Artist's Ordering System

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Abstract— **The Umevia platform is a state-of-the-art online artist booking system designed with an emphasis on efficiency, flexibility and user-friendliness. The project focuses on the use of modern technologies and providing automation in the field of order management. This article focuses on the technical architecture of the platform, including the implementation of key features such as artist filtering, availability calendar, order management and secure payment processing. In the following sections, we analyze the usage of the platform based on statistics on bookings and popularity of each artist category. An important part of the platform is also security and privacy, which is guaranteed by advanced encryption technologies and SSL certificates. The article also outlines the future development of the platform, which should strengthen the position of the Umevia platform for the management and booking of artistic services not only in Slovakia.**

I. INTRODUCTION

The very rapid development in the field of information technologies has become an irreplaceable part of our lives. That is why many companies seek for young professionals able to adapt to new or various changing trends very fast. One of the most affected subjects of these increasing changes are also the startup sector and private small companies, which use modern technologies to achieve their growth.

One of the most important features capable of turning into a competitive advantage that information technologies may bring to society is data analysis, which has become an integral part of many information systems and other software products [2], [3], [6], [17], and [21]. The main reason for its usage consists in the fact that it provides very valuable information resulting from real operational data [4], [7], [8], [14], [15], and [16].

The amount of data needed to be stored and processed has been rising very fast and thus, the attention of programmers and other scientifically oriented experts has been paid to the completely sophisticated spectrum of data science [9], [10], [11], [17], [20], and [23]. Because of data analyzing necessity, the international project was introduced [27] and the achieved results may bring significant benefits to all of us. Its main idea is based on using advanced database technologies in sophisticated data analysis [12], [13], [24], and [26].

We are currently experiencing a significant increase in digitization across a variety of sectors, and the cultural industries are no exception. With the development of online technologies and the digitization of services, more and more areas, including the organization of cultural and artistic events, are relying on digital platforms to streamline processes and simplify communication between service providers and their customers. One innovation in this area is the Umevia platform, which brings a new way to book artists for different types of events, from private celebrations to public events. This platform offers a unique space for artists of different backgrounds, such as musicians, presenters, photographers or performers, to easily offer and manage their services in a digital environment [18].

While traditional methods of booking artists often involve manual communication and intermediaries, the Umevia platform seeks to automate and simplify the process. Users can search for artists through an online interface based on specific criteria such as genre, location, price or availability, significantly reducing the time it takes to secure artist services for an event. At the same time, artists gain direct access to potential customers without having to use expensive intermediary services. This model is not just about technology, but also about democratizing the market for artistic services, where talented artists can build their careers directly through a digital platform without the need for a legal form.

In the context of global trends towards digitization of the cultural industry, similar platforms have seen success in other countries, which allow artists to offer their services digitally. Umevia builds on these foundations and brings a solution tailored to the needs of the Slovak and Central European market, where the demand for digitization of cultural events is growing, and the digitization of Slovak cultural heritage is an example.

Given these trends and the evolving market, Umevia represents a significant innovation for artists and promoters alike, bringing benefits in the form of faster communication, better management of bookings and a more transparent billing system.
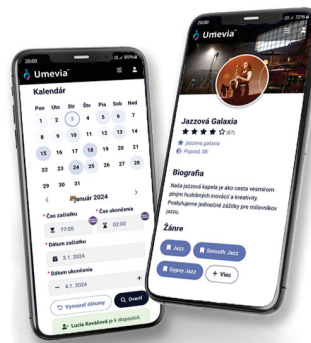

Fig. 1 Umevia platform on mobile devices

II. COMPARISON OF EXISTING SOLUTIONS

There are now several platforms that allow artists to promote their services and event organizers to find suitable performers. However, each of these platforms handles booking artists in a different way and has its own specificities. To compare the Umevia platform, it is necessary to examine competing solutions such as event agencies, social media (e.g. Instagram or Facebook) and some specialized booking systems, or its other similar foreign competitors.

