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Sport area information resources consolidation project

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Abstract. The project management process of creating an information system for consolidation of information resources for sport infrastructure services is presented in the article. The authors describe in detail the stages of the project to create an information system includes the following steps: setting aims and objectives of the project, work breakdown structure, division of work using the matrix of responsibilities, preparation of work diagrams, monitoring progress, completion of the project. The consolidation of the information resource is introduced by a single standard for information about each sport club. The proposed information system of consolidation information resources of sport infrastructure services provides users with access to structured resources.

Keywords: project, project management, information system, consolidation of information resources, sports infrastructure services, structured resource.

INTRODUCTION

The rapid growth of branched sport infrastructure has led to the emergence of a wide range of service offerings from firms and private owners on the market. Each of the offers specializes in a specific sport sector. And here it is important to find exactly the place that will develop the physical and emotional needs of a person, where he can be realized and self-asserted. At the same time, there is no comprehensive and structured resource that would contain and organize all the information about the existing sport clubs in the city and was simultaneously a 'search-and-discovery' service. As each of sport clubs is engaged only in the personal brand, without giving importance to experience of use of service for ordinary users. If there is a common goal of all sport clubs and the possibility to use them together, the need to create a consolidated resource of sport infrastructure services is generated.

Witold Chmielarz and Marek Zborowski identified the main factors influencing the management of IT projects [1]. Mladen Radujković and Mariela Sjekavica distinguished project management from project success, define project management success, consider different models of project management success [2]. Torbjørn Bjorvatn and Andreas Wald implement the concept of absorbing ability at the command level and studying its role as an intermediary between the complexity of the project and the success of project management [3]. Anna Neumeier, Sven Radszuwill, Tirazheh Zare Garizy suggest a new method for analyzing the criticality of individual projects in the context of a portfolio, considering both transitive dependencies and different types of dependencies in an integrated way [4]. The research [5] focuses on the conceptualization of the uncertainty of the development of a new product project and the study of how the uncertainty of the project affects the effectiveness of the project through cooperation. Jörg Sydow and Timo Braun presented the current status of the projects as temporary organizations and proposed three aspects of the IOPs analysis, which help promote the theory of temporary organization [6]. According to the approaches based on strategy in practice, it is proposed to use institutional theories to solve problems in the context of megaprojects [7]. By adopting a successful risk management approach and following best practices, you can increase the level of success and the productivity of global collaborative projects. The behavior of decision making under risk in megaprojects is explored in [8]. The current state of risk management in mega projects, their systematization are studied by Ana I. Irimia-Diéguez, Alvaro Sanchez-Cazorla and Rafaela Alfalla-Luque [9]. In [10] ways of using decision logic associated with efficiency in project and portfolio management through a multi-level model are investigated. Positioning of organizational design as an important phenomenon in the field of project management is carried out in [11]. A new conceptualization of a project-oriented organization is presented by Hans Georg Gemünden, Patrick Lehner and Alexander Kock [12]. Jamie Y. T. Chang, James J. Jiang, Gary Klein and Eric T. G. Wang built a research model based on the theory of setting goals for the system as a whole with additional goals set for cross-functional aims

[13]. The concept of project complexity and basic models of project complexity are presented by J. R. San Cristóbal [14]. Project management methods through which an organization can optimize cost and time project management success projects of development of information systems are identified in [15]. The attempt of information resource consolidation for social data institutions was made in [16].

The aim of the article is to analyze the project of the information system of the consolidated information resources of the sport infrastructure services market.

During the market analysis, the following problems were identified:

- Lack of standardization of information presentation. Each sport club presents its information resource according to its own criteria. The user spends a lot of time in order to find the necessary information about contacts with the manager of the sport club, clarifying the locations.
- Lack of comment and feedback.
- The lack of comments from real users does not promote the services provided by the club, or prevents the clarification of users' impressions. This state of affairs hinders the development of the company, which can not eliminate the disadvantages because it does not know about them. The presence of feedback helps sport services to become better, and users understand the real state of affairs.

