

An Online Platform in 3D Virtual Environment, a Tool in Entrepreneurship Empowerment for Goods and Services Supply Chain

IOANNIS DAGKINIS¹, PANAGIOTIS PSOMAS², ASPASIA VLACHVEI³,
ANDREAS KOSKERIS⁴, DIMITRIS ZIOUZIOS⁵, ELTON-ANTONIS FRENGKOU⁴,
NIKITAS NIKITAKOS¹

¹Department of Shipping Trade and Transport,
University of the Aegean
Korai 2a, Chios,
GREECE

²Department of Financial and Management Engineering,
University of the Aegean,
Koyntouriotou 45, Chios,
GREECE

³Department of Economics,
University of Western Macedonia,
Kozani,
GREECE

⁴Computer Technology Institute and Press “Diophantus”,
Patra, Peloponnesus,
GREECE

⁵Department of Electrical & Computer Engineering,
University of Western Macedonia,
Kastoria,
GREECE

Abstract: - This paper presents a virtual trade platform to promote entrepreneurial spirit and provide a systemic approach to support businesses and consumers to successfully promote their products and services in exhibitions through virtual reality, overcoming problems of transport, cost, and weakness for their participation due to insularity. Several activities were developed in the 3D Virtual World, involving the entrepreneurial spirit with innovative activities and procedures, increasing opportunities and putting theoretical knowledge into practice. The S.A.A.T. online expo platform uses 3D virtual reality (VR) to enhance entrepreneurship focused on the agri-food domain and tourism since it is possible for SMEs to promote products and services by overcoming distance problems from potential customers and interested investors, easily. According to the above-mentioned, the online S.A.A.T. expo platform provides some of the main functions of a modern virtual exhibition, to improve the applications of VR in those fields.

Key-Words: - Virtual reality, virtual environment, virtual market, digital entrepreneurship, platform, agrifood, goods supply chain.

Tgeglxgf <Ugr vgo dgt "38."42450Tgxkugf <Cr tkl3; . "42460Ceeegr vgf <O c { "43."42460Rwdrkuj gf <Lxpg"9."42460"

1 Introduction

Globalization and world economic growth have made it simpler to interact and exchange products and services. With the development of technology

like virtual trading platforms, artificial intelligence, and computer robots during the past ten years, there has been a dramatic shift in business models and investing strategies, [1]. These latest technologies may result in increased performance, productivity,

and competition and can be a possible tool to meet the future demand for promoting sustainable products, [2]. The current technology revolution can benefit all businesses irrespective of the company size. For example, by exploiting the technological developments of virtual reality which can enhance processes in an SME that can manage business activities remotely wherever they take place.

These management processes using innovative technologies can be an important enabler, especially in cases where proactive or mandatory restrictions on direct contact exist, as was the case during the COVID-19 exclusion period of business activities, [3], [4], [5], [6]. Of course, irrespective of the restrictions from mandatory social contact interruption conditions, SMEs may develop their business activities digitally and adopt virtual operational processes to improve accessibility to their online audience, become more competitive, and by increasing their business performance ensure their sustainability, [5], [7], [8].

Similar conditions and constraints exist for the agri-food and tourism business sectors, which are pillars for the strategic development of European countries. The development of entrepreneurship in both of these sectors is a field of employment for a large proportion of the population, which influences other sectors, especially in Mediterranean countries, as well as a source of wealth development in society as a whole, [9]. It is emphasized that innovative technologies to promote products and virtual reality tools can be very helpful in formulating new frameworks to support entrepreneurship in the agri-food and tourism sectors, which will be able to attract potential customers and help them to learn more effectively to carry out their activities, [10], [11]. 3D virtual world simulations can overcome barriers such as distance, space, and human resources, and can be used for more efficient, safe and comfortable training. The use of VR in the promotion of agri-food products can be a means for the promotion of agri-food products. Many quality products are produced in areas where it is difficult and costly to promote them by attending trade fairs, especially in remote areas.