One of the most traditional ways to secure artists for events is through event agencies. These agencies act as intermediaries between artists and clients, usually providing a complete service - from artist selection to logistics and communication. Although these agencies offer a high level of service, their disadvantage is often a higher price for mediation and less transparent pricing models. Clients do not have direct contact with the artists and the artists themselves cannot actively participate in the pricing of their performances. In comparison, Umevia provides a platform where artists and clients can interact directly, reducing costs and increasing transparency throughout the booking process.

Social media, such as Instagram and Facebook, also offer a space where artists can showcase their portfolio and interact with their fans or potential clients. Instagram allows artists to share photos and videos of their performances, while Facebook offers a more comprehensive space to create events and manage fan pages. However, these platforms don't have an integrated booking and billing management system, which means all communication and negotiation of terms is done informally through messages or comments. In contrast, Umevia is designed specifically for booking artist appearances, automating the entire process from search to booking to invoicing, making it easier for both parties to manage their time and resources.

Internationally, there are various competing platforms that focus on booking artists abroad. They are like the Umevii platform in that they offer a direct link between artists and clients without the need for intermediaries. However, Umevia brings a localized solution for the Slovak and Central European market with an emphasis on the specific needs of local artists and organizers. Additionally, Umevia allows artists to manage their availability calendar in real-time, a feature that competing platforms do not offer to such an extent.

Compared to these solutions, Umevia offers a unique combination of transparency, flexibility and process automation. While traditional agencies rely on face-to-face communication and full service, Umevia provides fast and direct access to artists with minimal intermediary costs. While social media allows artists to build their name online, they cannot provide the same level of professionalism and convenience as Umevia without a comprehensive order management and billing system [18].

The figure below compares the critical factors between competitors and the Umevia platform. This comparison allows for the identification of opportunities for improvement and innovation, as well as the development of unique competitive advantages that will be a key pillar in building a successful Umevia platform.
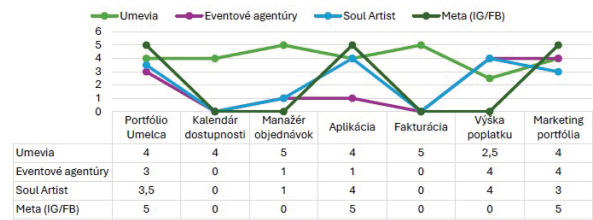

	Portfólio Umelca	Kalendár dostupnosti	Manažér objednávok	Aplikácia	Fakturácia	Výška poplatku	Marketing portfólia
Umevia	4	4	5	4	5	2,5	4
Eventové agentúry	3	0	1	1	0	4	4
Soul Artist	3,5	0	1	4	0	4	3
Meta (IG/FB)	5	0	0	5	0	0	5

Fig. 2 Comparison of existing solutions

III. PLATFORM ARCHITEXTURE

A. Technology stack

The Umevia platform uses a combination of proven and advanced technologies to ensure stability, security and scalability:

- **Frontend** (user interface): Angular - being a modern, component-based frontend framework, is perfect for building responsive and dynamic web applications. It offers two-way data binding, making it easier to handle real-time updates on reservations and payment statuses. Angular is highly scalable due to its modular architecture, which allows for better management of large codebases, crucial for a growing platform like Umevia [1], [5].

- **Backend** (server logic): Spring Boot - simplifies the process of creating robust, production-ready RESTful services, making it ideal for handling payment gateways and reservation systems. It integrates easily with JPA (Java Persistence API) for managing database interactions, and it offers built-in security frameworks for protecting sensitive data like payment information. Spring Boot supports the creation of microservices, which is helpful when dealing with modular features like payments, bookings, and user management. This ensures better fault isolation and easier scaling [19], [25].

- **Database**: MariaDB – is known for its performance, especially for complex queries and large datasets, such as booking histories or transaction logs. It also offers excellent compatibility with MySQL, while providing better performance in many cases. MariaDB's open-source nature makes it a cost-effective choice. MariaDB is well-suited for handling financial transactions due to its advanced encryption features, making it ideal for a project dealing with sensitive payment data [22],

B. System architecture

The Umevia system is divided into multiple modules that work together to provide a seamless user experience and efficient order management:

1. **User interface (UI):** Users (both artists and commissioners) interact with the system through a web interface that is built on the Angular and PrimeNG frameworks. Thanks to the responsive

design, the site adapts to different devices, ensuring usability on mobile, tablet and desktop.