PLANNING THE IMPLEMENTATION OF THE INFORMATION SYSTEM PROJECT

The project of the information system [17, 18] of the sport club search is a temporary project of small size, accordingly the team of the project will be formed only for the period of work on the project.

The project management process [19, 20] involves monitoring compliance with the work plan and an immediate reaction to any changes (changes in the monetary nature, changes in the specified workforce, modification of the scope of work). In addition to the main events, it is also necessary to manage the more likely, that is, risk management in the project design.

So, the project management process includes the following steps:

1. Setting goals and objectives of the project.
2. Creating a work breakdown structure.
3. Distribution of work using the matrix of responsibilities.
4. Preparation of work diagrams.
5. Monitoring of progress.
6. Project completion.

Creation of project of work decomposition, division of responsibilities for the project development. This group of processes includes, in fact, project planning and distribution of roles. An insufficiently thought-out plan reduces the chances of the project implementation.

The compositional breakdown structure allows project managers to plan their work more efficiently. The project is characterized by time-limited actions and fixed deadlines and costs. When it is finished, the project must meet the needs of the stakeholders whose problems it solves. Project management should plan the schedule, fixed costs and functional completion of the project and distribute responsibilities. WBS or the work breakdown structure helps to make this a permanent planning and ensures the effective implementation of the project.

The task of WBS is for each team member to implement his or her part of the overall functionality. When all tasks are completed, all partial functions are added to the full-featured project. For successful solution of the problem, the structure of decomposition of the information system of search for a sport club was developed (Fig. 1).

WBS is an official project document and any changes to it require the use of a project change management process. Any changes to the WBS change the results, and hence the scale of the project. This is an important point that helps to control the boundaries of the project.

A more detailed division is the division of the project into stages by the project manager. This action will help to ensure better project management. The stages of the project are shown in Table 1.

Table 1. The stages of the project

No.	Work that should be done
1	Business analysis of the sport club search project
2	Definition of requirements
3	Project planning
4	System design
5	Project development
6	Testing the development results
7	Risk management
8	Project closure

The transition from one stage to another is possible only after the previous one, confirming the results for accuracy.

Business analysis of a project is a practice of making changes in the organizational context, identifying needs and recommending solutions that give value. The strategy and objectives of the program, development of the enterprise architecture and support for continuous improvement are conducted. The result of its implementation are formulated requirements and described aim of the project.

When developing an information system, there is a thorough design of architecture, identification of the development environment and programming language. To implement our project, the Client-Server architecture with mobile extension support was chosen.

SYSTEM CHARACTERISTICS

Requirements of the web site is a list of necessary functions, capabilities or characteristics associated with the web site and the plans for its creation. There are several types of requirements that can be defined during the process, which are combined to focus and prioritize the project plan:

- Operating system. Since the system is a website, there are no operating system requirements.

