# IMPLEMENTING RESTFUL WEB SERVICE IN MENTOR SEARCH SYSTEM WITH AGILE SCRUM METHODOLOGY

**Fandy Indra Pratama[1*], Avira Budianita[2], Akhmad Pandhu Wijaya[1], Haikal Makin Syaifudin[1], Tegar Widya Mustofa[1]**

[1]Department of Informatics Engineering, Wahid Hasyim University

[2]Department of Digital Business, Muhammadiyah Kudus University

*email*: *fandy@unwahas.ac.id

**Abstract:** The rapid development of technology makes stakeholders need easy and fast services. One of them is an easy and fast tutor search service. Parents who have a very busy life and school materials that develop very rapidly make parents less able to help their children learn at home so parents need a solution in the form of an information system to facilitate the search for tutors. In the development of this information system adopts by combining the architecture of the model view controller (MVC) and restful web service because development using the architecture is very easy, fast and can be developed into multi platforms. Then in the development of this system using the Agile Scrum Methodology approach which is able to complete system development very quickly and organized. Regular communication in this Scrum approach makes the team feel comfortable because each member knows each other's progress process and obstacles. So that the achievements of each target can always be controlled and completed. So that the creation of an information system for the search for tutors is on target and can be used by the public.

**Keywords:** Agile, Agile Scrum Methodology, Information System, restful web service

**Abstrak:** Pesatnya perkembangan teknologi membuat stakeholder membutuhkan pelayanan yang mudah dan cepat. Salah satunya adalah layanan pencarian guru les yang mudah dan cepat. Orang tua yang memiliki kehidupan yang sangat sibuk dan materi sekolah yang berkembang sangat pesat membuat orang tua kurang bisa membantu anaknya belajar di rumah sehingga orang tua membutuhkan solusi berupa sistem informasi untuk memudahkan pencarian tutor. Dalam perkembangannya sistem informasi mengadopsi dengan menggabungkan arsitektur model view controller (MVC) dan restful web service karena pengembangan menggunakan arsitektur tersebut sangat mudah, cepat dan dapat dikembangkan menjadi multi platform. Kemudian dalam pengembangan sistem ini menggunakan pendekatan Agile Scrum Methodology yang mampu menyelesaikan pengembangan sistem dengan sangat cepat dan terorganisir. Komunikasi yang teratur dalam pendekatan Scrum ini membuat tim merasa nyaman karena setiap anggota saling mengetahui proses kemajuan dan hambatan masing-masing. Sehingga capaian setiap target dapat selalu terkontrol dan selesai. Serta terciptanya sistem informasi pencarian tutor tepat sasaran dan dapat digunakan oleh masyarakat

**Kata kunci:** Agile, Agile Scrum Methodology, Sistem Informasi, restful web service

## INTRODUCTION

The high level of technological progress is directly proportional to the demand of stakeholders to get easy and fast services. As was the case in ancient times, if you were going to communicate, correspondence with each other using paper media sent by post or the like, but today you don't have to use paper and expeditions anymore to send written and picture messages, only with a smartphone and internet quota can communicate with each other easily, cheaply and quickly. In addition, the registration of tutoring in the past could only come directly to the office, but now you can use online media to send and validate each other.

However, nowadays it is no longer constrained by the registration filing process but the difficulty of finding sources of information that are fast and on target. The center of information resources that are fast and targeted today is using web media or web-based information systems. Because the technology can be repaired or updated data at any time and users can access the system anywhere and anytime using only a browser and internet quota. So that web technology today is very useful.

Problems in the environment around researchers are not a few families who need tutors because, among others, parents lack time to guide learning, parents' incomprehension of the material provided and ineffective parental learning methods. However, parents' desire to find a tutor is constrained by access to find the expected tutor. The obstacles include: 1. the absence of time for parents to visit tutoring, and 2. it is difficult to find a tutor who fits the criteria.

