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SI BITA - DESIGN OF A THESIS GUIDANCE INFORMATION SYSTEM USING THE SCRUM METHOD FOR OPTIMAL EFFICIENCY AND RESPONSIVENESS

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Abstract: This research aims to design a system that can assist the final assignment development process by focusing on resolving frequently encountered obstacles, such as clarity of research title status, guidance process, and research schedule. The development method used is the Scrum method approach with a small scale and team. During the development process, an analysis of each sprint is carried out from preparation to the development process. The results of development using the Scrum method show that each feature was completed within 8 hours per day, with each sprint completed in a week. The total time required to complete all sprints designed on the BITA Information System is 128 hours. The application of the Scrum method provides results that enable rapid identification of changes during the development process, as well as optimizing the process of submitting and validating titles, determining supervisors, evaluating guidance, and scheduling exams. Thus, this research provides an effective solution in increasing the efficiency and effectiveness of the final assignment coaching process for students in completing their studies.

Keywords: information system; optimal efficiency; scrum method; SI BITA; thesis guidance.

Abstrak: Penelitian ini bertujuan untuk merancang sistem yang dapat membantu proses pembinaan tugas akhir dengan fokus pada penyelesaian kendala yang sering dihadapi, seperti kejelasan status judul penelitian, proses bimbingan, dan jadwal penelitian. Metode pengembangan yang digunakan adalah pendekatan metode Scrum dengan skala dan tim kecil. Selama proses pengembangan, dilakukan analisis terhadap setiap sprint yang dihasilkan dari persiapan hingga proses pengembangan. Hasil pengembangan menggunakan metode Scrum menunjukkan bahwa setiap fitur diselesaikan dalam jangka waktu 8 jam per hari, dengan setiap sprint selesai dalam seminggu. Total waktu yang dibutuhkan untuk menyelesaikan semua sprint yang dirancang pada Sistem Informasi BITA adalah 128 jam. Penerapan metode Scrum memberikan hasil yang memungkinkan identifikasi cepat terhadap perubahan selama proses pengembangan, serta mengoptimalkan proses pengajuan dan validasi judul, penentuan pembimbing, evaluasi bimbingan, dan penjadwalan ujian. Dengan demikian, penelitian ini menyediakan solusi yang efektif dalam meningkatkan efisiensi dan efektivitas proses pembinaan tugas akhir bagi mahasiswa dalam menyelesaikan studi mereka.

Kata kunci: sistem informasi; efisiensi optimal; metode scrum; SI BITA; bimbingan skripsi.

INTRODUCTION

Final assignment guidance is an important process in the academic curriculum. This process is an opportunity for students to develop their research skills and gain guidance from experienced mentors [1]. Final assignment guidance can help students to, formulate clear and relevant research questions,

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collect accurate and relevant data, analyze data accurately and objectively and write systematic and structured research reports [2].

In addition, final assignment tutoring can also help students to develop critical thinking skills, solve problems, and communicate effectively [3]. These skills are essential for students to succeed in the workplace. However, the end-to-do guidance process may be inefficient and unresponsive [4]. It can be caused by various factors, such as, lack of communication and coordination between students and mentors, limited number of mentors and unflexible tutoring schedules [5]. Inefficient and unresponsive final assignment guidance can have a negative impact on students. Students may experience difficulties in completing their final assignments, do not get the necessary guidance, and feel dissatisfied with the final task guidance process [6]. To solve this problem, efforts are needed from all sides, including colleges, tutoring lecturers, and students. The college needs to provide adequate resources to support the final assignment mentoring process[7]. The mentoring lecturer needs to improve their communication and time management skills. Students need to be more proactive in communicating with the mentoring faculty and to prepare themselves well for the final task mentoring [8].

One way to improve the efficiency and responsiveness of the end-task guidance process is by applying the Scrum method. Scrum, a flexible development methodology, offers a structured and adaptive approach to project management. By focusing on the principles of iterative and gradual development, Scrum enables teams to respond to change quickly and continuously improve the quality of final results [9].

