

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

Assessing the State of Adoption and Future Outlook of the Virtual Assistant Technology – *the
impact on non-life-threatening professions*

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01/02/2025

Abstract:

Even though Virtual Assistants have been developing for over seventy years, this study identified significant untapped potential in this technology. Amidst the rise of Generative Artificial Intelligence, today's society poses an opportunity to enhance Virtual Assistants, in terms of technical capabilities and applications. The goal of this thesis is to assess the use of Virtual Assistants in the personal and professional realms focusing on their applicability for life-threatening and non-life-threatening professions. The findings suggest that awareness of functionalities and trust are crucial for adoption, with non-life-threatening professions showing more openness towards the use of this technology compared to life-threatening ones.

Keywords: Virtual Assistants, Artificial Intelligence, Technology Adoption, Business Processes, Workforce Productivity

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

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1 Introduction

1.1 Background

Natural Language Processing (NLP) is a core technology behind Virtual Assistants (VAs). Its global market is in a significant growth phase, while at the same time experiencing an undergoing transformation. According to Statista, the expansion of this technological space is forecasted to take the industry to more than \$60 billion by 2030 (Statista 2024).

On the other hand, while the NLP market size is expanding, its annual growth rate has a more irregular pace. After a 101.2% increase in 2021, the market contracted by 28.83% in 2022, and recovered with a 30.35% growth in 2023. The initial volatility is set to stabilize by 2030, with a stable growth forecast of 10 to 15% (Statista 2024).

Among the factors that might have a high impact on the growth trend, we can include an increasing maturity of the NLP market and a denser competitive landscape. By analysing the data included in the report from Statista about the market in the United States market, it can be noticed that the number of Virtual Assistants users is expected to grow from 142 million in 2022 to around 157 million by 2026 (Statista 2024).

Parallel to the growth of NLP, the smart speaker market has been fluctuating. After reaching a peak in shipments in 2022 (116.4 million units), the market declined in 2023, with 106.9 million units shipped. Although forecasts indicate a recovery, with 122.5 million units shipped by 2027, market saturation and competition from other voice-enabled devices, such as smartphones and smart assistants, could slow down the overall growth of the segment (Statista 2024).

1.2 Motivation and Purpose

This study aims to investigate the potential correlation between an individual's occupation and its receptiveness to the Virtual Assistant technology in professional contexts.

The paper is structured as follows: **Chapter 2** provides a comprehensive overview of the VA technology, tracing its historical development and reviewing contemporary research. **Chapter 3** delves into the current utilization of VAs in everyday life, analysing survey data collected specifically for this study. **Chapter 4** outlines the future research directions of this project.

Subsequently, **Chapters 5** examines the adoption of VA technology in business processes for life-threatening and non-life-threatening occupations, respectively. These chapters will explore the current state of VA adoption, its potential impact on employee productivity, and its suitability for training purposes.

Finally, **Chapter 6** examines the future trajectory of VA technology, addressing common concerns and the regulatory landscape. The concluding chapters will discuss limitations, propose future research avenues (**Chapter 7**), and present overall conclusions (**Chapter 8**).

2 Literature Review

2.1 The concept of Virtual Assistants

According to the Oxford English Dictionary (2023), the first known uses of the term “virtual assistant” date back to the 1990s. Still, devices with VA-like features emerged as early as the 1950s. In fact, in 1951, Bell Laboratories created the AUDREY machine. This device could interpret ten digits, zero to nine, when these were spoken by the inventor. (Spicer 2021)

Following this, in 1961, IBM designed the Shoebox, an experimental calculator device that could recognise sixteen spoken words and convert their sounds into electrical signals to perform calculations. The words include the ten digits and six commands: *plus*, *minus*, *total*, *subtotal*, *false*, and *off*. (IBM, n.d.; Soofastaei 2021)

In 1976, following a five-year speech recognition research project funded by the Defense Advanced Research Projects Agency (DARPA), the HARPY program by Carnegie Mellon University was able to recognise 1,000 words. Building on this, IBM created the Tangora in 1986, a voice-activated typewriter designed for office workers that used statistical models to understand 20,000 words. (Spicer 2021; Hu and Downie 2024; Soofastaei 2021)

Additional programs of similar nature were developed and improved in the subsequent years until they started being commercialised in the 2000s. Advancements in Artificial Intelligence paved the way for more modern and sophisticated VAs with higher recognition accuracy and scalability. By adding context to the interactions, natural language processing and large language models further enhanced VAs ability to understand ambiguous terms and a variety of accents and word pronunciations (Hu and Downie 2024).

In the context of this paper, a VA is defined as an AI-powered technology that can take user requests, typically given through voice commands, and trigger a relevant response that might involve the output of information or the performance of a certain task. VAs can come in a variety of forms. The most relevant ones being stand-alone devices, like Amazon’s Alexa,

Apple's HomePod, and Google's Google Home, and software applications installed on smart devices, including Apple's Siri and Google's Google Assistant. (Marikyan et al. 2022; Ovington and Lewis 2022)

2.2 Research conducted on the Virtual Assistant Technology

Ever since the inception of the Virtual Assistant technology, the body of work conducted on this field has been growing steadily. In a comprehensive bibliometric review, Singh and Yadav (2023) identified 563 VA-related articles had been written and published in the Scopus database between the years of 2002 and 2023. The growth rate in terms of number of published articles was found to be 15.05% with the period of most significant growth starting after 2018, 82% of the studied papers were made public after such year. Whilst the bibliographic review in question only collected articles written up to March 2023, recent events suggest that the trend was persistent throughout 2023 and 2024.

Singh and Yadav (2023) highlighted education as a relevant research theme in this context. In accordance with this finding, the analysis of the literature conducted for the purpose of this work found substantial research with regards to the applications of VAs for learning purposes. Some of the most researched use cases include facilitated access to information, resolution of administrative issues, time-management and organisation functionalities including deadline reminders and personalised learning experiences to boost student motivation (Gubareva and Lopes 2020).

Additional themes that have been subject of research include e-commerce and voice shopping, enhancements in customer experience, and smart homes. Issues involving security, privacy, trust, and gender are also of high relevance. (Singh and Yadav 2023)

2.3 Research conducted on the Use of Virtual Assistants in the Professional Realm

Substantial research has been conducted to assess the potential of Virtual Assistants in the professional daily life.

The introduction of VAs has marked a significant shift in the healthcare sector. VAs utilize Artificial Intelligence (AI) to simulate human cognitive abilities and interact with patients, providing more accessible medical support.

Their 24/7 availability makes them an attractive option for patients requiring assistance anytime, anywhere (McClure et al. 2020).

VAs can operate through various platforms such as smartphone apps, voice-activated devices, or interactive phone systems (Gouda et al. 2021). For instance, Lantone, a Chinese company founded in 2004, developed a pre-consultation chatbot that guides patients through a series of questions about their symptoms, forwarding the information to a doctor before their hospital visit. The primary goal of these VAs is to streamline the data collection process, allowing doctors to access patient medical history more quickly and efficiently (Huiying and Jiaying Zheng 2021) .

Another example is CardioCube, a software developed for Amazon Alexa that collects patient medical history and transmits it to the electronic health record (Gouda et al. 2021).

Despite the numerous potential benefits of VAs, it is essential to address the challenges associated with their large-scale implementation. A study conducted on Siri, Alexa, and Google Assistant highlighted the safety risks for patients when using conversational assistants for medical information. The results showed that VAs can provide incorrect or incomplete answers, leading users to take potentially harmful actions (Bickmore et al. 2018).

Acceptance by patients and healthcare providers is another determining factor in the success of VAs. While preliminary studies have shown an openness to using these technologies, it is necessary to promote trust and familiarity with VAs to ensure their effective integration into

the healthcare system (Gouda et al. 2021).

On the other hand, with the COVID-19 pandemic, the impact of voice-based virtual assistants (VVBAs) in workplace activities has grown as a consequence of the adoption of fully remote working environment (Marikyan et al. 2022).

The utility of VVBAs lies in their ability to automate repetitive tasks, freeing up valuable time for employees. They can handle activities such as setting reminders, scheduling appointments, and organizing tasks, allowing workers to focus on more strategic and complex assignments (Saravanan, Vinu Balan, and Sankaradass 2023).

The ability of VVBAs to quickly retrieve information from various sources, including company databases and the internet, represents an additional advantage in terms of efficiency and productivity. By providing employees with quick and reliable access to essential information, VVBAs enable them to make more informed decisions and work more effectively (Saravanan, Vinu Balan, and Sankaradass 2023).

Furthermore, in industrial production contexts, VAs can play a critical role in improving worker safety and well-being. By providing workers with real-time critical information, step-by-step instructions, and knowledge support, VAs can help reduce the risk of errors and accidents (Majumdar, Kirkley, and Srivastava 2022).

Nevertheless, to ensure widespread adoption, it is essential that these tools are perceived as reliable, accurate, and capable of understanding user needs.

Concerns about data privacy and security are also at the forefront when it comes to a larger user adoption, as VAs often handle sensitive information. Ensuring adequate security measures to protect company and personal data is essential to build trust and promote wide user acceptance. Employee resistance to change represents another potential challenge that must be addressed considering perceived technology complexity (Marikyan et al. 2022; Saravanan, Vinu Balan, and Sankaradass 2023).

Group part

Overall, it can be concluded that significant progress has been made towards the introduction of VAs in the professional realm. However, the current research is focused on the analysis of this technology on specific industries, leading to a large variety of fragmented information that are lacking clear categorization and cross-professional findings.

Therefore, this research paper aims to identify common needs and potential use cases across different professions with similar risk profiles, suggesting a division in two different categories: life-threatening and non-life-threatening jobs.

3 Current Usage of Virtual Assistants for Personal Use

To assess the current usage of VAs at a personal level, a survey was created and shared among different platforms such as LinkedIn or WhatsApp. The survey results are given in Appendix 1

– **Virtual Assistant Usage Survey Answers** and briefly described in this section.

The total number of survey participants was 72, with 73.6% of the participants belonging to the 18-25 age range. Only two participants reported to be older than 60 years old, while the remaining portion is overall evenly distributed between four different age categories: 26-30, 31-40, 41-50 and 51-60. The categories were determined assuming the impact of age on the level of technology exposure, familiarity, and adoption.

Among the participants, 52.8% identified themselves as males, resulting in a 47.2% female participation. While twenty-one different nationalities emerged from the survey, 97.2% reports to currently live in Europe.

In terms of education level and current occupation, 55.6% affirms to hold a Master's degree, 30.6% a Bachelor's degree, 9.7% a High School diploma and 4.2% a PhD. Students represent 43.1% of our total sample, while 40.3% are employed or self-employed. A 15.3% is represented by working students, and only 1 participant reported to be retired.

When asked about the awareness about the Virtual Assistant technology prior to taking the survey, 98.6% of the participants confirmed their alertness about the topic.

Out of this percentage, 23.9% of the survey takers has declared that they have never used a Virtual Assistant. The most common reasons behind the lack of use of the technology are: preference towards a traditional approach such as typing instead of speaking; cost of buying the device in case of Apple Siri, HomePod or Amazon Echo; and privacy and security concerns.

On the other hand, 74.1% of the Virtual Assistant users indicated a level of confidence with the technology of 4 or higher on a scale from 1 to 5. The main reason (77.8%) behind the usage is reported to be convenience (for example, when they cannot use their hands to complete the

task). The remaining 22.2% would prefer to use VAs even when they have the possibility of getting the task done without the need to interact with them. This showcases a deeper level of adoption of the VA technology, since the motivation goes beyond a physical limitation.

The frequency of usage is fragmented: 35.2% uses VAs weekly, 25.9% only a few times, 20.4% daily, and 18.5% monthly. Analyzing these results, it can be said that 55.6% are heavy users (daily or weekly usage).

The most common tasks performed by VAs are: asking for information available on the internet (for example, weather forecasts); task management (set timers, reminders, appointments); controlling the music; phone handling (email, messages); or playing around.

On the one hand, 55.6% of users reports to see a positive impact of the usage of VAs on productivity at a personal level, sharing benefits relating to time management, convenience, simplification of day-to-day tasks, organisational skills, safety while driving, and multitasking abilities (being able to perform a task with the VA whilst performing another one).

On the other hand, criticism from users who do not find any added value in the VA technology in terms of productivity can be summarised as: failure to perform tasks that are complex or lengthy enough to have a real impact on productivity. Additionally, other claims include lack of responsiveness, inability to use the voice interface in loud environments or outdoors, and preference towards their usual way of completing tasks.

Finally, when asked about the top-of-mind VA brand and product, 53.5% of respondents selected Apple Siri / HomePod, 38% Amazon Alexa / Echo, and 8.5% Google Assistant.

4 Next Steps in the Research Trajectory

Recognising the limitations of the sample, the qualitative research conducted and analysed in **Chapter 3** leads to the conclusion that awareness of the VA technology is widespread in today's day and age. Going beyond awareness, usage of the technology for personal purposes is significant. Irrespective of whether users see a positive impact of VAs on their productivity in their personal lives or not, in general, they report a high level of familiarity with the technology. Our familiarity as a society with the use of VAs like Siri for personal use and the emergence of innovative VA assistants like the Humane Ai Pin rose the question on the potential use cases for current and emerging VAs in the business landscape. At this stage, it is relevant to distinguish between two types of VAs: Virtual Personal Assistants (VPAs) and Virtual Employee Assistants (VEAs) (Omale 2019). VPAs are those primarily developed for personal use. Assistants like Amazon's Alexa, Google's Google Assistant, and Apple's Siri and HomePod, all fall under this category. VEAs bring an additional layer of personalisation into the VA technology and have further applicability for workers and businesses.

From this point onwards, the aim of the research is to study whether the type of job performed by an individual impacts their view on the VA technology. For this purpose, a separation between life-threatening and non-life-threatening occupations was made. The life-threatening component refers mostly to those impacted by the work, but there might be risks for the worker himself or herself as well. The idea behind the choice of this criteria is to study whether the potential negative consequences inherent to the nature of the job affect the willingness of a worker to adopt the VA technology for work-related tasks. These queries will be explored in a qualitative way through interviews with professionals who work in one of the two categories.

5 Virtual Assistants in Business Processes for Non-Life-Threatening Jobs

This paper defines a *non-life-threatening job* as a profession which practice does not bear the risk of directly resulting in the life or death of the worker or the people directly affected by the execution of the job. Occupations that fall under this category are usually performed in an office environment and involve daily interaction with a personal computer. With this definition in mind, three interviewees were selected to study the impact of the Virtual Assistant technology in jobs of this nature. The profiles of the interviewees are as follows: a fifty-five-year-old Artificial Intelligence, Transformation, and Business Strategy Executive (**Interviewee D**); a fifty-two-year-old Digital Business Professor (**Interviewee E**); and a twenty-three-year-old Growth and Customer Acquisition Professional (**Interviewee F**). Appendix 5 – **Interview Transcripts for Non-Life-Threatening Jobs** includes the transcripts of the three interviews.

5.1 Adoption of Virtual Assistants in Non-Life-Threatening Jobs

The distinction between the concepts of Virtual Personal Assistant (VPA) and Virtual Employee Assistant (VEA) was made in **Section 4**. At this stage, it is appropriate to analyse the impact of both types of devices on non-life-threatening office jobs.

While primarily developed for personal use, VPAs provide a set of useful features that are useful for workers with non-life-threatening jobs at an individual level. These features include appointment booking, reminder setting, call handling, reading of contents written on a screen, translation of content, and web searching.

Apart from these capabilities, VPAs come with speech-to-text functionalities which are particularly relevant for office workers. These convert voice commands into written text and help employees compose emails, messages, and documents. Apart from helping with repetitive stress injury prevention, speaking is intuitive and allows workers to fully capture the idea they want to write about by eliminating the self-editing urge inherent to typing. When the

speech-to-text interface is accurate, there are also benefits in terms of speed.

Some VPAs can be accessed through devices like smartphones and smartwatches. This portability makes them easily accessible on-the-go, while driving, for example. Accessibility is an advantage for professionals. It enables productivity capture and can reduce the anxiety of having to remember to perform a certain task at a later stage, once sat by a computer. However, as mentioned by **Interviewee E**, it also means “*work seeps into every aspect of life*” and the line between professional and personal life gets blurred.

At the same time, the ability to convert speech to text in real time during work meetings, presentations, and conferences shifts employees’ mindsets. With the confidence that the content is being documented, there’s a tendency to minimise the cognitive efforts needed to interpret the information being shared and extract the key takeaways. Unless the content generated by the VPA is later analysed by the employee, learning and future recall are compromised. This concept is particularly investigated in education and academia. When students rely on VAs or other AI tools instead of “*actively engaging in the learning process*” their critical thinking skills, motivation, and independent learning abilities are all at risk of decreasing (Sabharwal, Kabha, and Srivastava 2023, 163).

Whilst acknowledging the capabilities of VPAs, it is important to note that they cannot always fulfil the specific needs of the non-life-threatening workforce. Due to this, there is a “*growing demand for more personalized and customizable digital assistants*” (Saravanan, Vinu Balan, and Sankaradass 2023, 1). This is where VEAs come into play.

Amazon’s Alexa for Business is a tangible example of an extra layer of personalisation added to the VPA technology. Introduced in November 2017, it gives employers the ability to manage multiple Alexa devices installed in offices, conference rooms and even hallways. Employers can give these devices organisation-specific voice skills that allow employees to find available meeting rooms, order supplies, report problems, start conference calls, amongst

others. (Lang and Benessere 2018)

None of the professionals interviewed for the purpose of writing this section of the paper reported the use of Alexa for Business or any other industry-specific VEA in their workplace. Given this, the concept of VA adoption will be studied with regards to the use of VPAs for the previously mentioned work applications.

Technology adoption is an extensively researched field of study. In the early 2000s, Venkatesh et al. (2003) presented the so-called Unified Theory of Acceptance and Use of Technology (UTAUT) that defined the determinant factors to the intention and usage of a particular technology from which **performance expectancy** and **effort expectancy** are of particular importance.

The concept of performance expectancy refers to *“the degree to which an individual believes that using the system will help him or her to attain gains in job performance”* (Venkatesh et al. 2003, 447). **Interviewee F**’s experience with VAs in the workplace highlights the strong influence of this concept in technology adoption. Despite considering themselves a technology-savvy individual, **Interviewee F** has not unlocked the full potential of the VA technology in the professional realm. One of the reasons for this is a low visibility of the benefits of the technology, resulting in low perceived performance.

Effort expectancy refers to *“the degree of ease associated with the use of the system”* (Venkatesh et al. 2003, 450). In the context of VAs, the concept of ease of use draws the attention to voice interactions, the cornerstone of the information flow from the users to the devices. As highlighted by **Interviewee D**, who considers ease of use as a critical success factor for the VA technology in the workplace, voice interactions must be *“flawless”*. If the VA has difficulties in understanding user commands, the user has to do multiple trial and error attempts before getting the output needed and the intent of the functionality is broken. VA functionalities

are meant to be easy to use while driving or while busy, if user commands are not acknowledged, the process is defeated.

Flawless voice interactions require VAs to understand voice commands in multiple languages, ideally being able to interpret a combination of languages in a single command, and be sensitive to the nuances between different accents.

According to Sattarapu et al. (2024), the development of VAs that can comprehend various accents is an emerging concern when compared to the ability of VAs to understand of multiple languages that has seen more advancements. The authors present a study conducted in India in 2022, to explore the impact of consumers' accents on their engagement with and adoption of AI-powered VAs. The study was performed in English and comprised both qualitative and quantitative research, with semi structured interviews and a structured questionnaire, respectively. The authors recognise that the context in which a VA is used impacts the users' reaction when faced with accent-related challenges. The workplace is categorised as a public environment where people around the user are non-close associates, neither family members nor friends. When using a VA in these settings, users felt "*scrutiny and emotional tension*" given by the presence of other people around them. Irrespective of the context of use, the study concludes that accent-related issues can lead to refusal to use VA devices again. To complement this, **Interviewee E** highlighted that the current limitations of the VA technology in understanding accents are a significant barrier for its adoption in academia. Universities are sensitive to the negative emotions students are exposed to in situations where a VA does not understand their accent.

Under the UTAUT definition, the concept of effort is mostly related to the operation of the technology itself. However, in a non-life-threatening work environment, the idea of effort must also contemplate the work required to successfully incorporate VAs into an employee's current work practices without compromising the outputs produced. In this light, **Interviewee F**'s effort

expectancy of the VA technology is high. The rejection and lack of eagerness to incorporate VAs into professional life stem from the perception of a steep learning curve needed to adopt it as a new norm. A feeling of laziness and reluctance arises when faced with the task of going beyond current knowledge to adopt smart assistance applications. In this case, the barrier for adoption is not a fault of the technology itself, but a willingness to stick to more traditional methods that **Interviewee F** has already optimised for speed and output as opposed to readapting to new methods. This decision is made with the consciousness that old-fashioned methods might not be the most efficient in the long term. **Interviewee D** applies a reverse logic by which the expectancy of an ultimate productivity increase is the motivation to invest time into learning how virtual assistance tools work, bearing the risk of not always getting the right output at first.

In addition to performance and effort expectancy, Marikyan et al. (2022) consider the frequently overlooked concept of **perceived enjoyment**. The authors created a questionnaire and subsequently analysed the 536 usable responses obtained from individuals employed in the United Kingdom who reported to be active users of VAs for work-related purposes. With this study, the authors concluded the perception of the use of VAs in the workplace as “enjoyable and fun” has an impact on the decision to utilise the technology that goes beyond the performance improvements expected. This idea goes in line with **Interviewee E**’s insights that suggest that, to foster adoption, manufacturers should not underestimate the importance of displaying VAs in a way that is funny and playful for the users, so they don’t feel threatened by the technology. **Interviewee E** made the analogy that technological innovations should be portrayed to users as “*Tamagotchis*” (Japanese toys) as opposed to robots. Marikyan et al. (2022) suggest that the capacity of VAs to bring entertainment to the workplace is two-fold. Firstly, VAs add an enjoyable component to functional tasks like managing appointments. Secondly, they can provide entertainment services like music and audiobooks for employees to

enjoy of while working. The willingness of individuals to find entertainment in VAs is also applicable in personal settings as demonstrated by the survey presented in **Section 3**. When asked about the uses they give to VAs in their lives, 40.7% of respondents selected the option “Play around”.

5.2 Impact of Virtual Assistants on Productivity in Non-Life-Threatening Jobs

In non-life-threatening office jobs the sole adoption of the VA technology doesn't suffice for it to be considered a relevant and impactful tool. For that to be the case, employees must adopt VAs in such a way that their productivity at work is enhanced by their use. Marikyan et al. (2022) introduce the concept of **satisfaction** with digital assistants as the leeway between adoption, given by what the authors describe as antecedents of satisfaction, three of which were discussed in this section (performance expectancy, effort expectancy, and perceived enjoyment), and ultimate job engagement and productivity.

From the antecedents of satisfaction considered in this paper, Marikyan et al. (2022) found performance expectancy and perceived enjoyment to have a positive correlation with satisfaction with VAs. The higher the sense of usefulness and feeling of enjoyment the workers link to VAs, the higher their level of satisfaction with them. In turn, satisfaction with VAs was identified to have a positive relationship with ultimate job engagement and productivity. In other words, the more satisfied workers are with the VAs they are using to perform work-related tasks, the more engaged they are with them, enhancing their output.

In terms of effort expectancy, the study conducted in the article found the relationship with satisfaction to be non-significant. This result is explained by the fact that the sample consisted only of active users of VAs. Effort expectancy gains relevance in the case of non-users of VAs in the workplace, as analysed in the case of **Interviewee F**.

This relationship between the antecedents of satisfaction, satisfaction, job engagement, and

productivity is shown using a diagram in Appendix 6 – **Components of impact of Virtual Assistants on Job Engagement and Productivity.**

5.3 Use of Virtual Assistants for Training Purposes in Non-Life-Threatening Jobs

Virtual Assistants have further applicability for training of employees in non-life-threatening professions. When it comes to particular use cases of VA-assisted training, **Interviewee E** listed training areas like health and safety, fire safety, and bias in recruitment. In addition, they raised the point that a lot of their working time is invested in training new teaching assistants on techniques to give feedback to students, like the sandwich method. A potential application of VAs for this matter would involve having the teaching assistant record or type feedback and the VA prompting them with suggestions in a question (“*Have you said something positive?*”) or reminder (“*Remember to say something positive*”) format.

Interviewee D presented the case of the company Second Nature. The firm provides a sales training solution that interacts with sales representatives being trained through a virtual pitch partner (Second Nature 2024). The virtual partner acts like a person and simulates real-life scenarios for better training outcomes. It can be tuned to be more or less demanding and cover specific points and concepts. The avatar also adapts to the learner’s progress on each topic. The interviewee finds particular benefits in this technology for jobs that involve interacting directly with people, as is the case of sales and customer support roles.

Interviewee F shed light on the lack of standardisation in onboarding processes in startup firms that make employees go through a personal trial and error discovery process with little guidance. A standardised VA would make the process more systematised, meaning anyone onboarding for the same role would have the same experience. Even though VA-powered training processes might reduce human error and bias, one must keep in mind human connection is still highly appreciated by some employees, especially during their onboarding process.

The way in which VAs can be used for training is strongly dependent on, not only the nature of the job, but also the profile of the company where it is being performed. **Interviewee D** works for a multinational company, **Interviewee E** for a university, and **Interviewee F** for a startup. When asked about the willingness they suspect the entities they work for would have to pay for a VA training service, all interviewees signalled the firms' eagerness to invest in automation but mentioned concerns around return on investment (ROI). As **Interviewee D** mentioned, firms "*don't write up blank cheques*". They need a proof of value to justify their investments. Beyond ROI, startup firms also have great interest in understanding how the automation brought about by VAs allows the firm to scale its activities. Companies with a more traditional profile tend to feel rejection towards the application of innovative technologies in training and other business processes.

Another concern stressed by the interviewees is that of privacy. In order to provide the training, VAs would need access to potentially confidential company data. As employees perform the training, VAs will store information and even recordings relating to them. This raises questions on the use of this data for future VA training. In the case of universities, they feel particularly challenged by regulations like the General Data Protection Regulation (GDPR), student privacy, and bias.