From the problems of parents, one path is also with the problems of teachers who still need activities that can increase income. One of them is an honorary teacher, the honorary teacher of the foundation gets a salary according to meeting hours so that the monthly income is not much. So that the problem of parents and tutors is how parents can find tutors easily and tutors get additional income.

Systems that can be a solution to similar problems include research that is made into a book with the title "Online Private Tutor Finder System Using PHP", The research brings together parents with tutors so as to produce the best learning for students [1]. Another research "Rancang Bangun Sistem Pemesanan Tentor Bimbingan Belajar Privat Berbasis Web" succeeded in making a tentor search system with a waterfall approach [2]. However, the study did not have a nearby search whose criteria could be adjusted as expected. As well as the tutor can not see the students who are just looking for the tutor.

From previous research, it is necessary to develop research so that it can produce a system that suits current needs. In making the system, there are several approaches, including using a waterfall approach [2], and using an Agile Scrum Development approach for making mobile applications [3]. As well as uses Agile Methodology in its manufacture for making IoTs with international standards [4]. From these approaches have a different character but with a plot that is close to the same. The Agile Scrum Development approach is good to use to create a system in a short time, because this approach is very well organized every step of the way and is done in a fast time and has good documentation[5]. So that the process of tracking the process and its evaluation is getting better [3], [6]. And this approach is able to develop features

in the midst of developing its main function [7].

Based on these problems, researchers built a tutor search system using the Agile Scrum Development approach[8]. The backend implementation uses the Laravel framework with the concept of Model View Controller [9] and the front-end uses AngularJs and the concept of data transfer using the Resful Web Service API architecture [10]. The architecture is used because of considerations for further development that can be used multi-platform [11] and RESTful Web Service is very powerful to solve various software and data integration problems in the control center [12]. As well as being able to reduce the load on the server [13].

**METHOD**

This research produced a complex product but was carried out in a short time, so a strategy is needed to complete this research. Based on references, this research uses the Agile Scrum Methodology approach. The approach that is very agile and organized will produce outputs that are in accordance with the objectives. The stages of Agile Development itself include [14], [15] : Identification, Concept Design, Business Process Planning, Implementation, Testing, Deployment. So if combined with scrum methodology illustration of the steps of this research approach as follows.



Image 1. Agile Scrum Methodology

At the identification stage, the supervisor and the member team carry out a survey together with the hope of getting information directly and quickly according to community expectations, so that the supervisor does not explain in more detail the results of the identification[16].

Furthermore, the results of the identification in the form of an identification report will be discussed to prepare and design business process logic with the team and evaluated with stakeholders. This activity is carried out quickly and precisely within 1-7 days with daily work.

The results of the business process logic design in the form of usecase diagrams, activity diagrams, mockup views and databases will be implemented with a framework with Model View Controller (MVC) architecture [17], [18], namely Laravel as the backend and AngularJS as the frontend. From this stage carry out so that the work can be organized and completed in a fast time.

At the implementation stage, the supervision distributes its coding tasks to the team which includes member 1 working on pages for admin access rights, member 2 working on pages for mentor access rights, member 3 working on pages for member access rights, and member 4 working on the images needed in this project.

This implementation stage works with a period of 4-5 weeks with the intensity of work Monday – Saturday with the provision of reports (What has been done?; What were the obstacles in the previous job?; What will be done today?) Every morning via social media (daily scrum) [19]. If further discussion is needed, the meeting can be held again in mid-working hours[16].

Then finally after the system is designed, a review is carried out by supervision and stakeholders to ensure the function and logic of its business processes are as expected and there are no errors. If there is an error, at that time the responsible team member will immediately correct it[20].

## RESULT AND DISCUSSION

The results of each research process with an agile scrum approach are in the form of documentation that illustrates the process in the system and the research discussion process takes place.