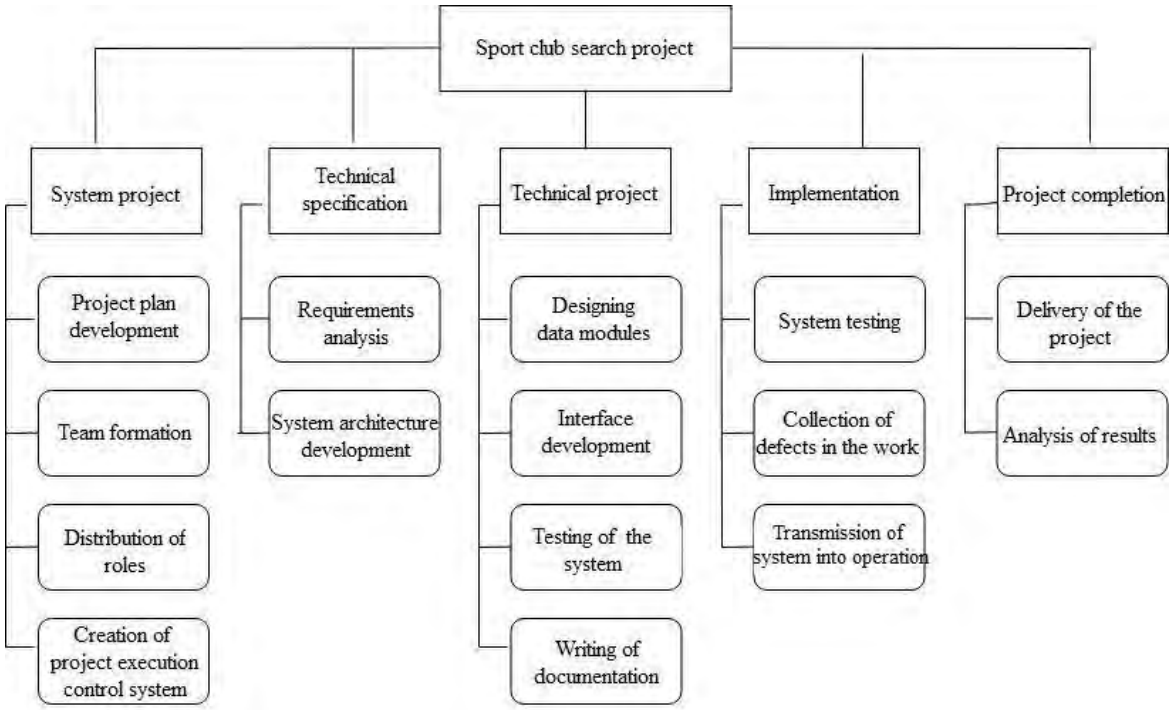

Fig. 1. WBS chart of the project of search system of the sport club

- Cross-browser. The web system is required to support browsers such as Google Chrome, Safari, Internet Explorer.
- Programming language The recommended programming language is Java for Back-end parts due to its object orientation, multithreading and scalability. As well as a large amount of ready-made solutions, so-called frameworks, which will accelerate the development. While for the Front-end part Angular-i is recommended for development. The advantage is that there is a Command Line Interface (CLI), creating a project from scratch and configuring it takes only a few minutes, it is possible to choose what you will work with (less sass or css). The essential advantage are the components – they can be inserted in any place. There are also no problems with variable transmission, unlike the functionality with a simple AngularJS controller.
- Download speed 24. It is important that the site is loaded quickly. This is one of the most important requirements when it comes to development. The system requirement is to load pages no longer than 15 seconds.
- Integration with third-party APIs. The system involves adding comments, so the best solution will be to connect the authorization through one of the social networks or the mailbox to provide an opportunity to comment on gyms and leave ratings.

The modular structure of the system represents a set of modules that are connected to a common system. The modular structure is represented by a set of only those modules that are presented in the initial vision of the project and have a high level of abstraction.

All stages of the project are visualized using the Gantt chart. It is used to become more productive, to expand your communications, to predict in the long run and to track the results. This is the visual basis for the work, and therefore there are fewer chances for misunderstanding, especially if we are talking about complex tasks. This is the visual basis for the work, and therefore there are fewer chances for misunderstanding, especially if we are talking about complex tasks. The Gantt chart allows all stakeholders to have the same information, set mutually understandable expectations and use their efforts according to the documentation.

The project plan, depicted using the Gantt chart is shown in the Fig. 2.

IMPLEMENTATION OF DESIGN SOLUTIONS

The next step is the critical path method, as one of the most commonly used and effective methods of project planning. The order of work execution in Table 2.

Table 2. The order of work execution

No.	Tasks
A	Business analysis of the sport club search project
B	Definition of requirements
C	Project planning
D	System design
E	Project development
F	Testing the development results
G	Risk management
H	Project closure

The ratio of precedence: H<E,F; G<D; F<D; E<D,C,B; D<C; C<B,A.

For such precedence relations the network of the project will look like this (Fig. 3).

The critical path will consist of the following steps: A, C, D, E, F and H. The project network marked with a critical path is depicted in Fig. 4.