6 The Future of the Virtual Assistant Technology

6.1 Level of Receptiveness of Society: the case of the Humane Ai Pin

The book *Society and Technological Change*, which latest edition was published in early 2024, looks at modern technology in the broadest sense of the term covering technological innovations from advances in medicine and genetics to electronic media and the Internet. When talking about the nature of technology, the authors make a statement that is strongly aligned with the findings of this paper: “*Today’s technology leaves us both exhilarated and terrified*”. (Volti and Croissant 2024, 3)

Today’s world is in fact increasingly receptive to technological evolutions, but also increasingly aware of its drawbacks and potential failures. The Humane Ai Pin poses an interesting case to comment on the specific characteristics of virtual assistant devices that impact society’s receptiveness to technological disruptions of this nature.

As experts suggest, in ten-years-time, mobile phones are likely to be a thing of the past. There are high chances we will own devices that project content onto our skin, like the Humane Ai Pin does, or other surfaces. However, with a large number of returns and criticism online, the Humane Ai Pin cannot yet be classified as a successful product. The Pin comes with capabilities that are new to users and, more importantly, it has a new type of interface for them to interact with: the laser ink display. Inserting these functionalities on devices that are more familiar to users, like smartphones, and taking an incremental approach to this innovation, can lead to better acceptance of the product.

The case of Google Glass, the smart glasses released to the public by Google in 2014, showcase how hardware can cause reluctance amongst users. Even though there were other factors behind the decision to discontinue the product, resistance to the hardware paid its toll on the faith of the Google Glass. People become very aware of external displays of technology when they are novel and tend to be reluctant to them. The fact that they are different make people see them as

an intrusion and, consequently, get much more concerned with aspects like privacy. If a user is wearing the Google Glass, other people might not want to interact with them due to fear and a sense of suspiciousness that makes them think the user might have access to more information than they do. However, the Google Glass did not, in fact, have many more functionalities than those available on the smartphones that we all carry in our pockets.

One must bear in mind that the Humane Ai Pin started shipping in April 2024 and is still in the innovator stage when it comes to the Technology Adoption Curve. When mobile phones started gaining traction, people believed they would just be a niche application. Nowadays they can be said to be the remote control for our lives. If we take the case of the iPhone, for example, the first version was very limited in terms of functionality. It was not until iPhone 3G and iPhone 3GS, with the beginning of the App Store where software developers could build their own solutions, that functionality and ultimate usability boosted.

The incremental nature of the development of the iPhone smartphones was key for Apple to establish its position in the market. Every iteration of the iPhone was significantly better than the last one, especially when we consider the first versions. This was something that people knew for a fact and facilitated adoption.

Early adopters play a crucial role in the development of a new technology, specifically when it comes to AI-powered devices like VAs. Developer firms take products like the Humane Ai Pin to the market with a premium price in an attempt to recoup the costs of building the hardware components and developing the underlying software. A large group of users will only acquire the product once it is more established, and its price has dropped. Considering this, early adopters who have the economic resources to purchase these devices at the start of their lifecycle carry the duty of sharing information and subsequently shaping the opinions of those in their social circles. (Park et al. 2022)

Other relevant aspects for the success of the Humane Ai Pin include the need to interact in an

ecosystem environment, just like Apple devices do, and the need to give potential users the confidence that the technology will not disappear or become unsupported. After purchasing the Pin, which price starts at \$499, the users must pay a monthly \$24 subscription fee, excluding taxes and fees. This subscription gives users phone and wireless features, cloud storage, and additional AI-powered services. The monthly plan is a requirement to use the Humane Ai Pin and showcases Humane's strategy: to portray the Pin as a standalone device that is an alternative, rather than a complement, to a smartphone. (Humane Inc. 2024c)

Integrating the Pin in an environment that comprises other devices users already own or are familiar with is another strategy to potentially increase society's level of receptiveness towards the product.

When it comes to the level of confidence potential users require before purchasing, Humane must find a way to give them the certainty that the technology will be functional and supported in the long run, and not show up and go bust like some technological advancements do.

6.2 Concerns regarding the Development of the Virtual Assistant Technology

The VA technology and its outlook raise concerns at various levels, one of which is the **image of women it perpetuates in society**. VAs like Siri and Alexa have female names and their predefined voices are also female. The fact that the default voice, and even its accent, can be changed by users does not invalidate this discussion. Evidence shows that users have a preference towards female AI products, like chatbots and VAs, as opposed to male ones due to a perception that they are friendlier and more empathetic. The strong link between these two characteristics and our perception of what it means to be a human make us perceive female VAs as more human than male ones. (Borau et al. 2021)

The preference towards VAs with female characteristics perpetuates the idea that women are servants rather than agents. They are transformed into AI objects which role is to respond to

orders made by the users and be readily available to assist them.

Apart from enhancing gender biased ideals, the further development of the VA technology has the **power to intensify inequalities of other nature**. Park et al. (2022) analysing two surveys conducted in the United States to assess the impact of socio-demographic factors (education, age, gender, race, and income) on the access, use, and understanding of the VA technology. When it comes to access and use, the authors found the digital divide previously observed in the development of the Internet is repeating itself with VAs. Higher status and income result in higher access and use of the VA technology.

Beyond access and use, the authors identified further inequalities in terms of its understanding. The socio-demographic groups found to have higher chances of deeming AI-generated content in VAs and other applications as accurate were younger generations, men, and nonwhites. Education and age revealed significant impact on individuals' understanding on the VA technology. Older generations showed high awareness of the threats of the consumption of AI-generated data, whereas younger generations were less likely to critically analyse this information. In general, out of the surveyed individuals, only those raised in environments with sociocultural advantages, had the ability to accept information generated by VAs in a healthy way that critically considers its risks like *“algorithmic misjudgment, bias in recommended content, or data surveillance”* (Park et al. 2022, 1). In individuals with a lower social status, these risks were camouflaged by the excitement of using AI-powered devices and the convenience that comes with it.

In a search for funding, companies developing AI-based solutions, like is the case of Open AI, hype up the tools and their capabilities. As users of these tools, we need to take a step back, dissect the content being given to us, and critically evaluate it. An oversimplistic demonstration of this concept stems from the idea that a user should not go down an unpaved road even if their GPS is telling them to do so. Likewise, if a VA like Siri tells them today is a very sunny day,

they still need to have the discernment to look out the window and carry an umbrella with them if they see it is actually raining. The underlying principle here is that users should not underestimate their human capabilities when interacting with technological tools.

Lastly, considering the focus of this paper on the business applications of the VA technology, it is relevant to analyse the consequences of its potential further penetration in firms. Employees working in warehouses or gig workers might be forced to use these devices daily raising concerns on lack of choice and surveillance issues with the potential monitoring of employee location and health metrics like heart rate. On the positive side, this could increase employee safety by, for example, sending a warning if an employee has fainted. For specific professions, VAs can be implemented in such a way that employees are more efficient. The time they save can be invested in more creative or strategic tasks that VAs cannot fulfil as of today. The performance of more meaningful and value-driven tasks can positively impact workplace fulfilment.

6.3 European Union Regulation concerning Virtual Assistants

The strict regulatory landscape in the European Union poses a challenge to the firms commercializing VA devices in this market. Within the scope of this paper, it is relevant to analyse the impact of the Digital Markets Act (DMA) on the VA technology.

The DMA, applicable since the 2nd of May 2023, was created to ensure the fairness and contestability of digital sector markets by addressing the powerful position of a few of its players. With the DMA, the European Commission (EC) introduces the concept of *gatekeepers*. These are powerful digital platforms providing services designated as *core platform services*, including, but not limited to, social networks, web browsers, search engines, and operating systems. At the time of writing, the gatekeepers under the EC's criteria are Alphabet, Amazon, Apple, Booking, ByteDance, Meta, and Microsoft. And a total of twenty-four core platform

services owned by these gatekeepers have been selected. The EC sets clear obligations and prohibitions (do's and don'ts) for gatekeepers. After an extension to the original list of core platform services, VAs were included in the DMA under such category. (European Commission 2024a; 2024b; 2024d)

Appendix 7 – **European Commission's Gatekeeper Designations** shows the latest gatekeeper designations published by the EC. For each gatekeeper, the EC has highlighted specific services they provide and organised them into different core platform service categories. The absence of VA devices in this classification highlights the fact that, even though the EC included VAs in the latest list of core platform services, no specific VA belonging to any of the gatekeepers has been pinpointed. Yet, the dynamic nature of the regulatory landscape of digital markets, is sufficient not to disregard the possibility of having names like Alexa, Google Assistant, and Siri as DMA core platform services in the near future.

The EC had already voiced concerns towards the VA technology prior to the DMA. In July 2020, in the context of the European Union competition rules, the EC initiated an inquiry into the industry of consumer Internet of Things (IoT) products and services. The four main concerns raised by the investigation include: **exclusivity** requirements limiting the use of different VAs on the same device; the role of VA providers as **intermediaries** between the users and the services that gives them control over user relationships; the **preference** of VAs to lead users towards complementary services, like music streaming, messaging and search, where the VA provider is also present as opposed to third-party services (self-preferencing); and the amount of **data** VA providers get access to. (Ovington and Lewis 2022; European Commission 2024c)

Additional evidence of the scrutiny on VAs is the fact that, in September 2021, the EC opened an antitrust investigation into Google to evaluate whether it was pressuring device manufacturers to set Google Assistant as the default VA on all Android devices (Ovington and

Lewis 2022).

The introduction of VAs in the DMA's core platform service list, the consumer IoT industry inquiry, and the Google Assistant investigation all demonstrate that the EC is fully aware of the powerful position held by VA providers and, hence, raises questions as to why there is no specific VA in the EC's gatekeeper designations. Even though there is no clear-cut answer to this, Noskova (2023) highlights the need for the creation of a separate decision mechanism for the case of VAs. The EC has defined three criteria that need to be met by a firm to be selected as a gatekeeper for a given core platform service. These criteria relate to: (i) the core service's financial impact on European Union revenues; (ii) the service's number of monthly active end users and yearly active business users, both in the European Union; and (iii) the need for the second criteria to have been met in each of the last three financial years (Humpe et al. 2023). Noskova (2023) highlights some characteristics of VAs that invalidate the use of such criteria for this specific use case. These include, for example, the inability to separate VA usage from other indicators of company performance and the inexistence of a price for the usage of a VA service.

Irrespective of the strategy followed by the EC to name gatekeeper firms for VAs, companies should prepare for the rules they would have to adhere to should they be designated as such. The preparation work involves, not only identifying the DMA articles that would be applicable to VAs, but also the implementation challenges they would face to comply with them. As an example, the enforcement of the DMA on VAs can potentially require gatekeeper firms to give users the freedom to choose the services they want to take care of specific requests and hence mitigate self-preferencing. In the case of VA devices that lack a screen, like Amazon Alexa or Google's Google Home, giving users the ability to choose a service might involve having the VA dictate a series of options to the user. If this were to be implemented, the discussion on the order chosen to read out service options to the users would gain relevance. (Ovington and Lewis

2022)

Furthermore, this additional step would hinder a smooth interaction between the VA and the end user and interrupt the request resolution flow. A more user-friendly alternative might require the use of a separate device with a screen to display a menu that allows users to make this type of selection in real-time or set default services applicable to all requests of a given type in an asynchronous manner. The practical implications of implementing a solution to self-preferencing, which is only one of the aspects of VAs that concern the EC, highlights the need for VA providers to prepare for the need to be compliant with the DMA without ultimately compromising user experience.

7 Limitations and Future Research

The most relevant limitations of this paper stem from the number of respondents and interviewees involved in the quantitative and qualitative research, respectively, and their characteristics. The survey created to study the use of VAs at a personal level had a total of 72 respondents. In terms of demographics, these respondents share some common characteristics: 73.6% of them were between 18 and 25 years old, 97.2% of them currently reside in Europe, 41.7% are Portuguese, and 43.1% are students. Conducting this survey with a larger and more heterogeneous sample, with a special focus on older generations working outside Europe, would be beneficial for the research.

With regards to the interviews, six interviewees were selected. This decision was made considering both the page limit for this document and the quantity and quality of the insights gathered as the interviews were performed. All interviewees work in Europe. Even though their contributions provided sufficient content for the purpose of this work, conducting further interviews with individuals who work outside Europe would enrichen the research.

The study of the impact of VAs on workplace productivity was particularly significant for this work. The lack of quantitative research conducted on this topic poses a limitation to the conclusions made. Selecting current users of VAs in the workplace and quantifying the productivity gain or loss they obtain with the technology would yield more objective conclusions.

Furthermore, with regards to the case of the Humane Ai Pin, having no access to Humane Inc.'s financial data limited the analysis that could be done on the performance of the product. The choice of this privately held company was conscious. The novelty and strong connection of the Humane Ai Pin to this thesis were taken as a trade-off for the lack of access to its financial information.

In terms of further research, apart from increasing the sample size to enhance the qualitative

and qualitative research, it would be pertinent to analyse the impact of VAs in the workplace by considering perspectives other than those of the workers themselves. Employers, shareholders, entrepreneurs, Chief Executive Officers, and Human Resources professionals are just a few examples of individuals whose inputs can complement those of the workers and extend the present research.

An additional extension to this research involves exploring the case of a firm that has successfully incorporated VAs into its common practices and one that has failed at doing so. An in-depth comparison of both scenarios might result in the creation of a set of key-takeaways to the fruitful implementation of VAs in businesses to positively impact employee fulfilment and productivity.

In general, to further contribute to this field of research it is crucial to continuously monitor the evolution of the VA technology and the successful and failed cases of its integration in the workplace.

8 Conclusions

8.1 An Analysis of the Current Personal and Professional Usage of Virtual Assistants

The specific occupation of an individual exerts a significant influence on their receptiveness to the Virtual Assistant technology. To delve deeper into this phenomenon, a meticulous analysis of the data gathered from interviews and research conducted for this thesis is imperative.

High-risk professions, such as the ones performed by **Interviewees A, B and C**, present a unique set of barriers to VA adoption. Beyond rigid operational protocols and a lack of integration with standard procedures, a pervasive scepticism regarding the reliability of technology in critical scenarios is evident. The stakes are exceptionally high in these contexts, with potential fatal consequences for human life and public safety. Consequently, trust in the capabilities of VAs emerges as a pivotal factor for adoption.

Interviews with the professionals mentioned above reveal that this trust remains tenuous, primarily due to the perception that VAs cannot replicate human judgment and adaptability necessary in complex and unpredictable situations. On-the-job training and experience are perceived as indispensable for operational effectiveness in these fields, elements that current VAs cannot provide yet.

In contrast to high-risk occupations, professionals in non-life-threatening roles, such as those in office settings, exhibit a greater inclination towards the Virtual Assistant technology.

The individuals interviewed for this paper perceive VAs as tools that can enhance productivity through features like voice dictation, scheduling, screen reading, and real-time translation.

However, even in this case, widespread adoption remains limited, mainly due to the perceived effort required to interact with VAs. This includes challenges such as voice recognition and processing complex commands where non-verbal cues are needed to successfully complete the required task. (Bellegarda 2013) As emerged from several interviews included in this paper, if voice interaction is not fluid, due to problems understanding accents or the request itself, the

user may prefer traditional methods, even if less efficient.

A further obstacle is the unfamiliarity with the user interfaces of certain VA devices.

Interviewee B, for instance, expressed a preference for Apple's Siri, which offers an integrated and intuitive display interface. By positioning themselves in the late majority of the Adoption Bell Curve, **Interviewee B** highly values familiarity with a known device or interface in order to consider introducing a new tool into their professional life.

On the other hand, the possibility of interacting with a device like Humane Ai Pin, which projects information onto an external surface, raises doubts about its practicality and reliability, since the lack of direct experience with this type of interface contributes to its limited usage appeal in high-risk context, where the user needs to feel as comfortable as possible in utilizing every tool at its disposal. (Pierce 2024)

As a matter of fact, perceived enjoyment, or the pleasure derived from using the technology has emerged as a positive factor towards a wider technology adoption. If interacting with the VA is not perceived as fun or stimulating, the user may not be motivated to use it (Song and Han 2009).

For instance, **Interviewee E** emphasizes the importance of an appealing design and a "*funny and playful*" interaction to encourage adoption, preventing the user from feeling threatened by the technology while firstly using it.

When Alexa and Siri were first launched in the market, people could use them for very simple tasks such as asking for the weather forecast or setting reminders. By allowing the users to play around with this technology, making sure that their requests are satisfied, will create an initial sense of familiarity that will eventually translate into an increased trust towards VAs.

Despite the identified barriers, the interviews also suggest untapped potential for VA utilization in high-risk professions. However, to realize this potential, VA technology must undergo significant evolution. Further integration with Generative AI is seen as a crucial step in

enhancing the personalization and utility of VAs (Grigul 2024). Future VA systems must be capable of learning from user interactions, adapting to specific contexts, and providing tailored support based on individual needs.

In conclusion, although VAs offer significant potential to enhance productivity and efficiency, their adoption is highly influenced by a variety of factors, mainly related to the intrinsic risk carried by the type of job performed.

8.2 Identifying Key Improvements to enhance the Virtual Assistant Technology

The quantitative and qualitative research conducted for the purpose of this work lead to the conclusion that nowadays' society demands two crucial improvements to the VA technology to enhance its usefulness and applicability: **frictionless interactions** and **higher personalisation**.

Smooth and customised interactions with VAs allow for their seamless integration into today's hectic lifestyles as opposed to their use at a mere surface level. This thesis identified that the latter is the case nowadays. This underpins the existing opportunity to intensify the interactions users have with VAs by expanding the number of touchpoints and use cases.

To achieve this, the ultimate goal of developers of this technology should be to create VA devices that are cleverly adapted to the needs of their users making them effortless and frictionless to use. For **Interviewee E**, reducing friction should take priority over increasing functionality set. From a user perspective, it is preferable to own a VA device that is simple and flawless with a reduced functionality set than one that comes with a large set of features that cannot be efficiently accessed and used.

Acknowledging this, practical examples of what personalisation could look like in this field cover both the personal and the professional spheres. At a personal level, the discussion turns again to the concept proposed by Humane with the Ai Pin: a device that is "*Your partner in everything*" (Humane Inc. 2024b). Users expect to be able to interact with a VA device that

acts as their personal assistant and right-hand man and is a seamless part of their daily routine. In the case of the Humane Ai Pin, although it has the functionalities and technical capabilities to fulfil the role of personal assistant, the frictionless component is, as customer reviews suggest, still missing. A VA device that often misunderstands or incorrectly executes user commands, tends to overheat, has a battery life shorter than a day, and pulls down the collar of the clothes worn by the user due to its weight is far from being a seamless and fluid element of an individual's daily routine.

The interviews conducted shed light into some functionalities users expect VAs to perform to support them in their personal lives. These include reminders to pay taxes and bills and alerts of utilities contracts up for renewal. These level of personalization of these alerts could be increased with suggestions of alternative providers offering better services at lower costs and the ability to recover an email with a valid promotion code the user previously received. This functionality could be extended to businesses with procurement departments being able to ask a VA a question along the lines of: *"Our tender is finishing; what providers met our requirements? Classify them in terms of the quality of their proposals."*

In the professional realm, a more personalised experienced can be given to users by, for example, enhancing VAs with time management and task prioritisation abilities. VAs can respond to commands like *"Prepare my day"* with a list of tasks the user should perform to meet upcoming deadlines and attend scheduled meetings and other commitments. Indications of progress in a way that is easy to digest like a percentage were appointed as a useful add-on. An example VA response with this information is as follows: *"Today you should focus on producing the report Mike asked you for as it is due tomorrow, and you have only completed around 20% of it"*.

8.3 The Opportunity posed by Synergies between Virtual Assistants and Generative AI

Generative Artificial Intelligence, commonly referred to as Gen AI, involves deep-learning models and algorithms that receive raw data as input and use it to generate statistically likely content which format ranges from plain text to (Martineau 2023; McKinsey & Company 2024)u 2023; McKinsey & Company 2024). After conducting extensive research on the Virtual Assistant technology, this paper highlights the integration of Gen AI into VAs as an essential element to meet the already mentioned needs for their further personalisation and streamlined interactions with the users. When considering Gen AI, the horizons of the functionalities introduced in 8.2 expand significantly.

In the book *Diffusion of Innovations*, published in 1962, Everett Rogers introduced the well-known concept of the Technology Adoption Curve. This theory segments society into five groups according to the rate at which they adopt new technologies in the market: innovators, early adopters, early majority, late majority and laggards. Innovators are extremely open to new technological advances whilst laggards experience scepticism and resist change. (Grigul 2024) During the interviews conducted, the respondents were asked to position themselves along the curve with regards to the Gen AI technology. **Interviewee D** identified themselves as an early adopter. Using Open AI's ChatGPT as an example, they raised the point that Gen AI entered our society in a "*Big-Bang manner*" that shortened the timeframe between the early adopters and early majority groups. The reasons the interviewee provided for this are threefold: the generative component; the multitude of use cases where Gen AI is applicable ultimately leading to pervasiveness; and accessibility of the technology as it is, to a certain extent, free.

In accordance with **Interviewee D**'s vision, Grigul (2024) confirms that Artificial Intelligence has the capacity of accelerating technology adoption and shifting the pattern given by the Technology Adoption Curve. It has the capability of blurring the lines between the groups comprising the curve or modifying their proportions in terms of number of users. The author

suggests that the key accelerator in AI adoption is the fact that it is trained to understand commands given by the users in a way that is natural to them. This means users can bypass the traditional process of learning how to give inputs in a format that the technology can interpret, as is the case in programming languages, for example. (Grigul 2024)

The idea of rapid and unprecedented adoption is supported by recent McKinsey findings. In an online survey conducted between late February and early March 2024, 65% of respondents reported their organisations were using Gen AI in at least one business function. This percentage nearly doubles the one observed in the 2023 survey where 33% reported this to be the case. (Singla et al. 2024)

Furthermore, Grigul (2024) touches on the personalisation capabilities of AI by stating that *“AI also enables products to be highly personalized from the outset, which can attract early adopters by offering them immediate value”*.

With the developments in the field of Gen AI and the tremendous potential of this technology, the boundaries between the Gen AI and Virtual Assistant technologies are fading. VAs are becoming more powerful and extending beyond the devices we traditionally called as such.

Revisiting the case of Apple, with Apple Intelligence, the technology giant is incorporating generative models into Siri. These make Siri able to better understand both typed and spoken commands, take new actions, have stronger contextual awareness, and tailor outputs to both the user and the information available on their iPhone. (Franklin and Roy 2024)

This paper strongly recommends developers of the VA technology to further invest in Gen AI capabilities to offer increasingly more personalised support to their users. In response to inquiries regarding new VA functionalities that would make their professional lives more efficient, most interviewees made direct reference to the need to use Gen AI for their desires to become a reality. This showcases not only the degree to which Gen AI is embedded into their lives, but also their awareness of the capabilities and applicability of the technology.

Interviewee A mentioned that embodying Gen AI into a VA can give assistance to patients as a pre-diagnostical process. In a controlled environment, such a VA can guide a patient to take pertinent actions to prevent their health condition for worsening before they are able to get the in-person medical support they require.

Interviewee E alluded to real-time translation and writing suggestions for professors marking assessments and typing student feedback in a language they are non-native speakers of. They also referred to the generation of summaries of documents or meetings.

Finally, **Interviewee F** touched on the repetitive data analysis tasks some workers must perform in the organisation. These include Search Engine Optimisation and traffic-related analysis. The company lacks automated systems that can quickly give the required results, and these tasks are therefore currently performed manually. For a VA to be able to perform this type of analysis and produce the outputs in the correct format, it would need a strong understanding of the context behind the numbers including a strong understanding of the business. Having full awareness of the complexity of tasks of this nature and not disregarding the need for human supervision, a Gen AI-powered VA has the capacity to eliminate human error and sets the stage for the generation of a more precise output.

During the week commencing November 18th, 2024, Microsoft held the annual Microsoft Ignite conference in Chicago (Microsoft 2024). This event is a prime example of how the concepts presented in this section are being considered by a major technology player and applied to enhance the products they commercialise.

Microsoft 365 Copilot represents the integration of Copilot, the firm's Gen AI-powered assistant, into the workplace through Microsoft 365 tools like Word, PowerPoint, Excel, Outlook, Teams, and SharePoint (Spataro 2023). With the vision of making Copilot the personal assistant for every employee, Microsoft announced the introduction of Copilot agents in Microsoft 365 during the event. As an example, Copilot agents integrated into SharePoint can

locate specific documents in a matter of seconds and summarise them. A user can create an agent with knowledge of specific SharePoint folders or files. Such agent will respond to any query using only data found in the specified documents. These agents can be shared in a Teams chat, allowing users to ask questions directly to the agent by mentioning it in the conversation. The seamless integration of the agents in the tools users are accustomed to using is combined with personalisation options. Organisations have the flexibility of building and manage access to their agents using the Copilot Studio. Elaborating on the case of SharePoint, sources external to SharePoint and specific actions can be added to agents using the Copilot Studio. (Spataro 2024)

8.4 Investigating on Users' Concerns and the Societal Impact of Virtual Assistants

The integration of Virtual Assistants into people's daily and professional lives has brought significant benefits in terms of convenience and efficiency. However, this growing reliance on VAs raises substantial concerns about privacy, critical thinking, and the formation of consumption bubbles.

In order to successfully execute users' requests and provide a personalized service, VAs necessitate the collection of vast amounts of personal data (Chung and Lee 2018).

This extensive access to sensitive information has consequently raised major concerns about the security and confidentiality of the data collected. It is essential to clarify who can access this information, how it is utilized, and which are the safety measures in place, since the absence of transparency and user agency may further cultivate mistrust and anxieties around potential privacy breaches.

A glaring example of these concerns emerged when it was discovered that Apple allowed its employees to listen to Siri recordings without explicit user consent. Although Apple apologized and made changes to the Siri evaluation program, this episode highlighted the fragility of

current privacy norms and the need for greater attention from technology companies in managing personal data.

Interviewee D emphasized the importance of transparency and user control as critical factors for the adoption of VAs.

While Virtual Assistants offer convenience, their reliance on algorithms raises concerns about potential perpetuated biases. These devices might filter information based on user preferences, directly reinforcing existing viewpoints and limiting exposure to diverse perspectives.

On the other hand, this also mirrors the role of human news editors, who often shape news to suit specific audiences and spring specific reactions.

To mitigate these negative effects in VA-provided information, automated tools can process and analyze vast datasets, providing a more objective representation of reality.

However, human oversight remains crucial to interpret the output of these tools and ensure that information is presented in a balanced and ethical manner.