In this paper, we present a novel virtual world platform to promote the entrepreneurship of agri-food producers and tourism enhancement through its products. It is designed to assist islanders to diffuse the production activities of highly quality local products, otherwise, they have to incur large expenses in transport and participation in live exhibitions for dissemination of their enterprises. This virtual world online platform provides the main functions of a modern virtual exhibition, aiming to

support potential users, such as ordinary visitors navigating through the stores, and retailers advertising their products/services.

Users can be of any age, regardless of gender, and will be able to easily create a virtual environment of products to be promoted from any Internet access point, either at home or in the business. Visiting will also make it easier for people with disabilities to access traditional showrooms, thus eliminating accessibility barriers. It can advance the process of modernizing agricultural promotion by improving VR applications in the agri-food and tourism sectors. The platform is well-suited for both formal and informal learning and has great potential for further development. The innovative S.A.A.T online expo platform in a 3D virtual tour environment will be a pioneering tool for all existing agri-food and tourism supply chains, which will enhance the extroversion and competitiveness, especially of very small businesses that do not have the opportunity to participate in trade fairs in physical presence.

Also, very important is the fact that the promotion of products and services through the platform skips over the presence of intermediaries, who have a large intervention in the formation of the final price, shrinking the profit of the producer. Finally, especially for the South Aegean Region of Greece, the platform will be an important development factor because it overcomes the problems of transportation, costs, and participation weaknesses due to the insularity of the Region.

The rest of this paper is organized as follows. Section 2 describes the virtual technology. Section 3 presents related works and the literature review. Section 4 describes the innovative online platform that has been formulated to assist users in exploring entrepreneurship used in the SAAT project. Section 5 concludes this paper.

2 Virtual Technology

The virtual environment can be described as a computing system, in which interactions take place, [12]. A virtual trading environment connects exhibitors and attendees so that they can communicate and share information regardless of where they are physically located, [13]. Through the Virtual Trade Environment, chat rooms, videoconferencing, augmented reality, 360-degree video, virtual reality, 4D, customized digital presentations, and interactive online product displays can be used to create interaction between exhibitors, organizers, and visitors. Using these tools, organizers can create a virtual media station

that can be accessed by visitors through a visit to the physical location or by logging on from home, [13].

Exhibitors have access to visitor details through registration, and customers have access to the virtual tour and the necessary brochure download through contact details. With the help of artificial intelligence, exhibitors can track visitors and make use of this data in the future. Virtual trade shows are equipped with powerful tracking devices that help exhibitors follow up on the leads they receive. Multiple visitors can log in at the same time. This gives them uninterrupted access to participate in video conferences or chat with exhibitors. A virtual environment with a high degree of VR and computer-assisted modes of communication allows exhibitors to save time and money.

Many new methods of solving problems can be provided by the emergence and development of VR technology. One of the greatest key technologies for the improvement of entrepreneurs in the field of agricultural products could be the virtual promotion of agricultural products. The VR technology for commercial agricultural food and tourism on virtual shops, we may find that VR is widely applicable and will create an innovative train of thought and new ways for agricultural science promotion and agricultural production. The application of virtual environments in exhibitions for agri-food and tourism can be an entrepreneurial use of resources, simulating the activities of picking, marketing, and playing to get businesses and visitors to participate and experience the availability of products easily, [14].

In conclusion, virtual technology can be applied to agriculture in the fields of scientific research, teaching, agricultural resources, planning, production, distribution of goods, and agricultural machinery design and manufacturing.

3 Literature Review and Related Work

The literature review focuses mainly on three dimensions of advantages of the virtual trade environment: First, as a marketing tool for establishing valuable relationships with stakeholders, to inform and communicate, leading to the value creation process and third as an online platform for marketers to create an experiential event, [15]. Increased sales, reduced costs, access to new or different markets, brand credibility and organizational legitimacy are the main motivations for participating in a virtual trading environment, [13]. The authors conclude that the future of virtual

trade shows will likely depend on the technological development of the systems and how they are integrated into existing technological and strategic corporate processes for exhibitors and visitors.

