Academic Research Paper

Leveraging Technology to Enhance Customer Experience in Wineries: a comparative case study in Italy

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Abstract: In the rapidly evolving landscape of wine tourism, Italian wineries are faced with a dual challenge: how to uphold the cherished traditions of the wine industry while adapting to the digital age to enhance the customer experience. This study aims to better understand how emerging technologies can be used to improve the customer experience during visits to Italian wineries and how these new technologies can add value to wineries. More specifically, it seeks to identify the specific challenges that small and medium-sized Italian wine enterprises face in adopting new technologies. This research positions itself in the broader context of the evolving wine tourism landscape, focusing on the Italian wineries' efforts to balance tradition and innovation while enhancing the wine tourism experience. In this qualitative research, a case study methodology was employed to delve into the customer journey strategies of three distinct Italian wineries located in the Emilia Romagna region of selected wineries: Podere Vecciano, Vigne di San Lorenzo, and Villa Venti. After interviews, as a valuable source of firsthand information regarding the wineries' customer engagement strategies, technological integrations, and daily operational challenges, a physical visit to the three wineries was conducted, providing a first-hand experience of their customer engagement practices and technological implementations. The new wine tourism customer journey was designed with the integration of emerging technologies, as well as the challenges that the three companies encounter daily in the integration of these technologies as virtual reality and augmented reality. The study reveals that while emerging technologies can play a complementary role, their adoption varies according to the size of the winery, the resources and the commitment to preserving authenticity. Additionally, the study underscores the challenges and barriers that these

wineries encounter to integrate emerging technologies, ranging from limited knowledge and expertise to constrained financial investments, time constraints, and the absence of supportive networks and skilled personnel in advanced technologies. From a theoretical point of view, this study contributes to a greater understanding of how new technologies influence the experience of tourists in the wine sector, highlighting the importance of a customised approach based on the specific needs and resources of each company. The study should provide valuable guidance for wineries in relation to the tourism sector, suggesting that the adoption of new technologies should be aimed at improving the experience of the tourist in a manner consistent with its offer of services and available resources.

Keywords: *Wine tourism experience; Firms technology adoption; Immersive Technologies; Wineries; Customer experience; Customer Journey.*

JEL Codes: M31; 03; Z3

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1. Introduction

Tourism Italian wine companies are a key pillar of the country's economy (Maffi et al.; 2021) and the Italian wine market has experienced a growth in value and volume in recent years. In 2021, it grew by 2.3%, reaching a value of USD 39,901.5 million. In 2026, further growth is expected to reach a value of USD 44,325.5 million, an increase of 11.1% compared to 2021 (MarketLine report; 2022). In terms of value, Italy was the third largest wine market globally in 2021 (MarketLine report; 2022). The country has a long tradition of wine production, which has become part of its cultural heritage (Maffi et al.; 2021). While Italy is known worldwide for its rich wine-making tradition, the Italian wine sector is facing significant challenges, particularly in relation to customer experience and the adoption of new technologies.

Customer experience has become a crucial aspect for the success of wineries: exploring wine cellars has evolved into a popular recreational pursuit for wine enthusiasts. These wine tourists don't just come to sample wines; they are drawn to the cellars to savour the picturesque scenery and gain insights into the rich traditions and heritage of the wine-producing region (Petelca et al.; 2022). Wine tourism developed as a unique blend of viticulture and travel, transforming from a niche form of leisure into a leading growth sector in global tourism. Wine has come to symbolise the distinctive character of regional cultures across the world (Petelca et al.; 2022; Platania et al.; 2016). According to Hall et al. (1997), wine tourism encompasses trips to vineyards, wineries, wine festivals, and wine tasting events, all while taking advantage of the unique offerings of a wine-producing region. These elements serve as the main attractions for visitors. Indubitably, gastronomic and oenological tourism stands as a pivotal asset within the realm of the wine sector (Tommasetti & Festa; 2014). Visitors from all over the world flock to Italy to explore wineries, taste local wines and immerse themselves in food and wine culture (Petelca et al.; 2022; Colombini; 2015). In light of this background, in 2021, according to ISTAT (2022), the number of active agritourism enterprises amounted to 25,390, representing a 1.3% increment compared to 2020. The wine industry in Italy has shown a remarkable capacity for adaptation and innovation over the years (Maffi et al.; 2021; Colombini; 2015). Prosperous wine tourism regions undoubtedly attribute their triumph to more than just the quality of wine produced; they also rely on the

cooperative efforts of diverse stakeholders involved in the extensive wine supply chain (Tommasetti & Festa; 2014). As widely acknowledged, Enotourism is widely regarded as a catalyst for bolstering regional economies, particularly in rural areas, as it fosters broad-based revenue generation and employment opportunities (López-Guzmán & Sánchez Cañizares; 2008; Giampietri et al.; 2018). However, it is evident that specific regions, while gaining recognition for their exceptional wine production on a national and global scale, tend to lag behind in the realm of gastronomic and oenological tourism (Tommasetti & Festa; 2014).

Despite the fact that wine tourism has experienced remarkable growth, small and medium-sized enterprises in Italy still struggle with a significant technology gap, so the digital transition is proceeding slowly (ISTAT; 2023). For wineries, this gap is partly due to the deep-rooted tradition and rigidity in the sector (Levitskaia et al.; 2020). The adoption of new technologies to improve the customer experience is an area where Italian companies seem to lag behind their European competitors (Eurostat; 2023). As a result, the wine industry is faced with the challenge of maintaining its authenticity and tradition while trying to adapt to the needs and expectations of an increasingly digitally connected customer base (Szolnoki et al.; 2018).

In this context, the primary objective of this article is to thoroughly investigate the transformative potential of emerging technologies in enhancing the customer experience during in-person visits to Italian wineries so that they can be a benchmark for other countries or sectors interested in developing similar technologies to boost their businesses.

By conducting an in-depth analysis, we seek to reveal the ways in which these technologies can not only add value to wineries, but also enrich the overall visitor experience. Furthermore, this research delves into the many challenges that small and medium-sized Italian wineries face in navigating the complex landscape of technology adoption. By providing an in-depth examination of different firms we aim to shed light on the hurdles these companies face and contribute to a nuanced understanding of the technology gap in the Italian wine industry. More specifically, this study aims to better understand how emerging technologies can be used to improve the customer experience during visits to Italian wineries and how these new technologies can add value to wineries and in second, identify the specific challenges that small and medium-sized Italian wine enterprises face in adopting new technologies.

In line with the objectives outlined above, this research aims to address the following research questions:

RQ1: *How do emerging technologies create value for wineries by enhancing the customer experience during in-person visits?*

RQ2: *What challenges do small and medium-sized enterprises face in the adoption of such technologies?*

Therefore, this research aims to enrich the understanding of the dynamics between technology and customer experience in the wine tourism sector and to offer new perspectives for improving these experiences for both visitors and wineries.

The next sections will present the state of the art of wine tourism in Italy, highlighting the dynamics of the customer experience and the opportunities offered by new technologies. Next, the methodology used will be defined, outlining how the interviews were conducted and the wineries selected for the comparative study and is presented in the third section. In the following, fourth and fifth sections, the results obtained from the interviews are presented and the implications for theory and practice are

discussed. Furthermore, possible directions for future research and the limitations of the present research will be examined and finally the conclusion remarks of the present research.

2. Literature review

2.1. Wine Tourism

Wine tourism constitutes a distinctive form of travel centred around wine and the wine-producing regions and represents one of the most popular forms of tourism in the world (Petelca et al.; 2022; Asero & Patti; 2009). The primary distinguishing aspect of wine tourism revolves around the simultaneous focus on wine production and the exploration of regional traditions. Wine tourism tends to thrive in regions with a profound cultural and historical heritage (Petelca et al.; 2022).

Several definitions of wine tourism have been given in the academic literature. Brown & Getz (2005) define it as "*a form of special-interest travel based on the desire to visit wine-producing regions or in which travellers are induced to visit wine-producing regions, and wineries in particular, while travelling for other reasons*". According to Petelca et al., (2022) "*Wine tourism is a form of marketing for wine and grape promotion and trade; it may be combined with all sorts of activities accompanying grape cultivation and wine product promotion, from agricultural producers and cellars to customers*". Wine tourism is also defined as a set of activities such as "*visiting vineyards, wineries, wine festivals and wine exhibitions*", for which "*tasting grape wine and/or experiencing the attributes of a wine region are the main motivating factors for visitors*" (Hall; 1996). From the various definitions presented in the academic literature, it emerges that wine tourism is a specialised form of travel based on the desire to visit wine-producing regions, with a particular focus on wineries, both as a primary destination and as part of travel with other purposes (Hall; 1996). These definitions acknowledge the wide range of activities associated with wine tourism, ranging from vineyard visits to wine tastings, wine festivals, and exhibitions. Moreover, they highlight that wine tourism involves not only occasional travellers but can also engage industry stakeholders, including producers and wineries, as part of wine promotion and marketing strategies.