Another point to consider, is that potential overreliance on VAs to perform daily tasks, from scheduling appointments to conducting research, could also compromise the development of critical thinking and problem-solving skills.

Interviewee F, who works in customer growth and acquisition, highlighted how the dependence on VAs for even complex tasks can limit the ability to learn, analyse and discover independently. As already discussed in **Section 6.2**, by over-relying on Artificial Intelligence assistants, we risk diminishing our capacity for critical thinking, innovation, and adaptation. When we outsource cognitive tasks to machines, we sacrifice the opportunity to develop our own problem-solving skills and cultivate a deeper understanding of the world.

This phenomenon can become particularly concerning in education, where the use of VAs for research and writing could lead to a decrease in cognitive engagement and critical analysis skills among students. As a matter of fact, **Interviewee E** expressed concerns about students who rely

too heavily on VAs, tend to present a more passive learning process, limiting their own ability to absorb and recall key information for their academical and personal development.

Therefore, although technology can improve our quality of life by saving us time and simplifying some activities, it is imperative to strike a balance between leveraging technology and preserving our core human capacities.

Furthermore, the integration of Application Programming Interfaces (APIs) into VAs, while offering a more seamless and integrated user experience, could contribute to the formation of echo chambers or consumer bubbles.

By limiting the range of services and information to those offered by companies with a higher influence on people's daily life, there is the significant risk of creating a homogeneous digital environment lacking diversity on the amount of information provided and absorbed.

Interviewee F expressed strong concerns about this phenomenon, arguing that excessive reliance on APIs could fuel market monopolization and limit the variety and breadth of results to which users are exposed. This limitation, coupled with algorithmic personalization based on user preferences, could reinforce existing beliefs and reduce exposure to diverse perspectives. The consequence would be a distorted and incomplete worldview, inhibiting intellectual growth and the formation of informed and critical opinions.

In summary, while the integration of VAs into society offers undeniable benefits, it is crucial to address the challenges related to privacy, critical thinking, and echo chambers.

Careful regulation, the promotion of conscious use, and the development of technologies that prioritize transparency and information diversity will be essential to ensure a positive impact of VAs on society. The potential of these technologies has to be effectively expressed without compromising users' privacy, ability to think critically, or freedom to access a diverse range of information and perspectives.

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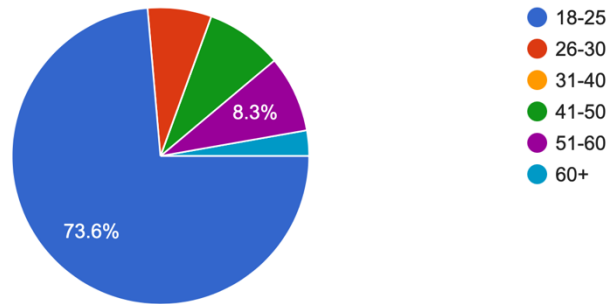
10 Appendices

Appendix 1 – Virtual Assistant Usage Survey Answers

Demographic Questions:

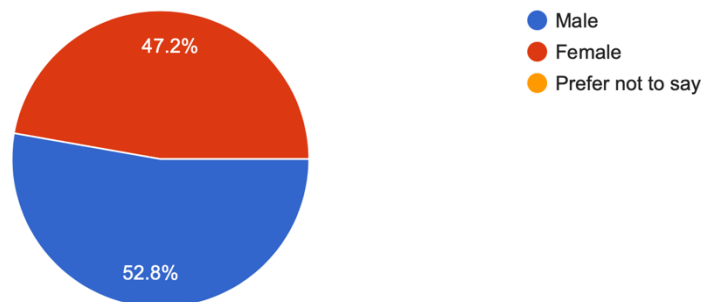
Specify your age range

72 responses



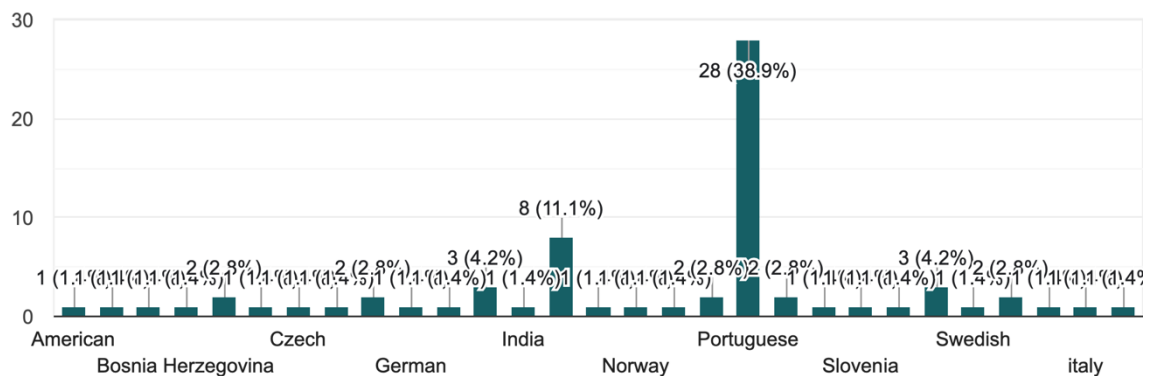
Specify your gender

72 responses



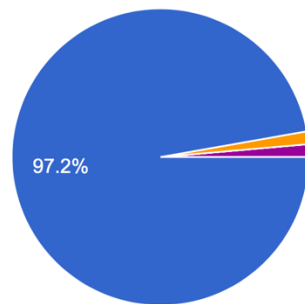
What is your nationality?

72 responses



Where do you currently live?

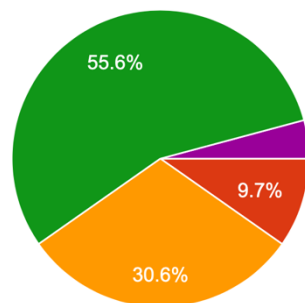
72 responses



- Europe
- Africa
- Asia
- North America
- South America
- Oceania

What is your education level?

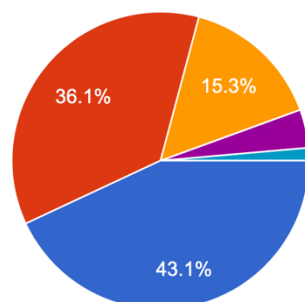
72 responses



- Middle School Diploma
- High School Diploma
- Bachelor's degree
- Master's degree
- PhD

What is your current occupation?

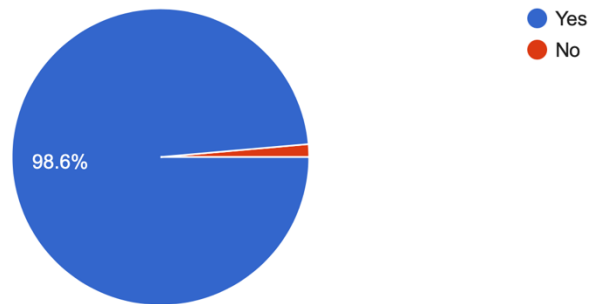
72 responses



- Student
- Employed
- Working student
- Unemployed
- Self-employed
- Retired

Do you know what Virtual Assistants (i.e., Siri, Alexa, Google Assistant, Cortana) are?

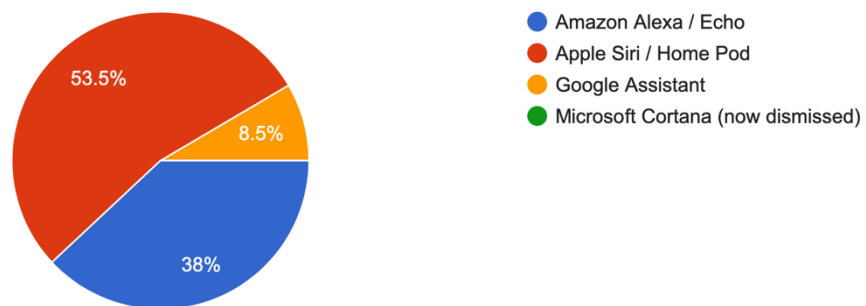
72 responses



Questions for Respondents who knew what VAs are:

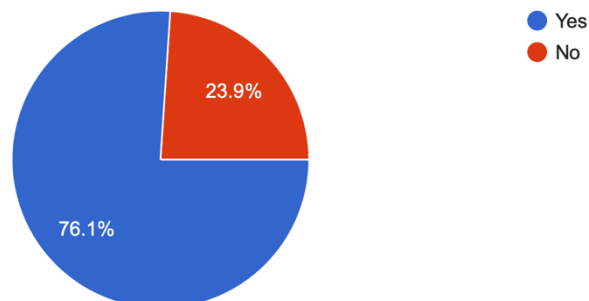
What brand and product first come to your mind when you think about Virtual Assistants?

71 responses



Have you ever used Virtual Assistants?

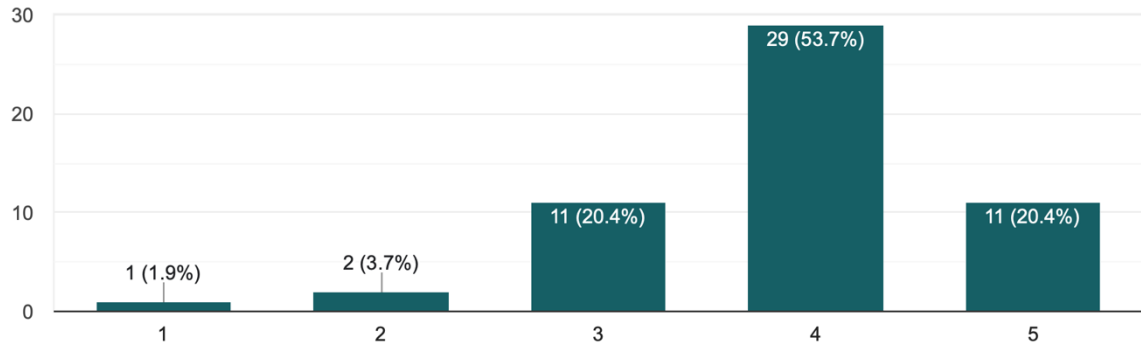
71 responses



Questions for Users of VAs:

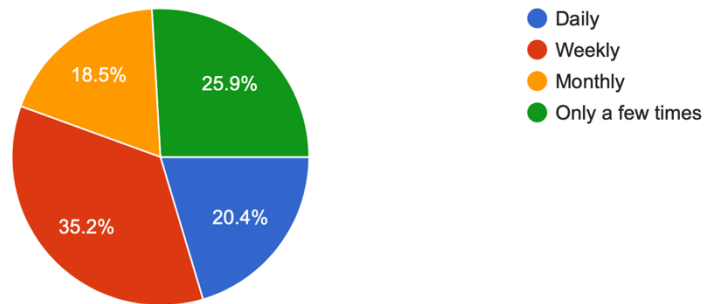
How confident do you feel when you use Virtual Assistants (i.e., how familiar are you with them)?

54 responses



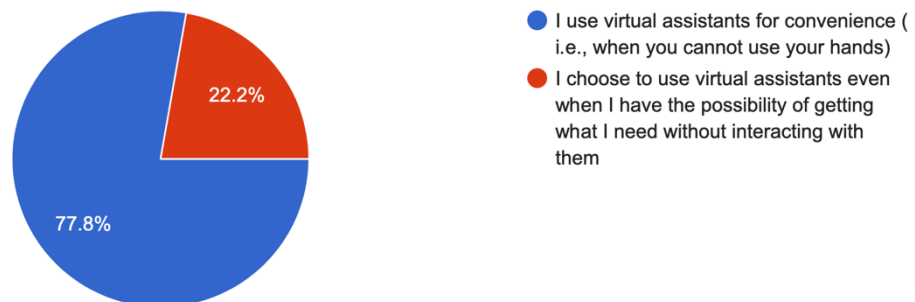
How often do you use or have used Virtual Assistants?

54 responses



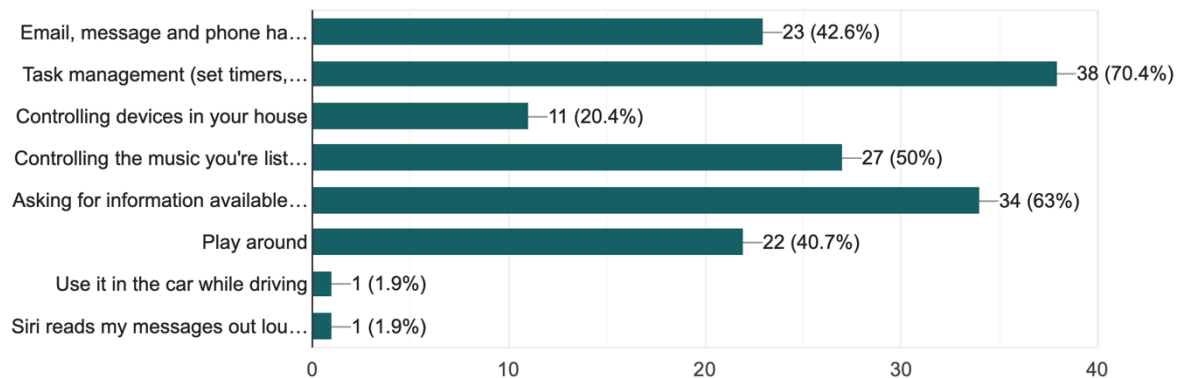
If you had to choose an option, which one would it be?

54 responses



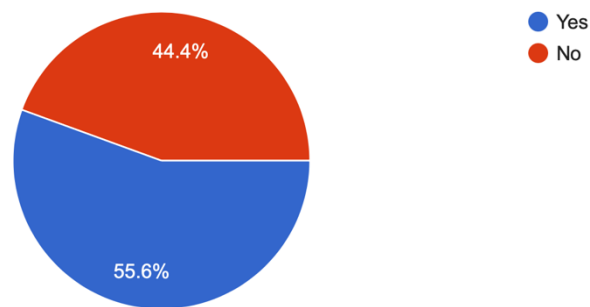
What have you used a Virtual Assistant for?

54 responses



Do you think that using a Virtual Assistant improved your productivity?

54 responses



If you think it improved your productivity, what kind of impact has it had?

27 responses

1. *"Virtual Assistants save me time. They allow me to perform actions with my phone while I am doing something else at the same time."*
2. *"Faster and more accurate typing."*
3. *"It simplifies day to day tasks"*
4. *"marginally"*
5. *"I save a lot of time with it"*
6. *"Positive impact, easy to use and helpful"*

7. *"Keeps me more organised, less time wasted on doing menial tasks. Helps me be less forgetful. E.g. I recently told Gemini that I have 5 birthdays that I want to remember, I was planning on adding them myself as reminders, it automatically added them as reminders into my calendar at once!"*
8. *"it's a matter of doing stuff that i cannot do in that moment, like if I am driving i cannot type messages, or if I am cooking I ask to set timer, so it allow me to do more stuff when I am busy"*
9. *"I was able to drive and text and get things done (calls etc) with safety while I was in the car"*
10. *"Reduced sunk time spent to do what the assistant could do itself"*
11. *"Spend less time on trivial activities"*
12. *"I am using Apple Siri the most when I am driving, through Carplay. it's a lifechanging function that enables me to call, change songs or even set reminders without taking my eyes of the road. i'd say it's a huge impact in convenience and safety."*
13. *"Time management"*
14. *"I'm more efficient"*
15. *"No"*
16. *"Allows me to finish some tasks quicker"*
17. *"I use Alexa in my kitchen, she plays music, sets timers for cooking, sets alarm clocks for the morning, tells me the weather etc. I havent really used her in terms of my work but saving some time."*
18. *"Company events and client meetings organization"*

19. *"makes everything more efficient and less time consuming"*
20. *"Time: more tasks in less time"*
21. *"Various micro Time savings"*
22. *"Just calling people faster than looking for their contact"*
23. *"Not a huge one, but when I am driving I can leglly use it to call someone."*
24. *"Save time"*
25. *"Time efficiency"*
26. *"It simplified some tasks, but smaller ones, so it did not impact my overall productivity."*
27. *"Made me gain a little bit of time each time, but it adds up"*

If you don't think it has impacted your productivity, what do you think was lacking?

20 responses

1. *"I think its not suuper productive for more because I dont think she is connected to my iphone calendar or really understands complex tasks. Wouldnt use it for important stuff like sending messages because she frequently misunderstands. Also Im probably not aware of the advanced features that are offered."*
2. *"I think the tasks of most assistants aren't too complex to have a real impact in my productivity"*
3. *"Lack of accuracy, bugs etc..."*
4. *"I just don't use it enough to utilize the full capabilities"*
5. *"There's always going to be an issue with the input being voice, with either loud rooms or being outside in a situation where you can't speak, it's not always ideal. But there's"*

still many situations where it's helped, especially when you want to pause the TV and turn on the lights when running to the kitchen to grab some ice cream during a good movie!"

6. *"i just prefer typing questions into google instead of asking out loud"*
7. *"I think that, mostly, it improved my safety because I can complete tasks when I need my hands for something else. I think that I would still attempt to do those tasks (e.g., answer the phone), but I would do it with one hand only."*
8. *"n/a"*
9. *"More complex/lengthy tasks still cannot be executed by virtual assistants to a 100% correct degree. The things i use it for are usually short questions, such as what is the weather, which saves me maybe 2 seconds of time."*
10. *"They should try to interpretate more our requests"*
11. *"It's not "smart" enough to help me tackle challenges that are directly related to increasing productivity"*
12. *"I can't identity if there's something lacking because I only use it when I need quick information and not often so in my case it's not a matter of productivity, it's just convenience in a specific moment"*
13. *"nothing"*
14. *"Nothing. Just not finding very useful for my life... yet"*
15. *"Real interaction capabilities"*
16. *"Lack of responsiveness"*
17. *"efficiency in getting completely right what I was asking for"*

18. *“Assertiveness”*

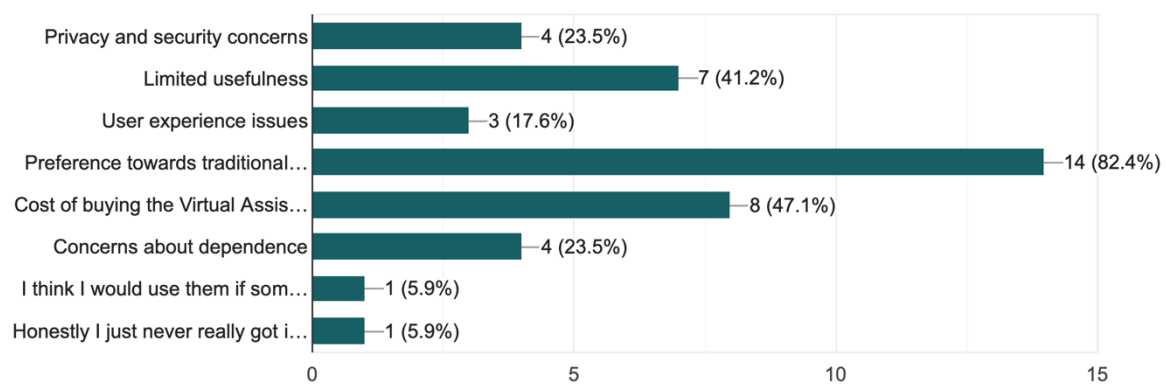
19. *“More applications towards Productivity tools”*

20. *“Integration to home is lacking hard to reach full potential”*

Questions for Non-Users of VAs:

What are the main reasons for you not to use Virtual Assistants?

17 responses



Appendix 2 – Siri Working Process Overview

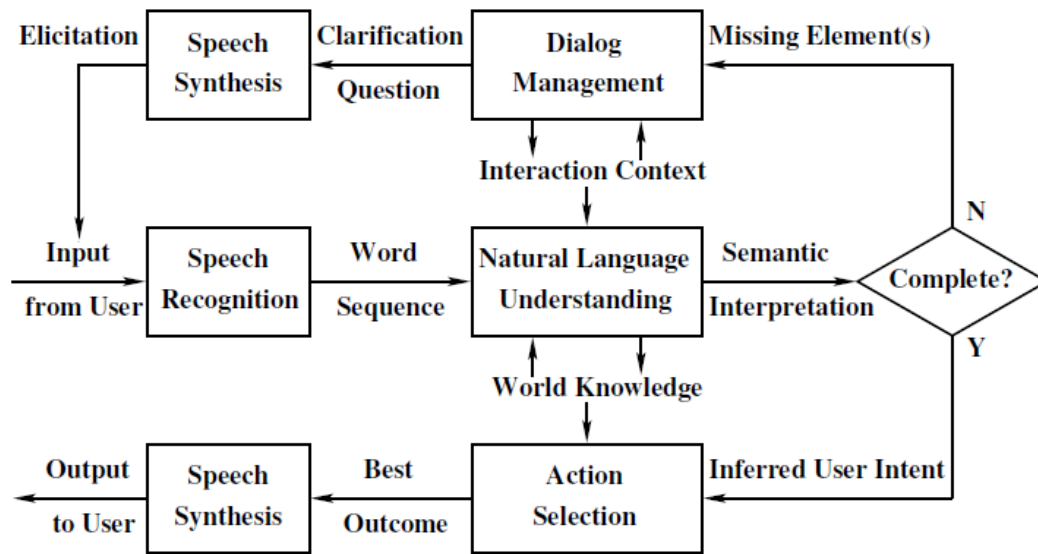


Figure 1 – Siri Working Process Overview (Bellegarda 2013)

Appendix 3 – Interview Guide

Virtual Assistants in Business Processes for Life-Threatening and Non-Life-Threatening Jobs

Introduction and Warm-Up

Good morning / afternoon / evening. My name is [Filippo/Joana] and I am currently writing my thesis for the Masters' in Management [Joana: with a specialization in Digital Business] at NOVA School of Business and Economics. The focus of the thesis is to study the virtual assistant technology and its impact on business processes.

For this purpose, I would like to interview you for approximately 45 minutes to 1 hour. I will ask you several questions, to which there are **no right nor wrong answers** and **you are free to say whatever** comes to your mind on the subject. We'll discuss your experiences with Virtual Assistants in the workplace, your perceptions towards their impact on your productivity and how you see the future of this technology. We'll also present you the case of two different Virtual Assistants and ask you to comment them.

To be able to analyze our interviews later, I would like to record our conversation anonymously. Your responses will be kept confidential, and you will not be contacted further past this interview, in compliance with the GDPR (General Data Protection Regulation), of May 2018.

- **Do you consent to proceed with this interview?**
 - Y [GO TO NEXT QUESTION AND START RECORDING. Be sure to start recording by thanking the person for consenting to participate in the interview.]
 - N [THANK FOR TIME AND FINISH INTERVIEW]

Filter Question

- Were you aware of the Virtual Assistant technology (e.g., Siri, Alexa, Google Assistant, Cortana) before this interview?
 - Y [GO TO NEXT QUESTION]
 - N [THANK FOR TIME AND FINISH INTERVIEW]

Background Information

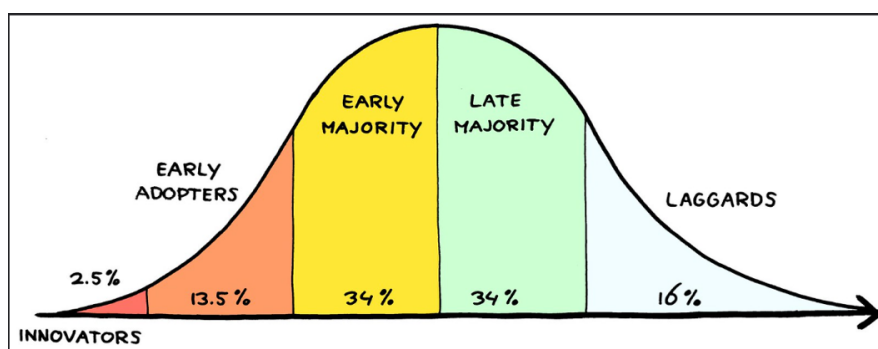
I'd like to get some background information on your professional life, if you're so kind to share.

- Can you tell me a bit about your role and responsibilities? Please be as concrete as possible in terms of your daily tasks.
- How long have you been in this position for? [If short time, ask about previous job]

Main Interview Questions

Part 1: Adoption Bell Curve

1. [Show image of technology adoption and acceptance curve] Are you familiar with the concept of the technology adoption and acceptance curve?



(Appelo 2010)

- a. Y [GO TO NEXT QUESTION]
- b. N [Give explanation]

2. Consider the case of generative AI chatbots like ChatGPT (first released in November 2022) and Copilot (first released in February 2023). If you use this technology, where would you position yourself in the curve for this technology?
3. Now consider the case of Virtual Assistants like Siri (first released in October 2011) and Alexa (first released in November 2014). If you use this technology, where would you position yourself in the curve for this technology?

Part 2: Current Use of Virtual Assistants

4. Do you currently use any Virtual Assistants (e.g., Siri, Alexa, etc.) in your personal life?
5. If so, which ones? How often? And what for? [Name example activities below
 - a. Email, message and phone handling (e.g., read messages out loud, reply to messages, pick up calls)
 - b. Task management (e.g., set timers, alarms, reminders, appointments)
 - c. Controlling devices in your house (e.g., control smart lights, TV, thermostat/air-conditioning/heating)
 - d. Controlling the music you're listening to (e.g., search for songs, play/pause, speakers)
 - e. Asking for information available on the internet (e.g., weather, news)
 - f. Check the time
 - g. Play around
 - h. Use it in the car while driving
 - i. Read messages out loud
 - j. Add item to shopping cart/purchase an item]
6. Have you ever used a Virtual Assistant for shopping (specifically Alexa to add an item to your Amazon basket)?

7. Do you currently use any Virtual Assistants in your professional life?

a. Y [GO TO PART 3]

b. N [GO TO PART 4]

Part 3: Users of Virtual Assistants in professional life

8. Which Virtual Assistants do you usually use at work?

9. What specific tasks do you use Virtual Assistants for in your job?

10. What specific feature of Virtual Assistants do you find most beneficial?

11. Do you feel that relying on Virtual Assistants has changed your approach to tasks or decision-making?

12. Have Virtual Assistants improved your productivity or efficiency? In what ways?

Part 4: Non-Users of Virtual Assistants in professional life

13. Why don't you use Virtual Assistants in the professional context?

14. Did you ever consider using them? If so, why did you not take the step?

15. What aspects of this technology would have to change for you to adopt it?

16. Do you think the Virtual Assistant technology would have the potential of boosting your productivity in any aspect of your job?