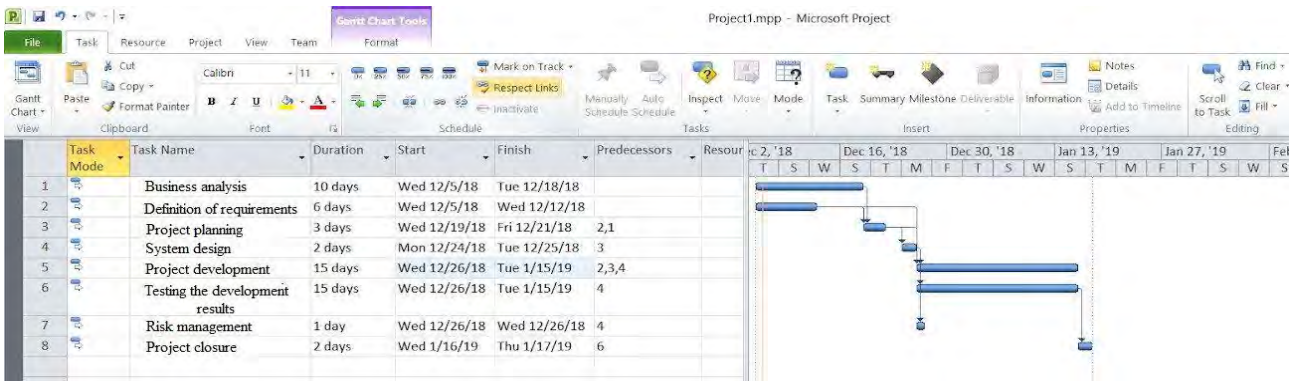

Fig. 2. Project plan, developed in MS Project

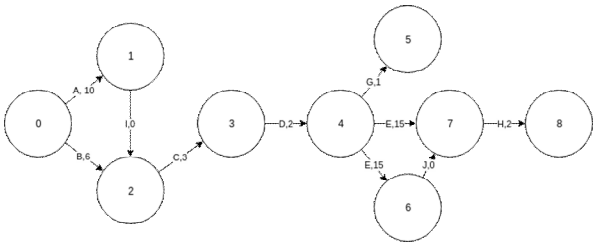

Fig. 3. The network of the sport club project in the "work-arch" format

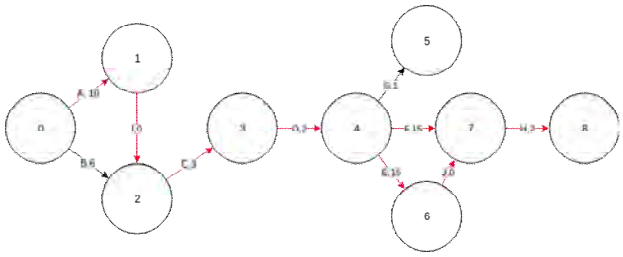

Fig. 4. The network of project with the specified critical path

Let's present a network of works in the "work-top" format (Fig. 5). And let's present the critical path in the Fig. 6 and Fig. 7.

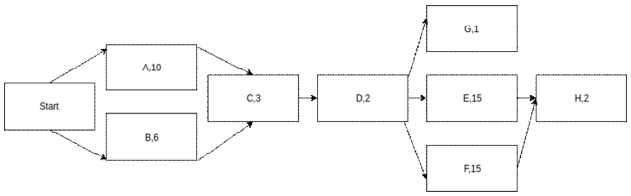

Fig. 5. The network of the sport club in the "work-top" format

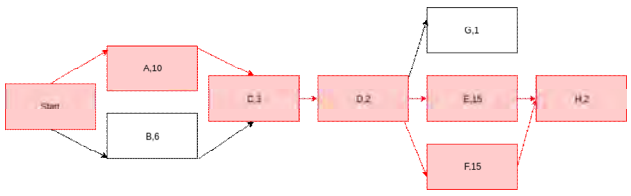

Fig. 6. The network in the "work-top" format with the specified critical path

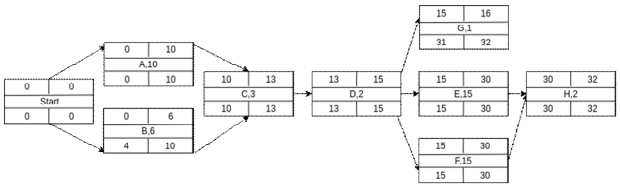

Fig. 7. Presentation in the "work-top" format with the specified time characteristics of the event

For a clear data visualization, we will present them using MS Project Fig. 8.