According to the International Organisation of Vine and Wine (OIV; 2023), the countries as the biggest wine producers are Italy, France, Spain, the USA and Australia. It is evident that these countries, characterised by extensive vineyard coverage and high wine production, possess the most significant potential for the advancement of wine tourism (Anđelić et al.; 2019). In this context, Italy not only provides a high-quality wine experience but is also recognized as one of the leading destinations for tourists seeking culinary experiences associated with wine (Colombini; 2015). The Italian wine industry, with its "Made in Italy" brand, has established a strong market presence and a global reputation (Presenza et al.; 2010). This reputation for excellence in wine and Italian cuisine production is a key factor that attracts tourists interested in tasting high-quality wines and immersing themselves in Italian enogastronomic culture.

2.2. Wine Tourism Experience

Today, consumers seek multi-optional offers and experiences that are provided in an exciting yet comfortable and authentic atmosphere. Wine tourism appears capable of meeting numerous emerging

customer demands (Pikkemaat et al.; 2009). Contemporary tourists are more experienced and, therefore, have higher expectations. They seek personalised experiences and are willing to invest in them (Kandampully et al; 2023). This type of tourist is more flexible in short-term travel plans and enjoys greater economic independence, although they are highly price-sensitive (Pikkemaat et al.; 2009). As emphasised by Pikkemaat et al. (2009), within the realm of tourism, this shift signifies that experiences have transitioned from being an optional supplementary feature to becoming an essential advantage in any tourism package. According to Pine & Gilmore (1999), in the context of wine tourism, the concept of experience involves wine producers within a specific location deliberately utilising services as a platform and products as supporting elements to actively involve individual customers. This engagement is designed to create a memorable and exceptional event.

Hall et al. (2000) highlighted the importance of the wine tourism experience by developing the 'wine tourism system' model, in order to understand the complex world of wine tourism. This model integrates consumer demand for wine tourism and the wine tourism industry. The core of this model is the wine tourism experience, which occurs when visitors come into contact with the various elements that make up the wine tourism product, such as wines, wineries, vineyards, festivals and wine landscapes. The wine tourism system holds two aspects together: on the one hand there is consumer demand, which concerns the perceptions, motivations and expectations of wine tourists, and on the other hand there is the supply side of the wine tourism industry, which includes all the resources used by tourists to have wine-related experiences and the companies and institutions that transform these resources into a wine tourism product.

Previous research indicates that tourist visits to wineries in a wine region remain the primary wine tourism activity, considering the entire wine region as the main focal point of wine tourism (Asero & Patti; 2011; Bruwer & Alant; 2009). Indeed, a comprehensive wine-related encounter predominantly takes place within the context of visiting a winery, where the tourist's experience significantly influences their future behavioural intentions (Leri & Theodoridis; 2019). In light of this, it becomes increasingly imperative for wine industry businesses to innovate and create novel experiences for their customers. These experiences should be highly personalised and unique, tailored to meet the specific preferences and expectations of individual visitors. Results from the study by Santos et al. (2019) indicate that in order to offer an original, unique and unforgettable experience, managers, marketers, operators, and stakeholders should design a set of activities that align with the most important and interconnected aspects. Within these activities, they should take into account the factors, traits, dimensions, and features of both wine and wine tourism. This should be done with regard to wineries, cellar doors, vineyards, wine routes, wine festivals and events, wine-themed accommodations, wine museums, and wine estates during visitors' trips.

2.3. New Technology trends in Wine and tourism sectors

Technology provides the opportunity for tourists to obtain information and establish a direct communication channel with providers of tourism services. This not only creates more engaging and immersive experiences but also leads to higher levels of user satisfaction (Aramendia et al.; 2021). The integration of new technologies and innovation within businesses holds the potential for manifold beneficial effects, including cost minimization, product distinctiveness, process innovation, and enhancements in managerial structure (Stasi et al.; 2016). In the context of wine tourism, embracing technology can enhance the overall visitor experience, making it more personalised, interactive, and

memorable. The implementation of innovative digital solutions for wine tourism experiences appears to be a crucial step in ensuring the sector's sustainability and growth (Festa et al.; 2023; Levitskaia et al.; 2020). In relation to Han et al. (2021), the use of modern technologies is crucial to remain competitive and appealing to tourists. They particularly recommend the use of augmented reality, a rapidly growing technology. Neuhofer et al. (2012) complement this argument by emphasising how the use of augmented reality has the potential to enhance the tourist experience and make it of high quality. Lorey (2017) highlights how the adoption of digital technologies represents a possible solution for attracting a younger audience to the wine tourism industry, especially the Millennials and Generation Z.

According to the report by the International Organization of Vine and Wine (2021), there are current global digital trends. These trends represent the widespread adoption of digital technologies in the wine and tourism sectors. In particular, digital trends include: Internet of Things (IoT), Artificial Intelligence, Robotics, E-Label and E-certificate (Table 1) and could be strategic in enhancing customer experience (Holmlund et al.; 2020).

2.3.1 Internet of Things (IoT)

The Internet of Things (IoT) is a term used to describe a network of physical objects that are equipped with various technologies such as sensors and software (OIV; 2021; Abdul-Qawy et al.; 2015; Patel & Patel; 2016). These technologies allow these objects to connect and exchange data with other devices and systems over the Internet. These objects can range from everyday household items to highly advanced industrial tools (OIV; 2021). In recent years, the IoT has emerged as one of the most significant technological advancements of the 21st century (OIV; 2021). It has enabled the connection of everyday objects to the Internet through specialised devices, facilitating communication among people, processes, and these interconnected objects, all made possible by mobile technologies (Patel & Patel; 2016). The development of sensor technology has enabled numerous devices to coexist and collaborate, sharing information on various aspects and allow to create new business models and defende other ones (Nevi & Dezi; 2022).

Today, the term "smart vineyards" refers to the utilisation of innovative measurement tools that rely on wireless sensors, occasionally in conjunction with satellite or drone imagery, all powered by artificial intelligence (OIV; 2021). Based on the International Organization of Vine and Wine (2021), wireless sensors, crucial components in the context of smart vineyards, are employed for the collection of diverse data points across a designated area. When applied to vineyards and wineries, these sensors can be positioned directly within the soil, integrated into the vine trunks, or strategically placed amidst the grapevine foliage. The primary goal of utilising sensors in winemaking is to oversee all the critical parameters required for a proper wine production process and ensure a high-quality end product.

2.3.2 Artificial Intelligence

Artificial Intelligence (AI) is a branch of computer science that focuses on creating intelligent machines capable of performing tasks typically associated with human intelligence (O'Connor et al.; 2022). It is an interdisciplinary field with a wide range of applications and is causing significant paradigm shifts across various sectors of the economy. Similar to the human brain, AI learns from experience by employing advanced algorithms and software to recognize patterns and features within extensive datasets (Wang; 2019). The effectiveness of AI heavily relies on sensor technology for

acquiring the necessary data to identify these patterns and make predictions (OIV; 2021).

In the final phase of the value chain, wine marketers leverage AI to reach the end consumers, reshaping the way wine is purchased and gaining insight into product preferences while establishing direct, disintermediated channels to the end consumer. Ultimately, this transformation contributes to increased productivity. An intriguing facet of this marketing phase involves the use of applications and virtual reality (VR) devices. Wine tourism can be effectively promoted through these applications, enabling consumers to engage in virtual wine tastings. By donning VR glasses, for instance, individuals can immerse themselves in vineyards or wineries, simultaneously savouring various wines from the comfort of their homes. This has the potential to unlock fresh opportunities within the wine industry, potentially attracting investors keen on advancing this technology and a new clientele eager to partake in such experiences.

According to Ramos et al. (2018), augmented reality is an expanding field that is playing a fundamental role in reshaping traditional tourism. Furthermore, the use of augmented reality allows tourists to access more engaging information through mobile screen overlay. Kounavis et al. (2012) argue that augmented reality applications aim to enhance the tourist experience by providing detailed information about destination attractions. According to Dieck & Jung (2015), augmented reality applications offer tourist activities in an entertaining and interactive manner, providing opportunities to enrich visitor experiences. Another noteworthy AI application is the "virtual sommelier," offering tailored recommendations based on individual consumer preferences (OIV; 2021).

2.3.3   Robotics

Robots possess the capability to aid humans or imitate human behaviours. Initially, their primary purpose was to execute repetitive tasks, but they have advanced to undertake more complex actions that facilitate various forms of work. Robots exhibit varying degrees of autonomy, ranging from human-operated robots that handle routine tasks entirely under human control to fully autonomous robots that can perform tasks independently, without external input or guidance (Krishnan & Susmera; 2018; Mihret; 2020; OIV; 2021).