### Identification Documentation

In the identification documentation produces a summary of notes as follows:

Table 1. Conclusion of problem identification and system requirements

| No | Description |
|----|-------------|
| 1 | Stakeholders want a tutor search system |
| 2 | Stakeholders want there to be control of registration data for tutors and participants |
| 3 | Tutors can make their own offers with adjustable time and standard prices. So that the price is not much difference between tutors |
| 4 | Participants are facilitated in the process of finding tutors with information that can be filtered as expected |
| 5 | Stakeholders ask this system to be implemented immediately so that it can be utilized by the wider community. |

At this stage it is coordinated by supervision by directly involving its members due to small members and short work time.

### Planning and Process Design Documentation

This stage uses a system to group each member's work which is distinguished by Green for member 1, Orange for member 2 and blue for member 3. As well as grouping the process of each task that must be created. If there are obstacles, it must be addressed during the scrum meeting every morning. Status can be said to be completed when the supervision has reviewed the results of the member's work by synchronizing with the task process on other members.

In this system there are three actors: Admin, Mentor (Tutor) and Member. Admin access rights are required to login before managing mentor and member data, managing price and subject limits. Mentor access rights can manage course time and its subjects. As well as on the access rights members must log in when they have to book tutors.

From the system's design, then explored by describing the process of each activity using the Model View Controller (MVC) architecture on the backend and frontend sides. Researchers use frameworks that use MVC architecture, namely Laravel and AngularJS. The framework is very helpful in the system development process because of the framework that has been provided [21].

The MVC architecture was developed using the Restful web service architecture because the use of this architecture speeds up data load and reduces the burden of excessive data packet usage [22]. So that system users can later be

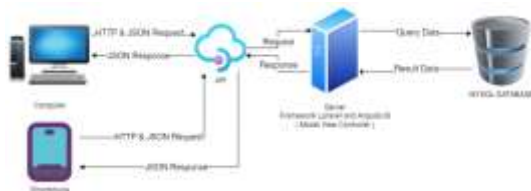comfortable because of the speed in operating the system.



Image 2. System architecture

From Image 3 it illustrates that users accessing data to the system will pass through an API Service which will be forwarded to the server to process requests from users, so that then actions will be carried out to the database as instructed by the user. Whether or not the user's request succeeds and fails will return the data to the user in JSON data format. This JSON language can be used for various multi-platforms. So if it is developed to another platform, it can still be used.

From the concept of technology and business processes, the distribution of tasks to members with one supervisor for management of the development of this system is also arranged. And this work is carried out every day and conducts meetings every day to see the process between members. The design of the distribution of tasks is according to the picture below.
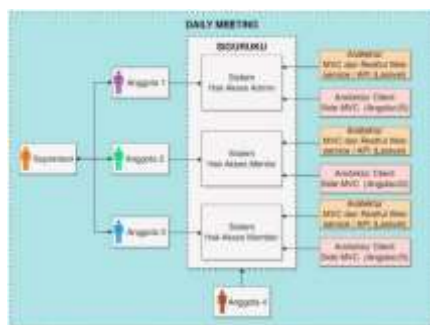


Image 3. Task division and system architecture

Based on Image 4, daily meetings are effectively held at the implementation stage. Because this implementation stage has its own challenges from each feature. At this stage, they must also communicate with each other to integrate between features created by members. So it is necessary to have a division of tasks that must be completed and communicated every day.

The division of tasks in this research is that supervision will direct which features will be created by members along with technology concepts and business processes. Then, each member will do according to their work by reviewing the results by the supervisor.

Members one, two and three coordinate the system according to the results of the process design stage because they have the competence to make the system. While the four members support graphic design to provide the images needed to be entered into the system.

The most important thing in this daily scrum is that if there are problems with members, other members and their supervisors immediately know the problem and find a solution. So that the implementation process of this system can be completed in a short time.

### Implementation

From the results of planning and determining business processes are then implemented in tangible form by the team. So as to produce database relationship structure and web view functionality according to plan.

From the database is able to store large databases according to the maximum limit of MySQL databases and can read database contents quickly and easily.

