

Multi-user event planning web-application

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Given the fact that we live in a time when everything is surrounded by technology and most of the people are looking for faster and more efficient alternatives regarding their problems, developers must adapt and provide modern solutions. By doing a research, we discovered that event planning is a domain which has not registered any standing out improvements in terms of technology yet. Therefore, in this paper, we propose a web application for making event planning a more efficient process.

Keywords: *event planning, efficient, multi-user web application*

1 Introduction

Event planning is a relatively new industry in Romania, in 2018 being on the 26th place of 35 European countries [1]. This domain is in a continuous development process, new technologies, equipment and even services have started to appear. There have been developed new tools so that people could organize their tasks, manage the seating plan for the guests or even personalizing their own invitation cards.

Romanian people are very popular for their excitement when it comes to parties, even if we speak about weddings, anniversaries or even corporate parties, but organising an event could be a long term process, involving a lot of time and energy. As we live in a time when nobody has as much free time as they desire, people are prioritizing their tasks and are trying to find efficient solutions that do not take much time.

Organizing a party could be exhausting, because there are multiple elements that should be taken into consideration. First of all, event organizers must do a brief research in order to get acquainted with the latest offers and services in this domain. Additionally, they should take into account the number of guests and the budget so that they book appropriate services regarding their wishes and financials. It is also necessarily to verify if those companies are

available on the day of the event and to ensure that they could offer the services you expect to.

Taking into consideration these aspects, we have decided to develop a web application that on the one hand, supports people in order to organise their party and on the other hand, provides a marketing platform for companies which activate in events planning field. This app is called “Plan it your style” and aims to optimize the steps of planning a party by automatically creating packages of service types offers. These packages will contain all the services needed in order to organize an event. They could include event locations, live music, decorations, candy bar, photo corner, fireworks, DJs and MCs, but restricted by the user’s budget.

Plan it your style also has a specialized interface for companies that provide services in event planning domain. This interface allows users to update their page with new information in any moment, without depending on people who are working for the app support and additionally, service providers could mention the dates that are no longer available.

2 Comparison with other software products

In event planning domain there has been developed a large variety of tools in order to help people when organizing a party. Most of them aim to inform users about the steps they need to follow in this process and are extremely useful especially for those who haven't any experience in this field. This kind of applications may seem like a guide which contains all the information and the tasks that should be done in order to get a successful result.

The first similarity between the presented app and the others is that they are free of charge. Therefore, the only taxes that a user must pay are those charged by the service providers.

One example of this type of application is Epic Plan (<https://epicplan.ro/>). Epic Plan offers users the possibility to create a personalized to do list which includes all the details that should be taken into account. It also provides a functionality that keeps track of expenditures where people can save the total price, the advance payed and also the remaining value that should be payed. In addition, Epic Plan has two more functionalities regarding the guests. The first one refers to a list where there are saved details about the guests. The list holds information about the name, the number of persons that he is accompanied of, the number of the table, the menu (standard/vegetarian), the relationship (friends/family), the email and also a checkbox that displays if the guest has accepted the invitation or not. The second functionality allows the user to manage the perfect seating plan by simply drag and drop the guests from a list.

Another type of software product is the one which is based on the concept of online full-service agency. This type of application offers the opportunity to preview companies that provide a variety of services in only one web page. In this way, users will easily find all the services that are interested in, without consuming much time. The application offers

information regarding the starting prices, a description of the company, reviews from other clients, contact details and also images that promote the products. An example of this kind of application is Fiestador (<https://fiestador.ro/>). Fiestador also has an interface for companies which provide services like photography, events location, candy bar, photo corner and many others.

There are multiple similarities between the presented software products and the one described in this paper. Plan it your style comes up with solutions for organizing the budget like Epic Plan does and it could also be named as an online full-service agency because in a single page users will find all the services they wish for.

3 Innovative functionalities

The presented application provides some innovative solutions apart from the ones described in section 2. One of them is that it focuses on the concept of personalization for both types of users: event organizers and service providers. For an event organizer, the process of personalization starts by completing a form, which contains three sets of images. Each image has associated a style and depending on the number of images selected from each style, the one with the maximum number is the result. When it comes to a service provider, they must choose their style in the registration form. The form contains a section where all the predefined styles will be listed along with their descriptions. In this way, a service provider will select the style which considers that suits the best their company's image.