The fact is that a focus on technology alone is not enough, [16]. Virtual marketing capabilities are necessary to adapt traditional marketing actions to the virtual environment to gain a competitive advantage. For instance, the use of virtual technology in marketing initiatives like trade exhibitions enables businesses to identify and take advantage of possibilities through new, difficult-for-competitors-to-imitating methods that are faster, more efficient, and less expensive, [17]. Virtual technology can also help businesses respond to consumer needs and communicate and interact with them in real-time. Virtual marketing capabilities allow a company to create an open, public, and low-cost global platform with rich content and real-time data and deploy it widely throughout the supply chain. These competencies may promote cross-organizational communication, worldwide reach, and foreign marketing, which may present possibilities or obstacles for an individual firm, [18]. Researchers point out that these opportunities can lead to increased customer loyalty through the provision of efficient and convenient quality service, [18]. In other research, it has been demonstrated that while the physical trade environment is crucial for human personal interaction, like the creation of informal contact networks and face-to-face interactions, the virtual trade environment is highlighted as a catalyst for promoting interaction and connection before and after physical exposure, [19], [20].

With regard to sales-related performance, virtual trade platforms are still deemed a sales-generating marketing tool, [13]. Virtual trading platforms increase the number of sales orders, although they mention that the exhibitors and the experience of the customers moderate the relationships between the activities and the results, [21].

Also, despite the inadequacies of virtual trade shows, related to characteristics of interaction, the technology expands the opportunities for companies to collect, store, and use data, [20], [22]. Thus, virtual trade fairs outperform live trade fairs in the areas of gathering and sharing information and understanding the market, allowing for an efficient exchange of information between exhibitors and visitors, [13], [23]. Virtual trade activities have a positive effect on maintaining the existing customer base and gaining new customers from the market, while managing virtual activities such as customer

acquisition and retention, is a big challenge for marketers, [13], [24].

The question of whether virtual trade shows could replace live trade fairs has been extensively discussed in the empirical literature and there are conflicting views, [25]. The virtual environment should be viewed as a setting that can both strengthen and enable new knowledge links, [26]. The boundaries between geographic scales and various sources of knowledge are blending more and more as the relevance of the virtual environment grows. The idea that the virtual and physical dimensions are inseparably linked poses new theoretical and empirical challenges. More research is needed to understand how innovation processes and collaborative dynamics unfold at the intersection between virtual and physical spaces.

Research on the effects of virtual trade shows on companies and their relationships with each other, [20], [23], [27], is relatively limited. Little is known about the platforms where trade shows may take place and their connections. Particularly, less focus is given to commercial activities associated with virtual displays [20], [23]. In addition, studies tend to focus on one stakeholder at a time, mainly emphasizing the side of exhibitors and neglecting visitors and organizers, [20], [27], [28]. The further stressed development of measurement for the effectiveness of the virtual trade environment, [13]. As the number of studies is very limited, further investigation can be made on developing, validating, and establishing more generalizable constructs to enrich this field. Future research can employ objective measures for capturing outcomes more vividly. Along with objective measures, researchers can also investigate non-sales and non-financial exhibition objectives, such as information acquisition, relationship improvement, corporate image, and the motivation of employees, [21].

4 An Application Case of Virtual Agri-food and Tourism Expo Platform

4.1 Online Expo Platform

S.A.A.T.'s online expo platform provides the main functions of a modern virtual exhibition, aiming to support potential users, such as ordinary visitors navigating through the stores, and retailers advertising their products/services. In the following section, we will describe the technical and functional specifications of the online platform,

which consists of two different applications, a 3D and a Web application Figure 1, Figure 2.



Fig. 1: Virtual exhibition



Fig. 2: Virtual navigation through the stores

4.2 3D Virtual Environment

The SAAT platform, [29], development is a 3D virtual environment using Unity3D (v.2019.4), which was later built and published in WebGL, [30]. WebGL is a JavaScript API that renders 2D and 3D graphics in a web browser. With the Unity WebGL build option, we can run Unity content in a web browser. Throughout the 3D project development, the Scripting Runtime version was .NET 4.6 equivalent, the C# compiler was Roslyn, [31] and the C# language version used was v7.3.