The application of Scrum in end-to-do guidance allows tutoring lecturers and students to work more collaboratively and effectively [10]. Through this method, teams can identify and overcome obstacles faster, as well as accelerate the feedback cycle between lecturers and students [4]. Thus, the mentoring process becomes more dynamic and adaptive, allowing changes in priorities or needs to be integrated smoothly into the work schedule[11].

In addition, the use of Scrum in end-to-end guidance also facilitates transparency and accountability [12]. Through rituals like the Daily Standup and Sprint Review, all parties involved can keep track of project progress and identify potential problems early on [13]. This not only helps ensure that the project goes as planned, but also strengthens team members' commitment and responsibility to the desired end result[14].

In the context of final task guidance, Scrum can be used to create a system that allows students to work their final tasks in a more efficient and responsive way. The system will be divided into sprints, which are short periods of time (usually two weeks) in which students will work on specific tasks [15].

The Scrum method has some advantages for guiding the final task. First, it's iterative and gradual, which means that students can make progress in their final tasks on a regular basis. Second, it is collaborative, meaning students and mentors work together to the sprint goals. Third, this is flexible, meaning it can be tailored to the needs of students and individual mentors [5].

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A system designed using the Scrum method can improve the efficiency and responsiveness of the end-task mentoring process in several ways. First, it will enable students to work on their end tasks in a more focused and productive way. Second, this will provide regular feedback to students from their mentors. Third, it would allow students and mentors to tailor the end -task tutoring process to students' needs [16].

Here are some specific features that can be included in a system designed using the Scrum method:

A task management system that allows students to track their progress in their final tasks.

A communication system that enables students and mentors to communicate with each other easily.

A feedback system that lets mentors give feedback to students about their work.

Systems designed using the Scrum method can be a valuable tool for improving the efficiency and responsiveness of the final task guidance process[4].

To continue this research, several previous studies have been conducted using various methods and platforms, producing an application called SI BITA which is a comparison tool. Previous research included an evaluation of the shortcomings and advantages, as well as considering the type of platform used as a comparator. References used in previous research will be an important foundation in developing this research further, enabling to gain a deeper insight into the application of SI BITA and its research environment. Analysis of the Application of the Scrum Method in the Development of Cooperative Accounting Information Systems[11], Application of the SCRUM Method in Regional Service Information System Development [5], Design And Building Of A Website-Based Learning Media Information System (Case Study: De Potlood Learning Guidance) [12], and Implementation of the Scrum Model in Information Systems Off-Campus Learning for the Independent Campus Entrepreneurship Scheme [9]. By using a structured and adaptive approach, the aim is to facilitate better collaboration between mentor lecturers and students, accelerate feedback cycles, and ensure that changes in priorities or needs can be integrated smoothly.

METHOD

This research adopts the Agile Software Development method known as Scrum, a framework designed to handle complex and ever-changing work. In the context of software development, Scrum provides an adaptive and flexible approach, enabling teams to respond to change quickly and efficiently [3]. With a focus on transparency, inspection, and adaptation, Scrum helps teams navigate complex challenges and address changing needs with appropriate solutions [4].

One of the main strengths of the Scrum framework is its ability to bring innovation and creativity. By promoting close collaboration between team members and stakeholders, Scrum creates an environment that allows new ideas to bloom[17]. Through short iterations called sprints, teams can continually evaluate and improve their products, allowing for rapid adaptation to feedback and market changes [9].

In addition, the Scrum framework also provides a clear structure and well-

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defined responsibilities. With roles such as Product Owner, Scrum Master, and Development Team clearly defin ed, each team member has a clear understanding of their responsibiliti es[18].

Sprints are a key element in the Scrum methodology, which establishes a consistent time limit for completing a certain amount of work. Typically lasting about a month or less, sprints offer a team the opportunity to focus fully on a predetermined set of tasks. During a sprint, the team commits to producing a product that works and adds value to customers or stakeholders[19].

A sprint process that has a consistent time duration provides great benefits in project management. This creates a high level of discipline and accountability among team members, and allows for more structured and predictive scheduling. Additionally, a fixed sprint duration allows teams to periodically evaluate their performance and make necessary improvements in each iteration, increasing efficiency and quality of the final result [20].