In the later phases of the value chain, robotic technology finds extensive application in many warehouse facilities, with certain logistics centres relying on it to efficiently manage inventories across various locations, ultimately boosting distribution phase productivity. Based on the OIV's report (2021) the incorporation of "smart storing," characterised by warehouse automation through robotics and artificial intelligence (AI), alongside the concept of "smart shops," significantly enhances the final stages of the wine lifecycle. As a result of this enhanced automation, distribution and commercialization processes become more efficient, thanks to time-saving measures and operational tasks running autonomously due to AI integration (Saiz-Rubio et al.; 2021). This technology provides heightened task security, enabling greater control and optimization of all logistical operations within the company, while improving inventory management capabilities and more.

2.3.4   E-Label

E-labeling, or electronic labelling, is an alternative and voluntary method that allows manufacturers to provide a greater amount of information electronically, eliminating the need for physical labels. In recent years, countries, regulatory bodies, and local authorities have increasingly required manufacturers

to include extensive information on product labels (OIV; 2021). This information can encompass warnings, material types, and even clinical data, often requiring translation into multiple languages. With the introduction of e-labels, the distribution of information within labels has become more efficient and practical.

E-labeling impacts the final stage of the wine value chain, distribution, benefiting manufacturers, regulators, and end consumers. For manufacturers and regulators, e-labeling offers a powerful alternative to traditional methods of displaying compliance information (Vrigkas et al.; 2021). E-labeling, often through QR codes, provides easy access to a wealth of information, exceeding what physical labels can convey, while ensuring security and reliability. QR codes are ideal for consumers to access from their point of purchase or at a restaurant, offering not only comprehensive product information but also links to videos providing insights into the specific bottle and grape-related experiences (Vrigkas et al.; 2021).

2.3.5   E-certificate

Based on the OIV's definition "*An Electronic Certificate (hereinafter, E-Certificate) is a set of data that enables (i) the identification of the holder of the certificate, (ii) a secure exchange of information with other persons and institutions, and (iii) the electronic signing of data sent in a way as to allow verification of its integrity and origin*". E-Certificates contain specific product-related information, certifying compliance with various requirements such as origin, health standards, import-export regulations, and taxation.

The digital nature of these certificates, stored securely in the cloud, prevents loss and forgery and allows access from multiple electronic devices (OIV; 2021). Notably, E-Certificates can consolidate information from various certificates, encompassing details like product origin, quality, producer, health compliance, and other requisites, facilitating efficient documentation for international trade.

Table 1. Emerging Technology Trends in the Winemaking Industry.

Technology trends	Definition	Associated devices	Use cases
Internet of Things (IoT)	Network of connected physical objects that gather and exchange data through sensors	IoT sensors, connected devices	Data collection and analytics for wine production, enabling advanced monitoring and predictive models; Full value chain traceability with RFID and blockchain, ensuring transparency and quality assurance.
Artificial Intelligence (AI)	The ability of machines to perform tasks requiring human intelligence	Virtual reality devices (VR); AI software; sensors;	Customising visitor experiences; production optimization
Robotics	Design and use of robots to perform tasks or replicate human actions	Robots, drones	Harvesting and grape management; cellar safety
E-Labelling	Electronic provision of information instead of physical labels	QR codes	Quick access to product information; paper-saving

E-Certificate	A set of digital data certifying aspects of a product	Electronic certification platforms	Product feature verification; access from electronic devices

Source: Author elaboration

2.4. Technological gap in the medium-sized Italian enterprises (SMEs)

While technology-based companies readily embrace the opportunities offered by information and communication technologies (ICT), traditional businesses often face constraints when it comes to digital entrepreneurship and this can be attributed to the prevalent inclination of traditional businesses towards stability rather than dealing with potential future uncertainties (Costa et al.; 2023). However, in challenging times, businesses are called upon to enhance their adaptability in order to manage and incorporate changes both internally and externally.

As demonstrated by Han et al. (2021), this adaptability necessitates the strengthening of adaptive strategies, leveraging the unique resources and capabilities derived from business endeavours. In the specific context of small and medium-sized enterprises, digital transformation encompasses the process of digitising all aspects of the organisation and its business operations (Costa et al.; 2023).

Despite the significance and potential of digitalization, particularly in the context of emerging technologies, small and medium-sized Italian enterprises appear to lag behind their European counterparts. ISTAT's 2023 report on "Information and Communication Technologies in Enterprises" highlights a concerning trend. While there is an increased level of connectivity among small and medium-sized Italian enterprises, the transition to digitalization is progressing at a relatively slow pace. In 2022, only 26.8% of SMEs with 10-249 employees achieved what can be defined as high levels of digitalization by adopting at least 4 out of 12 specified digital activities. This situation has implications not only on their competitiveness within the European Digital Economy and Society Index (DESI), where Italy was ranked eighth in 2022, but also on the overall growth potential of digital technologies, as the underperformance in e-commerce by small and medium-sized enterprise (SMEs) has hindered the effects of digital technology adoption recorded in the 2020 and 2021 editions of the survey. The ISTAT report of 2023 sheds light on the slow progress of digitalization among Italian SMEs, which not only affects their competitiveness within the European Digital Economy and Society Index (DESI) but also limits the full realisation of the growth potential associated with digital technologies.

The wine industry, in general, is characterised by a slow adoption of digital technologies and often struggle to incorporate even a digital tool like social media into their marketing strategies (Alebaki et al.; 2022). The imperative for businesses, particularly SMEs, to embrace digital transformation and the opportunities presented by emerging technologies is evident (Festa et al.; 2023; Platania et al.; 2023; Han et al.; 2021; Saiz-Rubio et al.; 2021; Sa et al.; 2020; Lu; 2017).

3. Methodology

3.1. Setting and participants

To meet our research objectives, we used the case study methodology which best allows us to understand in depth the dimensions of a phenomenon and is suitable for studying real-life context (Yin; 2018) and semi-structured interviews were conducted as follows on a selected sample of three cases most representative in the wine SMEs landscape.

It was decided to analyse three companies in Emilia-Romagna, in particular in the Romagna subregion, for several reasons. First, Emilia-Romagna is a region that stands out for its wide viticultural coverage and the quantity of grapes produced, ranking among the first Italian regions in this sense, as confirmed by Ismea and Agea in 2022. However, despite this prominent position, the vines of Emilia-Romagna do not enjoy the same level of notoriety as those of other Italian regions. In addition, the analysis conducted by the UIV, ISMEA and Vinitaly Observatory in 2023 revealed a significant increase in exports of wine and beverages from the region in 2022 (+8,9%), indicating a degree of dynamism in the wine sector of Emilia-Romagna. In spite of the positive data, SMEs are facing difficulty in establishing themselves in international markets. Emilia-Romagna is also known for tourism, but attracting tourists from all over the world who are interested in exploring the vineyards and listening to the stories of the region's wineries remains a challenge. Given the importance of the wine industry in Emilia-Romagna and its interesting developments, It was decided to analyse three SMEs wineries in this region to gain a better understanding of how to address the challenges of experiential tourism and the adoption of new technologies in a context that combines tradition and innovation. The three selected wineries were Podere Vecciano, Vigne di San Lorenzo, and Villa Venti, each of which was selected because it represents an example of SMEs Romagna wine enterprises embodying the principles of authenticity, sustainability, and customer-centricity. These wineries are characterised by direct management by the owners, who oversee the entire production process and welcome visitors to their cellars.

3.2. Data collection and analysis

After the sample selection of the three cases, it was decided to conduct different interviews and triangulate the data analysing the other content of the three different companies. In August 2023, a telephone interview was conducted with the three owners of each SME. Each interview lasted an average of 30 minutes and was audio-recorded and verbatim transcriptions were promptly generated following each interview session. Subsequently, at the end of September, it was decided to enhance the interviews through on-site visits to the wineries. This approach allowed for a more direct interaction with the interviewed entities, enabling a firsthand experience and observation of the work environment and business processes. After interviewing, the analysis and interpretation were conducted following the guidelines of Schmidt (2004). The semi-structured interview has been designed to capture a wide range of information and consists of 20 questions, divided into four specific thematic areas (Table 2) and categorised as follows. A first section dedicated to "General informative data": these questions focus on the interviewee's background and provide an overview of general information about the company. A second dedicated to "Customer relationship": these questions aim to investigate the relationship between the company and the customer, exploring the offerings provided to visitors. "Future projects": these questions are centred around the company's future projects and the interviewee's prospective vision regarding business trends and strategies. Lastly are questions due to "New Technologies adoption": these questions are centred on new technologies and explore their use and adoption within the company and utility of new technologies in enhancing the customer's experience during winery visits. After this first phase of data collection, the authors proceed with the analysis and interpretation of the results through a content analysis technique (Krippendorff; 2018).

Table 2. Interview Outline and Questions.