The 3D virtual environment consists of three scenes: *Loading*, *Login*, *MainApp*. In the first scene (*Loading*), the connection to the server (using PUN), [32] is made, and then we go to the second scene (*Login*), displaying the roles a user can enter the mall. The user roles are *Guest*, *Retailer*, and *Admin*. The first two categories of users enter the same "room" so that they can have visual contact with each other. The latter category redirects to the admin web application interface. Finally, we are transferred to the final scene (*MainApp*) where we enter the virtual environment of the "mall".

In the *Login* scene, the user can enter the mall as a guest (i.e., any user visiting the agro-food and tourism stores) and have free access to the online platform and visit the stores of the virtual mall.

Entering the virtual mall as a “Guest”, you can navigate through the stores either in a classic way (“W/A/S/D” keys for movement and the mouse for camera direction) or by using the map (“M” key) and choose the floor and the store to which he wants to be transferred directly. Furthermore, you can interact with the advertised products (description, price) and contact the retailer of the store for more details and any purchases. More specifically, you can view the product/service details such as image/video with its description and contact details of the retailer (website, address). Moreover, each store has a chat panel where the guests can have live contact with the retailer about products or the store, in general.

Retailers must meet some prerequisites to obtain the rights of a store in the virtual mall. First, they must register and create an account. After logging in to the web platform with their credentials, they will be able to submit the details of the store (name, address, website, tax number) and apply for acquiring one of the virtual mall's available stores. After the user's application is accepted by the *Admin*, he will be able to enter the mall with the retailer's permission. More specifically, the user will be able to add/update/remove product details (logo, description, images/video), internal design, and/or contact details of the assigned store. As stated above, he/she will be able to respond to guests' questions via a live chat panel. Finally, entering as “*Admin*” at the “Login” scene, the user will be redirected to the Admin User Interface web application.

4.3 Admin Web User Interface

To address the problem of managing the entities of the platform, we developed a web application using Symfony (v6.0), [33] and EasyAdmin [34] bundle (v4.1) to create a user-friendly administration backend. Throughout the web application development, the PHP language version used was v8.1.

First, we created the entities of our application: *User*, *Submission*, *Shop*, and *Product*, using the Doctrine ORM. A user can make many submissions and each shop can have multiple products. As a result, User and Submission entities have a Many To One relationship, as well as Shop and Product entities too. The *user* entity consists of 5 fields: *id*, *email*, *roles*, *password*, and *created_at*. Email is required to be a unique field. The roles field is of type json and can take the values “ROLE_ADMIN”, “ROLE_USER” and empty (string). for a user to obtain “ROLE_USER”, the admin must accept the

user's submission, otherwise, it will be an empty string.

The *submission* entity consists of 9 fields: *id*, *user_id*, *name*, *address*, *website*, *created_at*, *updated_at*, *status*, and *shop_id*. The *user_id* corresponds to the unique number of each user from the user entity. The status field can take 3 values, “PENDING_MODERATED”, “ACCEPTED”, or “DECLINED” depending on whether a response is pending, accepted, or rejected. Finally, there is the unique number *shop_id* which corresponds to the id of the shop entity for which a request was made.

Shop entity consists of 9 fields: *id*, *availability*, *status*, *internal_design*, *storage*, *name*, *address*, *website*, and *chat*. The availability field can take the boolean values TRUE / FALSE, based on which the submissions are made. Finally, the chat field takes the “out” and “in” values, corresponding to the retailer being online or offline for live chat.

Product entity consists of 8 fields: *id*, *shop_id*, *katastima*, *proion*, *name*, *link*, *description* and *uploaded*. *shop_id* corresponds to the unique number of the shop entity to which this product belongs. The fields *katastima*, *proion*, and *name* are strings used to display media (image/video).

Using EasyAdmin, we implemented a Dashboard displaying the application entities. Depending on the permissions of the logged-in user, different elements are displayed on the dashboard. More specifically, if the logged-in user has the “ROLE_ADMIN”, then can see all the entities on the Dashboard and, also, perform Create, Update, Delete (CRUD) operations on all entities. If the logged-in user has the “ROLE_USER”, the dashboard displays submissions of the current user and maintains the ability to perform CRUD operations only on his submissions, in this case.