Another new concept is the opportunity of automatically generating packages for the event planners. In order to create a package, a user must complete a form which contains three parts. The first one consists of event details like event type, number of guests, budget, the event date and the city, while the second part is represented by the style defining which has

been described by the personalization process. Last but not least, the third part of the form contains a checklist of service types. Each user must select a service type that wants to be included in the package. After filling in all the parts, the application applies an algorithm in order to display the resulted style and a set of packages of offers whose value fit in the budget. The offers belong to service providers that match the event's style and are also available on the event date.

For those who do not want to generate packages automatically, Plan it your style offers the opportunity of customising packages. The application contains a section named "My packages" where users can manage their sets of offers. They can add new offers to existing packages by surfing on service provider's personal pages. After the insertion, the value of the package will be automatically calculated by the program.

Another innovative functionality for event planners is a page that will display all sort

of statistics regarding the latest trends in terms of parties. The page consists of four bar charts that present the most popular service categories for every event type, the medium budget for all event types, the most popular styles and also the party types distribution on months. In this way, people who do not know much about events will be well informed.

In terms of service providers' interface, the innovative functionality is that they have the opportunity to personalize their page at any time and that they can manage their already booked dates.

4 Designing the application

In order to benefit of the application functionalities a user must log in. If he has not an account yet, he will complete a registration form. After logging in, the user will be redirected to the start page which contains a menu where the user can access the main functionalities. These functionalities are displayed in **Fig. 1.** through the general use case diagram.

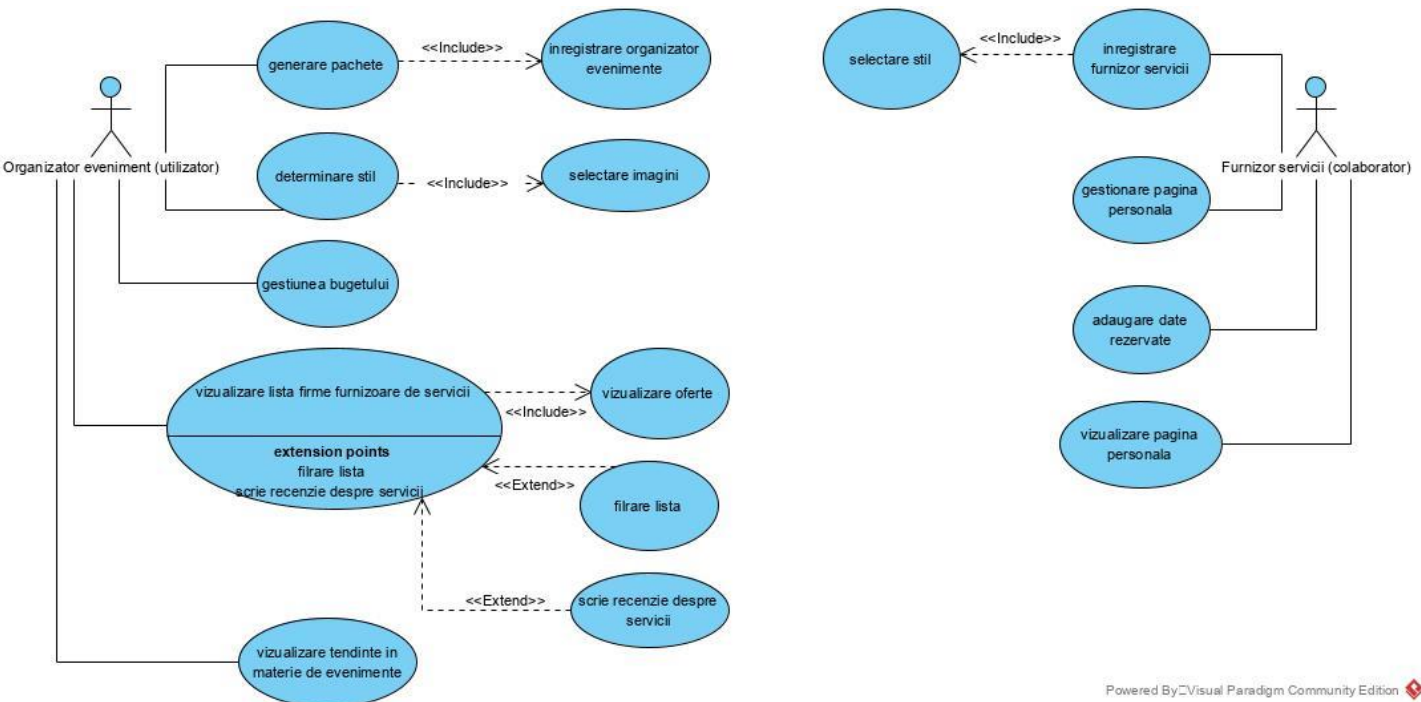


Fig. 1. General use case diagram

The use cases that need to be detailed are: the budget organizer, the management of the service provider’s page and also the package generator. **Fig. 2.** depicts the

actions that a user can do through the budget organizer page (insert, update or delete an expenditure, view the general situation regarding the expenditures).