Focus area	Questions
General informative data	1. What is your name, the name of your company, your role within the company, and could you provide a brief introduction to the company, including why it was founded and how long it has been in operation?
	2. How would you currently describe the winery tour experience offered by your company and what aspects make it unique and appealing to visitors?
	3. How many winery tour options do you offer to your customers? (e.g., traditional tours, personalised experiences, or thematic tastings). How have you selected and developed these different options?
	4. Some wineries are already using innovative technologies during tours. Have you had personal experiences with new technologies like virtual reality or augmented reality in these contexts?
Customer relationship	5. How would you define the relationship between your winery and visitors and how do you seek to establish a meaningful and lasting connection with those who visit you?
	6. What is your ideal vision for the winery tour experience? How would you like your winery to stand out in the quality of visitor relationships compared to other industry peers?
	7. Is there a particular focus on customising winery tour experiences and how do you adapt to the needs and desires of individual visitors?
	8. In your interactions with visitors, have you ever received requests or suggestions regarding the use of innovative technologies to enhance the tour experience? If so, what were the most common requests?
Future projects	9. Imagine your winery ten years from now. How do you envision the winery tour experience in the future? Will innovative technologies be an integral part of that experience?
	10. Do you plan to implement new technologies in the future to enhance the winery tour experience? If so, could you share some ideas on how you plan to use them?

11. What is your personal vision regarding the integration of innovative technologies into winery tours? Do you believe they can add value to the visitor experience?

12. Do you think technological innovation is essential to remain competitive in the industry? Or do you believe that a more traditional approach is equally valid for providing a quality experience?

13. Have you already experimented with the use of innovative technologies in the winery?

14. If your company is currently using new technologies, which specific technologies are you using, and at what points in the winery tour experience are they applied?

15. If your company is currently using new technologies, what are the primary reasons behind this choice?

New Technologies adoption

16. What has been the feedback from visitors? How have these technologies influenced visitor engagement and interest during the tours?

17. As winery tour managers, what advantages have you gained from the implementation of these new technologies?

18. If your company is not currently using technologies such as virtual reality or augmented reality during winery tours, what are the main reasons for this choice?

19. Do you have concerns about the adoption of new technologies in winery tours? Is there anything you fear may be lost or could negatively impact the overall experience?

20. Do you believe that experiences provided by new technologies can replace more traditional experiences?

Source: Author elaboration

4. Findings

The following section is dedicated to the presentation and examination of each case study so as to answer in detail to our RQs. It is organised in a way that includes a concise individual overview of each case study and a comparative analysis across the cases.

4.1 The case studies

Case 1. Podere Vecciano

Podere Vecciano is a winemaking company located in the hills of Coriano, in the province of Rimini. Founded in the 1990s by Davide Bigucci and his father Enio, the company originated from their passion for the land and wine. Davide immersed himself in the art of viticulture, focusing on producing high-quality wines and embracing sustainable agricultural practices such as organic and biodynamic farming. With the entry of Catia, Davide's wife, the company expanded, acquiring new vineyards and adopting cutting-edge technologies. Podere Vecciano's eco-friendly winery stands as an example of environmentally conscious innovation. The company produces authentic wines that represent the surrounding territory. They use recycled glass bottles to reduce environmental impact and employ recyclable materials for labels and packaging. Podere Vecciano embodies passion, dedication, and respect for the land, crafting wines that tell the story of the Coriano hills and continue a family tradition of love for wine.

The interview with Davide, the owner of the Podere Vecciano winery, unfolded in two phases: initially through a phone conversation and subsequently with an in-person visit to the winery itself. During the in-person meeting, it was possible to gain insights into the daily operations of the company. Davide Bigucci possesses a comprehensive view of the entire winemaking process. This perspective begins with the care of the vineyards, extends to the winemaking process in the cellar, and encompasses the management of hospitality and commercial aspects. In each sector, there is a dedicated and knowledgeable individual, but the modest size of the company demands consistent commitment in all areas. Regarding hospitality, Davide emphasised the substantial initial investments that enabled the creation of a welcoming sales area, designed to serve as a bridge between tourists and their premium wine products. Over time, they have tirelessly worked to enhance the customer experience at the winery. According to Davide, the strengths of the experience the company offers include the unique setting among the vineyards, the atmosphere surrounding the places where wine comes to life, the human approach, and the typical hospitality of Romagna, along with the sharing of passion for his craft. Last but not least, particular attention is given to producing wines that are healthy, clean, and economically fair. The experiences offered at Podere Vecciano range from traditional tastings, which include wine pairings with local cold cuts and cured meats, to more personalised experiences such as a "wine trekking" called "Podere Vecciano En Plein Air", a journey through the vineyards with breathtaking panoramic viewpoints. Currently, this experience is available only in Italian and English.

It was the introduction of "wine trekking" that highlighted the need for the company to use digital platforms and harness the potential of virtual or augmented realities to overcome language barriers and narrate the history of the company, the vineyards, and agricultural choices. Until now, the company has not made extensive use of new technologies, except for a brief virtual tour on Google that highlights the key points of the company. However, Davide had the opportunity to participate in a virtual tour in France, where visitors could learn about the history of the region and the characteristics of the vineyards, gaining a deeper understanding of the wine's attributes. Even during a visit to Lanzarote, he experienced tastings at more structured wineries that made extensive use of virtual and augmented reality technologies, all proving effective and well-executed. The interview reveals that Davide is aware of the existence of new technologies, such as the Metaverse.

However, he lacks a detailed understanding of specific features or potential applications in the context of winery visits and how to use these tools to enhance visitor experiences:

"You know, there are so many things to do, the winemaker generally lives a life where the things he does today should have been finished a week ago, always chasing after time. I would like it if communication agencies or companies that realise such technologies would also put more specific things in the catalogue for wine experiences. [...] I would like someone [...] to show me how I can improve the winery experience, the grape harvest experience, the wine-pressing experience, and I would like to find a way to make everyone relive this kind of experience [...]". D.

He believes that new technologies are still relatively unknown in the industry, especially among people of his age, and that there is a lack of adequate information dissemination on the subject. Additionally, Davide is of the opinion that a complete replacement of customer interaction with technology, especially if the customer is not accustomed to using these new tools, could be a risky and ineffective operation. From the visitors' perspective, there have been few specific requests regarding technologies, as the focus has always been on human hospitality. However, Davide is aware of the potential of technologies in overcoming language barriers and enriching the visitor experience. He believes that a more dynamic and interactive system can reach a wider audience. For Davide, it is essential to maintain a balance between traditional experiences and the adoption of innovative technologies. Technologies should be used as a complement to enhance the experience without altering its nature. Furthermore, for the entrepreneur, the combination of travel, experience, and wine is of paramount importance in choosing wines that should evoke emotions and sensations, rather than being just a list of features. The interviewee is open to the idea of implementing new technologies in his company in the future, as he believes they can improve accessibility to experiences and optimise visitors' time management, always respecting the importance of hospitality. He sees this evolution as a means to remain competitive in the market and offer an increasingly better experience while enriching his winery. However, at present, the main challenges for Podere Vecciano are the lack of time for those who manage the company entirely and the lack of financial support to undertake innovation projects:

"Fundamental is also the possibility of receiving aid from an economic point of view (public aid, but also aid from associations), instruments that help to make certain investments that are enclosed in a large project if you consider the size of our wineries. Because if it has to be me, who is not capable, who does not have the right knowledge, who does not have the right experience and who is still in charge of my own business, it becomes complex and difficult to implement". D.

Finally, the interviewee emphasised the need for a comprehensive project that can enhance the visitor experience at the winery, in addition to training and support for those who are not familiar with technology. Podere Vecciano has a room dedicated to accommodating a large number of people to offer them innovative and interactive experiences. However, the project is progressing slowly, as reported by Davide, due to the lack of experienced staff and economic possibilities:

"We were working on a project to make it possible to show a particular video on special monitors with somewhat more advanced technology, but renovation work in areas of the company

much more fundamental than this took place, which caused the project to be postponed until a later date; therefore, we can say that even the economic part is often a big limitation for companies like mine". D.

After conducting the initial phone interviews, we decided to further enhance our understanding of the company by visiting their physical premises. This on-site visit allowed us to directly observe the production process, gain insights into the visitor experience within the wineries, and obtain a comprehensive view of the company's environment. Furthermore, during this visit, we had the opportunity to develop a customer journey that mapped out the typical visitor's path, identifying key points of contact and interaction along the way (Fig.1). Creating this customer journey was pivotal for a more detailed assessment of the company dynamics and potential areas for improvement related to the implementation of new technologies or the enhancement of the customer experience.
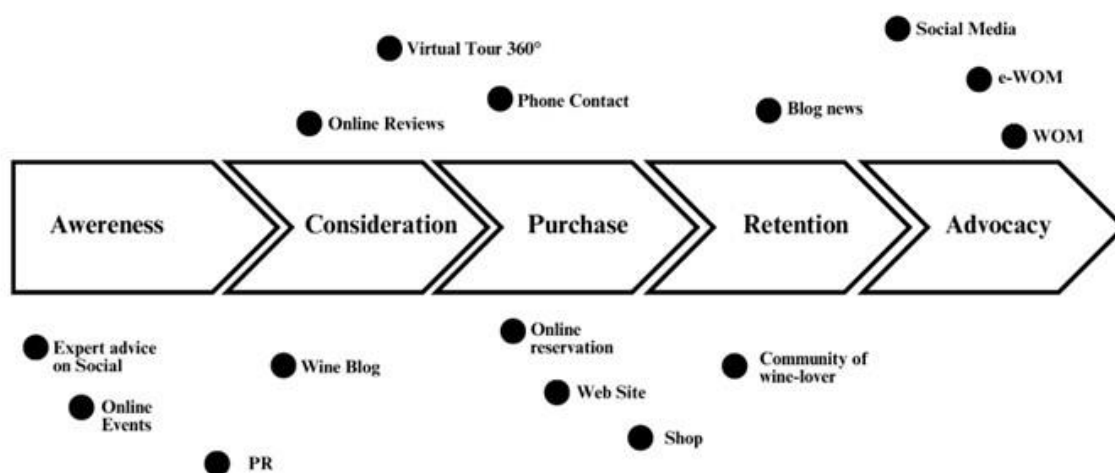

