performs tasks and its compatibility with different devices?
4
4
3
5
5
2
5
3
4
3
3
3
4
3
3
4
4
4

11. How would you rate the completeness of the content stored in the system?	12. How satisfied are you with the overall quality of the content within the system?
5	5
4	4
3	3
5	5
5	5
3	3
5	5
4	3
5	5
5	5
3	3
3	3
3	3
4	4
3	3
4	4
4	5
4	4

13. To what extent does the accuracy of the content impact your decision-making process within the system?	14. Do you feel that the system provides sufficient context and background information along with the content?
Minimum	Yes
Midium	Maybe
Crucial	Maybe
Crucial	Yes
Crucial	Yes
Minimum	No
Minimum	Yes
Crucial	Yes
Crucial	Yes
Midium	Maybe
Midium	Maybe
Minimum	Maybe
Minimum	Maybe
Midium	Maybe
Midium	Maybe
Crucial	Yes
Crucial	Maybe
I am not certain about the answer	Yes

15. Are there any specific features or functionalities you would like to see implemented to better manage the system's content as a foreign student?
No
All content should be such that it change change to English.
No
Self-registration option for courses
No
Not that i thought of
Boost the speed when accessing the system
Change the interface to properly organized dashboards
Notification setup and chatbot
Yes, an option to chat a live person or AI.
I don't think so
No
No, it fits to me very well
Permanet language setup option
Notification or Reminder
Yes, these are some of the features: multilingual support, simple and clear navigation, and integration of a chatbot.
Guide of use for students
No

Source: Author's own creation