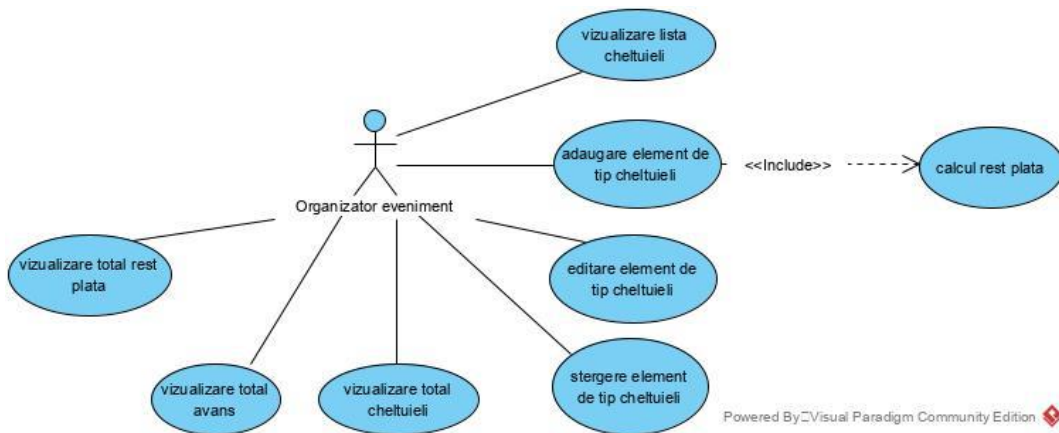


Fig. 2. Budget organizer use case diagram

Fig. 3. describes the functionality of managing the personal page associated to the service providers’ interface. A service provider can update the company’s

description, the profile picture and the contact information. This kind of user can also add, update or delete offers and presentation images.

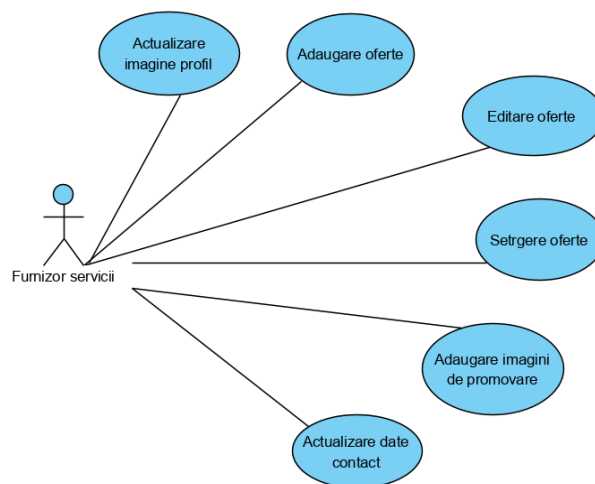


Fig. 3. Personal page management use case diagram

In **Fig. 4.** there is described the detailed use case diagram for generating packages. It can be observed that an event organizer

can generate a package automatically by filling in a form or he can customize one by selecting service providers’ offers.

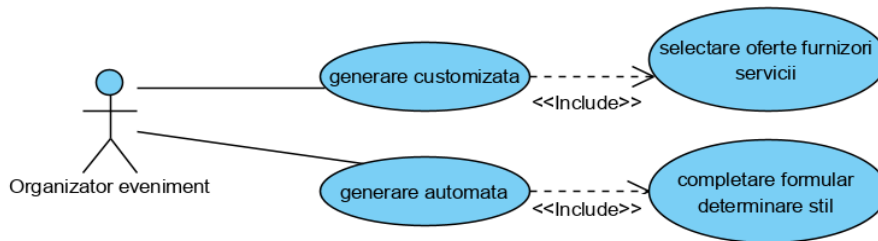


Fig. 4. Package generator use case diagram

When starting to complete the form in order to generate packages, the user should respect some rules so that he can successfully finish this action. For example, in the first part of the form all fields must be completed, where as in the second part, the user should select three images from each presented set. Regarding the last part, the event planner must choose at least one service type that he wants to include in the package. If the user does not respect any of the presented conditions, the access to the following parts will be restricted. The diagram displayed in Fig. 5. describes the whole process of filling in the form and displaying the result through an activity diagram.