When one sprint is complete, the process continues in the next sprint with a better understanding of the team's needs and capabilities. Thus, each sprint allows for continuous iteration and gradual product development [14]. In this way, sprints in the Scrum methodology are not only a tool to increase productivity and efficiency, but also to enable rapid and responsive adaptation to changes in the business or market environment [21].

The research stages in the agile scrum method are divided into several stages, namely:

Planning

This stage involves forming a team and determining research objectives as well as planning the first sprint. The team identifies research needs, compiles a backlog list, and determines priorities for work to be performed during the first sprint.

Sprint

This stage is where the team is actively working to complete a certain amount of work that has been selected from the backlog. The duration of a sprint is usually about one month or less.

Review Sprint

Every sprint, the team reviews the work that has been completed. This involves demonstrating results to stakeholders and getting feedback. Sprint reviews allow teams to evaluate their performance and adjust future plans based on the feedback received.

Retrospektif

Sprint review, the team conducts a retrospective meeting to evaluate their own work processes. The goal of a retrospective is to identify what worked, what didn't work, and how the process can be improved in the future.

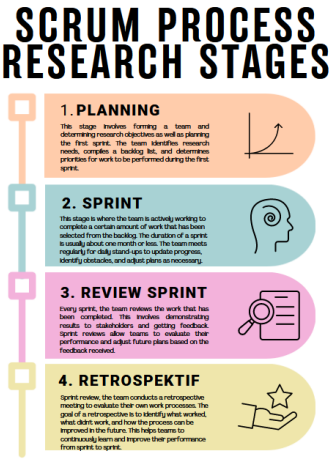

Figure 1. Scrum Process Research Stages [9]

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RESULTS AND DISCUSSION

This chapter represents the first section of a research study that summarizes the results of the SI BITA development process based on the data collected during the study process, which is conducted using a research methodology that is decided upon.

Planning

In the initial phase, researchers identified several participants and the first sprint's goals by determining the work priorities that will be selected based on the research goals and findings. The work priorities that will be developed are shown in Table 1, which includes four features that will be implemented in SI BITA.

Table 1. List of Built Features

No	Feature Description
1	Administrator
2	Lecturer Features
3	Head of Study Program Features
4	Student Features

Every Tim identifies the areas that are accessible to each and every feature on the SI BITA that will be constructed. These two groups are indicated in Table 2.

Table 2. Access List Each Feature

Feature Description	Fitur Akses
Admin	Access Login
	Access Logout
Lecturer	Access Login
	Access Logout
	Pressing Guidance
	Pressing Seminar Proposals
Head of Study Program	Access Login
	Access Logout
	Pressing Guidance
	Pressing Title Submission
	Pressing Seminar Proposals
	View the Dashboard
	Create Announcement Content
Student	Access Login
	Access Logout
	Pressing Title Submission
	Pressing Seminar Proposals
	View the Dashboard
	Create Announcement Content

Sprint

Based on the feature and access level of the SI BITA, we perform a long-term study of each feature and system development process. Every member of the team assigns tasks based on the agreed upon work schedule. The working hours for each shift in the SI BITA are listed in Table 3.

Table 3. Sprint Backlog for Each Feature

Sprint Backlog	Estimated time
Administrator	1 week
Lecturer Features	1 week
Head of Study Program Features	1 week
Student Features	1 week

The team conducts a thorough investigation to understand and assess the effectiveness of the SI BITA's development, identify the problems that

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have been encountered, and, if necessary, make corrections or initiate a fresh plan.

Over the course of about eight weeks, SI BITA development produced a few Sprint features that can be accessed based on the availability of a feature for access, similar to that shown in Table 2.