2. **Booking module:** One of the key elements of the platform is the booking management module. This module allows bookers to book artists for different events according to their availability and preferences. Thanks to asynchronous processing, the system can efficiently handle concurrent booking requests while minimizing the risk of conflicts.

3. **Managing artist profiles:** Each artist has their own profile where they can add information about themselves, their portfolio, availability and pricing. This profile is dynamically updated and stored in MariaDB, allowing for quick retrieval and modification of data without the need to restart the system.

4. **Payment system and invoicing**: Umevia has also implemented a payment and invoicing module that provides a seamless payment gateway. Invoicing takes place automatically once the artist's order is confirmed. This module is connected to external payment systems, such as Stripe, ensuring security and transparency of payments.

IV. IMPLEMENTATION OF FUNCTIONS

The Umevia platform is designed with ease of use and efficiency in mind, providing a wide range of features to ensure seamless management of artists and their bookings. Key features of the platform have been carefully implemented to enhance the user experience and provide flexible artist management tools.

A. Filtering artists

One of the main features of the platform is a robust artist filtering system that allows commissioners to search for artists based on a variety of criteria:

- **Category of artist:** Customers can choose from a wide range of categories such as musicians, dancers, theatre artists and more, allowing them to quickly find an artist that fits their needs.

- **Price range:** Filtering by price ensures that bookers can select an artist within their budget, making the system accessible for different types of events.

- **Ratings:** Feedback from previous customers plays an important role in decision making. Umevia has implemented a ratings and reviews feature that allows customers to choose an artist based on other users' experiences.

- **Availability:** The system offers the ability to filter artists by their availability, which simplifies scheduling and booking for specific dates.

This functionality ensures that every user can find an artist that suits their specific requirements quickly and efficiently.

B. Availability calendar

A key module of the platform is the availability calendar, which allows bookers to see the available dates of individual artists in real time. Artists can update their calendar, and customers can instantly make a booking for an available date without the need for further communication. This feature is designed to minimize the risk of double bookings and for artists to keep track of their upcoming performances.

C. Order management and invoicing

The Umevia platform includes a comprehensive order manager that allows both artists and bookers to track the status of bookings. Once a booking has been made, the order is registered in the system, where its status can be tracked - from the receipt of the order to its successful fulfillment.

This functionality also includes automated invoicing, which generates an invoice or contract upon order confirmation, depending on whether the artist is a company, a freelancer or represents an individual. This process is fully integrated with the Stripe payment gateway, which secures the transactions made in the platform.

D. Feedback and evaluation of artists

To support the quality of service, the platform implements a feedback and evaluation system for artists. Customers can leave a review and rating after each successful collaboration, which is then displayed on the artist's profile. This module helps to build trust between users and promotes transparency, as artists can also rate the approach of commissioners.

E. Transparency for users

For both parties - artists and commissioners - the platform is designed to provide clear navigation and easy access to information. Commissioners have an overview of all their commissions in the system, whether they are made, pending confirmation or completed, while artists are able to clearly manage their future performances and available dates.

V. STATISTICS AND USAGE ANALYSIS

In order to gain a deeper insight into the use of the Umevia platform, data on user activity was continuously collected and analyzed. These statistics provide valuable insights into the popularity of each artist category, the effectiveness of bookings and the overall growth of the platform.

A. Number of bookings and active users

Since its launch, the Umevia platform has experienced consistent growth in both its user base and the number of reservations. In the first six months, over 100 registrations of artists were completed, achieved either through cold emails followed by phone calls or through social media advertising campaigns. Statistically, the success rate was **42%** for direct calls and **58%** for advertisements. The platform's founders attribute the initial lower success rate of calls to a learning curve in effectively communicating with artists. As their familiarity with the artists' professional language increased, the efficiency of calls improved. In contrast, the social media

advertisements demonstrated success from the outset, contributing significantly to the platform's early achievements.