4.4 SAAT Online Expo Competitive Advantage

Attending trade shows and exhibitions can be beneficial to a business because it provides the opportunity to meet potential customers and generate, [29], [35], [36], [37].

Entrepreneurs of agro-food and tourism businesses type through SAAT can come closer to the benefits of participating in trade shows and a) Raise awareness (as exhibiting is a good way to raise a business's profile and create brand awareness including advertising and sponsorship opportunities), b) Networking (because trade shows are a great way to meet potential new customers, suppliers and learn more about your competitors), c) New product launch (exhibitions are a good place to introduce a new product or service, d) Build a

database (contacting leads at an exhibition helps build marketing lists and generate qualified sales leads).

The advantage of the development of the SAAT online expo platform is that it was developed with an emphasis on the needs of the region and the entrepreneurs of the remote island regions, considering the peculiarities of entrepreneurship in the South Aegean.

It takes the advantages of participating in conventional exhibitions while eliminating the disadvantages of booth space, booth design, and construction costs. This is achieved by providing a wide range of development and design alternatives to differentiate itself from competitors in the same field.

It also boosts interest and participation from more business sectors from different regions, addressing issues of low participation and creating equal opportunities compared to larger-scale businesses, while publicity and participation of more visitors are greater when a larger number of visitors are allowed to visit.

5 Conclusion

The virtual agri-food business and tourism platform is the result of combining agribusiness and virtual reality technology. Developing agricultural research in the virtual reality environment can reduce experiment costs, shorten the research time, get experiment results directly and finally this can improve the research efficiency of the agricultural domain.

In this paper, we presented the main idea of the project 'Enhancing extroversion of agri-food and tourism supply chains by developing virtual 3D virtual exhibition' – 'SAAT platform' which developed in the Operational Program "South Aegean 2014-2020", "Strengthening of research, development & innovation projects in the priority areas of the Smart Specialization Strategy of the South Aegean Region" with OPS Code 3437. S.A.A.T. the online expo platform is a virtual world platform to promote entrepreneurship. The innovative S.A.A.T online expo platform in a 3D virtual tour environment will be a pioneering tool for all existing agri-food and tourism supply chains, which will enhance the extroversion and competitiveness, especially of very small businesses that do not have the opportunity to participate in trade fairs in physical presence. This virtual environment aims at supporting commercial activities, and the potential users, whether they are men or women will be able to use it with great

comfort, such as ordinary visitors navigating through the stores, and retailers advertising their products/services, so the process of retailers to promote their products and services will become more and more intuitive. With the development of the SSAT online expo platform, the elements presented in the 3D rendering can optimize the user experience providing added value to the business activity of the agri-food and tourism sector. Due to its extensive features, the virtual reality that has been used adds more dimensions to the architecture to view the final product. Users feel that they are experiencing real participation while not limiting the experience of visiting an exhibition of groups with special needs such as residents of remote areas, and it should be added that it is also highly appreciated by people with disabilities, because by using virtual reality they can explore the real world. Furthermore, for the tourism sector, virtual reality gives a complete and detailed picture of a place. Finally, among the main advantages of virtual reality is that it helps to form new relationships in a more effective way compared to real life, providing a new experience of communicating with people.

The effectiveness, ease of use, and acceptance of the platform as well as its usability will be subject to further study, where it will be evaluated by users and improved accordingly, to become a powerful tool for the development of both businesses and remote island regions.