The algorithm of automatically generating packages is based on a successive data filtering. First of all, using an SQL interrogation it will be retrieved from the database a list of service providers' offers. These offers belong to service providers that match with the resulted style of the event and that are also available on the day of the event. The next step refers to building a dictionary, which is defined as a collection of keys and values. Therefore, the service types will represent the keys and the list of offers corresponding to each service type will represent the values. In this way, the collection is easily manipulated. In order to make this whole process more efficient, the program will calculate the minimum, maximum and the average value of the packages based on the offers from the dictionary. After that, the user's budget will be compared with the

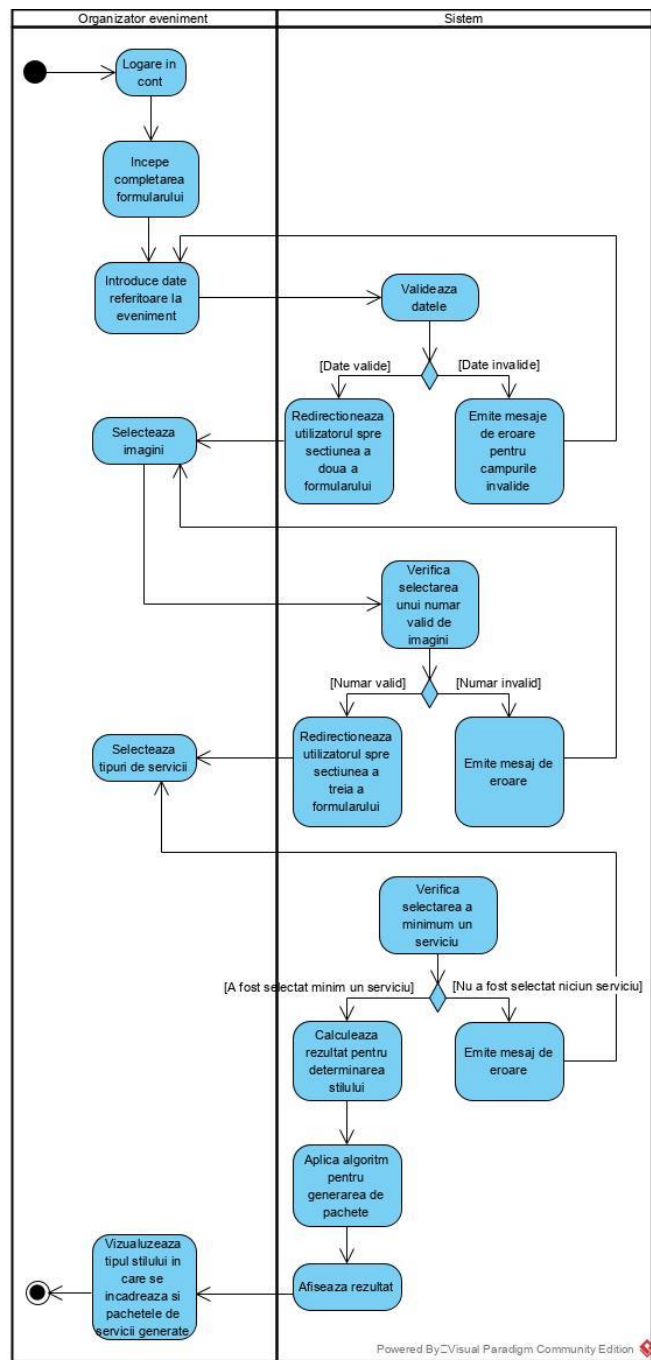


Fig. 5. Automatically generating packages activity diagram

earlier calculated values and it will be determined in which interval fits. The possible intervals are the following: $[0, \text{minimum_value})$, $[\text{minimum_value}, \text{average_value}]$, $(\text{average_value}, \text{maximum_value}]$ or grater than the maximum value. When the budget fits in the second or the third interval, the dictionary will be filtered by keeping just those offers which have a price between the lowest priced offer and the medium priced offer in that category, respectively between the medium priced and the most expensive offer. After the filtering, all the remaining offers are suitable candidates for being included in the generated packages, because the price belongs to the same category as the budget, the service providers match the event's style and all of them are available on the event day.

Therefore, it will be created a set of packages by randomly selecting offers from the filtered map, one offer for each type of service, but with the condition that the total value of the offers will not go over the budget.