B. The most frequently occurring categories of artists

An analysis of artist users on the Umevia platform revealed significant differences in the popularity of different artist categories. Musicians are the largest group, accounting for up to 50% of all artists on the platform, indicating a strong interest in live music. Photographers are the second largest group, representing 26% of artists. This category is particularly popular in relation to weddings and corporate events. Artists focused on children's work make up 22% of artists, making them the third most popular category. Finally, dancers represent only 1% of the total number of artists, making them the smallest represented category on the platform. This percentage representation is shown in the figure below.
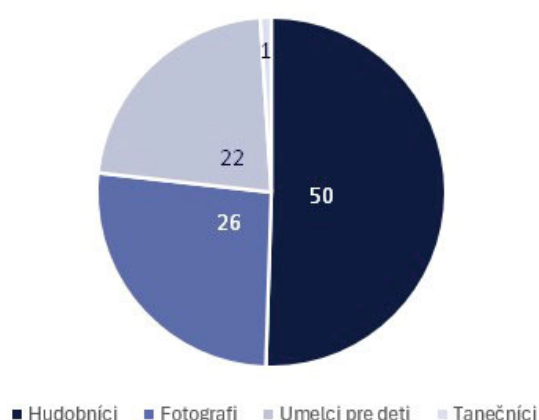

Fig. 3 The most frequently occurring categories of artists

C. Analysis of the busiest hours

The graph shown below highlights artist and customer hours used on the platform between 1 January 2024 and 31 July 2024. The X-axis shows the hours of the day (in local time), while the Y-axis shows the number of hours of activity at those times.

Artists show the highest level of activity in the morning and evening hours, with peak activity around 9:00 am, where they reach a maximum, i.e. around 5 hours of utilization. Another significant peak occurs at 2:00 pm and in the late evening, namely around 9:00 pm, a high level of activity is again recorded, reaching approximately 4 hours. In between, there are smaller levels of activity around 6:00 pm and 5:00 pm.

Customers are most active on the platform in the afternoon. Their highest activity is recorded between 12:00pm and 5:00pm, with a peak between 12:00pm and 2:00pm when 2 hours of utilization are recorded.

Based on this analysis, it can be concluded that artists are mainly active during the morning and evening hours, while customers show higher activity in the afternoon. This discrepancy in times may indicate a need to better align artist availability with the times when customers are most active in order to maximize the efficiency of the platform.

Fig. 4 Analysis of the busiest hours

D. Analysis of active profiles

The status of the artist's registration completion when verified in the Stripe payment gateway on the Umevia platform is shown below. The largest proportion of artists shows that 58% of artists have completed registration, meaning they have successfully completed all required details, including ID verification.

On the other hand, 42% of artists are not fully active on the platform, which significantly affects their visibility. This deficiency is divided into three categories, with 19% of artists having a limited account, which may indicate that the registration is incomplete or contains incomplete data. Then 11% of artists have an account activated but have not gone through full verification, and a smaller proportion, marked in the palest color, represent artists who have not yet created a Stripe account.

Statistics point to the fact that almost half of the artists are not fully visible on the platform because they faced problems uploading the necessary documents, namely their ID. This step, although necessary to ensure the reliability of the data, is a barrier that has discouraged many artists from completing the process. From the above, it is clear that the identity verification process needs to be rethought and simplified to reduce the barriers and allow these users to be reclaimed.
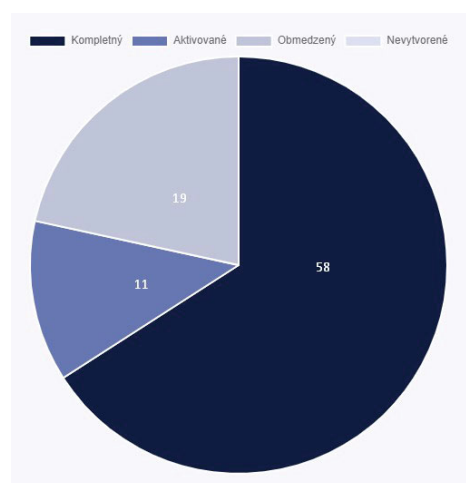

Fig. 5 Analysis of active profiles

E. Feedback and user satisfaction

The platform's user feedback system indicates a high level of satisfaction with the platform. The average artist rating is 4.9 out of 5 stars, with 90% of users leaving a positive review during their interaction with the platform.