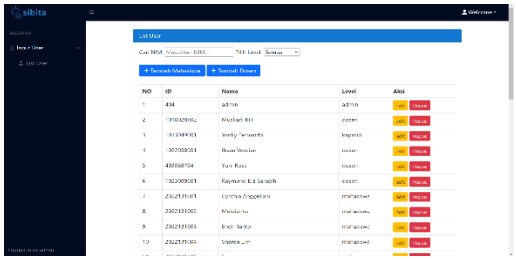

Figure 2. Sprint Administrator Page

The two sprints that are completed consist of a lecturer page that may be used to search for student data, verify student data, increase student data, and view student seminar proposals for each student that is mentored.

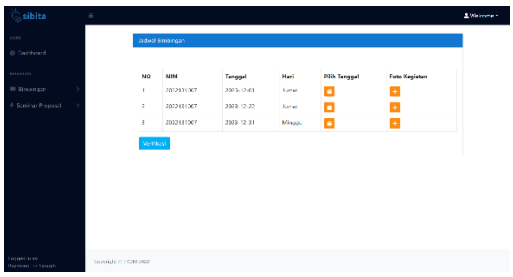

Figure 3. Sprint Lecturer Page

The Head of Study Program page is a sprint that came out of the system development process. The Head of Study Program will use this sprint to validate each student's application, choose supervisors, schedule proposal deadlines, and organize tests and results.

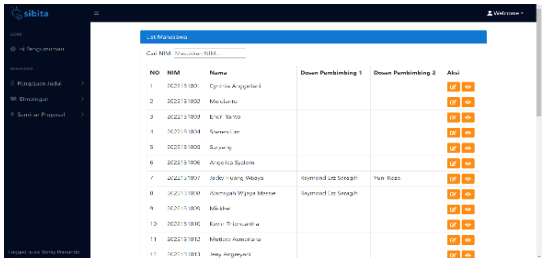

Figure 4. Sprint Page of Head of Study Program

The final sprint that was completed was a student sprint. Every student uses this worksheet to complete the research project, reviewing validating information, suggestions, lecturer guidance, activity guidance as well as proposal guidance, results, and closing.

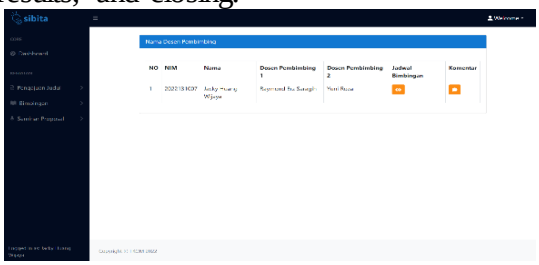

Figure 5. Student Page Sprint

Review Sprint

The process of SI BITA creation results in a user interface that is a Sprint of all the primary application, administrator, head of study program, lecturer, and student access points that are available to each user based on the available feature level.

Table 4. Sprint Backlog for Each Feature

Feature	Hour Estimate
Administrator	8 Hours/day
Lecturer Features	8 Hours/day
Head of Study Program Features	8 Hours/day
Student Features	8 Hours/day
Total	128 Hours /Mounth

Each sprint requires almost eight hours per day. Each sprint is completed in less than one week, meaning that each sprint will be completed in less than 24

hours per week. There are four sprints that are produced in the SI BITA development, therefore one hour is needed to complete each sprint in a semester.

Retrospective

The team conducts an evalu ation of the results of the fitter development process to determine whet her any fitters remain unsatisfied with their work. During the SI BITA develop ment process, each feature that serves as a system goal is selected at a time that corresponds to the time interval that was previously determined in step 3. The success of the fitter develo pment is demonstrated by the participa tion of the sprint administrator, lecture rs, heads of study programs, and students, just like in the sprint.

CONCLUSION

Based on the results of the SI BITA project that was completed using the scrum method with small and medium-sized teams, it can be conclu ded that this approach is effective because it makes it easier for partici pants to identify and respond to chan ges that occur during the projects. The results of SI BITA include maximum efficiency in the process of final assign ment title, validation title, supervisor determination title, guidance evaluation and examination schedule determinati on, as well as the presence of docume ntation activity archives.Every user who is present at every stage of the title process needs to have their SI BITA features updated and updated. Through development, SI BITA can become a system that is efficient and systematic in reducing task completion after graduation.

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