Part 5: "The Ideal" Virtual Assistant

17. If you had to choose a very tedious task that you want a Virtual Assistant to do for you, which one would it be?

18. Thinking back at your industry, do you think Virtual Assistants can be used for training of new employees in your industry?

19. And do you see companies having the willingness to pay for those kind of training services or are they still quite skeptical about it from your experience?

Part 6: Cases

I am now going to present you the case of two companies that developed Virtual Assistants and we'll have a discussions about some topics.

Apple: Siri

Let's start with the well-known case of Siri.



(Armin 2020)

- Siri is a virtual assistant integrated into Apple devices' operating systems.
- **Price:** Cost of acquiring Apple device
- Siri allows users to interact with their devices using natural language, expecting the system to understand their intent and take appropriate action.
 - Hands-free activation with “Hey Siri”
 - Ability to access third-party apps
 - Translation and text-to-speech
 - Siri can work offline
 - Siri can summarize and prioritize user notifications using Apple Intelligence
- **Limitations:** Language barrier and security / privacy challenges.

Humane Ai Pin

Moving on to the Humane Ai Pin.



(Humane Inc. 2023)

- Humane is an American consumer electronics firm founded in 2018. The CEOs of the company are two ex-Apple employees.
- The Ai Pin is a wearable, AI-powered device that attaches magnetically through your clothes and is intended to act as your personal assistant. It started shipping in April 2024.
- **Price:** \$699 for the device + \$24/month subscription (to get a phone number and data for the pin)
- **Functionalities:**
 - **New interactions** (beyond touch and screens)

- *Laser Ink Display*



(Humane Inc. 2024a)

- *Touch and hold*
 - *Other familiar gestures* like touch, tap, and swipe

- **Trusted Contacts:** The Ai Pin learns what takes priority and lets you know when the so-called trusted contacts reach out to you.
- **Catch Me Up:** Quickly catch up on what you've missed by saying "Catch me up".
- **Ai DJ:** The Ai Pin generates the perfect playlist for every moment.
- **Health (*coming soon*):** You can ask if a food is ok for you to eat by asking "Can I eat this?" while holding up the food.
- **Ai Messaging:** You can compose messages by talking to the Ai Pin.
- Can act as an **Interpreter** and **take pictures**
- **Limitations:** Overall, the things it does do, it does them "pretty well" (e.g., play music, deal with texts and phone calls). But there's still a lot that it doesn't do. We have to bear in mind though that this is the first generation of a device that has a lot of potential to improve.

[Show clip https://www.youtube.com/watch?v=_w1vv7_dU2Y from 12:55 to the end]

Discussion

20. Which device do you see yourself using in a professional setting?

- a. [If needed, complement the question with: Do you think you would go for a simpler and more standard approach using Siri that is more likely to do what you want or a sophisticated Humane Ai Pin with less certainty on the result?]
- b. Do you think you would ever adopt both and switch between them depending on the task at hand?

21. There are many reviews online that criticize the Humane Ai Pin (we've already discussed some of its limitations). Siri has been around for years and can be said to be a successful VA.

- a. What would you say are the 3 most important criteria to define the success of a VA product?
- b. Why would you say the Humane Ai Pin is getting this negative feedback? Are we ready for such an innovative product?

Part 7: Concerns and Future Outlook

- 22. How do you see the future of virtual assistance in the workforce? Are you worried about people potentially relying on tools like Virtual Assistants in the future? Or even having their jobs drastically changed (or even replaced) by these tools?
- 23. What do you think are the biggest misconceptions about the use of Virtual Assistants as a tool in professional settings?

Sociodemographic Questions

- **Age (in years):**
- **Gender:**
- **Nationality:**
- **Country of residence:**

Education level:

- ☐ Can't read / write
- ☐ Less than 4th grade
- ☐ 4th grade
- ☐ 6th grade
- ☐ 9th grade
- ☐ 11th /12th grades
- ☐ Professional, Vocational or Arts Degree
- ☐ Incomplete Undergrad
- ☐ Undergrad in Nursing, Social Services, Childcare, Primary Schooling, Tourism, Secretariat,
Accounting, Archiving
- ☐ Other undergrad programs
- ☐ Post-grad or Masters
- ☐ PhD

Occupation:

- ☐ Middle and Top Management
- ☐ Specialized Technicians and Small Business Owners
- ☐ Employees of Tertiary Sector
- ☐ Qualified / Skilled Workers
- ☐ Unqualified / Unskilled Workers
- ☐ Retired / Unemployed
- ☐ Students
- ☐ Housewives

Wrap-Up

Is there anything else you'd like to share about your experience with Virtual Assistants in the workplace? Do you have any additional questions?

Thank you so much for your time and insights. Your responses are incredibly valuable to our study. If you have any questions or would like to receive updates on the study, feel free to contact us.

Have a great day!

Appendix 4 – Interview Transcripts for Life-Threatening Jobs

The interview transcripts were automatically generated and later translated with a software due to the interviewees being non-English speakers.

Interviewee A: Doctor specialized in Ophthalmology

Filippo Vianello OK.

So you should receive the notification.

Let me know when you see it.

Interviewee A: Yes, I saw it.

Filippo Vianello Amazing.

OK.

So let's start.

Thank you again, by the way for being here.

I already introduced you a little bit the topic of our thesis.

So now we can start with the interviews with the question. We're gonna start with a feature question, actually.

Were you aware of the virtual assistant technology like Siri Alexa Google Assistant Cortana before this interview?

Interviewee A: Yes I was aware of that OK.

Filippo Vianello Great OK now I would like to get some background information about your professional life.

So yeah, if you could tell me a little bit more about your current role and responsibilities.

Try to be as concrete as possible yeah in terms of your daily task especially.

Interviewee A: It's so much 25 year old Doctor. I'm currently specializing in ophthalmology.

However, soon as I graduated from medical schools like after six years of university.

I was working in an emergency medical care center in my town where I was giving medical support outside of the doctor's office hours.

Filippo Vianello OK nice and how long have you been in this position for.

Well I've been concretely working as a doctor only for one year but for the medical school I had to carry out several.

Trainships in different units like, I don't know, urology, ophthalmology.

Cardiovascular department and everything so. All these experiences made me see a lot of different medical situations and expose it to a very. Large variety of different tasks that doctors usually do on a daily basis.

Filippo Vianello Great nice. Now I'm gonna show you an image.

Let me know when you see it.

Interviewee A: I see it. OK, great.

Filippo Vianello OK. Have you ever have you ever seen this curve?

Does it?

Does it look familiar to you?

Interviewee A: No OK OK.

Filippo Vianello And then I'll explain you.

It's called the adoption well curve.

It has been developed by Everett Rogers and basically it shows you how technology spreads within a population over time as you can see follows the normal probability distribution and you can see like 5 different categories on the left side you have innovators.

There's clearly majority and then on the right we have the late majority in the lacards.

So now there's some questions related to this considering the case of Gen AI chatbots like ChatGPT or Gemini or or copilot I just want was just wondering if you use this technology.

Where would you position yourself in the core of this technology?

Interviewee A: I would say I would position myself in the early majority.

I like tech.

I'm quite of a nerd sometimes so as soon as the bars around ChatGPT started I began to use it as well and to test it out.

Filippo Vianello Great great great and considering now the case of virtual assistants like Siri for example released in October 2011 and and Alexa I was wondering where would you position yourself with this technology on the curve.

Interviewee A: Well in this case I think I will go for a late majority but many furnished factor because yeah I was still too little at the time that city came out to have a smartphone and the way I was like using my phone was very limited to you know.

Send messages to my classmates parents my friends I I think I started using.

Siri only in the last years of high school but not that much.

Even now I use it quite rarely and just to perform, you know, basic task if my hands are dirty or I cannot use the screen on my phone. It's just like I don't know when I'm driving or or whatever. Asking to play music, setting timers and read mess.

And for Alexa no I don't have it at home so I never used it.

Filippo Vianello OK OK nice.

And so yeah you told me that now you currently use visual assistance in in your life.

And yeah you were mentioning some some tasks.

Do you have like any other ones that comes to your mind?

I don't know apart from setting timers alarms or controlling the music.

Interviewee A: No no really to be honest.

Maybe you know if I have a very back day I just like.

Set some reminders from city, but yeah it's very very rare.

Filippo Vianello Nice. And have you ever used visual season for shopping, for example, like

Alexa?

Interviewee A: No. Never like I don't have it at home. As I said before.

And yeah never had a chance to use it. Like not even the one from my boyfriend or my friends.

Filippo Vianello OK. Do you use virtual assistants in your professional life?

Interviewee A: No I don't

Filippo Vianello OK and yeah you could tell me like a little bit more about the reason why you don't use virtual assistant in your professional context.

Interviewee A: So mainly because nobody that I know really uses them and to be honest like I wouldn't really know how I could integrate them on on my job.

Like right now I mean I have so many ideas of course but as far as I know the technology 's not there yet so I cannot make it happen.

I don't need to play music or set time or schedule appointments.

Which are normally activities that I use for because there's someone else taking care of that kind of stuff?

You know for me not for playing music but I don't know set timers or schedule appointments secretary doing it for me.

So no, I never use a virtual assistant in my job.

Filippo Vianello Have you ever considered like using them, and if so, why you didn't take the step?

Interviewee A: No, no, really.

To be honest, I don't really know how to use them in my current job. As I said before, I don't think. The current features of Siri or any other virtual assistant that I know are ready to make me more productive or to carry out some tasks medical related, you know.

Filippo Vianello OK, OK.

That's interesting and.

One aspect of this technology would have to change for you to talk to then.

Interviewee A: I think that our job is so delicate that it would be like we would need a specific virtual assistant only for medical purposes so it should be filled only with reliable and updated information to be of course as useful as possible for us and for the patient.

And there must be somewhat a connection between patient data, the virtual assistant and.

And us, of course, as doctors.

Filippo Vianello OK OK. Got it.

And do you think that that this technology has the potential of boosting your productivity in any aspect of your job.

Interviewee A: I think the potential is there for sure.

But I don't know how long it will take to be expressed.

You know for example we do. A lot of repetitive tasks every day like I don't know prescribing medications sending emails to our colleagues or patients certificates to the patients like especially if you are a General practitioner the amount of bureaucracy.

If you want to call it like that that you need to take care of it's pretty high and it takes a huge chunk of your time not a joke please.

Filippo Vianello OK and if you had to choose then a tedious task.

That you want a virtual assistant to do for you.

Which one would it be?

Interviewee A: I think the first thing that comes to my mind is as I was kind of saying before routine medical prescriptions like if there was a way to automatize it like asking. Virtual assistants something like remember that every 2 weeks you need to send.

This patient this prescription it will save time to him and those to the doctors since he won't need to go to the doctor's office just for a routine prescription.

Or a stamp basically.

But yeah also like if even if it's not a tedious task if it was a General practitioner I would like my virtual assistant to inform me if any of my patients is having a severe medical condition of course it will have to be you know as I said.

Before connected with a patient somehow maybe through I don't know like a smart watch. Monitoring basic like parameters but imagine if I'm at home or just outside the office or the hospital where I'm working I receive a notification that. X Patient of mine is having a heart attack. And maybe this person lives alone.

Nobody can call an ambulance.

What if I received a notification from my visual assistant and just with a click I can send an ambulance there?

Like of course it means that most likely then I would work.

Way more than I should.

But I mean we are paid and also we want especially to save lives.

So I think it will be a massive help.

Filippo Vianello OK. OK. OK. that's interesting.

That's interesting.

Interviewee A: Oh yeah, another thing.

Sorry, like I was also thinking if a virtual assistant.

Was linked to a patient.

It will also be helpful for a prediagnostic screening like with the right information.

It might already tell the patient something about their gravity of his condition.

And if I'm not working and once I go back to work I will see like a report like this patient has said his stomach has been hurting for 2 days taking some tabs but

Without success has done ABC. But it doesn't work.

And yeah training may be the virtual assistant to ask the requests to the patient remotely.
Without even more for the for the pre diagnosis.

See the patient afterwards, because although the first assessment the virtual assistant can be very helpful.

Full there are some things that I can't understand or treat only by seeing the patient physically, you know.

Filippo Vianello OK, OK. So thinking back on your industry, you think.

The Virtual assistants they have potential, but do you think they have potential also for training purposes like to for training new doctors for example?

Interviewee A: Yeah, yeah, yeah, absolutely.

I mean, it's true that in Med school we do several apprenticeships. As I was saying before.

But at the same time, we're lacking the practical skills once we graduate.

You know so having a virtual assistant that help us to identify the right questions to ask a patient confirm a diagnosis that we made or somewhat gamifying a virtual surgery experience like OK you decided to make a cut here.

Parameters are still like 120 80 whatever.

What do you want to do next and so on?

Like it's it's not like having a real life experience but in my opinion it will help us a lot and keeping us trained for the practical scenarios.

Filippo Vianello Nice nice nice.

And do you see companies having the willingness to pay for those kind of training services or do you think they're still quite skeptical about it from your experience.

Interviewee A: Well since my purposes are still.

Far from reality I think.

I think you know hospitals or medical clinics are still skeptical about using this technology on

such a delicate sector.

Maybe they will invest more in using virtual assistants for training purposes as I was saying before.

But yeah that's a different sector it's in university and I don't know how involved universities wants to be in this process.

Filippo Vianello OK. Nice nice.

Now let's move to to a case part.

I'm going to present you now 2 cases of 2 different companies that developed the virtual assistants and we'll have a discussions about some topics.

So let's start with a well known case of Siri which is a virtual assistant as you know integrated in apple devices.

Prices the cost of acquiring an apple device itself you cannot buy Siri separately and it allows you to carry out a large variety of tasks from.

Accessing 3rd party applications translation working offline summarized notifications beside all the tasks that you mentioned before and that you already use.

And then we have the human AI pin new device came out in April 2024.

The price is \$700.00 for the device itself and then you also have to pay \$24.00 a month as a subscription you know to get the phone number and the data for the pin to work and read the messages and everything OK and in terms of functionalities.

It has a lasering display.

So as you can see here from from the screen.

You can touch and hold it.

Read some familiar gestures like touching typing and swiping.

You can create a list of Trusted Contacts.

And update you on the latest news.

Can be a DJ.

Also you know to compose messages.

To get an interpreter you can take pictures can do a bit of everything of course but there's still like a lot of room for for development.

So coming to you know to a discussion which device do you see yourself using a professional setting.

Interviewee A: I think Siri mainly because I don't like the idea of having a pin on me and visualizing everything on a separate surface different from a screen.

I don't know.

It feels weird.

I can imagine myself using a healthcare version of Siri and every time but it on a smart watch.

On a smart watch for example but if you like a pin is a bit too much also feel like I'm so used to the action of scrolling a screen. Even with a gesture instead of touching it.

That I really don't see myself using just my voice and having a pin and kind of forgetting about the scrolling and the typing action.

OK and do you think you would ever adopt both actually and switch between them depending on what you have to do.

Interviewee A: No no no no.

I don't think so. To me, it's either one of the other.

Filippo Vianello OK, very interesting.

And yeah, there are many reviews actually online that criticize the humane, discuss about some limitation, use margin of improvements while Siri has been around for years and years and can be said to be a successful virtual assistant.

So yeah, in your opinion, which are the most three most important criteria to define the success of?

Of this technology.

Interviewee A: I would say.

The ability you know to perform tasks.

Smoothly like at the moment of the day.

Design wise, maybe as well, like even a very smooth.

Wearable or light look?

Practical design, you know, in terms of interface.

Yeah, like, well, embodied also on the on the whole structure of the device.

Filippo Vianello OK, OK. Fair enough.

And why would you say that?

The human AI ping is getting this negative feedback around it. Do you think we're ready for such an innovative product or is it too far?

Interviewee A: Think we're not ready for that at the moment, mainly because of the whole interaction that people need to have with it. Like it's very different from a traditional device with a screen and everything.

So I don't know.

I feel like it's too much about drastic change going from screen like a physical device in your hand.

Moving like to a PIN.

I don't know if feels a little bit too overwhelming as a change, you know, to the substitute a phone and just having a pin doing everything by that.

Filippo Vianello Talking about concerns and the future outlook of virtual assistant, how do you perceive the future of this technology in the workforce?

Are you worried about people relying on tools like virtual assistant in the future or even having their job changed or or replaced by these tools?

Interviewee A: Well I don't think they will ever replace a doctor because as humans we have empathy and emotional intelligence that these devices don't have.

Those skills are crucial.

You know people around the job like being a doctor.

Also you know having.

We have a vocation for saving people so I don't see myself allowing a machine to decide a very critical situation like in the end we are.

Want training the assistant so.

If there's a human error on the source there's going to be the machine right on the virtual assistant so it will eliminate the error on routine and like those very mechanical tasks?

Yeah I mean it makes sense because in terms of innovation also I'm thinking some surgeries that we do are completed on by robots.

We just need to put the right inputs right so potentially it could be done also for virtual assistant but I feel like having a 360 degree like virtual assistant for the healthcare too much of a step ahead.

Could be a massive out for us and for the patient?

Maybe, but our inputs and our presence is just fundamental I would say.

Filippo Vianello OK interesting and what do you think are the biggest misconception about the use of virtual assistant as a tool in professional settings.

Interviewee A: To me, I think it's about priority concerns and and accuracy of the diagnosis. Like I was mentioning before like you can, I can already imagine some people giving up or doing things the usual way.

Just because the virtual assistant failed the task once took too long to respond to commands, you know.

It's also storing personal sensitive data, such as the medical ones in a device.

That I don't know.

Might be very tricky to deal with for some people you know so that there are still storing servers, laptops and everything, but the impact of hearing a voice different from the doctor's one. Talking about your health, I don't know.

I think it can be uncomfortable for some patients.

Filippo Vianello Great, great, great.

Thank you so much.

I'm just gonna ask you to wrap it up some social demographic questions.

Age. You told me 25, right?

Interviewee A: Yes.

Filippo Vianello gender.

Interviewee A: Female

Filippo Vianello nationality.

Interviewee A: Italian

Filippo Vianello Country residence.

Interviewee A: Italy.

Filippo Vianello Educational level.

Interviewee A: Med school is masters. I think.

Filippo Vianello Yeah. I would say.

Occupation.

Interviewee A: doctor.

Filippo Vianello Is there anything else that you wanna share?

With your experience with virtual assistants, do you wanna make some more insights?

Do you have questions for me?

Interviewee A: No, no, I don't have any any other questions. And yeah, thank you so much

for having me here.

No, thank you so much for your time and for your for your insights.

It's very valuable for for the final outcome of our study. And yeah, even if you have any questions in the following days or you want to receive updates on the study, feel free to reach out. It was there. Happy to help.

Interviewee A: OK, sounds great. Have a nice one.

Filippo Vianello Bye bye. Have a great day.

Interviewee B: Police Officer

Filippo Vianello So let me know when. You accept it.

Interviewee B: Can you hear me?

Filippo Vianello Have you accepted it?

Interviewee B: Yes I think

Filippo Vianello alright. So thank you so much again for for being here, first of all.

And yeah, let's start with the interview.

Here we go.

So I already gave you a little bit of introduction on our.

Thesis, research and yeah, first question of the interview.

Were you aware of the virtual assistant technology like Siri, Alexa, Google Assistant, Cortana before this interview.

Interviewee B: Yes, I was aware of it.

Filippo Vianello Amazing OK. Now I would like to get some more background information about your professional life. If you are that kind to share.

So yeah, if you could tell me a little bit more about your role and responsibilities and yeah, try to be as concrete as possible in terms of your daily tasks.

Interviewee B: So I am a 26 year old policeman. 26 year old policeman operating in the north of Italy. In terms of daily activities, we conduct patrols, investigations, take action in emergency situation and and also. Which is a big part of our daily life, a lot of administrative duties, such as writing reports or complaints and findings, OK.

Filippo Vianello Great. Great. Thank you for sharing that and how long have you been in this position for?

Interviewee B: I've been working this position for one year and a half now, but before I was part of a private security company so.

Some type of work was very very similar.

Filippo Vianello OK. OK, great.

Thank you so much for sharing that.

Now I'll show you an image.

Let me know if you can see my screen.

OK, great. Have you ever seen this?

Are you familiar with the with this concept of technology adoption?

Interviewee B: No, no, never, never seen this,

Filippo Vianello OK.

I will explain a bit for you.

This is called the adoption Bell curve.

It also has another name, like the diffusion of innovation theory that's been developed by a sociologist, Rogers. And basically it shows how technology spreads within a population over the time, as you can see, it follows a normal probability distribution.

And yeah, it divides basically the adopters into five different categories.

We have the innovators, the early adopters, and the early majority on the left side and on the right side. We have late majority and laggards. OK, you got it.

Interviewee B: OK. Feels better now. Great.

Filippo Vianello OK, now I wanna ask another question, which is considering the case of.

Gen. AI. like chatty or copilot releasing in 2022-2023.

I wanted to ask you if you use this technology, where would you position yourself in the curve?

Interviewee B: I would say late majority I am not very tech oriented so I only started using ChatGPT after it became very popular and yeah to be honest.

I don't use it very often, but whenever I use it I think it it tells me. A little bit.

Filippo Vianello Interesting. And considering the case of virtual assistants like CD and Alexa, Siri was released in 2011 and Alexa in 2014.

Same question.

So where would you position yourself in the curve for this technology?

Interviewee B: I think I will position myself in the late majority again.

So because when Siri came out I was still like too young to have a smartphone, you know? So I started using a virtual assistant when I was 16. 17.

Not Siri, but it was the Google One.

And yeah, but it used just to make any telling jokes.

And everything like to have fun with my friends.

But now we're only use it when I'm driving, and of course I cannot reply to messages or read messages, so I ask.

The virtual assistant do it.

Filippo Vianello OK. OK. So you you use it in your personal life.

Interviewee B: Yeah, yeah. I use it in my personal life.

As I said before, yeah, more to read messages answer, make phone calls.

Or to change the music while I'm driving.

And yeah, the buttons on my steering wheel are not working.

So yeah, I change it on my using using Siri

Filippo Vianello OK. And have you ever used a visual system for shopping?

Interviewee B: No, never use visual system for shopping

Filippo Vianello Got it, and you currently use those type of visa assistance in your professional life?

Interviewee B: No, no, no, I don't.

Filippo Vianello OK and why don't you use this other technology in a professional context?

Interviewee B: Well, because as far as I know, nobody really does this.

And when I really could apply too much of, you know?

Filippo Vianello OK, OK, so you never even considered using them.

Interviewee B: No.

I've never seen, you know, our procedures are very standardized.

So the rules are are strict and also the devices we can use.

So yeah, since we we are not presented.

The possibility to use.

So a virtual assistant, nor professional life. I never even thought like I oh, I really need one.

You know?

Filippo Vianello OK. OK, OK. And what aspects of this technology do you think would have to change for you to adopt it?

Interviewee B: Well, for my specific profession, I believe it has to be something unique because it's a very specific job, you know, so it it cannot be a general virtual assistant.

It has to be helpful for us in our specific daily tasks.

It has to be specific for the police needs. It has to know the procedures, the law being intelligent enough to, you know, understand the conversation between I don't a police officer and someone who who shows up to our station.

Kind of featuring information and then helping us to, I don't know, to write a document, for example, or to recognize a person based on a description like it.

I think it's very complex.

Filippo Vianello OK.

OK. OK.

So you think that mutual assistant technology in general have might have the potential of boosting your productivity?

Interviewee B: Yeah, yeah, yeah.

I think there's potential for sure.

It's very difficult to make it real.

My opinion, it can help us, of course, on the administrative side, which is, yeah, the most annoying and repetitive 1.

But yeah, again, since we are not allowed to use it.

Yeah, just potential so far. Yes

Filippo Vianello We just wanted to know about the the potential, it's fine.

So you told me that the administrative part is the most annoying part for you.

So yeah, just to be.

More precise with you if you had to choose a very tedious task that you want a virtual assistant to do for you, which one would it be?

Interviewee B: Well, yeah, the administrative task is can be very, very annoying for us.

We spend a lot of time in our offices, you know, registering crimes or losses of documents or missing people or fights and and everything.

So everything has also to be written in a very formal.

Fancy way.

So sometimes I acknowledge that I'm more focused on finding the right words to put into the report rather than being fully focused and pay attention to every detail of the conversation I'm having with the person in front of me.

Filippo Vianello Wow. OK. That's interesting.

And looking at your professional landscape, do you think that virtual assistants can be used for training of new, you know, like policemen for example?

Interviewee B: Not sure to be honest.

Maybe can help us to train for.

You know, real life emergency situation by asking questions to us and we need to reply.

How we would react to a certain type of input?

But for the rest I'm I'm not sure how we can help.

Filippo Vianello And do you see, like, companies like the government in your case, having the willingness to pay for this kind of technology and training services? Or do you think there's still a lot of S?

Interviewee B: I think there's still a lot of skepticism, to be honest, because yeah, I think it can become useful just for one of our activities that we perform.

So yeah, since the usage is that limited, I don't think that the government would be willing to invest in it already.

Filippo Vianello OK, nice.

Nice. Now I'm gonna present you the case of two companies, different ones that developed virtual assistants. And yeah, we'll have a a little discussion about some topics.

So we have, yeah, Apple with Siri.

Very familiar with that I guess.

Quite mainstream.

It's integrated into every Apple device basically.

The price itself is the cost of acquiring an Apple device because you cannot buy Siri separately.

Yeah, it allows you to use your own natural language.

And yeah, of course you expect the system to understand your intent.

What you wanna do?

What you wanna the virtual assistant to do for you?

It can access to other apps, can translate text to speech, can work offline, and can summarize and prioritize the notification according to according to your needs. Yeah, some limitations.

Language barrier, of course, because not every language is supported and also some privacy concerns.

Then you have human AI pin which not sure if you're very familiar with that.

Interviewee B: No, no, no. It's first time that I heard of that.

Filippo Vianello Yeah. It's like a very recent company Fundament 2018. The series are X Apple employees.

The Pin is a wearable device.

AI powered, as the name says.

It attaches with a magnet on your clothes and yeah, it's meant to be your personal assistant.

Basically came out in April 2024 around \$700.00 for the device.

And yeah, you have to pay your someone monthly subscription of \$24.00.

Per month in terms of functionalities.

Let's say it goes beyond the usual display.

The usual screen.

There's a lasering display.

Touch and hold. You can control it also with very common gestures like touch typing on the device and swiping.

Can make a really substant contacts that are gonna be prioritized in your notifications.

Can ask him to catch you up on the latest news can DJ.