So, the networks of two different types: "work-top", and "work-arch", which help to make clear calculations were depicted. The start page of the sport club search system is presented in Fig. 9.

Thus, the proposed information system will help to solve or reduce the existing problems in the market of sport industry services. When consolidating the information resource, a single standard for information about each sport club is introduced. Each sport club will have its own information page with mandatory fields:

1. Title. String type field, which specifies the current name of the sport club.

2. Sport sector or specialization. Kinds of sport you can go in for.

3. Hours of work. The hours at which the sport club works for visitors.

4. Location and contact details of each sport club. A map will be added that will contain sport club locations with information window including contacts and exact addresses.

5. What kind of sport clubs exist? If the sport club has additional sections that can be visited by users then it is necessary to specify it.

6. The price of a standard subscription and separate circles. The exact prices of each type of subscription or circle are important here.

7. Personal trainer option. In case of a positive answer – the price per hour of work with him.

8. Photos of gyms. It is important to assess the real conditions in which people go in for sport.

9. Users' comments with the ability to leave estimation on a scale from 1 to 5.

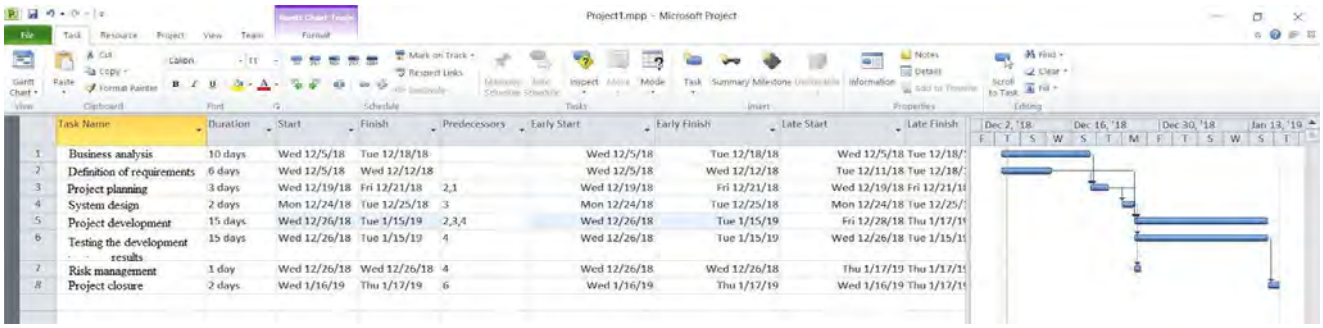

Fig. 8. Gantt chart with calculated Early-Late Start-Finish.

Fig. 9. The start page of the sport club search system.

10. Other. Additional comments are *necessary* to clarify the work of the sport club. The requirement to fill in information about sport clubs is the first step in automation and standardization of the resource. The lack of these locations and contact information, service covers by standardization and obligation to fill in, because without this information, the presentation of information about the sport club will be impossible. The lack of comments and feedback is thought out in the comments section. In addition to the standard opportunity to leave a comment, the opportunity to rate the sport club on a five-point scale, where 1 is "not liked at all", and 5 – "really liked" is added. Feedback is planned to be implemented through synchronization with the Facebook API.

CONCLUSIONS

Thus, the proposed information system for the consolidation of information resources of sport infrastructure services provides users with access to structured resources that will help 85 % faster find sport club, ability to comment, assess and share recommendations. For the owners of sport clubs, the proposed information system serves as a marketing channel to find new customers. It provides the ability to track comments about infrastructure objects in order to improve their functioning. For the authorities and potential investors – an opportunity to analyze the sport infrastructure of the city.

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