References:

- [1] Kakani V., Nguyen V.H., Basivi P.K., Kim H., Pasupuleti V.R., A critical review on computer vision and artificial intelligence in food industry. *Journal of Agriculture and Food Research*, Vol. 2, 2020, 100033.
- [2] Chan, C. M., Teoh, S. Y., Yeow, A., & Pan, G., Agility in responding to disruptive digital innovation: Case study of an SME, *Information Systems Journal*, Vol.29 No 2, 2018, pp.436-455.
- [3] Akpan, I. J. Udoh, E. A. P., & Adebisi, B., Small business awareness and adoption of state-of-the-art technologies in emerging and developing markets, and lessons from the COVID-19 pandemic, *Journal of Small Business & Entrepreneurship*, Vol.34, No.2, 2022, pp.123-140.
- [4] Akpan, I. J., & Brooks, R.J., Users' perceptions of the relative costs and benefits of 2D and 3D visual displays in discrete-event simulation, *Simulation*, Vol. 88, No.4, 2012, pp.464-480.

- [5] Akpan, I. J., Soopramanien, D., & Kwak, D. H. A., Cutting-Edge Technologies for Small Business and Innovation in the Era of COVID-19 Global Health Pandemic, *Journal of Small Business & Entrepreneurship*, Vol.33, No. 6, 2021, pp.607-617.
- [6] Smith, A. C., Thomas, E., Snoswell, C. L., Haydon, H., Mehrotra, A., Clemensen, J., & Caffery, L. J., Telehealth for Global Emergencies: Implications for Coronavirus Disease 2019 (COVID-19), *Journal of Telemedicine and Telecare*, Vol.26, No.5, 2020, pp.309-313.
- [7] Ting, D. S. W., Carin, L., Dzau, V., & Wong, T. Y., Digital Technology and COVID-19.” *Nature Medicine*, Vol. 26, No. 4, 2020, pp.459-461.
- [8] Papadopoulos, T., Baltas, K. N., & Balta, M. E., The Use of Digital Technologies by Small and Medium Enterprises during COVID-19: Implications for Theory and Practice, *International Journal of Information Management*, Vol. 55, 2020, 102192.
- [9] Vodă I. A., & Florea N., Impact of personality traits and entrepreneurship education on entrepreneurial intentions of business and engineering students, *Sustainability*, Vol.11, No.4, 2019, pp.1192.
- [10] Orel M., The Potentials of Virtual Reality in Entrepreneurship Education. In *New Perspectives on Virtual and Augmented Reality: Finding New Ways to Teach in a Transformed Learning Environment*; Daniela, L., Ed.; Routledge, Taylor and Francis Group: London, UK, 2020.
- [11] Grivokostopoulou F., Perikos I., Konstantinos K., & Hatzilygeroudis I., Teaching Renewable Energy Sources Using 3D Virtual World Technology. 2015 IEEE 15th International Conference on Advanced Learning Technologies, Hualien, Taiwan 2015, pp. 472-474.
- [12] Mazurek, G., Virtualization of marketing. *Contemporary Management Research*, Vol.8, No 3, 2012.
- [13] Gottlieb, U., Bianchi, C. Virtual trade shows: Exhibitors’ perspectives on virtual marketing capability requirements, *Electronic Commerce Research and Applications*, Vol.21, No 1, 2017, pp.17-26.
- [14] Li, H. Analysis of Virtual Reality Technology Applications in Agriculture. In: Li, D. (eds) *Computer And Computing Technologies In Agriculture*, Volume I. CCTA 2007. The International Federation for Information Processing, 258. Springer, Boston, MA, 2008.
- [15] Gani, M. O., Takahashi, Y., Faroque, A. R., Mortazavi, S., & Alam, M. Z., Virtual trade show: past assessment, present status, and future prospects, *Journal for International Business and Entrepreneurship Development*, Vol. 13, No. 3-4, 2021, pp.286-310.
- [16] Trainor, K. J., Rapp, A., Beitelspacher, L. S., & Schillewaert, N., Integrating information technology and marketing: An examination of the drivers and outcomes of e-Marketing capability, *Industrial marketing management*, Vol. 40, No.1, 2011, pp.162-174.
- [17] Bengtsson, M., Boter, H., & Vanyushyn, V., Integrating the internet and marketing operations: A study of antecedents in firms of different size, *International Small Business Journal*, Vol.25, No.1, 2007, pp.27-48.
- [18] Li, L., Antecedents and effect of internet implementation for trade shows, *Journal of Business & Industrial Marketing*, Vol. 25, No. 4, 2010, pp.272-283.
- [19] Levy, S., Does usage level of online services matter to customers’ bank loyalty? *Journal of Services Marketing*, Vol. 28, No.4, 2014, pp. 292-299.
- [20] Sarmiento, M. and Simões, C., Trade fairs as engagement platforms: the interplay between physical and virtual touch points, *European Journal of Marketing*, Vol. 53, No. 9, 2019, pp.1782-1807.
- [21] Singh, J., Shukla, P. and Kalafatis, S.P., IT usage for enhancing trade show performance: evidence from the aviation services, *Journal of Business & Industrial marketing*, Vol. 32, No. 3, 2017, pp.398-408.
- [22] Rust, R. T., & Espinoza, F., How Technology Advances Influence Business Research and Marketing Strategy, *Journal of Business Research*, Vol. 59, 2006, pp.1072-1078.
- [23] Geigenmüller, A., The role of virtual trade fairs in relationship value creation, *Journal of Business & Industrial Marketing*, Vol. 25, No. 4, 2010, pp. 284–292.
- [24] Singh, J., Shukla, P. and Kalafatis, S.P., IT usage for enhancing trade show performance:evidence from the aviation services, *Journal of Business & Industrial marketing*, Vol. 32, No. 3, 2017, pp.398-408.
- [25] Bathelt, H., & Schuldt, N., International trade fairs and global buzz, Part I: Ecology of global buzz, *European Planning Studies*, Vol.18, No.12, 2010, pp.1957-1974.