Can help you to compose messages with AI can be an interpreter, can take pictures.

Can also be helpful in terms of else, but it's still under development. You can ask you for food.

Is is like can't be eaten. You know, just by holding the food close to the camera and then it's gonna scan it and analyze it and yeah.

There's still a lot a lot of stuff to do.

Still, many things that it doesn't do, but yeah, that was their first their first try.

So yeah, considering these two virtual assistants, which device do you see yourself using in a in a professional setting?

Filippo Vianello Well, I would prefer to use something like Siri since it will give me a more precise visual feedback. You know on the screen besides the vocal one. And I also, you know, know seed better.

It has been around for many years since I will, so I will. I will trust it more.

Filippo Vianello OK, OK. And do you think you would ever adopt both and switch between them depending on when you need them?

Interviewee B: No, I don't think so.

Filippo Vianello OK, OK. There are many reviews online that pretty says that human AIP, we will discuss some some limitations before and Siri has been around for many years and can be said, you know to be as successful. So what would you say are in your.

Opinion the three most important criteria to define success of a virtual assistant.

Interviewee B: Well, I would say first of all, the ability to perform tasks effectively and at any moment of the day and also being.

Very intuitive.

Since it's told you before, I'm not very tech.

And also having an accessible price. Yeah. I feel like sometimes the the price of acquiring city, for example, is is way too high consumption.

You have to buy a phone or an iPad or or a laptop.

Filippo Vianello OK. Fair enough.

And why would you say that?

The human AIP is getting this negative feedback. Do you think we are ready for such an annuality product?

Interviewee B: I am not an expert but I think we are not ready for that at the moment.

It's very different from Siri because yeah, it's not embodied in in a phone, for example.

And yeah, the the pin that you presented me.

Looks like a separate thing from a phone.

So yes, I will either like use one or the other.

So I think it's too early, you know, to make the switch.

Imagine also, we'll lose a big part of the way we interact with the apps.

Like with scrolling and social media and everything.

So I believe that very few people are are ready for that.

Filippo Vianello Interesting. The part of of scrolling and how do you see the future future assistance in the workforce?

Are you worried about people potentially relying on tools like V as in the future, or even having, I don't know, their job drastically changed or replaced by these tools?

Interviewee B: No, no, no.

I am not worried that we will write too much on the technology or that.

My job position is going to be replaced.

Our presence, you know.

Listening to people and and being there and assisting and talking emergency situations and.

You know.

It's crucial for us to be there, like the physical intervention itself, when there's a fight, when there's a crime, there is something too human to be, to be replaced by something virtually, I think.

Filippo Vianello OK, OK. And what do you think are the biggest misconceptions about the user feature assistance as a tool in professional settings?

Interviewee B: I think that we are not questioning enough virtual assistance capabilities of

doing the task for us, so we tend not to trust them enough on a normal scenario, you know. So

I think like at least in my opinion, I'm not a big user of technology on enormous.

On my normal life, so I think I would be even more skeptical.

If I will have to use it for.

Job purposes or in a critical situation like I would rather.

You know, make a decision on my own and see something bad happening. But see, like respecting my protocol rather than delegating.

Tasks to.

Otherwise, and having the regret that I might have done it better, you know. OK. OK, **Filippo**

Vianello OK. OK, nice. So we are done with with the questions about visual assistance.

Thank you so much for your for your insights. And I just wanna ask a couple of social demographic questions.

So yeah, your age. You told me it's twentyssix, right?

Interviewee B: Yes.

Filippo Vianello gender.

Interviewee B: male.

Filippo Vianello nationality.

Italian

Filippo Vianello current residence

Interviewee B: Italy.

Filippo Vianello OK. Educational level.

Interviewee B: High school diploma.

Filippo Vianello OK, OK.

And occupation.

Interviewee B: police officers.

Filippo Vianello OK, qualified worker, OK.

Great, great, great.

Yeah. Is there anything else you would like to share about your experience with virtual assistants in the workplace?

Or do you have like I don't know any other additional question.

Interviewee B: No, no. Thank you.

Filippo Vianello OK.

So yeah, thank you again for your time for your ideas, for your besides super useful for us.

So yeah, in case I don't know, you have any questions like in the following days, just feel free to to reach out.

We'll be happy to support you.

Filippo Vianello OK. Sounds great.

Interviewee B: Thank you so much as well.

Filippo Vianello Amazing. Have a nice one. Bye bye.

Interviewee C: Member of the Special Forces of the Italian Army

Filippo Vianello OK.

Let me know when you can hear that did everything.

Interviewee C: I'm ready OK.

Filippo Vianello Great OK.

So OK I already gave you a little bit of introduction so let's start with the interview and again thank you so so much for participating.

It's very very very helpful. So yo first question for you.

Are you aware of the virtual assistant technology like Siri Alexa Google Assistant or Cortana before this interview?

Interviewee C: Yes yes I was.

I was aware of the.

Technology but yeah I was aware of that.

Filippo Vianello OK.

And now I'd like to get some background information on your professional life if you are so kind to to share them with me.

So if you can tell me a bit more about your current role, current job and and the responsibilities that you have and I would kindly ask you to be as concrete as possible in terms of your daily tasks.

Interviewee C: OK.

So yeah I'm 34 year old army soldier.

I'm a member of the special operations task force of the Italian army.

Most of my time is spent on the field.

Let's say missions for for peacekeeping we usually scored politicians or like high generals or whoever my needs.

Our protection in a sensitive environment my team and I are usually in charge of the funny routes like which was to take.

Be a different plans for different scenarios or also.

Identify. You know those potential situations or triggers that might cause troubles in our peacekeeping missions.

And well, I mean, if you're not employed in these missions abroad, we usually stay in our home base in Italy.

Where we we train and we do some.

You know all the paperworks that happened before and after the mission. Like all the reports and.

The fast that we had to carry out.

Filippo Vianello And how long have you been in this position for?

Interviewee C: It's been.

It's been a while already.

It's been 12 years now that I that I joined the army, but I've been part of the task force only for the last seven years.

Filippo Vianello OK, great.

Thank you so much. OK. Now I will show an image.

Let me know if you are familiar with with this concept of technology adoption and acceptance curve.

Have you ever seen this? Is it new for you or?

Interviewee C: No it's the first time that I see it actually.

So yeah, I've I really don't know what to think here.

Just explain me a little bit better what it is.

Filippo Vianello Yeah. Yeah, for sure. For sure.

For sure I will explain it a bit for you.

This is called the adoption by core.

It's also not like as the diffusion of innovation theory and has been developed by sociologists, and it depicts basically how technology spreads within. A population over the time.

As you can see, he follows a normal probability distribution and it categorizes the adapters, the adapters, the users into five different groups, innovators, the early adopters, the majority, late majority and laggards.

And so now. We'll see like a little bit of overview. That we have here that I just gave you and considering the case of like Gen. AI chat bots like CHATGPT and Co pilots release strategy like in 2022 and copilot in 2023.

I just wanted to ask you if you use this technology, where would you position yourself in the cur for this?

Interviewee C: Yeah, for this technology. I would say late majority 'cause I am not very tech oriented so I only started using ChatGPT after it became mainstream and to be honest I really use it in general. But whenever I do like I think it's quite helpful.

Filippo Vianello OK, great. Now consider the case of virtual assistants like Siri, who was first released in in 2011 and and Alexa in 2014 from Amazon. If you use this technology again, why would you position yourself on the core?

Interviewee C: I think late majority again because I started using CD only when I got my first iPhone. But the technology was already out for awhile.

So yeah I haven't used any any other like virtual assistant before.

Like I never used Alexa for example.

And yeah I started using Siri only only with my iPhone.

Filippo Vianello OK OK got it. Thank you.

And do you currently use any virtual assistant like Siri and like in your personal life what's

your usage?

Interviewee C: Yeah I I use it but it's pretty rare.

I use Siri to set timers alarms reminders.

Or yeah just to control the music that I'm listening to in my hands.

I'm like busy or dirty and I'm yeah I I cannot use my phone you know with my hands.

So that's how I come in.

It comes in handy but usually.

It is I I don't really use it.

Filippo Vianello OK and have you ever used like a virtual assistant for shopping?

Interviewee C: no no no not for shopping and like do you use city for example also in your personal life or do you use it only for your private life.

No no no I only. I only use it for my for my personal life.

No we're not allowed to use like I.

I don't think we're allowed to use it in my professional life.

Nobody has ever mentioned that so yeah.

Filippo Vianello So yeah you kinda already gave me a reply but yeah next question would be why don't you use like visual assistance in the professional context.

So if you would give me a little bit more of informations about that.

Interviewee C: Yeah yeah sure. Basically it's because as far as I know nobody does that.

And honestly, I wouldn't really know how I could apply.

This technology on my job, I know that there has been some trials in the past about mobile devices that could assist you during missions, but they never became very popular.

I never tried them.

So yeah, I have some ideas on how future visual assistance could help me out.

But yeah, again I think it will be more nice to have for me or like for my colleagues, rather

than a massive.

Filippo Vianello OK, OK. But did you ever consider like using them?

And if so, why did you not take the step like for example, with a previous trials that you were mentioning before?

Interviewee C: No, no, no, no.

I never consider adopting them fully. I think our trainings are very strict in terms of.

Rules and compliance. What to bring, what to use. So since we are not even presented the possibility of officially using a virtual assistant on a permanent base, I never felt the need of having one because we basically.

Learn how to carry out the operation.

From A-Z and the protocols are very very strict.

So if a virtual assistant is not in the protocol, it's like you.

You don't even think about.

About having one, you know, I can think about how it should look like to be you know.

Useful but yeah.

Nothing more.

Filippo Vianello OK. And what else did technology would have to change for you then to to adopt it?

Interviewee C: I believe it has to be something unique. Starting first of all, from the materials or for the battery life.

Of course I cannot think about you know something very I cannot think about a virtual assistant that looks like a cylinder like Alexa for example it has to be something very light easy to carry either with us while we are working or doing our recognitions. Or in our backpack. Doesn't have to be visible has to be resistant to you know rain snow or other light extreme conditions like when it's super super hot.

And yeah also if you like. A general virtual assistant will not be helpful for us.

It will need some military training as well. Because as I told you before our procedures are very firm.

We need to be super precise with them and the virtual assistant should be able to know them all.

And yeah what else real time updates are also very important for us while also being able to use it without fail without using our hands for activating it or also being able to use it while speaking with a low tone of voice or just by making signs you.

On on a screen if you have a display.

Filippo Vianello understood and do you think that the virtual assistant can have the potential of boosting your productivity then in any aspect of your job consider what would you what you just tell me.

Interviewee C: Yeah I think there might be some potential for sure but it's very difficult to make it real in my opinion. Thin you can help us with the paperwork, as it was seen before and post our missions. In order to have you know, some updated information about the person or country or or the currently status.

Of the mission without having to look for it, having a lot of tabs open. Making phone calls to the embassy or. All, all that kind, you know, routine tasks that we do. They take us a lot of time. Yeah, they are very important for, you know, successful mission.

Filippo Vianello OK. OK. I mean, you kinda anticipated an answer here 'cause. My next question would be like if you had to choose a very tedious task.

That you want the visual assistant to do for you. Which one would it be?

Interviewee C: Yeah. I think as I said before, probably the paperwork is where it can be more useful.

You know storing data, providing them to us, it's gonna be pretty helpful, especially if they're

like, constantly updated those who can save us some time. I was also thinking about, you know, using a virtual assistant able to receive commands and be linked to other tech devices that we.

Use.

So yeah, just by seeing something to the virtual assistant, we can control all the rest of the devices as well. You know, like you give an input to the virtual assistant and it's like a domino. Everything falls into place also with different devices, you know.

Filippo Vianello OK. And yeah, thinking like looking at your industry, do you think that virtual assistant can be used for training or of the new of the new soldiers in this case in what do you think about that?

Interviewee C: I think it depends on which type of training. To be honest, I think it can help us to keep ourselves in a good physical shape. I mean, we all have.

Personal training plans you can have like also in some apps like very common one can download like on Google Store in the App Store.

Yeah, maybe like. A virtual assistant that suggests us particular workouts or or exercises considering the conditions that we'll find in our missions, like in that country. But yeah, I think that still those suggestions have to be monitored by our trainers as well as they do. With with our worker plans.

Filippo Vianello OK, OK. OK. And do you see companies having?

The willingness to pay for those kind of training services or do you think they're still skeptical about it from your experience?

Interviewee C: I mean, yeah, ours, of course, is not really a company. We work for the government. So yeah, I believe that virtual assistants won't be a priority for investments.

Since in my opinion, honestly they're not gonna have a major impact on our job.

But well, I must say that there has been some investments on things that I was skeptical about

at first, but now became an essential in our kids.

So let's see if that's the case of virtual assistants as well.

Filippo Vianello Well, thank you so much.

Now I'm gonna present you the case of two companies that developed.

Two virtual assistants, and we'll have a discussions about some topics.

Let me share my screen. OK can you see it?

Interviewee C: Yes.

Filippo Vianello OK, OK.

So we've watched. Those two. Visual assistance you have city and the human helping city as you know, is a virtual assistant integrated into Apple devices operating systems.

The price, of course, is the cost of acquiring a Apple device, so nowadays.

Yeah, that's that's the price. They don't have a separate Siri that you can buy, and it allows users to interact with their devices using natural language, expecting the system to understand the intent of the users and take appropriate actions.

So activation just by saying, hey Siri.

I can access for party apps.

This translation text to speech works offline, can summarize and prioritize your notification using Apple intelligence.

But yeah, of course there has been some limitations about not all the languages in this planet that are supported and also some security and data leaks challenges.

And on the other hand, you have the human AI pin.

Maybe you are less familiar with that.

It's an American company from in 2018.

The company was founded by two example employees.

As you can see, it's wearable is not embedded embedded in in a phone or like in an external

device.

AI powered it attached with a magnets on your clothes and it's intended to act as your personal assistant. And yeah, it just came out in April 2024.

Very, very recent, the retail price in the US, it's around.

\$700. Plus, \$24.00 a month for the subscription.

There's a functionalities yeah Azure in display touch and old as you could see.

Response to Famer gestures like touch, Tap, swiping as before, you have, you can prioritize it like contacts can catch you up on, you know what you've been missing can be a DJ. messaging.

Can an interpreter can take pictures

And yeah, they're also working to give like our support in terms of health.

Like you can ask if a food is OK for you just by asking, you know, can I eat this and holding up the food under the lens there's a limitations.

The thing that he does, that he he does them pretty well, but there's still like a lot of things that he doesn't do.

We also, we always have to bear in mind that there's a first generation of a device that has a little potential to improve.

So yeah, considering those two virtual assistants, which device do you see yourself using a professional setting?

Interviewee C: I think the shape of the human eye pin is very interesting for us because it looks like it doesn't take much space.

It's light, can fit anywhere in our jackets.

I'm skeptical a little bit about the magnet, but that could be that could be fixed, of course. Of course it will need a huge improvement in terms of material and technology as well as it was seen before because like I was looking at the display and everything and.

Yeah, I cannot ask this device to display some text or maps or documents under a very heavy sun. I won't see properly, of course.

Or also night. You know, if you're operating in in full dark.

We're not meant to be seen. So yeah, a laser display?

Filippo Vianello Yeah.

Interviewee C: Won't be the best solution, but yes, I feel like the the shape of it and the design has a lot of potential.

Filippo Vianello OK. OK. And do you think you would ever adopt both of them as reach between them depending on the task on at your hand switching between seed and the human IIP?

Interviewee C: no, I think no, I don't think I will.

I will switch them or adopt them both.

Filippo Vianello OK, OK. Well, just so you know, there are many reviews online that could be says the humane AI pincer has been around for years already and can be said to be a successful virtual assistant.

What would you say are the three most important criteria to define a success of IVA product?

Interviewee C: Three of them, OK.

I would say.

The ability to perform tasks effectively and at any moment of the day.

Being well designed for.

The Army specific needs in our case.

And yeah, correlated to that, a very long battery life.

Filippo Vianello OK, OK. And why would you say like just in your opinion, why would you say that?

The human AI pin is getting this negative feedback.

Do you think we're ready for such a novelty product?

Interviewee C: No, I think we're not ready for that at the moment.

It's very different from Siri because it's not embodied in a phone.

And to me, looking at the human AI being, it seems like a substitute of a phone already.

So I think it's too early to make this switch, but of course that's my, that's my opinion.

Filippo Vianello OK.

And how do you see the future of virtual assistants in the workforce?

Are you worried about people potentially relying on tools like virtual assistants in the future, or even having their jobs drastically changed or replaced some extreme cases by these tools?

Interviewee C: No I mean as far as I'm concerned I'm not worried that we rely too much on the technology.

That will be our replacement.

Ours is a very physical job so yeah there's the need for us to be there.

But it's got to go it.

Filippo Vianello Got it.

And what do you think are the biggest misconceptions about the use of virtual assistants as a tool in professional settings?

Interviewee C: Well, in my professional setting, I'm concerned about the durability and ease of use in critical scenarios. I won't have any time for the virtual system not working.

So yeah, since I'm afraid about the virtual assistant not working.

I might not even like use it or try to activate it activate it but as I said again it's because every novation that we receive is introduced very slowly.

Into our procedures so maybe with some more guidance and technological development power my thoughts will be canceled.

Filippo Vianello OK OK.

Thank you.

That was the end of our interview.

I will just ask you some.

You know sociodemographic questions your age.

You told me before it's 34 right.

Interviewee C: Yes

Filippo Vianello gender

Interviewee C: men

Filippo Vianello nationality

Interviewee C: Italian

Filippo Vianello Country of residence

Interviewee C: Italy.

Filippo Vianello Educational level.

Interviewee C: A professional degree yeah with young OK.

Filippo Vianello Occupation.

Interviewee C: I will put you qualified worker, OK.

Filippo Vianello Nice. Thank you so much.

And yeah, is there anything else you would like to share about your experience with virtual assistants in the workplace?

Do you have any other additional questions?

Interviewee C: No, not really, not really.

No, I'm I'm alright.

Just looking forward to see what's gonna how's the future gonna look like?

Filippo Vianello OK, great, great.

Well, thank you so much for your time and your insights.

Your answers are like super valuable for study.

And yeah, if you have any questions or would like to receive updates on the study, feel free to contact me, OK?

And yeah, speak to you soon. Bye. Bye bye.

Appendix 5 – Interview Transcripts for Non-Life-Threatening Jobs

The interview transcripts were automatically generated by software.

Interviewee D: Artificial Intelligence, Transformation, and Business Strategy Executive

22 October 2024, 05:21pm

Joana Aleixo da Silva Pereira 0:22

I think you have to agree for the transcription to start.

Interviewee D 0:28

Yes, I've, yes, I've given, OK.

Joana Aleixo da Silva Pereira 0:32

OK, perfect. Thank you. So the first question I have for you is, were you aware of the virtual assistant technology before the interview? So Siri, Alexa, Google Assistant, Cortana, are you familiar with this device, these devices?

Interviewee D 0:48

Yes, yes, I am, yes.

Joana Aleixo da Silva Pereira 0:49

OK, perfect.

So.

Just to contextualise the interview, I'd like to get some background information on your professional life. If you're so kind to share, so could you tell me a bit about your role and responsibilities?

Interviewee D 1:10

Well I've I'm currently working at a BPO International International BPO company, business process outsourcing company and my current responsibilities, which change recently are to coordinate.

The delivery of solutions and technology solutions basically.

The AI based technology solution.

In the in the at the world live level.

Joana Aleixo da Silva Pereira 1:40

Perfect. So you've actually also responded to another question I have, which is how long you've been in this position for and since you said it's a short time?

I'd like to ask you about your daily tasks. I'd ask it to be as concrete as possible, and if you prefer to refer to your previous job, that's completely fine. Just to contextualise you a bit, this is so we know what specific tasks you do and where virtual assistance could apply later on in the interview.

Interviewee D 1:56

OK.

Joana Aleixo da Silva Pereira 2:19

You give me a more concrete description of your tasks please.

Interviewee D 2:25

On my daily tasks.

Joana Aleixo da Silva Pereira 2:27

Yes, if possible.

Interviewee D 2:28

So.

So currently we I support.

The the teams in identifying opportunities for the use of AI based solutions out of the available portfolio that we have.

So if you look at it from a flow standpoint.

It will be identifying opportunities for use of AI. Some solutions as I mentioned then.

Ability study or ensure that the feasibility for the deployment of such solutions, solutions and.

The benefits of it, so based on ROI calculation and then.

Ensure the proper deployment of the tools from.

Integration development into.

Roll out.

Additionally, I'm also attentive to shifts in the market and opportunities to build new solutions, either in house with our own teams or by partnering or acquiring.

Third party solutions.

Joana Aleixo da Silva Pereira 3:49

Perfect. Thank you very much.

So moving on to the next part of the interview, you can see on the interview guide there's an image of the technology adoption and acceptance curve.

Let me know if you can see the image and if you're familiar with this concept, have you ever seen this before?

Interviewee D 4:13

Adoption Bell curve, yes.

Joana Aleixo da Silva Pereira 4:14

Yes, and your your.

Interviewee D 4:16

I'm familiar. Yes, I can see it.

Joana Aleixo da Silva Pereira 4:18

Perfect.

So looking at this curve and considering the case of generative AI chat bots like ChatGPT, if you use this technology currently and please let me know if you don't. Where would you position yourself in the curve for this particular technology?

Interviewee D 4:39

I currently use it.

Joana Aleixo da Silva Pereira 4:41

Mm hmm.

Interviewee D 4:42

I would say I was one of their doctors.

Although the generative AI technology took the world by storm, so this bell is is very much.

Joana Aleixo da Silva Pereira 4:48

Brilliant.

Interviewee D 4:59

Well, reduced in time from early adopters to early majority.

Joana Aleixo da Silva Pereira 5:01

Mm hmm.

Interviewee D 5:04

You kind of.

Everybody jumped into the bandwagon very quickly, but yes, I was part of the early adopters.

Joana Aleixo da Silva Pereira 5:11

OK, perfect. And in terms of virtual assistance, so let's think that Siri was first released in October 2011 and Alexa in November 2014, so 10 years ago.

Where would you position yourself in terms of this technology?

Interviewee D 5:33

Alexa, more on the late majority or late or laggards. I never acquired the the Alexa product.

Joana Aleixo da Silva Pereira 5:42

OK.

Interviewee D 5:43

We cannot go into detail. Why not?

But privacy being one of the main topics.

On on the Siri.

I did.

I was an early adopter, but not the very successful one. It was very limited. The features set of Siri.

So during many years I I had not use it that frequently.

It was more.

It's more focused on simple tasks and only more recently, only more recently I've been a more heavy user.

Joana Aleixo da Silva Pereira 6:21

Mm hmm.

Interviewee D 6:28

Mostly in terms of dictation or or speech, speech to text. So anything related with.

Writing text based on on on voice, which is much much much faster.

Joana Aleixo da Silva Pereira 6:40

OK, perfect.

And I feel like you've kind of answered our next question as well. You said your answers were different to both questions. Is that because you think ChatGPT was entered our society in more like a Big Bang, Big Bang Manor as opposed to virtual assistance?

Interviewee D 7:02

Yes, yes.

Joana Aleixo da Silva Pereira 7:04

OK.

Interviewee D 7:07

The generative component of ChatGPT. Yeah, it it.

And the use the multitude of use cases.

The number of use cases is so, so, so great in comparison with the with the Siri or Alexis.

That that, yes, it became more pervasive.

Also accessibility to it, so being free and and many regards free to to a certain extent.

Also, people use it more, more, more often. Alexa, you would have to buy a device, so there's some some.

Joana Aleixo da Silva Pereira 7:39

Mm hmm.

Interviewee D 7:47

Entry.

There's more, or should I say.

Joana Aleixo da Silva Pereira 7:53

A barrier to adopt, yeah.

Interviewee D 7:53

Just one more step. Yeah. Barrier entry barrier. Yes, that's exactly it, Siri. Although it's available on on, on iPhones. So we're widely used.

Again the the the, the abilities and the features were not so so widespread as as GPT.

Joana Aleixo da Silva Pereira 8:17

OK, perfect.

Thank you so much for your answers. We're moving on to Part 2 now.

You've already said you currently use Siri and you don't use Alexa.

What do you Siri for? Or is there any other virtual assistant you use? I should ask this question before.

Interviewee D 8:32

Correct.

Joana Aleixo da Silva Pereira 8:39

In your personal life, sorry.

Interviewee D 8:43

So personally, yes, I use Siri, as I said mostly to to type text.

Joana Aleixo da Silva Pereira 8:48

Mm hmm.

Interviewee D 8:49

To to also some other features like book an appointment or send messages while while I'm driving.

Joana Aleixo da Silva Pereira 8:57

Mm hmm.

Interviewee D 8:58

So I think that's another area where I use it a lot, although it could be improved.

The amount of.

Features available either is not widely explained or or or accessible. You have to do trial and error, or if it fails and you're driving and it fails, it's kind of.

Breaks the the the intent or the the the intention of the functionality which is to use very to make it easy to use while driving or while busy. And if you have difficulties doing some commands then it breaks it.

It defeats the purpose.

Joana Aleixo da Silva Pereira 9:45

Yeah.

Interviewee D 9:46

Anyhow, so why do I use it more? So Siri more to those to those to those effects.

Gpt ChatGPT or copilot for Microsoft. I use it for for yeah, programming from programming to qualifying questions to process data. Then I'll have options to you. You, you dump data and you can make analysis or or or philtre data, or even clean up data. So there is our things that I I

also do.

Do I don't know if it falls into the virtual assistance, but I also use the the text to speech for Microsoft on Windows, so anything again from writing emails, writing documents, writing chats, writing teams, messages, etcetera.

Joana Aleixo da Silva Pereira 10:38

OK, perfect. And.

Interviewee D 10:40

Similar similar to Siri.

Joana Aleixo da Silva Pereira 10:45

We have a little fun fact we don't know if you, if you were aware of this, but Amazon faced a little issue, let's say with Alexa because they designed it. Their main goal was to have people use Alexa to add items to their Amazon shopping cart.

And they found that people were actually using Alexa to ask it. Things like the weather, for example. What will the weather look like tomorrow? So my question for you is, have you ever used the virtual assistant for shopping to add an item to a shopping cart?

Interviewee D 11:22

No, not directly. Maybe to do some to do some comparisons. Give me comparisons of of product A versus product B functionality kind of thing to compare solutions, but not actually to have to do to shopping cart.