Figure 1. Podere Vecciano's Customer Journey. *Source: Author elaboration*

Consumer awareness of the winery is primarily established through participation in online events organised by industry associations such as Slow Food and Slow Wine, along with exposure from public relations efforts and endorsements from industry experts in online and social media platforms. The perception of the winery and the potential visitor experience is significantly influenced by reviews, narratives shared in wine blogs, and the opportunity to conduct a comprehensive 360° virtual tour of the winery in advance. Purchasing options encompass a range of methods, including direct phone contact, online reservation systems, dedicated forms on the winery's website, and transactions at the winery's in-house shop managed directly by the proprietors.

In terms of customer retention strategies, the winery places substantial reliance on its dynamic community of wine enthusiasts. They regularly disseminate updates and relevant information through their website's blog, thereby fostering a sense of belonging and engagement among consumers. This continuous communication keeps customers informed about upcoming events and imminent developments, further reinforcing their sense of being part of a cohesive community. Ultimately, the consumer plays an active role in promoting the winery, sharing their personal experiences and opinions via social media platforms or through interpersonal recommendations to friends and family.

In concluding the analysis of the first case study, Podere Vecciano, several significant

considerations come to the forefront. Firstly, the extensive involvement of the owner in every facet of the winemaking process, from tending to the vineyards to managing hospitality and commercial aspects, underscores his commitment and passion for the enterprise. This approach emerges as a distinctive hallmark of the company. Secondly, over time, the company has laboured tirelessly to enrich the visitor experience by leveraging its unique location among the vineyards, the evocative atmosphere enveloping the wine production areas, and the typical hospitality of the Romagna region. In this context, the introduction of new forms of wine tourism, such as "Wine Trekking," has revealed the need for further expansion of experiential offerings for visitors, including through the incorporation of new technologies. Although the company has only begun to explore these new technologies, the owner, Davide, is receptive to the idea of harnessing their potential. However, the interview highlights several challenges, ranging from financial constraints and limited resources to the lack of digital skills among collaborators and the owner himself. Therefore, the challenge lies not only in financial limitations but also in the scarcity of experienced personnel.

In summary, Podere Vecciano represents a typical small-scale winemaking company deeply rooted in the passion and dedication of its proprietors. The visit to the winery has underscored their artisanal approach and commitment to providing visitors with an authentic and memorable experience. The potential of new technologies is acknowledged, but this necessitates solutions tailored to the context of wine tourism, coupled with training and financial support to overcome the associated challenges. This case study illustrates the delicate balance between tradition and innovation that small winemaking enterprises like Podere Vecciano must navigate to thrive in a competitive wine tourism landscape.

Case 2. Vigne di San Lorenzo

Vigne di San Lorenzo, situated in the Campiume village of Brisighella, Ravenna, provides a distinctive vinicultural experience. Under the guidance of Filippo Manetti, a dedicated custodian of tradition, the winery produces wines that serve as historical narratives of the region. Filippo, with his self-directed learning background, employs an artisanal and minimalist approach that allows the terroir to express itself fully. He maintains exacting standards for both himself and his wines, asserting his willingness to forgo a vintage if these criteria are not met. This resolve symbolises his unwavering commitment to excellence and consumer satisfaction for those who select his wines. Vigne di San Lorenzo signifies the confluence of human artistry and the natural splendour of Val d'Amone, serving as a tribute to passion, devotion, and respect for history, evident in each tasting experience.

Similar to the first case study, the interview for Vigne di San Lorenzo was initially conducted over the phone, followed by an in-person meeting to explore the winery. Filippo is responsible for all winery activities, from vineyard operations to customer interactions. Although he receives limited assistance in vineyard work, there is no support available for marketing and communication. Currently, Filippo manages the agricultural business, and winery visits are possible by reservation only. This choice primarily stems from his limited availability of time. During the booking process, visitors can choose between a simple wine tasting or a guided winery tour. To date, Filippo has stated that he has never had the opportunity to experiment with experiences involving new technologies such as virtual, augmented, or mixed reality. His interaction with technology is currently limited to the website and social media, and he collaborates with a graphic designer for

label design. Additionally, Filippo admitted to not having an in-depth knowledge of new technologies.

"I belong to a different generation, which does not have the knowledge and skills to use these technologies, unlike young people who are much faster and quicker to learn how to use new tools". F.

He describes himself as someone who is not particularly passionate about technology, especially when it appears to threaten direct customer contact and question the authentic experience of a winery visit, where one can connect with nature and the land. Filippo does not believe that there will come a time when people would prefer to have experiences in a virtual world rather than the real one. For him, the intrinsic value of a winery visit, with all its scents, flavours, and physical interactions, is irreplaceable. His priority is to convey three fundamental points during winery visits: the craftsmanship of his wines, the dedicated love for land cultivation, and the choice to produce natural wines. To date, visitors to the Vigne San Lorenzo Estate have not shown significant interest in more technological winery experiences. However, Filippo does not rule out the adoption of innovative technologies in the future because they could be a means to reach a broader audience and enhance market visibility. A significant obstacle to the adoption of more advanced technologies in Filippo's company is the lack of time, as vineyard work requires constant attention and dedication. Furthermore, there are no associations or organisations that can provide support or advice in this sector. The lack of information, resources, and technology knowledge represents a significant barrier, regardless of economic factors.

"The issue of time remains central. To give you an idea, this year I am on my 27th vintage and only now have I decided to create, with the help of a graphic designer, a printed brochure to show the wines I produce, but so far I have never produced anything. [...] If I want to do something I have to organise myself, in my own time and with my own financial possibilities and time resources. Even just the idea of being able to make a video to show on a tablet, I wouldn't know how to realise it". F.

Filippo envisions a future where visitors can have a virtual reality experience, including a virtual vineyard tour that would be enjoyable even in adverse weather conditions. Despite these technological possibilities, Filippo remains convinced of the fundamental importance of maintaining a direct and authentic relationship with his customers. He has no intention of replacing human interaction with the use of technology but rather considers technology as a complement that can enhance the overall winery visit experience.

"I am not a person against technology in any field [...]. However, I would like the relationship with the customer to always remain central and important, to get to know the visitor and to be able to drink wine together, to talk, to compare notes". F.

Finally, he believes that in an ever-evolving world, it is essential to keep up with the times and offer experiences capable of satisfying a variety of visitors, including those who are younger and tech-savvy. Technology could serve as a bridge between different generations and might appeal to a portion of the audience who may prefer larger and more industrialised companies. Following the

initial phone interview, we conducted an on-site visit to explore the visitor experience and construct a customer journey (Fig.2).
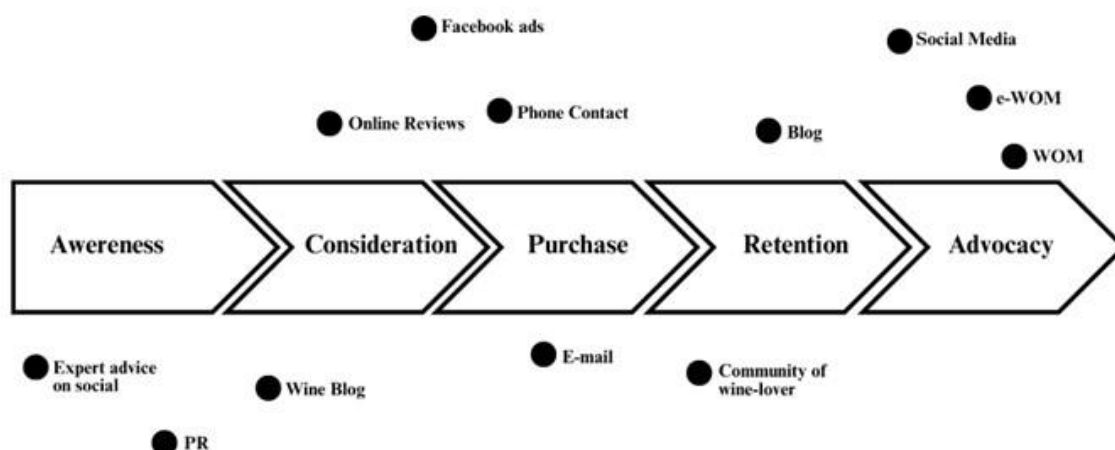

Figure 2. Vigne di San Lorenzo's Customer Journey. *Source: Author elaboration*

Consumers become acquainted with the company primarily through public relations activities or recommendations on online and social media platforms by industry experts. Their perception of the company and the potential winery experience is influenced by reviews, narratives shared by other individuals in wine-focused blogs, and Facebook advertisements promoted directly by the company itself. When it comes to making purchases, consumers can choose the most immediate route, which is direct phone communication, or they can contact the company directly via email, establishing a direct connection with the owner. Regarding customer retention strategies, the company relies on its active community of wine enthusiasts and updates shared in various blogs dedicated to natural and organic wines. This serves to keep consumers informed about future developments, fostering a sense of belonging to a community. Lastly, consumers will endorse purchases by sharing their experiences and opinions on social media platforms or through word-of-mouth recommendations among friends and family.