On the other hand, if the user's budget is lower than the minimum possible value, the initial dictionary of offers will be filtered and will store just those offers that have the minimum value for each category. Each service type has a priority form 1 to 3, priority 1 being the most important. Therefore, the dictionary will be sorted by priority and by price and then the last offer will be removed in order to verify if the value is still over the budget. The action of removing offers will be done until the value will fit the budget.

The database schema is presented in Fig. 6.

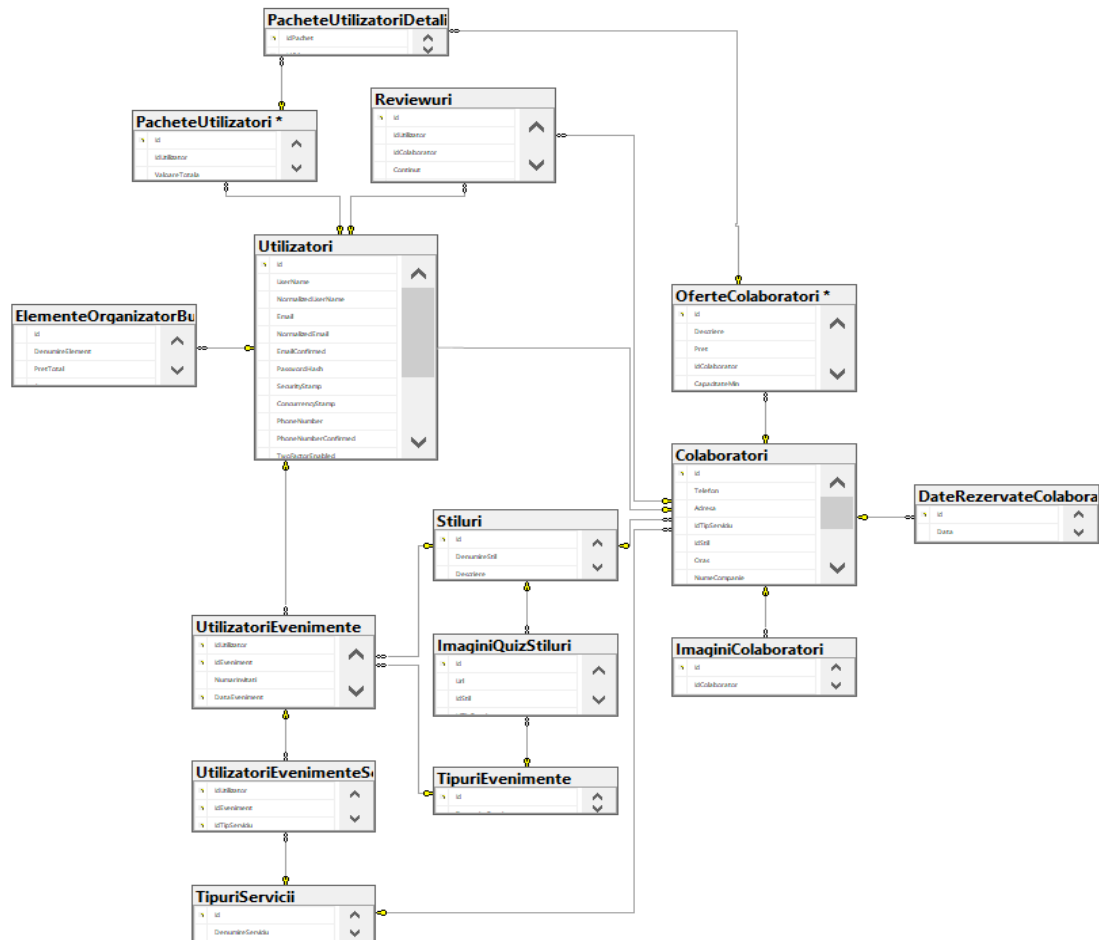


Fig. 6. Database schema

5 Software technologies

Plan it your style is an app with a REST Api architecture. REST stands for Representational State Transfer and it represents an architectural style being often used in the development of web services. REST does not enforce any rule regarding how it should be implemented at lower level, it just imposes high level design guidelines and gives you freedom in choosing your own implementation [2]. In addition, both the client and the server components can be build independently, without each knowing about the other. This means that the code on the client side can be changed at any time without affecting the operation of the server, and the code on the server side can be changed without affecting the operation of the client. Although, the messages format should be respected during the communication between the two components, otherwise the system will no longer work correctly.