Joana Aleixo da Silva Pereira 11:25

OK.

And so this is everything relating to virtual assistants used for personal life in terms of professional life. Do you also use virtual assistants or you don't?

Interviewee D 12:01

I may have mislead you a little bit also.

Some of the answers were both personal and and professional.

In the previous section, I'm sorry for that, but yes, I do use the.

Joana Aleixo da Silva Pereira 12:08

OK.

No, that's totally fine. So you do.

Interviewee D 12:14

Yeah, yeah, yeah. If we could, if we could split, if we could split anything that I do at a computer.

Joana Aleixo da Silva Pereira 12:16

OK.

Interviewee D 12:22

No. OK, with the exception of maybe reading 2 windows to or or typing text and voices to text in in Windows.

Joana Aleixo da Silva Pereira 12:31

Mm hmm.

Interviewee D 12:31

Which I do more professionally professionally.

Than than all the rest. I use it both professionally and and and personally.

From from generating code to getting information or or or or typing texts.

Or or advice to text again.

Joana Aleixo da Silva Pereira 12:52

OK. And for calls as well?

Interviewee D 12:56

And it calls. Yes, some something like call this or call that or redial last number, yes.

Joana Aleixo da Silva Pereira 13:03

OK. And what feature of if you had to choose just one feature or one characteristic of virtual assistance, which one do you find the most beneficial for your job?

Interviewee D 13:24

The the the ease of use of of voice to text typing. I think other areas I'm not not so much I don't use them today maybe because I don't know how or they're not available yet but.

Joana Aleixo da Silva Pereira 13:31

Mm hmm.

Interviewee D 13:41

Commands like instructions open this programme or launch this activity. I tried that in the past in Windows professionally and it's kind of cumbersome, but it could. It could be helpful there. Or other things like which I didn't mention, but Siri does do that in in in iOS and iPhone which is read a page or read contents of the screen. So I think professionally.

I could benefit from reading pages or reading contents of documents or or pages or websites et cetera, but also.

Controlling the facilitating the PDP.

From answering emails or or or checking the schedule, what's my schedule?

Microsoft does provide now here and there. I've seen attempts of providing for instance, emails with summaries of the upcoming events or or previously flagged emails. You do have like the to do dashboard but.

I would love if they could take that to one step further, which would be, you know, prep my day. You know, this is what you have for today. Tomorrow you have this and this deliverable in a weeks time you have this one and you are 20%.

I need progress of that. So like a personal assistant, I would focus.

Joana Aleixo da Silva Pereira 15:09

Mm hmm.

Interviewee D 15:14

I know, for instance, when you book a meeting, you already have, even in in in iOS on on teams or outlook, you already know you have old e-mail or all the files that are related to that subject. So it's already an attempt to to to brief you and it's quite helpful. Sometimes you do have an appointment and it brings you up to like the two or three documents that were shared.

Related to that, or with that person or into that subject.

But yes, I would love to have a little bit more.

Of a personal assistant 5. Let's say.

Than than what's available today.

Joana Aleixo da Silva Pereira 15:56

OK. That's actually very interesting because it's very related to one of the use cases that we'll cover in a bit. So thank you very much for that.

Interviewee D 16:03

OK.

Joana Aleixo da Silva Pereira 16:05

One last question on this topic would be.

Do you feel like virtual assistants have had a significant impact in your productivity or efficiency, or they're not as impactful, such as to have an impact on how productive you are?

Interviewee D 16:23

Professionally.

Joana Aleixo da Silva Pereira 16:25

Yeah.

Interviewee D 16:27

Yes, they do. They do. They do have a positive impact. Not everything is a better roses. Let's

say you do have to invest a little bit in in learning how to use these tools and and and sometimes you don't get it right at first.

Or the answers are not perfect at first.

There's some investments, but yes, in the end, yes, I do think it's it's it increases my productivity, yes.

Joana Aleixo da Silva Pereira 16:54

And in terms of decision making, do they impact your decision making or do you solely rely on, let's say, yourself and your brain?

Interviewee D 17:05

Well, not to make the actual decision, but to support me. The decision definitely when I asked for him to chat, APPT or copilot.

Joana Aleixo da Silva Pereira 17:08

Mm hmm.

Interviewee D 17:16

Information is about this or that. Maybe. For instance, a trend in the market or most relevant. Topics.

Under investigation or to summarise a few documents and and and extract the content.

Or to keep points. Yes, it's it's helpful. The decision one may say, OK, if you get the summary from a GPT, it doesn't go through the whole document. You're already being influenced. So you're already gonna be just taking the actual decision, is it the GPT that selected the most relevant parts of the document or is it used? But that's theoretical debate, but but.

Joana Aleixo da Silva Pereira 17:58

Yeah.

Interviewee D 18:01

Yes, I would. I would still make the the call myself if the information is enough or not or.

I also double check for instance, I don't blindly trust the the the feedback or the summarization, for instance of a document I do double check.

Well, the original way find keywords go through the index and go understand the document.

What it's all about. Read the most relevant parts before making it a decision based on information provided.

Joana Aleixo da Silva Pereira 18:37

OK, perfect.

So let's now kind of think about your ideal virtual assistant, and I feel like here you've kind of already covered most of the aspects we were interested in because you mentioned that you would like to have a virtual assistant that acts as your own personal assistant.

So I think I'm going to take that as the answer, right. So if you had to choose a very tedious task that you want a virtual assistant to do for you, would it be the access your personal assistant and kind of get all your emails, put them together and catch you up on that?

Is that correct?

Interviewee D 19:19

Yes. And on top of that, yes. And on top of that, more more on the personal aspects, everybody has.

To manage you know, the household leisure is the the utilities.

Pay, pay taxes, pay dues.

And those activities?

You really can't drop them off. You can drop them off. You can't forget about them and and they're tedious. There. You have to remember you have to address them so.

A personal season that address that and, for instance.

No, not only that your utilities contract is finishing or is up for renewal and but also that there are other providers that that.

Should look at that bring us additional services and better services at less cost.

Those are the kind of things that I would expect from from my personal assistants.

That go beyond. Of course. I would still use it for the more simple tasks, but then if it if it could make sense of all you know, recover that that, that e-mail with a promotion that is really relevant. Because if you don't do that or because you can really reduce costs.

Joana Aleixo da Silva Pereira 20:26

OK.

Mm hmm.

Interviewee D 20:46

On this or that service?

That can be very powerful for for personal use.

Joana Aleixo da Silva Pereira 20:53

Yeah, definitely.

So thinking back at your the industry, you said you work on, so BPO, you also deal with AI.

Do you think virtual assistance can be used for training new employees in your industry?

Interviewee D 21:15

Can you repeat if you if you.

Joana Aleixo da Silva Pereira 21:17

If you think virtual assistant could be used for training so.

For example, having the virtual assistant tell the new employee what they have to do.

Interviewee D 21:28

Oh, definitely, yes. Yeah, you too.

Joana Aleixo da Silva Pereira 21:29

Or OK.

Interviewee D 21:32

Definitely. If you look at there, there's a company which is called second nature and what they do is they.

Joana Aleixo da Silva Pereira 21:37

Mm hmm.

Interviewee D 21:40

Do do stimulated stimulated interactions for training and and for exactly for training and they they act as a as a person.

Joana Aleixo da Silva Pereira 21:44

OK.

Interviewee D 21:52

And it can be tuned to.

Be more demanding or less demanding or and go through certain points. So if you're being trained to to do a certain type of job and you have to.

Follow certain guidelines.

That that avatar or that person that you interact with can can ask you the proper questions and and simulate the real life scenario. This is mostly for if you're interacting with people, but even if you're not, you can't simulate multiple scenarios and and be like a personal trainer. A custom 1 to one trainer to you. So it's not a one-size-fits-all.

You kind of even adapts to to your needs or or to your specific case. If you're progressing well and some topics are not so well and some of them. So yes, I definitely think it can. It has huge advantages for training, yes.

Joana Aleixo da Silva Pereira 22:44

Mm hmm.

Mm hmm. And do you see companies having the willingness to pay for those kind of training services or are they still quite sceptical about it from your experience?

Interviewee D 22:51

Get your benefits.

They are open to to pay.

Joana Aleixo da Silva Pereira 23:09

Mm hmm.

Interviewee D 23:10

The big the big questions they have or what I've seen is.

Well, return on investment.

Proof of proof of.

Of value.

They don't write up blank cheques, so they want to see proof of value. The other one is is is privacy, the other one is privacy.

Joana Aleixo da Silva Pereira 23:31

Yeah.

Interviewee D 23:35

Access to the information always the information being used because for instance in the example is giving one of the things is that you end up having to record the person having the training.

And interact with it. So there are concerns about what the privacy of that data and whether or not that's going to be used for future learning and future trainings. So those are the main concerns I see from the companies in deploying such solutions.

Joana Aleixo da Silva Pereira 24:06

OK, that's perfect. Thank you very much for that.

So we're nearly getting to the end of the of the interview. We're just going to briefly go over it

to case studies of virtual assistance. So the first one would be Siri or the Apple Homepot.

You've already said you're familiar with Siri, so.

I won't get into too much depth on the description of what it is, but do let me know if you have any any questions about it.

But the other case, which is way more interesting in in our opinion would, is the humane AI pin.

Interviewee D 24:40

Mm hmm.

Joana Aleixo da Silva Pereira 24:45

So this is an American consumer electronics firm.

Founded in 2018, the CEOs are two ex Apple employees and they've developed a product they've called the AI PIN and they've started. Sorry, they started shipping it in April 2024. So the device is selling for six hundred €699 and then the users have to pay \$1224.00 a month for a subscription to get a phone number and data for the PIN.

Because this thing doesn't connect to your phone, it's meant to access a separate device, so you have a separate phone number that goes with it and a separate data plan.

For for this device.

It has a lot of functionalities and maybe you'll be able to see some of them a bit better in a short video that I'll show you, but basically it offers new interactions beyond touching screens, so it brings stuff on your hand with the technology that they call laser ink display and then you can interact with it by moving your fingers in different ways.

If you touch and hold the pin, you can talk to it and it will reply back. And there's also different gestures you can use on the pin itself to make it do different things, like for example, control

the volume of the music, or take a picture.

It kind of acts as the personal assistant that you were talking about before.

So for example, if you say to it catch me up, it will just give you the most significant notifications that you've missed. It also learns how to like eliminate unnecessary notifications that you usually don't pay attention to.

It makes playlists for you.

It lets you compose messages when you talk to it. It translates it, take conversations, it takes pictures.

And coming soon it all it it will also have a new functionality where you show it a food product and you ask it whether you can eat it and it will say whether it's healthy for you or not.

But this is also this is something they're still developing and then?

And then it has a like a software tool where you can manage the photos you took with the pin.

You can connect your contacts to it, your music accounts and you can manage everything there.

It has some limitations and there's loads of reviews online on it.

And overall, what people are saying is that what it can do, it does pretty well, but there's still a lot that it can't do when you kind of like have to bear in mind that this is the first generation of the device and it will eventually.

Improve.

Oh, we wanted to show you a short clip. I don't if you'll be able to see my screen.

Let's try.

Can you see my screen by any chance?

Interviewee D 27:51

Let me see.

No, no can you is there.

Joana Aleixo da Silva Pereira 27:59

No.

So I'll send you, yes.

Interviewee D 28:02

So when you're sharing the links and all, I'm trying to see.

Joana Aleixo da Silva Pereira 28:06

I'll send you the link in the chat.

And.

You can watch it from minutes 1255.

Onwards.

Interviewee D 28:38

Well, from which minutes are you?

Joana Aleixo da Silva Pereira 28:41

55.

Interviewee D 28:57

OK, I'm back.

Joana Aleixo da Silva Pereira 33:17

OK, perfect.

So obviously now we have two different very different virtual assistants.

We have Siri, which is way simpler, can do, has less functionalities, but maybe it's more likely to do what you wanted to do because it's more mature and then you have the humane AI bin which can do way more stuff. The technology behind it is way more sophisticated.

That you have less certainty on the result that you're going to get out of it. So knowing yourself, which one do you think you would use in the professional setting?

Do you think you would use both like depending on the task or just one or just the other?

Interviewee D 34:03

When we're talking about serious talking about the home pods, correct, remind me the the price of the home pod.

Joana Aleixo da Silva Pereira 34:17

For the home port or or Siri itself.

Interviewee D 34:22

A Siri from.

Siri can use on the on the iPhone, but you mentioned the home pod correct as the device.

Joana Aleixo da Silva Pereira 34:31

Home pod it depends on the on the generation, but you can get it for 110 for the first one like the mini 1 or 354 for the second generation one.

Interviewee D 34:48

Professionally, it will be tough to have like the home pods, maybe in a conference room or in meeting room. But just for me it I will probably not not not have it.

If we're talking Siri on the iPhone or any virtual system functionality.

Then it it would come for free, or at least. Well, that's for free with the once you buy a an iPhone.

Joana Aleixo da Silva Pereira 35:13

Mm hmm.

Interviewee D 35:14

So I would definitely so it's more pervasive available. So I would I would more easily use the Siri option for professionally in in, in.

With Siri.

Do you mean the human AI? What do you call it? AI pin the AI pin.

Joana Aleixo da Silva Pereira 35:36

Yeah.

Interviewee D 35:38

Yeah, the entry price is is just too absurd as this time, but that's that's how how things start. If you remember iPhone, iPhone one didn't have copy paste, it was like.

It was laughable. And look at where it is now and the price was was just enormous, even for the time.

So yeah, if your question is what I would use today unless I'm doing an investigation and I have some investment money to use.

Yeah, I would not go with the with the AI pin.

Joana Aleixo da Silva Pereira 36:15

OK. And why? Why do you think it's getting this negative feedback? Do you think we as a society are ready for?

Such an innovative product like is it. Is it a problem of our mindsets, or is it the actual quality of the technology? That's not just by there yet?

Interviewee D 36:38

So much it's it's the current status of technology. I think the world is more and more. Receptive to to.

But is also more and more aware.

Of the drawbacks or the potential failures you can.

In the old days, let's say.

Any new computer is a new computer, so it's better than the last or even even iPhone even.

And you generate iteration of iPhone is better than the last, so that's for sure that people know that for a fact.

So adoption makes it so it's it facilitates adoption. But on the other hand, if you're not an established company like iPhone, if you have, if you're in the early stages, there's so many out there that show up and then they go bust and you end up having a device that and and and nowadays everything has to work within an ecosystem.

Joana Aleixo da Silva Pereira 37:23

Mm hmm.

Interviewee D 37:41

Integrated with other systems have a platform. Even if you have to pay, what happens if the

company goes bust and you know you, you lose the service. So even if you want to pay the \$24.00 a a month, you don't have it. So those are barriers to the innovation into the adoption.

Joana Aleixo da Silva Pereira 37:56

Mm hmm.

Interviewee D 38:01

So.

It's a it's a balance, but I do think that people are are more prone to adopting technology, but they don't just don't go blindly.

Joana Aleixo da Silva Pereira 38:14

Yeah.

Interviewee D 38:14

Accepting it if if the the the return is there. If the benefit is there and if there's a good support structure to it. So some confidence that the technology will not go away or that the the company will not go bust in a year or two, then adoption is easier, yeah.

Joana Aleixo da Silva Pereira 38:34

Yeah.

I agree actually.

Interviewee D 38:37

But for instance, if if I take if I take the iPhone example I was, I couldn't say I was an early

adopter of iPhone. I I I started it, I I the first iPhone I acquired was my like number iPhone 33GS.

Joana Aleixo da Silva Pereira 38:52

Mm hmm.

Interviewee D 38:52

Shows in the third Gen the third iteration, so three years on. I don't exactly know what the time was. They were launching months every year.

But again, yeah, as I said, the first and two are very limited. The three was the one that started to have a little bit. What was the also the the the beginning of the App Store and and and and people started and softer vendors started or software developers started to build in solutions after to them.

Joana Aleixo da Silva Pereira 39:19

Yeah.

Interviewee D 39:21

And you kind of blew up from there, but.

Yeah, there's, there's this. I didn't. You'll find the niche and you can you can wither the storm the initial store.

And and go go beef or or or you have to go a little step by step. So this the APN is is at the crossroads. You can bring a lot of potential but it still has some some way to go.

Joana Aleixo da Silva Pereira 39:48

Yeah, definitely.

Interviewee D 39:48

But if you don't, if you don't have use then it will never go. It will never go.

Joana Aleixo da Silva Pereira 39:56

If you don't have, sorry, I lost you.

Interviewee D 40:00

If you don't have users, early adopters.

Joana Aleixo da Silva Pereira 40:02

So yeah.

Interviewee D 40:02

Then it will never, it'll never grow. I think they're they're betting because of the price tag that they're betting on a similar approach to Apple, which is premium. And they would expect. People to.

Knowingly know that knowingly give give the money up, but understand understanding that is still a version that will that will.

Have to go through three different iterations to get to where it it it can be.

Joana Aleixo da Silva Pereira 40:38

Yeah, definitely.

So there's actually quite a lot of research into this, but for you.

What are the three critical SuccessFactors for virtual assistant?

Like the most important things that it has to do for you to actually use it.

Interviewee D 40:54

Sorry, what are the three?

Joana Aleixo da Silva Pereira 40:57

Critical Success Factors for virtual assistance.

Interviewee D 40:59

Yeah. So.

Ease of use. It really has to.

Joana Aleixo da Silva Pereira 41:05

Mm hmm.

Interviewee D 41:08

And you know.

Nowadays you have. You have to.

I'm Portuguese, so I speak Portuguese, but I mix it a lot of English. I I think nowadays everybody mix, every language mixes a lot of in English and and so these are views as to go so far to as to go to the extent of, you know, knowing when I'm speaking in Portuguese and and and mixing English words or the other way around, mixing words in English with mixing portugues so.

Because voice is the main interaction point, so it has to be flawless.

Joana Aleixo da Silva Pereira 41:45

Mm hmm yeah.

Interviewee D 41:47

So the ease of use of the voice.

Then the the the functionality set. So not only just read my last e-mail, but you know, go beyond that. See my appointments.

Know where I'm at and.

If if I like coffee from a certain brand, knowing where I'm at, it's time for coffee and recommended or I can go for that coffee.

Joana Aleixo da Silva Pereira 42:11

Yeah.

Interviewee D 42:16

And thirdly.

Thirdly, what guarantees do I have that if I put all my life into this systems into these products?

That is kept secure and that there is.

In the wrong way, namely advertising. And we all know Google goes through all of our emails at Gmail and they can basically know your they know your life and they advertise and they make money out of it. I would like not to have that option if if an app if I have to pay a little bit extra.

The Gmail's for free.

'Cause you're the product as we know, yeah, those will be like the three key points is it use functionality and then and then.

Security and privacy, yes.

Joana Aleixo da Silva Pereira 43:12

Perfect. So to finish off, let's just look at the future.

Do you have any particular concerns or are you worried about people potentially relying on tools like virtual assistant in the future, or even having these tools?

Impact your job? Replace your job in a very extreme place. Like how do you see the future of virtual assistance in the workforce?

Interviewee D 43:43

I-I area of concern is how bias this is and how how how if she knows, so will do then.

I I don't recall the the, the, the, the company.

Cambridge Analytica and all the the.

Joana Aleixo da Silva Pereira 44:00

Mm hmm yeah.

Interviewee D 44:01

Well, all the all the issues around it, which is OK, you know what you're interested with. So if

I trust blindly on a virtual assistant, like a personal assistant, I'm sure you will give me the news.

I want to hear read. And the images of the world that I'm.

Either I want to to know about or that I'm pushed so.

That's.

You were asking about the areas of concern. So that's one area of concern, whether it is personal, social or professional, because again, if I'm, I'm fed with a certain information, limited information, or biased information.

Joana Aleixo da Silva Pereira 44:35

Yeah.

Interviewee D 44:42

Then I'm. I'm I'm going to take decisions based on those biased information, so that's that's a little bit of the risk.

But like like like you rely on editors of some sorts throughout the throughout the ages of the.

Selecting for you, the newspaper editors, the news editors, etcetera.

Bringing a view of reality or or a view of the world as as as close to reality as possible, we would need some kind of editing editors for all this. This amount of knowledge. The thing is that it's humanly very humanly impossible out nearly humanly impossible or very difficult to do the auditing manually. So again, we're back to using tools.

Joana Aleixo da Silva Pereira 45:31

OK.

Interviewee D 45:33

But you can use tools to philtre and then to select and then to help like a a human versus a human.

Support the AI engine or or something like that or vice versa.

AI supporting editor. So that's an area of concern.

Joana Aleixo da Silva Pereira 45:51

Yeah.

Interviewee D 45:54

Replacing jobs.

Yes, it's an area of concern, but it that's that's been what we've been doing every time all the time. So today there are jobs.

That are today. There are no jobs that exist at ten, 20-30 years ago.

Umm, people have to adapt and hopefully we'll have.

Better things to do or other things to do.

Than than the tedious jobs that AI may have.

Removed or elk to reduce.

Joana Aleixo da Silva Pereira 46:31

Yeah. And the very last question is whether do you think there are misconceptions on the use of virtual assistants in the workplace and the quality of the work that you can do when you use these kind of tools or are people slowly accepting them and incorporating them?

Interviewee D 46:55

Misconceptions.

Again, is around the the the two topics I mentioned security and and and bias.

So people, I see people trusting it.

Blindly so, if it is being generated or said by and we know that there is, there are hallucination risks of the generic debate technology so.

So there's some misconceptions. So, for instance, one of the things we're doing at our company is, is, is, is, training, is, is education is making people aware of what AI can and cannot do and how to use it responsibly. So that's that's a very big task that all companies should do.

And then followed by by the regulators also on on how to approach it.

Joana Aleixo da Silva Pereira 47:56

Perfect. Thank you very much for your time. Your responses are very valuable for us and our work. And if you have any other questions, feel free to reach out to us.

Interviewee D 48:08

Great, great. Excellent work. Thanks for having me.

Joana Aleixo da Silva Pereira 48:11

Thank you.

Interviewee E: Digital Business Professor

26 October 2024, 10:36am

Joana Aleixo da Silva Pereira 0:07

Perfect.

So the first question we have.

Interviewee E 0:11

Emeril went off. Sorry.

Joana Aleixo da Silva Pereira 0:13

I think so. Yeah. I thought you had turned it off for the recording. I didn't wanna.

Interviewee E 0:16

No, no.

Joana Aleixo da Silva Pereira 0:18

Perfect. So first of all, were you aware of the virtual assistant technology? So Siri, Alexa, Google Assistant, and Cortana before the interview?

Interviewee E 0:27

Yes, I was.

Joana Aleixo da Silva Pereira 0:28

OK, perfect.

So we'd like to get some background information on your professional life. If you're so kind to

share. So could you tell me a bit more about your role and responsibilities?

Interviewee E 0:36

Mm hmm mm hmm.

So I'm a I'm a I'm an academic. I'm a professor of digital business at [University name] in [Country]. I've been an academic for 20.

More than 20 years.

So my responsibilities include teaching. I teach across all levels, and the graduate masters post pH, DS and MB as and assessment. I do research as well. That's another important part, and I do research mostly about technology adoption and consequences of technology adopting technology.

Yes. And then, yeah, that's mostly I'm mostly research and and teaching I also have I'm director in a PhD programme. So I look at about training students and preparing them for getting jobs and doing research and things like that.

Joana Aleixo da Silva Pereira 1:29

OK. So you actually said a few things that are quite very relevant for this interview because I was going to move on to the adoption Bell curve and ask you if you're familiar with the concept I assume.

Interviewee E 1:29

It.

I am, yes, I teach this bell curve.

Joana Aleixo da Silva Pereira 1:42

Exactly, exactly. I assumed you were.

So if we look at the curve and we consider the case of generative AI chat bots like ChatGPT, considering that they were first released in November 2022.

Interviewee E 1:52

Mm hmm mm hmm.

Joana Aleixo da Silva Pereira 1:57

If you use this technology, where do you think you would position yourself in the curve?

Interviewee E 2:00

So in terms of generative, AI I would consider myself an early adopter and the reason is because I teach about these things. So I feel that I need to know how they work and their pitfalls. I need to know what I'm talking about. Right. So I had the class yesterday about whether we can use these to analyse data, so I need to use it to know what I'm talking about. So I would say I'm an early adopter of generative AI.

Joana Aleixo da Silva Pereira 2:13

Yes.

OK, perfect. And would your answer be the same or different if we consider virtual assistance like Siri released in 2011, Alexa 2014?

Interviewee E 2:30

Yeah.

So.

So I'm again because I teach about these things I teach. I used to teach digital marketing. I would play around with these so I could tell my students about the potential for marketing. But in my personal life, I would say I was more an early majority than an early adopter. So I would read about these, play around with them, but actually using them, I would say I'm an early majority.

Joana Aleixo da Silva Pereira 2:46

Mm hmm.

OK. OK. Thank you very much. So actually moving on into the use of virtual assistance in your personal life, which ones do you use and what for?

Interviewee E 3:08

We have we have Google at home and we use it at home and then I use Siri on my phone so they are very different for Google. I mostly use them to to listen to music and podcasts volume up and down. I will do things like checking the weather or checking the news. For instance, in the morning I will also use timers, so if I'm doing something I'll ask for a timer, I'll say 25 minutes. So I move on to the next task.

Joana Aleixo da Silva Pereira 3:11

Mm hmm.

Interviewee E 3:36

And then something that my family thinks it's very funny. We communicate with each other through Google because we have.

Joana Aleixo da Silva Pereira 3:42

Oh.

Interviewee E 3:42

Three or four around the house, so we will kind of say dinner time or wake up or things like that, but it's more as a joke than really that it's convenient. And then for Siri, I use Siri to do all the sorts of phone functions, and I use also use Siri on my I have a watch and I use it on my watch as well, so I do things like, you know, texting or sending emails when I'm driving, for instance, or if I'm walking.

I like walking and running so seems come to mind and I'll make notes about them as I'm doing this.

Joana Aleixo da Silva Pereira 4:12

Yeah.

Interviewee E 4:14

I will also sometimes add things to my diary through Cirrus. I add these to diary again, I'll use its alarm. I use it for fitness. So for instance, if I'm sometimes I notice I'm going for a walk or I'm cycling and my Serie will say it looks like your cycling. Should I record this and I say yes please.

And and I do. It's mostly I like to use it when I'm driving or walking right for convenience.

Joana Aleixo da Silva Pereira 4:40

Yeah, yeah.