In summary, the case study of Vigne di San Lorenzo highlights a winery led by a highly involved and dedicated owner committed to craftsmanship and tradition. The company maintains high quality standards and continually seeks excellence. Although Filippo Manetti, the owner, has not yet fully explored the potential of new technologies, he does not rule out the possibility of adopting them in the future to reach a broader audience. However, the lack of time and limited knowledge of new technologies pose significant challenges. Filippo emphasises the importance of maintaining a direct and authentic relationship with customers and sees technology as a complement, not a replacement, to the winery experience. In an ever-evolving world, he believes it is essential to offer experiences that cater to a variety of visitors, including younger, technology-savvy individuals.

Case 3. Villa Venti

The Agriturismo Villa Venti in Roncofreddo province of Cesena is an exceptional proof of the dedication and love of the Giardini family, a winemaking family from Italy. Nestled between the mediaeval village of Roncofreddo and the "Villaggio Ideale" of Longiano, Villa Venti represents the harmonious union of three generations of this family. Each day, with dedicated commitment, they

cultivate the land to create unique wines that reflect the authenticity of the territory. Their daily life, steeped in traditions such as the preparation of homemade products, is rooted in craftsmanship and sustainability. The agriturismo exudes familial energy, warmly welcoming guests and providing an authentic experience of rural life. Their winemaking production is exclusively based on native grape varieties, thus preserving the genuine essence of the territory.

The interview was conducted with Beatrice Giardini, the daughter of the owner, Mauro Giardini. She actively manages communication, creates content for social media, organises cellar events, and handles international trade contacts. Villa Venti's visits to the winery and the estate revolve around the owners' desire to make visitors feel immediately welcomed as part of the family. The distinctive element of these visits is the opportunity to personally meet and interact with those who conceived the projects and produced the wine. Both family members and visitors establish personal and informal relationships during these experiences, which evolve into open and in-depth conversations. Villa Venti does not currently have a cellar located near the vineyards and the tasting room. The visit includes wine tastings, overnight accommodation with breakfast, a restaurant serving local products for small groups (by reservation only), and space rental for private events and parties. These experiences can be customised based on the needs and desires of the visitors. During the summer, the company organises theme nights on the beautiful hills of Cesena, with the participation of various wineries. During these evenings, participants have the opportunity to engage in debate, comparison, and wine tasting sessions. To date, Beatrice has not had the opportunity to experience cellar visits that involve the use of new technologies. However, she is very curious about these tools and believes it is essential to welcome them with interest rather than reject them. The interviewee emphasises that in terms of visitor feedback, there has never been a strong demand for innovative experiences or a more technological approach to cellar visits. Nonetheless, Beatrice identifies a significant limitation that smaller companies like Villa Venti must address: the difficulty of conveying the passion behind their work and product creation when wine bottles are on supermarket shelves on the other side of the world. In these situations, the story and tradition can be lost because there is no producer to share their love and passion. In this context, the interviewee highlights the pivotal role that technologies can play, allowing the channelling of history and tradition into bottle labels, using virtual or augmented realities.

"[...] we were just talking about how you could enclose inside the label and inside the bottle all this story and this you can do with the discourse of leaning on virtual realities, augmented realities and so on and giving people the possibility of being able to tap into little pills, just by scanning a QR code on a label rather than typing certain words on the internet or being able to bring them to your home even if they are on the other side of the world". B.

Despite the vast possibilities offered by new technologies, Beatrice emphasises the importance of not making technology the focal point of the experience, as it is crucial to maintain dialogue and direct interaction with visitors. This allows for the transmission of craftsmanship, a love for the land, and, at the same time, the narration of the wine production processes that are often lost during the journey the bottle makes before reaching the final consumer. In conclusion, Beatrice believes that technology represents an added value for visitor experiences and can also overcome accessibility barriers for those with disabilities. Among the obstacles encountered in adopting these new technologies for Villa Venti are a lack of knowledge, limited financial investments, insufficient time,

and a shortage of technology experts.

"[...] on the other hand, with regard to things more related to augmented reality, so-called artificial intelligence and so on, nowadays there is mainly a knowledge gap, because I don't know enough about it myself, I can't even tell you how accessible it is from an economic, budgetary or structural point of view, or all those things together. [...] It is undoubtedly a combination of many factors and the lack of time is also the source of all evil here, in the sense that if you have time you can devote to training and you can think of pursuing a certain path or project, in the absence of that the chain is partly broken'". B.

Following the initial phone interview, we conducted an on-site visit to explore the visitor experience and construct a customer journey (Fig.3). Consumers' initial awareness of the company is primarily generated through their participation in online events organised by industry associations such as Slow Food and Slow Wine, as well as public relations efforts. Additionally, they are influenced by recommendations from industry experts within the online and social media sphere. Their perception of the company and the potential winery experience is significantly influenced by various factors, including reviews, narratives found in wine-focused blogs, and the social media advertisements regularly disseminated by the company. Purchasing can be accomplished through various channels, including placing a phone call, making online reservations, submitting dedicated forms on the company's website, or directly through the online shop. To ensure customer retention, the company actively engages with a community of wine enthusiasts and provides regular updates through its blog, keeping consumers informed about upcoming events and imminent news, thereby fostering a sense of belonging to a larger community. Additionally, there is an option for consumers to subscribe to the company's newsletter. Ultimately, consumers express their endorsement of the product by sharing their experiences and opinions through social media platforms or by means of word-of-mouth recommendations among their acquaintances.
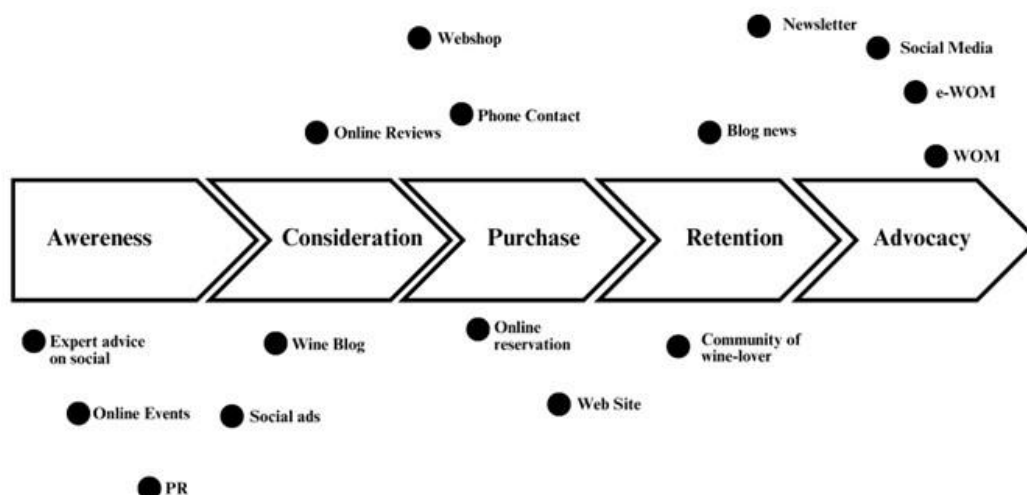

Figure 3. Villa Venti's Customer Journey. *Source: Author elaboration*

In summary, Agriturismo Villa Venti, a family-owned winery, upholds traditions and offers authentic rural experiences. While not yet incorporating advanced technologies, Beatrice Giardini

recognizes their potential for global storytelling. However, smaller wineries like Villa Venti face challenges, such as limited resources and low technology expertise, when considering tech integration to enrich visitor experiences.

Each company acknowledges the potential benefits of technology in enhancing visitor experiences but face the same challenges related to limited resources, knowledge, and time constraints, as reported in Tab.3 with the most relevant quotes and the related content coding.

Table 3. Challenges in New Technology Adoption for Wineries in Small and Medium Enterprises (SMEs).