The communication between the client and the server starts with a request of a client to the server in order to retrieve information or to modify data on the server. A request has a standard format and must contain a HTTP verb (GET, PUT, POST or DELETE), which will define what type of operation to perform, a header that allows the client to pass along information about the request, the path to the source and an optional message called body message that contains all the data a client sends to a server [3].

Methods defined by the HTTP verbs are in close connection with the CRUD concept. CRUD is an acronym for CREATE, READ, UPDATE, DELETE. These form the standard database commands that are the foundation of CRUD. When an Api is build, we want to create a model that has the ability to perform at most these four functions so that it can be considered complete. Therefore, in order to create new resources, in a REST Api architecture, most of the times we will use HTTP POST method. Also, for reading data it will be

used HTTP GET, for updates HTTP PUT and for delete actions we will use HTTP DELETE method.

In order to make the communication between the client and the server more efficient and more secure, it has been used a JSON Web Token (JWT) mechanism. JWT is an open standard (RFC 7519) that defines a compact and self-contained way for securely transmitting information between parties as a JSON object. This information can be verified and trusted because it is digitally signed [4]. Therefore, when a user loges in, the application will generate a unique token that will be valid until the user loges out. This token will be passed along with every request to the server, in this way, the profile of the user who sent the request being kept privately. The token has a standard format and consists of three parts separated by a dot (General format: xxxxx.yyyyy.zzzzz).

Plan it your style is an application that was implemented using ASP .Net Core and Angular technologies. ASP .Net Core is a framework developed by Microsoft which is usually used for creating modern web applications. It has a modular architecture and more advanced features can be added as NuGet packages, depending on the application's requirements. Therefore, ASP .Net Core provides benefits like high performance, less memory required, less deployment size and easy maintenance. [5]

In terms of server-database communication, we utilized a technology named Entity Framework Core. This framework is used as an object-relational mapper (ORM), enabling developers to work with a database using .Net objects, this way reducing the amount of code they needed to write in order to access the data. Regarding the client implementation, it has been utilized Angular technology. Angular is an open-source front-end web framework that uses HTML and TypeScript. An angular application is

defined by a set of NgModels, which provide a compilation context for components. Components define views which are sets of screen elements from the application and use services in order to provide specific functionalities, but are not directly related to views [6].

In terms of the database administration, it has been used SQL Server Express along with Microsoft SQL Server Management Studio, which provides a user-friendly interface in order to manage the data. SQL Server Express is a database management system that can be used to store and access the information held in many different databases. It uses SQL, which is a domain-

specific language utilized in programming for maintaining data stored in a relational database system.

6 Application's Interface

The presented application has a user-friendly interface for both kind of users (**Fig. 7.**). All the actions that can be done are very intuitive, being suggested by suitable pictograms. For instance, the action of deleting an item will be presented as a trash can icon.

In addition, the main functionalities will be presented in the application menu, so that they can be easily accessed.



Fig. 7. Event planner interface main page

When it comes to the service providers' interface (**Fig. 8.**), the main page is represented by the management of their personal page. Here, service providers are

able to update offers, to add or delete presentation images or even to change their profile picture.

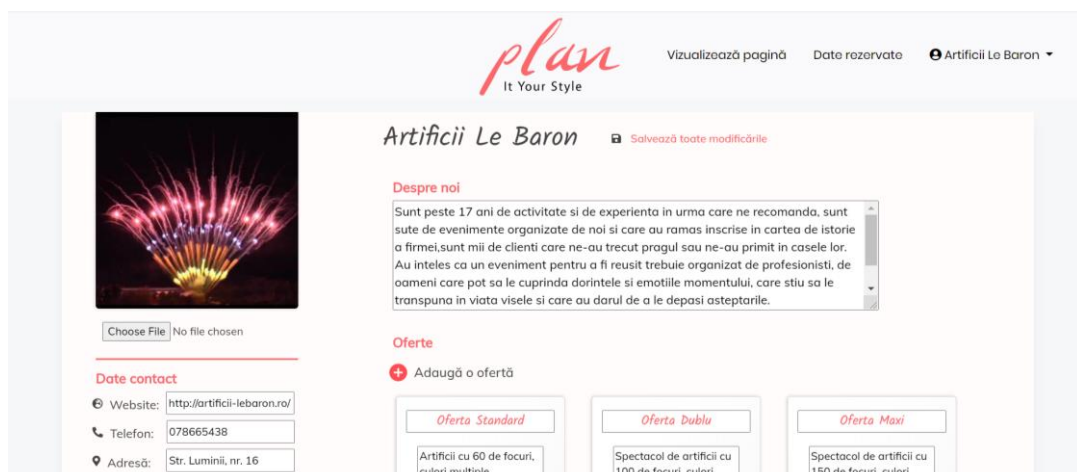


Fig. 8. Service provider interface main page

Through their specific interface, event planners can automatically generate packages, as there has been presented in the previous sections, they can also customize packages, visualise the service providers list, organize their budget and last, but not least, they can inform about the latest trends in terms of events.