Interviewee E 4:41

That's mostly how I use it.

Joana Aleixo da Silva Pereira 4:42

Yeah, I have a similar experience with with Sirius. I would agree.

And actually we have a there's a little fun fact. I don't know if if you've heard this before, but.

They say that Amazon first released Alexa so that people would add more items to their cart using Alexa, and then they found that people and then they found that people weren't really using Alexa for that. They were asking Alexa about the weather and the news and all of that stuff. So yeah, and that too.

Interviewee E 4:59

It I I can't believe it.

Jokes, you can ask. You can ask Siri or Alexa to tell you jokes. It's really funny.

Joana Aleixo da Silva Pereira 5:13

Exactly. So it didn't really meet their expectations in that sense. Let's say, have you ever used a virtual system for shopping?

Interviewee E 5:21

Not only to add items to my list on my phone, but not to buy directly.

Joana Aleixo da Silva Pereira 5:21

No.

OK, OK. Perfect. Makes sense.

So moving on to your professional life, do you currently use any virtual assistants at work?

Interviewee E 5:37

So I do I do I do. I initially I thought I didn't, but actually when I think of it, I do. I use Siri a lot to record notes. Right. So instead of writing or typing them, I like to. If I'm saying about something, I'll say Siri record this note and then I'll write a note. Sometimes it's like an idea for a lecture or sometimes it's student feedback or.

Joana Aleixo da Silva Pereira 5:47

OK.

Interviewee E 6:02

An idea for a paper, so I use the voice feature on Siri a lot to record notes.

It's faster, it's more intuitive, because if I'm talking I'm not self editing. When you're writing, you tend to edit what you're writing, so I think I capture more of the idea and also helps with repetitive stress injury. You know, type 10 minutes.

Joana Aleixo da Silva Pereira 6:22

Mm hmm. Yes, yes, yes, yes.

Interviewee E 6:25

So that would be kind of the main use and then I don't know if you would, I don't know if you would qualify notebook LMI, don't think you would qualify them as a virtual assistant. But lately I'm using it to dissect documents. So I'll have a document and then I'll use the the podcast version of the notebook LM to digest it. It helps me see a paper or something in a different light.

So I'm using that to explore.

Joana Aleixo da Silva Pereira 6:39

Mm hmm.

Yeah.

Interviewee E 6:52

Alternative ways of looking at things, but this is something I'm only kind of playing around with at the moment.

Joana Aleixo da Silva Pereira 6:56

Hang around.

Interviewee E 6:57

It's mostly to record notes on secret.

Joana Aleixo da Silva Pereira 7:00

OK, OK. Yeah. I mean the definition is quite fuzzy sometimes. I means depending on where you where you look at the information, something's followed as into the category of systems. And then in another article, whatever they don't. So it's, yeah, it's flexible, let's say.

Interviewee E 7:04

Yeah.

Yeah, yeah.

Joana Aleixo da Silva Pereira 7:17

And do you feel like the use using virtual assistance has impacted your productivity? Has it made you more efficient in your job?

Interviewee E 7:23

Yeah. Well, I think it's it. There are good things and bad things. The good thing is that if I have an idea while I'm out and about, I can capture it immediately. So it's good in that sense that it allows me to capture things as they happen. If I'm if I'm trying again, if I'm driving. And I'm thinking I need to tell these to students, I'll just record a note and then it's there. So it it may be more productive. On the other hand, it also means that work seeps into every aspect of life. So if I'm.

Joana Aleixo da Silva Pereira 7:27

Mm hmm.

Mm hmm.

Interviewee E 7:52

If I'm shopping or something and the idea come.

If I didn't have the cereal with me, I might just wait for until I got home. But then so yeah, so it does help with productivity capture, so make sure I don't lose those ideas, which means that maybe maybe I'm more relaxed about this.

On the other hand, it does mean work is everywhere, isn't it?

Joana Aleixo da Silva Pereira 8:11

Yeah.

Yeah, that's actually very interesting. I've never looked at it that way. Yeah.

And do you feel that relying on these type of devices has changed your approach to how you work or the decisions you have to make at work? Do you feel like you rely on them a lot, or do you still think you can kind of like keep a distance from them and make your own decisions?

Interviewee E 8:38

Something again, something that I'm I went to a meeting the other day about the way because I know that you can't record things. I saw somebody in the conference and they were recording the conference in their phone and then notes and see you again on Apple phones recording the notes. And I didn't think about it. So it actually could be a good idea. It might allow me to focus more, but then actually it's the opposite, isn't it? You learn more if you're making notes rather than just recording it.

Joana Aleixo da Silva Pereira 8:51

OK.

Interviewee E 9:08

So I think it could, it could create a problem where you feel that you need. If you are recording, it's fine. You don't need to pay attention.

Joana Aleixo da Silva Pereira 9:14

Yeah.

Interviewee E 9:15

It could have that downside, but so I think because it's there, it makes it easy to record things

and I don't like that side because I think it's first, there are all the privacy issues in second.

You'd you're not making the notes to the cognitive efforts, but on the other hand, I do feel that it makes it easier to capture things which is good.

Joana Aleixo da Silva Pereira 9:34

OK. Yeah, that's actually very true. Sometimes in lectures, you're like, oh, it's being recorded.

It's fine, but you're never going to look back at the recording. So you really need to be there and pay attention.

Interviewee E 9:40

Exactly.

No, and you're not. You're not making the effort then to think, what are the key points, is it?

Joana Aleixo da Silva Pereira 9:47

Exactly. Not saying I did this in lectures, by the way. It's just it's just a fun fact.

Interviewee E 9:51

Not do it.

Mm hmm.

Joana Aleixo da Silva Pereira 10:01

Are there any very tedious tasks that you have that you would like a virtual assistant to help you with that right now they kind of can't really do for you.

Interviewee E 10:11

I would sometimes and and again. This is something that generative AI can help. It's making summaries of things so. So the I think virtual systems themselves cannot make it directly, but if you start using margin generative AI into virtual assistance, they will make these summaries of documents or meetings. I think that would be really helpful.

Joana Aleixo da Silva Pereira 10:17

Mm hmm yeah.

Interviewee E 10:37

I think so. Yeah. I think mostly these kind of making summaries would be really helpful.

Joana Aleixo da Silva Pereira 10:41

Yes.

Interviewee E 10:42

And we would get there. I think with generative AI.

Joana Aleixo da Silva Pereira 10:46

OK, definitely yes. So looking back at your industry, so obviously you're an academic education. Do you think that this technology can be used for training of new employees or new academics or maybe even students in this case?

Interviewee E 11:03

Yeah, I think it could, because, for instance, in academia we have, well, a couple of things. One,

for instance, when you give student feedback, you should always use what we call the sandwich method. You say something nice, you say what needs to be improved and then you end up on a positive note. And I think sometimes with new academics, they just go, they just say, oh, this is what you need to improve on. So I when you have, when you have a new teaching assistant, I spend so much time telling. No, no, no, you need to use a sandwich method sandage method. So I think.

That could help with that if you rent. If the person was typing feedback and then the virtual assistant say oh, have you said something positive here? Have said something positive there, so it could be help with those kind of repetitive tasks like make sure you apply this method. I think also in academia we have a lot of non-native speakers and sometimes that could help with.

Joana Aleixo da Silva Pereira 11:43

Yes.

Mm hmm.

Interviewee E 11:55

Translations and improving how you write, so I'm not talking about. I'm not talking about writing on your behalf, but improving making suggestions.

It could be helpful, but again, we're talking about.

This is more about generative AI than really virtual assistance, isn't it? I think a virtual assistant would be, yeah. For instance, if I if I type a note then it's say that fit. Imagine that I'm saying, as I said, I'm writing. I have this idea for feedback. I record the notes and maybe the virtual scenes could say remember to include something positive maybe like that. I don't know it could help on those repetitive tasks I suppose.

Joana Aleixo da Silva Pereira 12:13

Yeah.

Yeah, yeah.

Yeah, I agree. Definitely. And do you think that companies or in your case maybe universities would have the willingness to pay for these kind of like training services? So if you were to implement a virtual system, for example, for the repetitive tasks that you just said, do you think the university would be willing to do that or they would be still quite sceptical about it?

Interviewee E 12:57

No, I think that I think universities are very keen to automate things, to save money.

Joana Aleixo da Silva Pereira 13:01

Mm hmm.

Interviewee E 13:02

So I see. I think they would definitely. It all depends on the on the price, isn't it? But I think I think they're very keen to automate things that a lot of my own training like health and safety and so on is automated and I need. So I need to do lots of training about fire safety and and bias in recruitment and things like that. And I watch videos and then I need to do tests. So I'm sure it would help. It's about the price.

Joana Aleixo da Silva Pereira 13:07

Yeah.

Interviewee E 13:28

And then universities are very concerned with GDPR. You know, privacy, student privacy and bias. I think that's probably the might be the challenge. I think. For instance, some of these virtual assistants, they really struggle with accents. I don't, for instance. And I think that would be a problem that if students felt that felt bad because the virtual assistant was struggling with their accent. I think universities would be very sensitive to that.

Joana Aleixo da Silva Pereira 13:29

OK.

Mm hmm.

Yeah.

Yeah, yeah, definitely. That's a big topic of, of discussion. The accent thing, yeah.

Interviewee E 14:00

Yeah.

Joana Aleixo da Silva Pereira 14:03

So let's now move on to the two cases that I that I spoke about the start. So obviously on one side we have Siri.

Which you are familiar with and you use so I won't go into too much detail into describing what it is because I know you're you're familiar with it. But then we have, let's say, a more innovative case. And this is the case of the humane AI bin.

I've put a picture of it in the in the interview guide.

Interviewee E 14:29

Yep.

Joana Aleixo da Silva Pereira 14:31

So this is basically an American consumer electronic firms that was founded in 2018. The CEOs are two ex Apple employees and this is a wearable that is meant to be your second brain and be your personal assistant and help you with everything. It has a bit of a high price. It's \$699 for the device. And then you also have to pay the monthly subscription, but it has a bunch of functionalities.

That I've detailed in the in the guide, so it's it's an interesting. It's an interesting new device that's coming out there and it's bringing this idea of sometimes they even say that they want to replace phones because you're just going to need this device. Then they kind of go back and they're like, oh, no, we actually didn't say this but well.

Interviewee E 15:04

Mm hmm.

OK.

Yeah.

Joana Aleixo da Silva Pereira 15:17

So there's a video. Maybe it's easier if.

You access the video instead of me sharing it because I've.

Doesn't usually work very well. I've sent the link in the chats.

Interviewee E 15:33

You want me to watch the video now?

Joana Aleixo da Silva Pereira 15:35

Yeah, it is a bit long. So we've just thought that maybe for minutes, minutes 1255 to the end that's.

Joana Aleixo da Silva Pereira 18:37

Perfect.

So I guess that gave you a brief overview of the what the situation is right now.

Interviewee E 18:45

Mm hmm.

Joana Aleixo da Silva Pereira 18:46

Obviously we have on one side like this. Simpler, more standard. You know, Siri, that's more likely to do what you want, and then you have this more sophisticated device that you have less certainty on the result, but maybe it has like more capabilities. Do you see yourself using or adopting the humani? I've been at work since you already use Siri. Or do you think you would just stick to Siri?

Interviewee E 19:06

Yeah. I I I think it's it's, I do feel that in some years time not in two but 5:00 to 10:00, well certainly 10. I'm sure in my children's adult life they would funds will be a thin mobile phones will be a thing of the past. It will be more this kind of devices that project onto your skin or

some sort of surface right.

Joana Aleixo da Silva Pereira 19:24

Mm hmm.

Interviewee E 19:29

It's difficult for us to imagine now, but I remember when mobile phones started being popular, people still thought it was. It was just a niche application, right? And now it's the remote control for our lives and I think.

It will change because of technology, because I think also these technology companies are really keen to bypass the apple system right to the have other devices where they can show. So I do feel that there will be an alternative to phones and this seems like a very cool feature.

Joana Aleixo da Silva Pereira 19:50

Mm hmm mm hmm.

Mm hmm.

Interviewee E 20:00

What I there are some technical problems. Of course. I would worry about the, I think things that you can control with the voice will will take over tactile ones. I agree. I would worry about things like like with the accent, but I'm guessing skin tones. Would it work in all skin tones or wrinkles for instance? I'm guessing that would be another.

A wrinkly hand, but I can see this being helpful. I think for instance, about my mother-in-law that she's she struggles to deal with her phone and it would be so much easier for her to just touch her hand or control things with her phone with her voice. Isn't it? So I think it's. I think

it's good ideas. There are some lots of concerns around privacy, I think because this device would be.

Joana Aleixo da Silva Pereira 20:27

Mm hmm.

Yeah.

Interviewee E 20:44

But again, phones do that as well.

I think there will be some issues, Joana because for instance we had this with Google.

The Google lenses, isn't it? Google glasses? I don't. Do you remember? I think people resist some of these tools.

Joana Aleixo da Silva Pereira 20:55

Mm hmm. Yeah, yeah, yeah.

Interviewee E 21:01

So I think if I was wearing one of those people might be put off, might not want to talk in front of me or something. If they see it. So initially that that concern might be there. But again it's not doing nothing that your phone doesn't do anyway. But I suppose we are used to France different.

Joana Aleixo da Silva Pereira 21:08

Yes.

Yeah.

That was actually another another question we had. So you so you don't think maybe as a society, we're ready for such an innovative product to just come out and disrupt the market.

Interviewee E 21:29

I think I think as a society, when we have these external displays of technology, just like we had the Google glasses, it becomes really because it's different, right? Because it's not. It's new. People become very aware of it and become we. I don't like the idea. People didn't like the idea that you had that thing or and you'd have information that I didn't have because you had the glasses right. Whereas with the phone we all have the phone.

Joana Aleixo da Silva Pereira 21:35

Mm hmm.

Interviewee E 21:54

And it evolved gradually. It evolved from something that was voice and then text, and then had the snake. There was incremental innovation in the phone, bringing more and more information capabilities to a device that everybody had. So it was.

Joana Aleixo da Silva Pereira 22:02

Mm hmm.

Interviewee E 22:06

The incremental innovation was easier. I do feel that I do feel that this will have a place. I I think we are at the innovator stage of the.

That you told me about at the beginning, right? We're playing around. I think. Here we also

have problems with hardware. Hardware is really expensive to develop. Really tricky. I think that we have a lot of full starts, but in a few years time, I'm sure there will be a device that will replace the phone.

Joana Aleixo da Silva Pereira 22:19

N.

Yeah.

Interviewee E 22:35

And and it could be just start with the watch. Actually the watch without the need to have a phone to connect to have more function. So if you have the human UI/UX on a phone, it might make it more acceptable, even though it's still the same. Does that make sense? If it's more of an incremental innovation? So you have completely new functions, but on a device that people are used to, I think it will be easier. I think we'll have this other alternative to phones in a few years time.

Joana Aleixo da Silva Pereira 22:42

Mm hmm.

Yeah, yeah, yeah, yeah.

OK.

Interviewee E 23:02

But for the time being, people will see it as an intrusion because it's different. People will be much more concerned with things like privacy.

And do you have some information that I don't have and be a bit suspicious?

Joana Aleixo da Silva Pereira 23:15

Yeah. So acceptance would be smoother if they incorporated it into an already like familiar device to us, yeah.

Interviewee E 23:16

Yeah, that's.

I think they need to put the functionalities in and more familiar device and then it will be OK.

Joana Aleixo da Silva Pereira 23:28

OK. Yeah, that's that's really interesting. Yeah. And just a last question on this topic. Obviously, there's a lot of criticism around the pin and basically what people say is that when it does work, it's amazing. But most of the time it doesn't work. It's very slow. The hardware about the different skin tones I did specifically.

Read about that, but I read about something similar like the light you know at night time. It was hard to see and what not. So what would you say that for you are the.

Very critical SuccessFactors for Ava to be worth it for you to use.

Interviewee E 24:06

I think you need to reduce friction. It needs to be very simple, not not right. So maybe you don't have a lot of functionality, but what you do you do well. You understand, right? Maybe it's just the weather. But when you ask about weather, it really understands that you're asking about weather, right. I think that part of this device that sometimes they try to do everything and then I do feel. I remember for instance. And then there's a bit of play as well. I remember in the beginning people loved Alexa and Siri because of the jokes they would.

Joana Aleixo da Silva Pereira 24:10

Mm hmm.

Mm hmm.

Hmm.

Interviewee E 24:36

Alexa, to say joke or trick them or these kind of things. So if you can find a think of playing with them. So I think these manufacturers shouldn't take themselves too seriously, right? If you ask Siri about, I don't know. Or Alexa, I don't know. So these things. So I think it's.

Not a lot of functionality, but do it really well. Whatever you do to reduce this friction in the problems make people play with it. Find way reasons for people to make it silly. You might even want to have it. Yeah. Say, you know, say you know yes, display it in ways where.

Joana Aleixo da Silva Pereira 25:02

Mm hmm.

Interviewee E 25:10

It's funny and people don't feel threatened by it. They would be Dwight.

Yeah, I suppose.

Joana Aleixo da Silva Pereira 25:18

Yeah, actually the question that we sent out, we added playing around as an option for people to to choose when they when they had to describe their use of virtual assistants. And a lot of people went for, went for that option. Yeah.

Interviewee E 25:24

Yeah.

Yes, I I think playing being so you don't feel threatened by it, right? It's not a robot, it's a Tamagotchi.

Joana Aleixo da Silva Pereira 25:36

Mm hmm.

Yeah, yeah.

Interviewee E 25:40

It's a toy.

Joana Aleixo da Silva Pereira 25:42

So we're getting towards the end we we're just going to have a brief discussion on the future outlook. How do you see the future of this of this technology? So how do you think it's going to impact the workforce? I don't, I don't think in my opinion it has a very big impact in the workforce right now. Please let me know if you disagree, but do you think it will have a?

Interviewee E 26:00

Yeah.

I think it would have if it's used. If it's used regularly, I can. I can see for instance employees in a warehouse or gig workers being forced to use to use these things, right? Instead, if you have a delivery person instead of having a phone, they would be forced to use this because it then it also monitors where you are. So so one of the concerns could be when people have to use these instead of an option, right? So we would have some issues around surveillance and lack of

choice.

Joana Aleixo da Silva Pereira 26:11

Mm hmm.

Yeah.

Interviewee E 26:30

These devices will monitor where you are. They may even monitor things like your heart rate.

Joana Aleixo da Silva Pereira 26:36

Mm hmm.

Interviewee E 26:36

I think depending on what the device. So I would be concerned around surveillance of certain groups of employees like in gig work and warehouses and so on.

I would think there may be some issues, but it could increase safety as well. I'm not saying I'm just saying you're asking me about the concerns, so this would be the concerns. It could increase safety as well, right? If you feel that somebody is about to faint or whatever. But yeah, I could see that. I think there's an issue if you saw for instance, the demo, the video showed me they always use these male female voices.

Joana Aleixo da Silva Pereira 26:53

Mm hmm.

Interviewee E 27:08

And it's one of the concerns with virtual assistants that perpetuates this idea that I'm giving order, that women are assistants, right? Women are there to help you, to enable you, and you give them orders.

Joana Aleixo da Silva Pereira 27:08

Mm hmm.

Yeah.

Interviewee E 27:21

So there's quite a bit of interesting research around is when you have the VA with female voices or male voices.

So one concern I have is that all of these are about they give them women's names, they they use female's voices. And this perpetuates the idea that women are servant and assistance rather than agents. So I think this would be 2% surveillance and the image of women in this society.

Joana Aleixo da Silva Pereira 27:45

Yeah.

Definitely I changed my Siri to my voice to be honest. It felt weird.

Interviewee E 27:50

Yes, yes.

Joana Aleixo da Silva Pereira 27:55

And yeah, the last question we've we just wanted to ask you if whether you think there's still

misconceptions about the use of not only virtual assistants, but also like ChatGPT and other stuff in professional settings, like for example, in your case, how do you, how do you, how do you look at it when your students, for example use these type of technologies like chatchpete or?

Copilot and what not to write their assessments.

Interviewee E 28:22

Yeah. So I think one concern I have is that sometimes people think they are that these tools are much more capable than they are. So yes, they're very fluent, right? They're very fluent. They they write beautiful prose.

Joana Aleixo da Silva Pereira 28:35

Mm hmm.

Interviewee E 28:36

It it's very well written, but when you start dissecting the content, it's actually sometimes it's not critical at all, and there are lots of mistakes. So one of the things I worry about is that people just use these tools and it reads beautifully and they stop. Don't don't think about what they're reading, if that makes sense. And they're not critical enough about what the ChatGPT, what the genre, I what the virtual assistant is producing. So yeah, I may even ask whether.

Joana Aleixo da Silva Pereira 28:53

Mm hmm.

Interviewee E 29:02

So if I were to ask about whether I need to still look outside of the window and see if like if, if my Google tells me it's going to rain but it's sunny or the other way round, I would still be critical. So still be critical about the tools I think is one of my main main concerns, because it's true that these companies like, say, open AI, they're trying to get funding, right? So they will hype up.

Joana Aleixo da Silva Pereira 29:13

Yeah.

That's a nice example, yeah.

Interviewee E 29:27

The tools are very capable, but they will hype up what the tools can do and and we we can it's a bit we we need to.

Step back and see that they're not that good. This very fluent, but not that clever and and not rely on some of these. We again we had these in the beginning with say GPS navigation systems where they would tell you to go through down down it will give you wrong directions right it would send you down the track instead of a road. So I think it's a concern that I have is that people stop.

Joana Aleixo da Silva Pereira 29:46

Mm hmm.

Yeah.

Interviewee E 29:59

Question. Believing themselves, they start questioning, start questioning what the machine tells them to do.

Joana Aleixo da Silva Pereira 30:03

Yeah, yeah. I mean, this is slightly off script, but I feel like for for you and me, maybe because we understand the technology behind this, we can kind of keep that distance. I feel like it's harder for people that don't really understand what's going on behind, you know, the tool that is actually just aggregating a lot of information and spitting it out to you in a way that sounds like a human because statistically it that's how humans speak.

Interviewee E 30:10

Mm hmm.

Yeah.

It sounds great. It sounds great.

Joana Aleixo da Silva Pereira 30:28

Yeah, exactly.

Interviewee E 30:30

Absolutely.

Joana Aleixo da Silva Pereira 30:32

But yeah, that's it. That's everything I had. Thank you so much for your time. Let me just stop the let me just stop the.

Interviewee F: Growth and Customer Acquisition Professional

28 October 2024, 06:23pm

Joana Aleixo da Silva Pereira 0:06

Yes, perfect. It usually turns off your video. You're free to keep it off or on however you like.

So the first question is, were you aware of the virtual system technology before the interview?

So I'm talking about devices like Siri, Alexa, Google Assistant, or Cortana.

Interviewee F 0:26

Sorry, yes, I was. I was aware of these.

Joana Aleixo da Silva Pereira 0:28

OK.

Perfect. So.

As background for the interview, I'd like to understand a bit more about your professional life.

If you're so kind to share, so could you tell me a bit more about your roles and responsibilities in the most concrete way possible please?

Interviewee F 0:47

Yeah. So.

I work for an American startup called Bamas. I've been working at [Company name] for just over a year and three months.

Within bounds I work in the growth team essentially at [Company name] growth means customer acquisition in whichever way that that can happen.

That can come to a series of multiple channels that sort for broadening our scope and and reaching more audiences.

But within growth that [Company name], I am focusing that primarily on SCO, which is search engine optimization.

Within the SEO team.

I mainly do the content strategy across the different types of pages on our site across the different markets and languages that we serve.

We are worldwide, so naturally that spans over a lot of different regions and languages, mainly having seven different editorial languages.

And for that I have a constant or let's say daily interaction with our different editorial teams across the board as well As for marketing pages, but also more on top of funnel customer acquisition such as.

More blog related type of pages which also serves for other types of let's say growth channels such as socials or paid.

Joana Aleixo da Silva Pereira 2:18

Thank you. That was very useful. Thank you very much.

So I'm going to send into the chat an image I'm sure you've seen something like this before.

Let me know when you can see it.

Interviewee F 2:38

OK, now you can hear me. Yes, I can see it.

Joana Aleixo da Silva Pereira 2:40

Yeah, perfect. So are you familiar with the concept of the technology adoption and acceptance curve? Have you ever seen this before? Yeah, perfect. So let's think about the case of generative AI chatbots like ChatGPT. That was first released in November 2022. And we also have, for

example, Co pilot released in February 2023. If you use this technology, where do you think you would position yourself in the curve?

Interviewee F 2:46

Yes, ma'am. Yeah.

Joana Aleixo da Silva Pereira 3:06

Considering the kind of time frame that I said.

Interviewee F 3:10

So what would the time frames be in terms of months since November 2022?

Joana Aleixo da Silva Pereira 3:18

Well, we don't really need to be that precise, but let's say that right now.

It's kind of like a borderline between like early majority, late majority.

Kind of thing right now. Yeah. So if you adopted it like at the very, very beginning, so say if you started using ChatGPT at the end of 2022, then you would be an innovator, an early adopter.

Interviewee F 3:30

That's.

Joana Aleixo da Silva Pereira 3:44

If you only started using it now, then you're more in like late majority kind of thing.

Interviewee F 3:50

Then I believe it would be between early adopter and the early majority. I think I started using chat 2BT.

Mainly once I started working at actually no, maybe in like March 2023 so.

Joana Aleixo da Silva Pereira 4:10

So early adopter maybe.

Interviewee F 4:12

Yes, yes.

Joana Aleixo da Silva Pereira 4:14

Yeah. Perfect. So we just wanted to give the case of ChatGPT, because it's kind of fresh in everyone's mind and to kind of give a point of comparison because I'd now like to ask you the same question in terms of virtual assistant. So let's say Siri was released in October 2011 and Alexa in November 2014. I don't know which ones you use and where would you position yourself in the curve in terms of this technology?

Interviewee F 4:39

Well, that's a bit of a difficult question because back then when it was released, I didn't have technology at my disposal.

Joana Aleixo da Silva Pereira 4:43

OK.

Yeah.

Interviewee F 4:53

So I think.

Probably I might have started using Syria. I haven't really used Alexa because I don't really own any Amazon services. But maybe Siri in around 2016, so that might have made me a late majority or even lobbyists. But that's just mainly because that's when I started owning Apple products.

Joana Aleixo da Silva Pereira 5:05

Mm hmm.

Yeah.