New Technologies Adoption challenges	Excerpts from interviews
Financial limitations	"We were working on a project [...] of somewhat more advanced technology, but restructuring work [...] more fundamental than this took place, which caused the project to be postponed until a later date; so, we can say that even the economic part is often a big limitation for companies like mine." (Podere Vecciano)
	"If I want to do something, to realise a project, I have to organise myself, in my own time and with my own economic possibilities and time resources." (Vigne di San Lorenzo)
	"There is nowadays, primarily, a knowledge gap because I myself am not sufficiently familiar with it. I cannot even tell you how accessible it is to implement new technologies from an economic, budgetary, and structural perspective, or all these factors combined." (Villa Venti)

Lack of time	"You know, there are so many things to do, the winemaker generally lives a life where the things he does today should have been finished a week ago, always chasing time". (Podere Vecciano) "The issue of time remains central. If I want to do something I have to organise myself, in my own time and with my own economic possibilities and my own time resources". (Vigne di San Lorenzo) "Time is a central theme, especially in small artisanal contexts, where people tend to do more tasks, cover multiple roles, and thus following specific projects really takes away a lot of time from other activities [...]. Lack of time is somewhat the root cause here as well, in the sense that if you have time, you can devote yourself to training and consider pursuing a specific path or project. Without that, the chain, in part, breaks." (Villa Venti)
Lack of technological support	"I would love it if communication agencies or companies that make such technologies would also put more specific things in the catalogue for the wine experience. [...] I would like someone to come and knock on my door and show me how I can improve the winery experience". (Podere Vecciano) "In general, companies like mine are alone in this journey, I have no one who can help me, in any way and at any level. We are 100% alone. If I want to do something, to realise a project, I have to organise myself, in my own time and with my own economic possibilities and time resources." (Vigne di San Lorenzo) "The idea of being able to rely on someone else, perhaps industry experts, can certainly be an advantage, especially at the beginning, to acquire the necessary skills and knowledge to pursue specific paths." (Villa Venti)
Limited technology knowledge	"Because if I have to put myself in, that I am not capable, that I don't have the right knowledge [...] it becomes complex and difficult to realise" (Podere Vecciano) "Even just the idea of being able to make a video to show on a tablet, I wouldn't know how to realise it, I belong to another generation, which doesn't have the

	knowledge and skills to use these technologies, as opposed to young people who are much faster and quicker to learn the use of new tools." (Vigne di San Lorenzo)
	"There is nowadays, primarily, a knowledge gap because I myself am not sufficiently familiar with the new technologies [...]." (Villa Venti)
Shortage of Technology-Proficient Personnel	"I don't have the right knowledge, I don't have the experience, and I take care of my business 360°" (Podere Vecciano)
	"We are producers of a generation, selling wine and giving experiences to a much younger generation, which is used to the constant changes and evolutions of technologies. Probably the young people are too far ahead and we are still too far behind in this respect." (Vigne di San Lorenzo)
	"Unfortunately, there is still relatively little discussion about it. In fields such as art, fashion, or historical augmented reality experiences, there is much talk, but in the world related to wineries, wine, productivity, or craftsmanship, there is less discussion. There are fewer examples, or at least fewer well-known examples, which undoubtedly hampers the development and implementation of technologies." (Villa Venti)

Source: Author elaboration

5.   Discussion

From the analysis of the selected cases, several interesting reflections can be obtained on the role that technologies play in the customer experience and as differentiating practices for better competitive positioning (Maeran & Di Tella; 2012). In the new customer experience economy (Pine & Gilmore; 1998) the role of new technologies have a real impact in management and marketing practices so that is it is increasingly common to refer not only to technology enhanced experience but to real technology empowered and illusive experience in the case of augmented and virtual reality and Metaverse (Buhalis et al.; 2023).

In the following subsections, we proceed to the description of the collected results and the comparison in terms of similarities and differences between the different case studies. A summary of how the customer journey varies for each of the three companies will also be presented (Ponsignon et al.; 2017).

5.1. Similarities and differences between the selected cases

The establishments of each company are characterised by an approach that remains faithful over time, where the same people who supervise and look after the entire operation are those who then welcome visitors to their cellars. The three cases present specific similarities as that they are small

businesses, mainly specialising in the production of natural wines. These wines are distinguished by their respect for the environment, soil, territory and climate, but above all for the end consumer. The selected wineries also distinguish themselves by growing grapes using sustainable agricultural methods, but they also follow winemaking processes that minimise the use of chemical additives and harmful substances. Their efforts are aimed at preserving the quality of the terroir and producing wines that authentically reflect the unique character of the Romagna region.

In examining the owner's involvement across the three case studies, differences and distinct patterns emerge. At Podere Vecciano, Davide Bigucci, the proprietor, assumes a highly engaged and hands-on role in overseeing virtually all facets of the winery's operations, from the meticulous care of the vineyards to the management of hospitality and commercial aspects. Similarly, in the case of Vigne di San Lorenzo, Filippo Manetti takes on comprehensive responsibilities, encompassing vineyard operations and customer interactions. Their active engagement is evident. In contrast, Villa Venti operates with a more collaborative approach, with the Giardini family spanning three generations dedicating themselves to cultivating the land and preserving traditions. In this setting, various individuals contribute, with Beatrice Giardini, the owner's daughter, actively managing communication, social media content, events, and foreign trade relations. This diversification of roles reflects the multifaceted nature of Villa Venti's operation. In analysing the visitor experience aspect across these three wineries, distinct strategies and approaches are evident. At Podere Vecciano, the emphasis lies in fostering a welcoming atmosphere, enriched by its unique vineyard setting. The winery prioritises offering a spectrum of visitor encounters, from traditional wine tastings to more personalised "wine trekking" experiences. In contrast, Vigne di San Lorenzo focuses on establishing personal and informal relationships during visits, deviating from the conventional concept of a cellar situated near the vineyards. Rather, it introduces an alternative experience characterised by a direct connection between the family and the guests. Meanwhile, Villa Venti stands out for its pursuit of making visitors an integral part of the family, bestowing upon them a comprehensive experience that extends beyond mere wine tastings. This approach includes options for overnight stays, dining, and hosting private events. Each winery tailors its visitor experience to its unique strengths and resources, striving to offer memorable encounters that align with its individual character and ethos.

Such results may appear counterintuitive, but in reality, as highlighted in Massa and Bedè (2018), the consumer's experience in the wine industry can be built on the following values: 'hedonic', 'economic', 'social' and 'legacy'.

In examining the adoption of technology and the challenges faced by these wineries, several common threads and distinctive traits emerge. Podere Vecciano reveals a limited current use of technology but exhibits openness to innovation, with the principal barriers being a dearth of information and financial support as also noted in Doloreux et al. (2013). Conversely, Vigne di San Lorenzo primarily relies on fundamental online tools, such as a website and social media, without significant engagement with advanced technologies. The winery is constrained not only by time limitations, owing to their hands-on involvement in vineyard work, but also by the absence of supportive associations or entities. In the case of Villa Venti, while recognizing the potential of technology for global storytelling and accessibility, advanced technologies have not yet been fully integrated into their visitor experiences. The challenges faced by Villa Venti encompass various aspects, including a deficiency in technology expertise, limited investments, time constraints, absence of supportive associations or entities and a shortage of personnel adept in advanced technologies.

In summary, these wineries share a commitment to tradition and authenticity that are able to

promote both economic than general sustainability (Gerardi & Sfodera, 2023), and excellence in their wine production, therefore in accordance with Angelini and Gilli (2022) it is strategic for each company to create a specific identity on these different dimensions of the customer experience. The interviewees share the vision of a future in which a balance between tradition and innovation will play a key role in their wineries and that are fundamental for family firms (Nevi et al.; 2023). Therefore, it is clear that all three respondents recognize the value of technologies, but at the same time feel that direct contact with visitors, physical experience, the contact with the earth and hospitality of Romagna are fundamental elements and irreplaceable. Direct and personal visitor interactions remain a crucial element across these wineries, ensuring that the art of winemaking and the story behind the wines are conveyed effectively.

5.2. *Customer Journey*

Tourism demand is very different and the role of technologies reaffirm this differentiation, for example in online and onsite behaviour The term "customer journey" pertains to the ongoing experience of a customer as they progress through the various stages of the service cycle, encompassing pre-purchase, purchase, and post-purchase interactions (Koronaki et al.; 2023). The customer journey provides a valuable framework for understanding the similarities and differences across the three case studies. It allows us to explore how consumers become aware of these wineries, the factors shaping their perceptions, and the diverse channels available for making purchases and staying engaged. By examining the customer journey in each case, we can gain insights into how these wineries approach customer engagement.