VI. SECURITY AND DATA PROTECTION

Security and privacy are critical aspects of any platform in the digital age, and Umevia is not lagging in this regard. With an increasing amount of sensitive information being processed for bookings and payments, it is imperative to implement strict security measures to ensure that user data is protected from unauthorized access or leakage.

A. Privacy Policy

The Umevia platform is designed with an emphasis on compliance with data protection legislation, specifically the GDPR (General Data Protection Regulation). All users' personal data, including information about artists and commissioners, is stored and processed in accordance with this legislation. An advanced encryption system is used in the storage of data to ensure that sensitive information is protected even in the event of unauthorized access to the database. Data encryption prevents hackers from reading personal information should the system be penetrated.

B. Securing transactions

The Umevia platform uses SSL certificates (Secure Sockets Layer) to ensure encrypted data transfer between users and servers. This certificate protects all data that passes through the platform and ensures that sensitive information, such as login and payment information, is transmitted securely. Payments made through the platform are processed through the payment gateway Stripe, which uses its own security protocols to protect financial transactions.

These gateways implement additional layers of encryption and security, including 2-factor authentication and fraudulent transaction monitoring, to keep all payments safe and secure from abuse.

C. Access rights and authentication

To minimize the risk of unauthorized access, the platform uses a user account-based authentication system where each user is required to create a strong password and verify their identity. A multi-level access rights system is also implemented, which means that sensitive data is only accessible to authorized persons.

Additionally, for administrator accounts and sensitive operations, 2-Factor Authentication (2FA) can be enabled, which adds an extra layer of security by requiring login verification via mobile device or email [18].

VII. FUTURE DEVELOPMENT AND INNOVATION

The Umevia platform is constantly evolving to improve the user experience and adapt to changing market needs. Future developments of the platform will focus on integrating new technologies, improving functionality and expanding opportunities for both users and artists.

A. Advanced analytical tools

Going forward, Umevia will continue to expand its analytics tools that provide detailed statistics on artist performance and user behavior. Artists will be able to track how often their profiles are visited, what their most popular periods are, and what regions their customers come from. This data will help them better target their marketing activities and improve their visibility.

B. Extending payment options

In order to increase accessibility and convenience for users, the introduction of other payment methods is planned, including cryptocurrencies or expansion of payment options. There are also plans to split the payment, i.e. the customer will have a choice whether to pay in part or the full amount at once. These new payment methods would allow for faster and more flexible transactions, improving the overall user experience.

C. International expansion and multilingual support

One of the long-term goals is the international expansion of the platform. Currently, Umevia is mainly focused on the Slovak market, but in the future, it is planned to expand to other countries. This includes the implementation of multilingual support, which is partly integrated, but further adjustments are needed to make the most of it to reach an international audience.

"The primary goal of the Umevia platform and its development team is to continuously monitor the benefits of the platform for its users. This responsibility includes not only regular monitoring of customer satisfaction, but also actively responding to user feedback and requests. The long-term success of any digital platform depends on its ability to flexibly adapt to the changing needs and expectations of its users. It is therefore essential for Umevia to implement dynamic development processes that enable the rapid integration of new features, and the improvement of the user experience based on specific community requirements. This strategy ensures that the platform remains competitive and efficient in fulfilling its primary purpose - to provide a high-level artistic service," said the co-founder of the Umevia platform.

VIII. CONCLUSIONS

The Umevia platform represents an innovative solution for digitalization of the cultural and artistic sector in Slovakia and abroad. Its contribution lies in the efficient connection of artists with the public through a simple and intuitive booking system that simplifies the organization and management of events. Automated processes such as invoicing and order management save time and resources, allowing artists to focus on their creative work. The platform also contributes to more transparent feedback and improved quality of service.

Going forward, Umevia has the potential to improve and expand its functionality, for example through integration with analytics tools that will provide deeper insights into the success

of events and artist profiles. These improvements can contribute to even better support for artists and organizers, making Umevia a key tool for the digitalization of the cultural sector and its further development.

The Umevia platform has expanded the promotion opportunities for artists, thus aiming to support the development of the cultural sector in the digital era in Slovakia.

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