In **Fig. 9.** there is depicted a bar chart that displays the most popular service types for each event category. It can be observed that for an anniversary the top 3 service types are candy bars, live music and decorations, whereas for a corporate party the most popular are fireworks and candy bars.

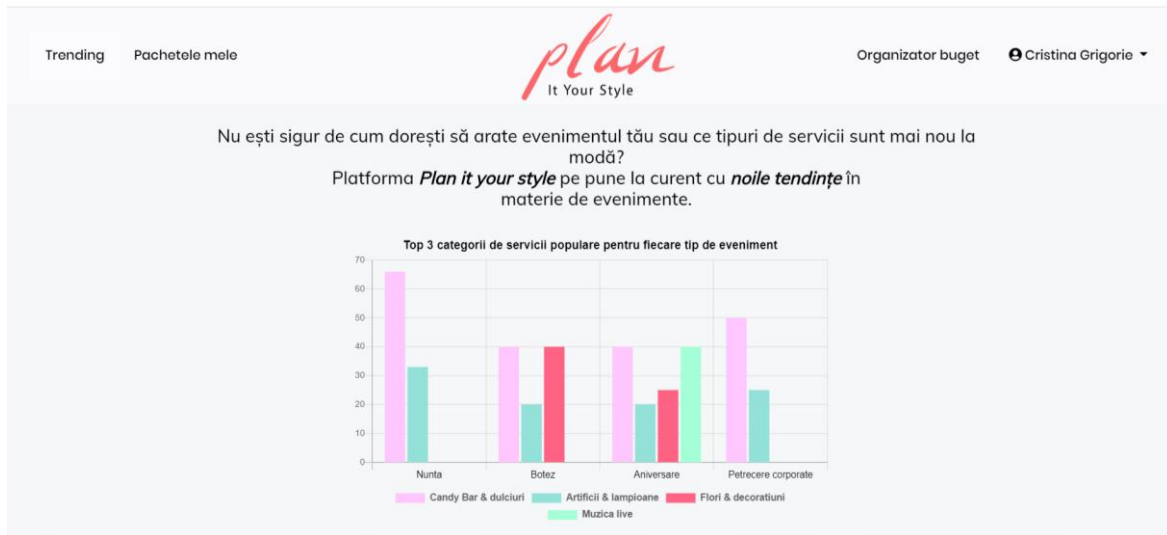


Fig. 9. Most popular service categories for each event type chart

Regarding the budget organizer (**Fig. 10.**), the page consists of two sections. The first section presents the general situation of the expenditures, containing details about total value of the expenditures, the total advance that was paid and the total remaining payment. Also, in order to highlight the percentage that has already been paid from the total sum, it has been used a progress bar. The second part of the page is

represented by a table where there are stored the expenditures along with their details: name, total value, advance payment and remaining payment. In addition, the user can edit or delete any of the existing elements from the table. After every action on these items, the values from the first section will be automatically updated by the program.



Fig. 10. Budget organizer page

In terms of a service provider interface, the functionalities that he can benefit of are managing the personal page, viewing his page as an event planner user and also manage the already booked dates.

Because we consider that feedback is an important aspect, we have offered the possibility to the service providers to view their page as they were an event planner

user. Apart from the elements they have added through the management section, they will be able to see the reviews from other clients (**Fig. 11.**). This way, service providers can improve the quality of their services and will be informed about whether the event planners enjoyed the experience of working with them or not.