In this context, the customer journeys of Villa Venti, Vigne di San Lorenzo, and Podere Vecciano exhibit fundamental similarities (Fig.4).
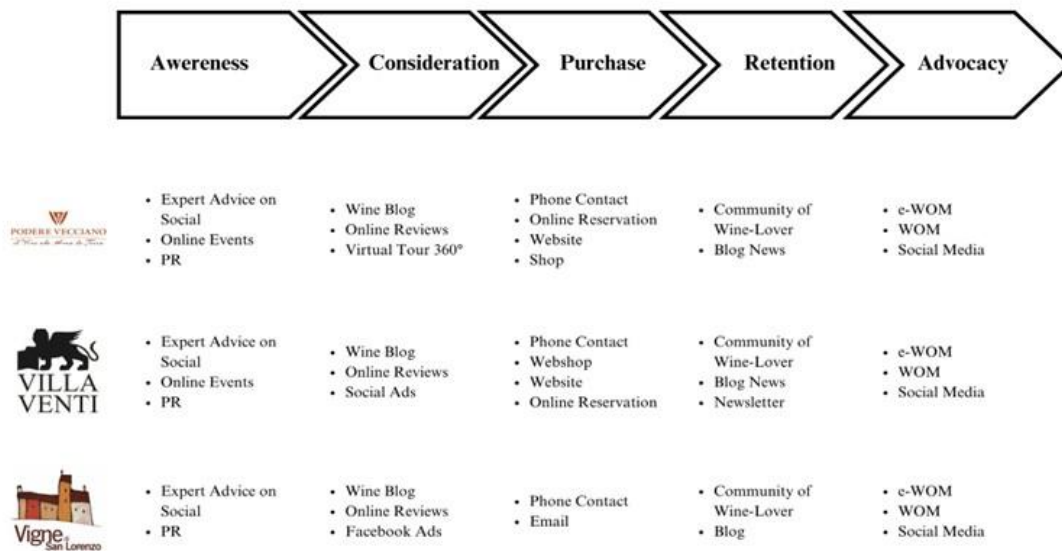

Figure 4. Customer journey comparison of the implemented technologies by the three case studies. *Source: Author elaboration*

In all three cases, consumer awareness of the wineries is significantly influenced by public relations initiatives, such as trade fairs, conferences, trade meetings, conventions both online and offline, publicity and communication of the company's core values; participation in online events

organised by industry associations such as Slow Food and Slow Wine, and recommendations from experts in the field through online platforms and social media. The perception of the companies and the experiences they offer is shaped by reviews, narratives shared on wine-focused blogs, and social media advertisements disseminated directly by the companies themselves. In the purchasing process, all three cases provide various channels, including direct contact via phone, online reservations, dedicated forms on the companies' websites, and online shops managed directly by the owners. To foster customer retention, the three companies rely on active communities of wine enthusiasts, regularly updating consumers through blogs or newsletters to keep them informed about upcoming events and imminent developments, thereby fostering a sense of belonging to a broader community. Additionally, consumers often have the option to subscribe to the companies' newsletters. However, there are also some significant differences among the customer journeys. For instance, Villa Venti offers consumers the option to purchase directly from their online shop, whereas Vigne di San Lorenzo and Podere Vecciano do not mention this option. Moreover, Vigne di San Lorenzo emphasises direct contact via phone or email with the owner. In terms of promotion and consumer engagement, Podere Vecciano offers a complete virtual experience through the 360° winery tour, a feature not provided by Vigne di San Lorenzo and Villa Venti. Promotion and support of the wineries by consumers occurs through posting on social media, or through online and offline word-of-mouth (e-WOM and WOM) of their satisfaction.

In summary, these three companies share an approach to customer engagement that is based on public relations initiatives, recommendations from industry experts, and the construction of communities of wine enthusiasts. Nevertheless, the specific methods of purchase and details of the experiences offered exhibit slight variations among the case studies.

As the existing literature emphasises, new technologies play a disruptive role, but each company needs to adopt them differently depending on the service it offers (Vaidyanathan & Henningsson; 2023). Specifically, in the wine industry, they offer opportunities for enhancing customer experiences. However, it's essential to recognize that the adoption of these technologies can vary significantly depending on the unique services offered by each winery. In the case of Villa Venti, where the emphasis lies on providing a comprehensive and personalised experience, the adoption of technology is approached with curiosity and openness, recognizing its potential to complement traditional offerings. On the other hand, Vigne di San Lorenzo, with its focus on personal and informal relationships, has not yet fully embraced advanced technologies in its visitor experiences, indicating a more cautious approach. Podere Vecciano, with its commitment to diverse visitor encounters, takes advantage of technology to offer a 360° virtual tour, showcasing a more innovative implementation.

While new technologies present disruptive opportunities, the manner in which they are integrated into the customer journey varies among these wineries, reflecting their distinct service approaches and priorities. This highlights the importance of tailoring technology adoption strategies to align with the specific characteristics and goals of each winery's customer journey especially in the nascent hospitality industry 5.0 (Gangwar & Reddy, 2023).

6. Conclusion

The way we perceive tourist destinations is evolving, with physical and virtual spaces becoming increasingly interconnected, thanks to advancements in technology (Egger & Neuburger; 2022). Italian companies appear to be somewhat behind their European counterparts in embracing new technologies to enhance the customer experience (Eurostat; 2023). Consequently, the wine industry is confronted with the task of preserving its authenticity and heritage while simultaneously responding to the demands and anticipations of an ever more digitally connected customer demographic (Szolnoki et al.; 2018). Therefore, this research aims to enrich the understanding of the dynamics between technology and customer experience in the wine tourism sector in Italy and in particular in relation to small-medium enterprises of Emilia Romagna, as well as investigating the barriers that these companies encounter in the implementation of new technologies.

The findings established that the three wineries under study share a commitment to tradition, authenticity, and excellence in wine production. Their customer journeys, albeit with some differences, demonstrate a consistent focus on customer engagement through public relations initiatives, industry expert recommendations, and the construction of communities of wine enthusiasts. Technology emerges as a potential complement to visitor experiences, yet it never replaces direct customer contact, physical experiences, and interaction with the land. These elements are considered irreplaceable by the winery proprietors for conveying the art of winemaking and the stories behind the bottles. Moreover, despite the opportunities that New Technologies can offer in the experience of tourists, the challenges arising from the adoption of emerging technologies to enhance customer experiences during in-person visits include time constraints, limited investments, a lack of technical expertise, the absence of support from associations or entities, and a shortage of personnel skilled in new technologies. These challenges may vary among the wineries, but they are a constant in the three experiences examined. While new technologies have the potential to enhance the customer experiences in wineries, the way each winery chooses to incorporate these technologies should be tailored to its specific circumstances and also incorporated with the aims to enhance regenerative tourism (Antolini & Ruggieri; 2023). This means that there's no one-size-fits-all approach; instead, wineries need to consider their unique services, resources, and target audiences when implementing technology. The technology should work alongside the traditional aspects of the winery visit, like personal interactions, physical experiences, and a connection with the land.

7.   Implications

The implications of this research are significant for both theory and practice. From a theoretical point of view, this study contributes to a greater understanding of how new technologies influence the experience of tourists in the wine sector, highlighting the importance of a customised approach based on the specific needs and resources of each company. From a practical point of view, the conclusions of this study provide valuable guidance for wineries in relation to the tourism sector, suggesting that the adoption of new technologies should be aimed at improving the experience of the tourist in a manner consistent with its offer of services and available resources. Wineries can benefit from implementing technology solutions that enable more personalised customer engagement and improve communication and accessibility. However, it is essential that this happens without compromising the authenticity and tradition that are central in the wine sector. In addition, this study stresses the importance of maintaining a balance between tradition and innovation in the

wine sector. Companies can see the adoption of innovative technologies as a complement to the customer experience, rather than a substitute. This makes it possible to broaden the reach and diversification of customers, reaching even the youngest and digitally connected consumers, without alienating those seeking a more traditional experience. In conclusion, this research provides a useful framework for wineries wishing to enhance the customer experience through the use of new technologies while maintaining their authenticity and tradition.

8. Future research and limitations

This study, like all research, suffers from certain weaknesses, primarily the focus on a single country. future research should increase the sample analysed and extend the survey to other countries and sectors besides wine. A further weakness lies in the fact that only business owners were interviewed. Further surveys should also capture the point of view of the purchaser and end user as well as employees and other stakeholders such as developers. Furthermore, in the face of the increasing use of these technologies, not only should quantitative analysis approaches be used in addition to these qualitative ones, but also ethnographic and neuromarketing tools that could capture consumers' reactions to the various tools.

The theoretical and practical implications outlined in this study can guide further research and guide the strategic decisions of wineries in the context of a constantly changing market. It would be intriguing to delve deeper into the specific emerging technologies and their impact on various stages of the customer journey in wine destinations. This may encompass more intricate research on applications of virtual, augmented, or mixed reality and their implementation strategies. Furthermore, further exploration of differences in winery sizes and how they influence the adoption of new technologies could provide valuable insights for the industry. Lastly, given the increasing interest in wine tourism, a broader focus on wine destinations in other wine regions worldwide and a comparison with the dynamics in Italy could lead to a more profound understanding of the global challenges and opportunities in this evolving sector. In summary, future research should aim to explore in greater detail the impact of emerging technologies on enogastronomic tourism, considering the specificities of different business sizes and various wine regions on a global scale.

Conflict of interest

All authors declare no conflicts of interest in this paper.

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