From the domain path that has been created using two data request methods, namely the GET and POST methods. The GET method is used to look for displays that carry graphic design in response. While the post method is used to send data whether there are images or just JSON text. So when visiting the main path or main domain, a display like in Image 6 appears.

Table 2. Blackbox Testing

| No | Activity | Expectations | Status |
|---|---|---|---|
| 1 | Login using registered account | Login successful | OK |
| 2 | Login using an account that has not been registered / password is blamed | Login failed | OK |
| 3 | Register as a mentor | Able to enter the register page and successfully register as a mentor | OK |
| 4 | Register as a member | Able to go to the register page and successfully register as a member | OK |
| 5 | Admin view mentors list | Able to enter the mentor page and successfully view the mentor data | OK |
| 6 | Admin view member list | Able to enter the mentor page and successfully view the mentor data | OK |
| 7 | Admin change pricing data | Able to enter the price setting page and successfully change the price data | OK |
| 8 | Admin add/edit/delete subject data | Able to enter the course page and successfully add/edit/delete data | OK |
| 9 | Mentor add/remove schedule data | Able to enter the schedule page and successfully add/edit/delete data | OK |
| 10 | Mentor add/remove subjects | Able to enter the course page and successfully add/delete data | OK |
| 11 | Mentors view booking results | Able to enter the booking page and map to view the booking history | OK |
| 12 | All the actors saw the willingness of the mentor | Able to go to the mentor search page and see the data | OK |
| 13 | All actors can edit profiles | Able to enter the profile page and successfully edit the profile | OK |
| 14 | Members can view order history | Able to enter the order history page and view order history data | OK |
| 15 | Logout | Successfully logged out | Successful |

Image 4. Landing page system

In Image 6. This landing page users are free to read without being required to log in. Users can visit various menus that have been provided including login / register as Admin, Mentor or Member access rights.
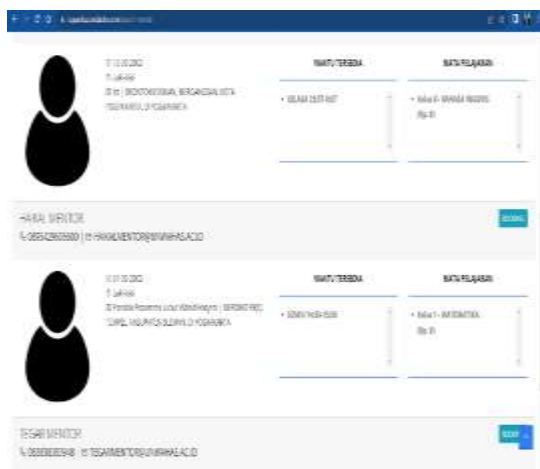


Image 5. Searching Mentor from member access.

In Image 7. Is a user page to find tutors who have been verified by the admin. Technical users are only users who have logged in. If the user is not logged in, only the list of mentors can be seen and cannot book time to the mentor.

**Testing**

At this testing stage, members are carried out first to ensure that the system created has no errors. If you feel that there is no error, it is sent to the supervisor to be tested as a whole, especially the integration between features. If it has successfully passed the testing by the supervisor, then continue to test the system to the surrounding community with the hope of feedback for future system developments. The results of the system testing all answered the same questions based on analysis and identification at the beginning of the study. The list of test results using the black box method is in table 2.

**CONCLUSION**

In this study, researchers have implemented agile scrum methodology that carries out scrum activities in each process with dokomentation outputs at each stage. The application of Agile scrum methodology in the development of information systems for tutor search is able to answer the hypothesis of the success of this research because this method is able to complete the process of developing this software very well and quickly. In addition, team members feel comfortable in working to complete their tasks because of clear communication and work direction by conducting regular communication (daily scrum). As well as the use of the Model View Controller (MVC) concept in the construction of this system is able to overcome rapid and group development improvements so that to find the source code to be repaired much faster and easier. Therefore, this research will be further evaluated by looking at the enthusiasm

of the community in using this system.

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