Interviewee F 5:19

So yeah. However, I don't really use Siri very often.

Mainly because I just don't.

I haven't really incorporated in my daily routine. I think I'm still very much.

In comparison to that GPI C ChatGPT value very prominently. Where Siri, I think I'm much more used to maybe the older school methods of utilisation.

Where if I want something I self-serve to written text rather than by.

Going towards the assistant for support in a voice activated manner. So although I have used Siri before and I could pinpoint it back to 2016, most likely I don't really consider myself as an avid user of that type of virtual assistance.

Joana Aleixo da Silva Pereira 6:11

OK, OK. That's also very interesting for for our research to be honest.

So moving on into your current use of virtual assistance, you've already kind of touched on it a

bit. You said you own Apple devices, but you don't use Siri. Is there any other device that you use maybe in your house or not at all?

Interviewee F 6:32

Yeah, not at all. I think in this, although I do consider myself quite a tech forward kind of person. And I think with this type of software on virtual assistants, I still just haven't really.

Incorporated it and and probably haven't really ever unlocked its full potential and that's why I don't see the full.

Benefits of it, and therefore I think I am a little bit more on that. I don't even know if it's laziness or how to frame it, but it's more on that side of.

Joana Aleixo da Silva Pereira 6:57

Mm hmm mm hmm.

Interviewee F 7:07

I'm going to keep doing things in the way that I do them rather than accepting and using this new technology because I don't so clearly see it. But yeah, just no other virtual assistants, mainly because of that. My reluctance, I guess, to kind of go beyond my.

Current knowledge or let's say not comfort zone. Maybe you could call it to try to adopt more of those smart yeah assistance applications.

Joana Aleixo da Silva Pereira 7:36

OK, fair enough. And do you this might be a bit of a let's say broad question, so feel free to to approach it whichever way you want. So what aspects of this technology do you think would have to change for you to adopt it and now focusing on the professional life and on your, you

know the the job role you described at the start, do you think there's anything that could change for you to adopt it or you think that even if there were like massive improvements?

On the technology, you'd still be quite sceptical towards using it.

Interviewee F 8:08

And here for virtual assistance are we talking mainly just Syria, Alexa or are we talking things such as, for example, speech to speech to or text type of assistance?

Joana Aleixo da Silva Pereira 8:20

Speech to text also applies. Yes, yes, any kind of.

Technology aided device or tool that would help you in your in your job or even like boost your boost your productivity in in some sense you know.

Interviewee F 8:36

We actually have a very interesting scenario of this.

So I know that at this point this type of technologies are so.

Developed as to really be precise and correct in the way that they work.

And recently I've had tendonitis in my hands where I.

'Ve considered using you know speech to text?

So that instead of having to type, I could just speak to my laptop and get my work done in that way. But I think just, although I did give it a go because.

It is different to my typical unusual way of working which I have already developed and let's say mastered it just felt a bit slow, a bit inconvenient, and it wasn't really so much the fault of the device. Or let's say the software and it's accuracy, it was just more of a.

Having to readapt and really learn and perhaps take a a learning curve to in order to get there

and and incorporate it as a new norm. So I think that's where the rejection or the.

Lack not lack, but like slowness to or uneagerness to incorporate. It would stem from.

Joana Aleixo da Silva Pereira 10:02

Yeah, yeah. I mean that makes total sense. Like if you feel like the technology's kind of flawed, then you're going to you'd rather stick to more traditional methods.

Interviewee F 10:11

So that's that's not what I meant. It's not that I feel like the technology is flawed. I just think that it requires a learning curve in order to adopt it as a new norm. So it's more like I deviate from my standard way of working, which I've already mastered. And I already kind of optimised for speed for output and doing it in this alternative way maybe could benefit certain things. And in this case my tennitis right, but it just takes.

Joana Aleixo da Silva Pereira 10:20

Oh, OK.

Mm hmm.

Interviewee F 10:37

Time to learn to adopt and to incorporate into my routine. Which honestly?

It just falls a bit of a of a bother and which is why I stuck with the more traditional way, although it might not be as the most beneficial for.

Joana Aleixo da Silva Pereira 10:46

Mm hmm.

OK, OK, makes sense. I got it now. Thank you.

So let's now consider what kind of your ideal virtual assistant would be. I know you. You don't really use them, but is there? If it's, it's fine. If your answer is a no, I'm just curious to know is there a very tedious task that you have to do in your job that you would love a virtual assistant in the broadest sense of the word to do for you?

Interviewee F 11:24

It's it's interesting you ask this because well, if you say virtual assistant and it's broadest sense, I do have a lot of virtual assistants in my job, but this is actually performed by a human.

Joana Aleixo da Silva Pereira 11:30

Mm hmm.

OK.

Interviewee F 11:36

So in my teams we have a lot of manual repetitive tasks where we do specific data analysis which we do not have the automated systems in order to get results from quickly.

And this could be traffic analysis or more specific SCO related things such as physicians on a search page.

And because we do not have the engineered engineered back software to be able to pull that easily, this is a lot of manual work.

And then.

Rather than having an E virtual assistant, we actually have in person virtual assistants that do this type of work. I think that.

This is definitely a kind of thing that I would be.

Very interesting shoes that help from from.

An technology based virtual assistant, but at the same time I do feel that a lot of.

Context is needed to be provided in order to get.

The outputs that I am looking for that I feel that at the point where virtual assistance is at right now and in this case I'm talking virtual assistance, maybe more the ChatGPT type.

I think that it's still probably better performed by a human in terms of context giving.

And and getting the output that I am looking for. Although I do think that.

Online based so technology based virtual assistance would do a better job.

If if being able to get the full contacts would do a better job probably, than maybe because we know that there's human error whereas machines or technology is much more.

Or tends to be much more precise once it bumps or the the context is that it's 100% glory, so yeah.

Joana Aleixo da Silva Pereira 13:35

Mm hmm.

Yeah, that's super interesting. Thank you so much for sharing that.

Just to finish off this section, I'd like to touch on the topic of training. So maybe if you consider your onboarding at your company and how your experience was, do you think there's any kind of virtual assistant that would have been able to help you with?

Your training for your job, or do you think it's way too complex?

For you know, for virtual assistant.

Interviewee F 14:09

I I don't. I don't think it's it would be complex I I mean.

My on boarding for my job when it was done.

It was let's. I mean we have to consider that it is a start up. So a lot of things are not really.

Joana Aleixo da Silva Pereira 14:26

Mm hmm.

Interviewee F 14:30

Let's say systematised, so I didn't really have that much of an on boarding. There was a lot of like personal trial and error and error, personal discovery.

And there I do think that having a little bit more of a walk through to over things would be really good. Great. I think in this case, in order to make things, yeah, systematised and.

Let's say efficient and.

What's it called? Standardised a virtual assistant.

Joana Aleixo da Silva Pereira 15:02

Mm hmm.

Interviewee F 15:05

In whatever shape or form could be great because the types of onboarding would be the same for anyone onboarding for a certain role. Again, going back to that like human error or like human.

Spark that you know could influence the onboarding that a human would do towards a person.

So in that sense, I think that virtualization could be great and it could have, for example, in the format of video or in the format of whatever could have really helped.

We understand the walk through of certain tools and and elements of of my work at the same time. I personally really value like human connection. So I think that I would have also

appreciated.

Joana Aleixo da Silva Pereira 15:42

Mm hmm.

Interviewee F 15:54

If if I needed some sort of assistance or or walk through over something during my onboarding, I would have appreciated perhaps maybe some real person next to me, or even through a screen to be able to, you know, come with questions or like on the moments kind of feedback on certain elements.

Joana Aleixo da Silva Pereira 16:15

Makes total sense and.

Considering your company profile so you know American startup and all the all the knowledge you have about your company, do you think the company would be willing to invest and pay for this kind of training service that you mentioned or do you think they'd rather stick to to the way they do things now?

Interviewee F 16:37

I mean.

That's a a great question, because it really depends.

I think startups, especially tech startups, are all about automation, all about efficiency.

Joana Aleixo da Silva Pereira 16:50

Mm hmm.

Interviewee F 16:51

So in that sense, if there's a proven.

Point on how much virtual assistance would.

Benefit, operational efficiency and and and automation absolutely, I think it is something that.

A company of the same.

Constitution, as as the one I work for would definitely consider, but then another really important element to keep in mind with startups is that everything needs to be makes sense financially, right? When you're a start up, you don't. I mean, of course it depends on the startup, but you really got to watch your spending and you really got to understand the return of investment, right? So.

If there's a proven return on investment.

You're automating and scaling.

To virtual assistants, I think it would definitely be something that would be considered by a company like the one I work for.

Joana Aleixo da Silva Pereira 17:51

Yeah, I agree. Thank you very much.

So we're now going to move on to the cases.

I brought two cases. The first one is Siri. As you said, you own an Apple device. I won't bother you too much with a description of Siri, because I assume you're familiar with it. But do let me know if you want some more details into how this technology works, but a more interesting case that we wanted to present that people are not usually that familiar with is the case of the humane AI pin. So.

There's actually a picture of it in the interview guide, but you're going to see it in in the in a video shortly, but basically humane is an American consumer electronic firm that was founded

in 2018 and the CE OS are actually two ex Apple employees. And basically their idea is to create this wearable AI powered device that acts as your second brain as your personal assistant as your whatever you want to call it.

They sometimes say that they want to replace phones with this device because it acts as it has a separate phone number.

For data package, let's say it doesn't connect to your phone, it it's like a separate phone.

They started shipping it in April 2024, so this year the price is \$699 for the device. And then you also have to pay \$24.00 a month subscription for this data and phone number plan that I was telling you about. And just to give you a bit, yes, tell me.

Interviewee F 19:20

Sorry, could you that you said it was 600 for the one, but how much for the subscription?

Joana Aleixo da Silva Pereira 19:26

699 for the device and then \$24.00 a month for the subscription subscription. Sorry.

And yeah, in terms of like its basic functionalities, it's meant to come with like new ways of interaction. So it actually displays things on your hand with the laser ink display they call and you can like move your hands to, you know, manage the menu that's coming up on your hand.

You can also, like, touch it and hold it to talk to it. You can touch, tap, swipe to do.

Different sorts of things like taking pictures, for example.

It's also meant to be very mindful of your time, so it learns the people you usually interact with, and it kind of like only gives you the notifications that you are going to that you usually consider to be high priority. You know, so it's like very mindful of not wasting your time, they say.

It will also catch you up on the stuff you've missed if you just tell the device. Catch me up, it will like, give you a brief overview of, you know, summary of your notifications. It also creates

playlists for you. You can compose messages like you. It creates messages that sound like you because it knows how you usually write. It can translate conversations, take pictures.

And there's another feature that's coming soon, which is, like, you hold the food product and then you tell the pin. Is this healthy for me to eat? And it's meant to, like, look at the product and tell you whether you can eat it or not.

Overall, what people are saying on the Internet is that what it does, it does pretty well, but there's still a lot that it doesn't do and you know, we have to consider that this is the first generation of the technology with a lot of potential to improve. So I just wanted to show you a short clip. So you have a better idea of what I'm talking about. I've put a link in the chat, and if you could watch it for a minute, 1255, just to the end. So the last few minutes of the video.

Interviewee F 21:41

Sorry from which socket and from what minute? You said 1255 until the end of the day.

Joana Aleixo da Silva Pereira 21:45

455 yes.

Interviewee F 25:42

Alright, I need to watch that.

Joana Aleixo da Silva Pereira 25:44

OK, perfect.

So.

Now obviously we've we've looked at two different very different use cases of what a virtual assistant can be, right? We have like Siri, which is simpler, more standard approach. There's

kind of like more likely to do what you want it to do. And then we have this more sophisticated bin that maybe can do more stuff, but you have kind of like less certainty on the result that you're going to get.

You said you haven't even adopted Siri, so maybe this question is quite.

Expected like what your answer is going to be, but do you think you would ever adopt any of them in your professional life? Like what's your? What's your opinion on it? How do you, how do you see this?

Interviewee F 26:31

That's a good question. In my professional life or in my life.

Joana Aleixo da Silva Pereira 26:34

In your professional life.

Interviewee F 26:40

I mean, I think that again I might not use virtual assistance.

Oh wait, sorry. When you say when you say adopt it or adopt them, do you mean virtual assistance or do you mean this is specific virtual assistance that we've watched on the?

Joana Aleixo da Silva Pereira 27:01

Yeah. Like, let's say, if you had to choose between between like the simpler theory, if you if you needed to use a virtual assistant in your professional life, right?

Which one would you choose like considering one of them is like very simple and more likely to give you?

The output you want and then you have this more like sophisticated thing that you could like.

Try. You're not sure about the outcome that is going to give you. Does it make sense?

Interviewee F 27:27

So with the current prototype, the current level of accuracy that it gets.

Joana Aleixo da Silva Pereira 27:31

Yeah, yeah.

Interviewee F 27:33

Then definitely the one that's going to give me the right output. Yeah. So Siri and I think that, for example, I might be more lenient or more drawn towards using virtual assistants professionally than personally, because.

Joana Aleixo da Silva Pereira 27:36

OK, OK.

Interviewee F 27:50

Professionally, I am looking for efficiency, maybe. Personally I am not so much so I could potentially adopt.

Joana Aleixo da Silva Pereira 27:52

Mm hmm.

Interviewee F 27:59

Virtual assistance or Siri, let's say for a professional environment, but I think it's just like again

that learning curve or that like re adaptation of my ways of working that would still hold me back despite in the long term being more long term being more efficient. But yeah, I would definitely go more posterior in this specific scenario or like not just Siri but something like Alexa. Whatever. It's something with a more precise output within this new.

Joana Aleixo da Silva Pereira 28:26

Yeah.

Interviewee F 28:29

Very abstract, very early on prototype of whatever that is.

Joana Aleixo da Silva Pereira 28:36

OK, OK. So if you think about like the three or the top criteria that a virtual system product needs to meet for you to use it, you've kind of touched on maybe a learning curve that it's not that steep like very easy to start using and incorporate into your life straight away. Is there anything else that you would value or is that the main kind of?

Criteria.

Interviewee F 29:02

Yeah. I think one of the one of the things.

Touching on steepness of the learning curve, I think that learning curve of course the the shallower like the yeah, the shallower it is. So the easiest it is to adopt especially from an early on perspective the better and then once you're into that then you can get into the more complex stuff.

Joana Aleixo da Silva Pereira 29:19

Mm hmm.

Interviewee F 29:26

But I think that it's not so much about the ease, it's more about bringing the way of using it to live.

Joana Aleixo da Silva Pereira 29:33

Mm hmm mm hmm.

Interviewee F 29:33

Because it might be easy, but if I do not see the benefits from the get go, if I do not see how I could incorporate it and how I can.

Go from my current setup into the new setup and how much better or how much? Yeah better that is and how easy it is to do that. I would still even if it's easy, I would still probably not adopt it. I really need to see concrete examples, concrete use cases, concrete ways.

To really see like, oh wow, these are things I didn't even consider I could do with this assistant and this is how much better it's going to make it.

And I think that would really bring it to life. So Prince of painting this like, narrative, this picture, the second thing I think is accuracy.

Joana Aleixo da Silva Pereira 30:19

Mm hmm.

Interviewee F 30:21

I've decided I even if something could be more sophisticated in the way that it's set up, if it's not going to give me a reliable result, then I don't want it. And then thirdly, I think.

No.

Maybe yeah. Scalability or?

Efficiency. So it's like ease of use.

It's accuracy. I know how much more efficient it's gonna make me. How much I could scale my work.

Joana Aleixo da Silva Pereira 30:58

OK. Yeah. Makes total sense. Thank you.

And just a last question in the in terms of the humane AI pin, obviously I've I've kind of mentioned that it's getting a lot of negative feedback online.

Do you think as a society we're ready for this type of, you know, such innovative and ground breaking products?

Interviewee F 31:23

I have a lot to say about this.

As a society, or from my personal perspective.

Joana Aleixo da Silva Pereira 31:27

Go for it.

Up to you up to you.

Interviewee F 31:33

I really despise it.

Joana Aleixo da Silva Pereira 31:36

OK.

Interviewee F 31:37

I really despise it because I think that again, it really depends on the context of utilisation. But based on what I saw in the video, it's not necessarily meant to just be a professional use.

I see it also being a lot for personal use. You know the examples that it displayed was to purchase an item, it was to send a message. Sorry, not send a message, set an alarm. A lot of these things, more of professional life.

Joana Aleixo da Silva Pereira 31:57

Mm hmm.

Interviewee F 32:07

I think two things about this. Did they also mentioned how this humane AI could be incorporated with Amazon? And then it talked about AI API incorporation. I think this is really problematic because it's gonna really fuel monopolisation of markets. It could potentially fuel monopolisation of markets. I think that.

If this became a really widespread thing because of.

Obviously.

In in today's day and age, accessibility data users is is the the number one currency that's any sort of company strives for.

If we start using something like this, that can only display things from API integrations and things like that, we are only going to be we're going to be more and more skewed to showing results.

Or recommendations or outputs that are based on very large corporations that are based on very only like those that can have access to API purchases. If there's API and have access to being featured in something like this, and I think that that is going to make things actually a lot more flat in terms of what's going to be available in the market because it's always going to be.

The same kind of.

Corporation corporations that are going to sell the exact same kind of things and then the prices are going to be.

Kind of the same.

From 1:00 to another because they're going to be competing only in this landscape with only those that can do it. So I think that in that way, it would be very detrimental.

Towards variety and.

Yeah.

Breadth of.

Results and it would be very skewed towards just one type of thing. Viewpoint, whatever. And I think that in in my perspective, not just technologically but also politically, socially whatever we're more and more and more trending towards.

Joana Aleixo da Silva Pereira 34:08

Yeah.

Interviewee F 34:27

Polarisation.

And this actually then touches on to my second point, which is I genuinely believe that we are in a day and age where we're trending towards this polarisation.

Because we are really.

I don't know if allowing is the right word, but a lot of the things we see online because a lot of our life is now online is.

Worked on or displayed or whatever by technology and technology has a lot of bias based on what it's been trained, so you get fed a lot of the things that you reinforce and you get more closed into specific.

Consumption bubbles that might show you just what you're looking for and not the entire breadth of what's gonna cause possible or available. And I think that socially that's really detrimenting us because it's showing us a very specific type of thing. So what I'm trying to mean with this, with my second point is that one of the the main things that I see as a as a why I don't like this idea is because I think one of the this idea is really geared towards like.

Joana Aleixo da Silva Pereira 35:13

Mm hmm.

Interviewee F 35:39

Having things at the at the lake of the moment, in the in a second and stuff.

Joana Aleixo da Silva Pereira 35:42

Mm hmm.

Interviewee F 35:44

Having things like really, they're really present in in whatever way. So first of all I think we

should really question what kind of things am I giving in the in the like, the whole moment, what is the, the, the, the, the resource that this is coming from but secondly.

Touching then on that more human, I think part of the the the human, the beauty of the human experience lies in our uncertainty, lies in having to figure things out, being not knowing of everything and and and learning towards getting there. I think as a society, if we're only relying on this virtual assistance.

And what type of data we're getting with commercial systems, which I think we should always be very sceptical about, we're gonna take away part of that human experience of constant learning and constant growth cognitively, which is where I'm gonna have things in the in the.

Yeah. In the clip of a of a button.

And honestly, it makes me a bit suspicious because it makes me feel that we're giving a lot of power to the machine and taking away a lot of like that's self agency of learning and discovery.

And.

Which comes out of having to figure things out and do things in a humane way. So I know that I'm painting it in a very negative light, but I am a bit not like I I do believe that.

Joana Aleixo da Silva Pereira 36:58

Mm hmm.

Interviewee F 37:08

Technology is very beneficial, but I also think that we should always question the extent to which.

It influences our day-to-day lives, so yeah.

Joana Aleixo da Silva Pereira 37:17

Yeah, that's actually super insightful, honestly. And you've answered my next question. So with that, you only have one question left. But honestly, thank you so much. That was that was super insightful to listen to.

So my only last question for you is.

If you think if we think of virtual assistants and maybe more the case of ChatGPT and generative AI and all that, do you think there are still a lot of misconceptions in the workplace when it comes to performing work?

Using these tools like how do you how do you experience that in your in your company when you see people using it or you even use it to deliver some piece of work?

Interviewee F 37:58

That's a great question from my personal experience and my my professional environment, I think we're very pro the use of assistance like ChatGPT or any sort virtual virtual assistance, because I think we're very geared in the work smarter, farther kind of thing. It's not so much about your personal capabilities. I think part of your personal capabilities.

Are showcased in you figuring out how to get a virtual assistance to give you an output that you might have taken hours and that you can do in seconds with that right.

Joana Aleixo da Silva Pereira 38:28

Mm hmm.

Interviewee F 38:29

So it's not like, Oh no, you're unable to do it. No, it's like, wow, kudos to you for being able to do it in such a efficient way. Right. So I think in my case and there I do share the sentiment. I

think if you can really get things set up and automated and spend your time in a lot more.

Fulfilling and actually like impactful actions rather than going and manually cleaning it, let's say Excel spreadsheets. Well of course, go for it. Use that virtual assistance. But I do know from a lot of peers that are not in my same work environment, but there's a lot of of, especially in more traditional style companies, there's a lot of rejection towards this. Actually one of them I was talking to them recently. They're like, yeah, our work bans ChatGPT, they really.

The question like why? Why you know, it's this is more about that kind of thing that I was mentioning, it's more like Oh no, you gotta show us how to do it, but it's that shouldn't be the goal. The goal is like doesn't matter how you get there as long as you get there and it's quality and it's like if you can do it.

In a way that works and fast. Then amazing, right?

And then making sure that that then doesn't mean that that's it. You're done in like an hour. But it's like, then how can you use your time?

To think of things or or or do things that maybe a virtual assistant cannot use. You know, I think that virtual assistant is very good for like manual tasks or virtual assistance can be very good and like automated kind of things or like, yeah, you know, repetitive robotic. I mean robotics to the lack of a better word kind of word. But when it comes to creative when it comes to strategy when it comes to a lot of things.

Joana Aleixo da Silva Pereira 40:13

Mm hmm.

Interviewee F 40:18

That really require out-of-the-box thinking it still does a very very faulty job at that, and I think that that's where we can find that middle ground.

Between the usage of it and not because we can find.

Those tedious tasks that don't really add any any value to be done by the the robot or the assistance.

Joana Aleixo da Silva Pereira 40:39

Mm hmm.

Interviewee F 40:45

And then the more meaningful and value driven impact for work to be done by us. And I think that also really helps with workplace fulfilment because you're not going to be stuck doing. Inspiring things, but rather spend your time in a much more also self fulfilling way. So yeah.

Joana Aleixo da Silva Pereira 41:05

Yeah, that makes total sense. Thank you so much for your time. I'm going to stop the transcription.

Appendix 6 – Components of impact of Virtual Assistants on Job Engagement and Productivity

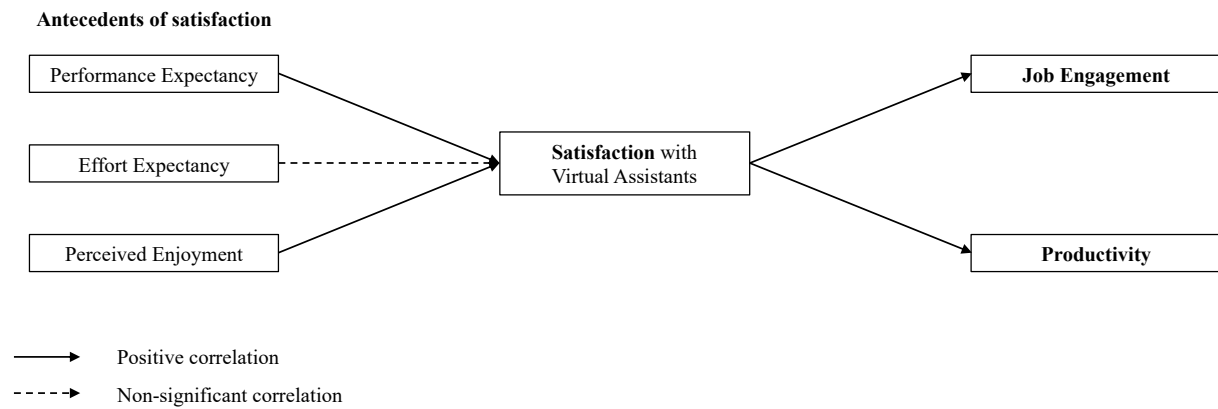


Figure 2 – Relationship between antecedents of satisfaction, satisfaction, job engagement, and productivity – Adapted from (Marikyan et al. 2022)

Appendix 7 – European Commission’s Gatekeeper Designations

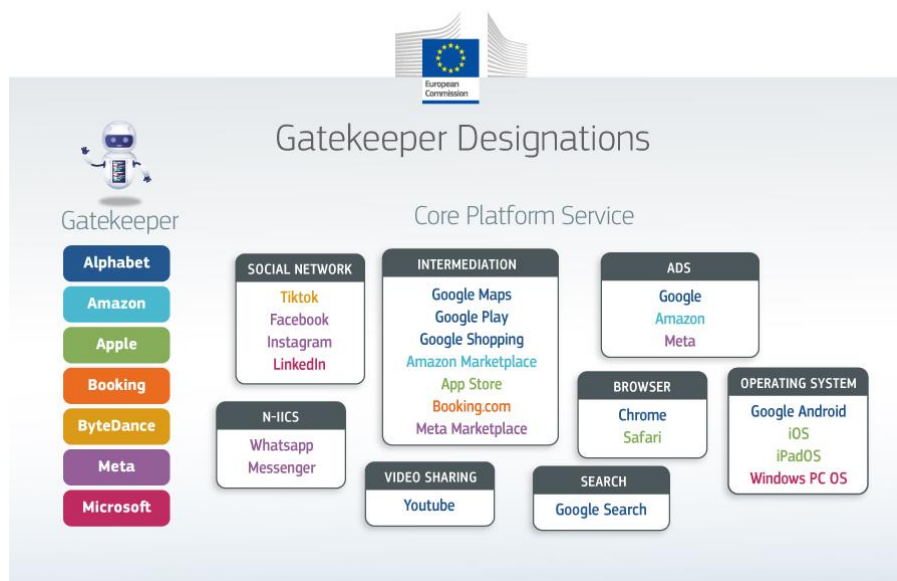


Figure 3 – European Commission's Gatekeeper Designations (European Commission, 2024b)