Scrum Adoption Challenges in Higher Education in Indonesia: Case Study of Board of Information System, Universitas Islam Indonesia

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Abstract. The level of success in project development information systems or software in many countries is still low. A study of 110 information system projects in Indonesia found that most information system projects are problematic, and 18% were canceled. Even though it has been around for a while, Scrum as an approach is relatively new in Indonesia's software development. Many efforts to adopt agile in various organizations are not running well. This research aims to identify the challenges in agile adoption in a higher education organization in Indonesia using the Scrum Adoption Challenges Detection Model (SCADM) theory. The study found that even though Scrum is performing well, there are still some works needed. Especially in improving the experiences and transforming the organizational culture and structure to make the scrum adoption more effective.

Keywords: Scrum, Agile Adoption, SCADM.

1. Introduction
The degree of success in project development of information systems or software in many countries is still low. [1] explain that e-government projects in developing countries, only 15% are considered to be successful, while 35% experienced a total failure, and 50% had a partial collapse. Hence, it is necessary to identify successful software development tasks for others to learn. [2] in Chaos Report conducted surveys from 1994 to 2015 on information system projects across the USA and Europe. This survey explained that information system projects' success rate is still between 16% to 31%. Figure 1 shows the success rate of the development that is not stable. Sometimes it went up, but at many times also went down.

A study of a software project in South Africa in 2013[3] explained that 34% of software development projects are considered successful, but at 66% is considered a failure and challenge. By 32% and by 34%, software development projects fail to face challenges due to a software development project not completed on time or does not fit the budget estimates. Meanwhile, [4], in a study of 110 information system projects in Indonesia, 27% of information system projects were within budget and finished on time, up to 55% of projects are problematic, and 18% of project owners cancelled the development. The results showed that the success rate of information system projects in Indonesia is still low as also experienced by other countries. To overcome this issue, many organizations started to look into different kinds of software development approaches, and agile is one of them.
Agile is a relatively new approach in software development [5]. Many leading organizations have adopted Agile in all or some of their projects [6]. Agile is becoming increasingly popular that many organizations seeking to take Agile software development [7]. The need for a better, faster, and cost-effective software solution, and at the same time, also provide a level of employee satisfaction high drove this popularity [5].

A study that takes a sample of data from 1,002 projects in various industries and countries has conducted tests on the effects of the use of Agile in the two-dimensional organization of project success: efficiency and overall satisfaction of stakeholders toward organizational objectives. The research findings indicate that Agile methods positively impact both the dimensions of the project's success [8]. As stated in the Chaos Report conducted by the Standish Group in 2015, other results identified factors that create success: the Agile process and small projects. Small projects that use Agile methods have a failure rate of 4% only [2].

Chaos Report provided reports and showed that Agile projects have nearly four times the success rate compared to the Waterfall. In comparison, the Waterfall project has three times the failure rate compared to Agile [2]. Many studies show the attempts to adopt Agile in various organizations or companies in several countries are not running smoothly. Those studies found a wide range of challenges that affect success in adopting Agile. For example, in Kosovo's financial institutions, the challenges are the lack of support from management and the skills needed to implement the methodology, the allocated budget, and the number of willing to jump into Agile mode [9].

In research with case studies of projects in Brazil's multidisciplinary teams, they explained that direct communications from stakeholders to team members had caused constant disruption in the development process. Other than an excessive number of informal communications, the centralization of information on a particular member represents created challenges in adopting agile [10].

One of the most popular methodologies used in agile is Scrum [11]. The Scrum itself can be characterized as a self-management team that brings decision-making authority to the level of operational problems and uncertainties. However, even though Scrum is the most popular agile approach, research on an eCommerce company in the United States showed challenges in agile adoption with Scrum, such as lacking permission from the board of company [12]. Meanwhile, in the study on government entities in the United Arab Emirates, the challenges of Scrum adoption are missing roles such as lack of Master Agile, the absence of the pilot project, and no employees were experienced enough with agile methods. The entities were also facing working pressure, and it was not very easy to persuade the top management to invest in the new methodology. Lastly, government bureaucracy and extensive documentation requirements hindered the adoption of Scrum [5].
What about Indonesia? To the best of our knowledge, no study was conducted yet on how an organization outside technology company/organization in Indonesia used Scrum. Based on the discussions above, we found that different organizations adopted Scrum in different variations. This study aims to find a model of agile adoption in a higher education institution in Indonesia, with a case study in the Board of Information Systems, Universitas Islam Indonesia. The board of information systems is the IT unit at the university. As part of the university, it is naturally adhering to a higher education industry culture different from software industry culture. However, in recent years, the higher education industry faces an arduous effort to comply due to regulations, internal and external governance compliances, and digitalization. These things have forced the Board of Information System at Universitas Islam Indonesia to adopt and develop information systems faster than it used to be. The board has been experimenting with the use of the Scrum approach since 2018 to develop software faster and robust. A robust system is necessary since almost 30,000 users will access it.