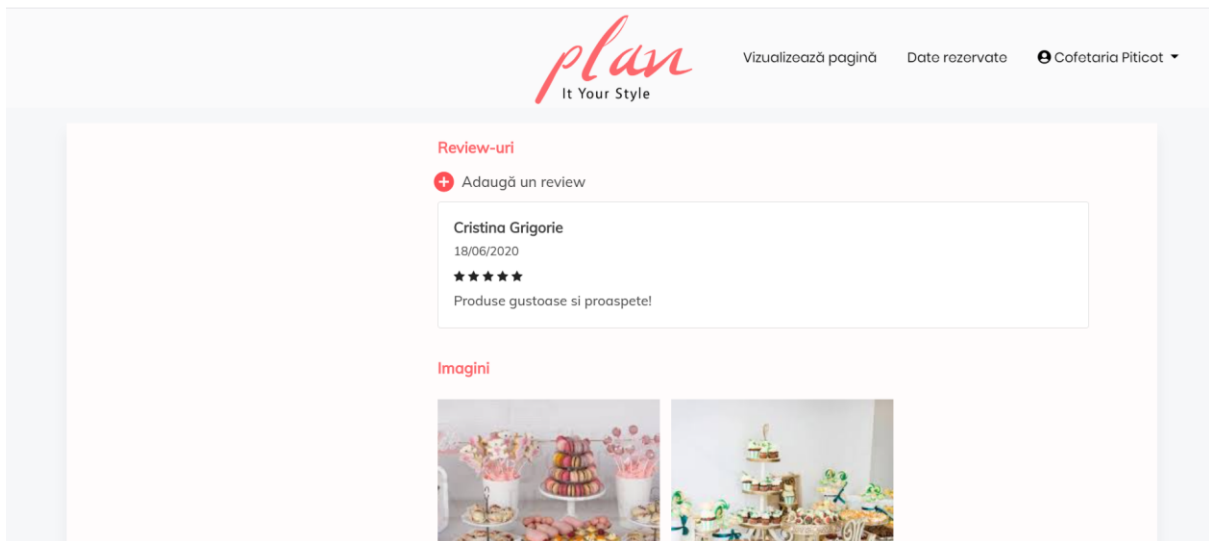


Fig. 11. Review section from view page option

Regarding the booked dates management, a service provider can access the option from the main menu. This way, it will be displayed a pop-up with a calendar where the already booked dates are highlighted

(**Fig. 12.**). In case an event was cancelled, a user can make that date available again. In order to save the changes, the service provider must press the save changes button.

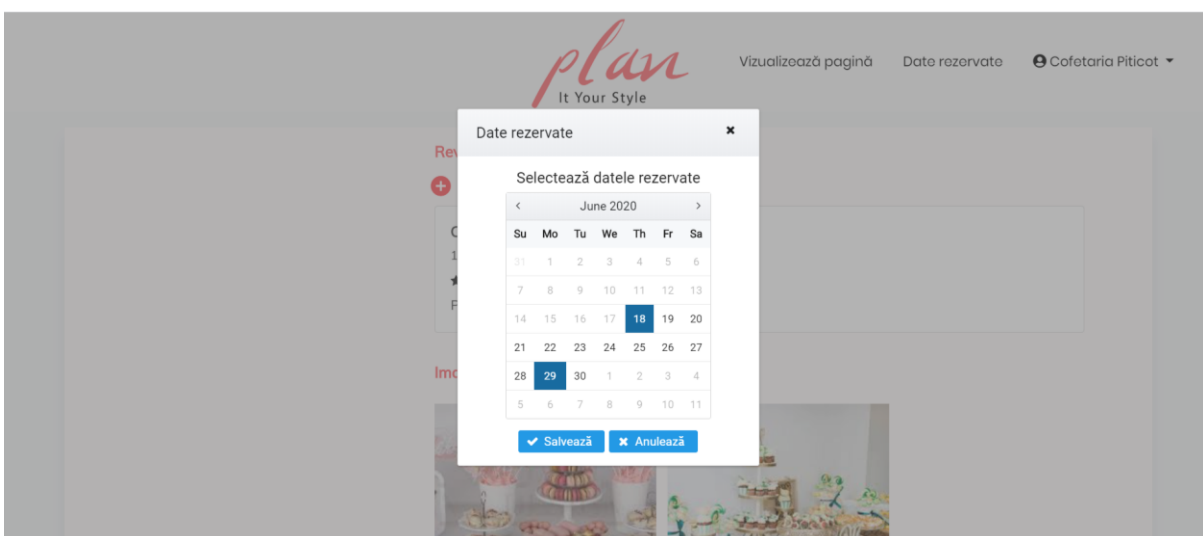


Fig. 12. Reserved dates functionality

7 Conclusions

In conclusion, Plan it your style is an application that aims to make the event planning process more efficient by automatically generating packages of offers. In addition, the presented application focuses on both types of users, trying to make their experience a pleasant one by providing a user-friendly interface and multiple functionalities. Plan it your style is an app that concentrates on people's needs and because every person has a different personality, this solution is based on personalization. In this way, event planners will see offers that they are interested in and that match with their style, whereas the service providers will benefit of the opportunity of being included in event planners' packages that have the same vision as they do in terms of planning a party.

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