- [26] Aslesen H. W., Martin, R. & Sardo, S., The virtual is reality! On physical and virtual space in software firms' knowledge formation, *Entrepreneurship & Regional Development*, Vol.31, No.9-10, 2019, pp. 669-682,
- [27] Bloch, P. H., Gopalakrishna, S., Crecelius, A. T., & Scatolin Murarolli, M., Exploring booth design as a determinant of trade show success. *Journal of Business-to-business Marketing*, Vol.24, No.4, 2017, pp. 237-256.
- [28] Rinallo, D., Borghini, S., & Golfetto, F., Exploring visitor experiences at trade shows, *Journal of Business & Industrial Marketing*, Vol.25, No.4, 2010, pp.249-258.
- [29] SAAT online 3D platform, [Online]. <http://platform.saat.gr/> (Accessed Date: May 14, 2024).
- [30] WebGL, The Khronos® Group, [Online]. <https://www.khronos.org/webgl/> (Accessed Date: January 10, 2023).
- [31] Roslyn, [Online]. <https://github.com/dotnet/roslyn> (Accessed Date: January 12, 2023).
- [32] PUN, Photon, [Online]. <https://www.photonengine.com/en-us/photon> (Accessed Date: January 10, 2023).
- [33] Symfony, [Online]. <https://symfony.com/> (Accessed Date: January 18, 2023).
- [34] EasyAdmin, Symfony, [Online]. <https://symfony.com/bundles/EasyAdminBundle/current/index.html> (Accessed Date: January 19, 2023).
- [35] Herbig, P., O'Hara, B., & Palumbo, F. A., Trade show: who, what, why, *Marketing Intelligence & Planning*, Vol.16, No.7, 1998, pp. 425-435.
- [36] Hlee, S., Lee, J., Moon, D., & Yoo C., The acceptance of 'intelligent trade shows': Visitors' evaluations of IS innovation, *Information Systems Frontiers*, Vol. 19, 2017, pp. 717-729.
- [37] Rodriguez, A., Reina, M. D., & Sevilla, C., Trade shows as marketing tools. *Sustainable Tourism: A Collection of Tools and Best Practices*, 2015, pp.89-102.

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

The authors equally contributed to the present research, at all stages from the formulation of the problem to the final findings and solution.

Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself

No funding was received for conducting this study.

Conflict of Interest

The authors have no conflicts of interest to declare.

Creative Commons Attribution License 4.0 (Attribution 4.0 International, CC BY 4.0)

This article is published under the terms of the Creative Commons Attribution License 4.0

https://creativecommons.org/licenses/by/4.0/deed.en_US