The remainder of this paper is organized as follows. Section 2 provides a background on achieving success in the software development projects and challenges that affect the success in Scrum adoption. We describe the research methodology in section 3. Subsequently, we present our findings in section 4, with detailed discussions in Section 5. In section 5, we explain the limitations of our study. Lastly, we conclude this study in section 6.

2. Methodology
We conducted this research to answer a research question i.e. what are the challenges faced in the agile methodology adoption in Higher Education institutions? This study used quantitative research based on surveys and interviews to examine agile adoption challenges in universities. We used the Scrum Adoption Challenges Model Detection Model (SACDM) [13], which is a model adapted from the theory of Diffusion of Innovation (DOI) to measure the adoption of Scrum. Figure 2 shows the SACDM conceptual framework that consists of four constructs: individual, team factors, organizational factors, and technological factors. We used nineteen independent variables to develop the four constructs.

### Individual factors
- Escalation of commitment (-)
- Experiences (+)
- Over Engineering (-)

### Technology factors
- Relative advantage (+)
- Complexity (-)
- Compatibility (+)

### Team factors
- Resistance to change (-)
- Communications (+)
- Specialization (-)
- Management sprint (+)
- Teamwork (+)

### Organizational factors
- Collaboration (+)
- Management support (+)
- Organizational culture (+)
- Organizational structure (-)
- Quality (+)
- Recognition (+)
- Resources (+)
- Training (+)

**Fig. 2. SACDM conceptual framework [13]**

2.1. Respondents
Participants who participated in our research came from different roles in the organization. Those are Scrum Master, Product Owner, Team Member (Development and Operational), and Management team of the Board of Information System, Universitas Islam Indonesia. The number of respondents is 41 out...
of 50 people who work for the Board of Information System when the research was conducted (82.9% males and 17.1% females) with the details as follows: 21 people from Developer team – Dev (51.2%), nine Operational team member – Ops (22%), six Product Owner – PO (14.6%), and five people (12.2%) as Scrum Master – SM_Mg. Most respondents are generation Y (millennials) amounted to 90.2%, and 9.8% are generation X. From the educational background point of view, most respondents have a bachelor's degree and consist of 70.7% of the respondents, master’s degree 12.2 %, doctoral degree 2.4%, polytechnic degree 4.9%, and 9.8% are high-school graduate. We collected the questionnaires from our respondents from December 2019 until January 2020.

2.2. Data analysis
We analyze the data using quantitative data based on completed questionnaires from respondents and validate the test using test validity and analyze the results by calculating each variable's mean of each construct.

2.3. Test Validity
We performed test validity using the bivariate correlation between the respective indicator scores and the constructs' total score. We obtained significant values from the results of the test validity results that indicate the questions are valid. Table 1 presents detailed results.

3. Results
We calculated the means from each variable from each construct, i.e., individual factors (3 variables), team factors (5 variables), organizational factors (8 variables), and technological factors (3 variables). Table 2 shows the means calculation for each variable in the individual factor. Variable is measured in likert scale, where 1 indicate the unlikeliness or strong disagreement and 5 indicate the likeliness or strong agreement.

Of the three variables on individual factors, the largest means average is Over Engineering variable with its score 3.83, and the lowest average is experience. This reflects the fact that Scrum is only applied in the organization in recent years. The board of information system, Universitas Islam Indonesia, started implementing Scrum in mid-2017. Hence most team members felt that they are not confident yet with the experience variable. Since the organization has only been applying recently, it often changes team composition and also the team tasks that contribute to the high score of the Over Engineering variable.

Table 3 shows that all variables in the team factor have average scores above 4.00. The highest average value in the communication variable with a score of 4.43 and indicates that the team members can communicate well and can exchange ideas with other team members easily. The teams also established common goals and collaborated intensively to achieve the goals. Team members felt that working intensively in a team is much more preferable than working alone. With regard to the specialization, respondents expressed that senior team members who have higher capability are helpful and collaborate easily with junior team members. In Sprint Management, respondents have understood its function well, which is to monitor and manage the sprint's progress and prevent the lack of timely feedback. In the change-resistant factor, most respondents see the benefit of using Scrum compared to the waterfall methodology that was previously used extensively and did not felt that Scrum hinders the works.

Table 4 shows only two out of 8 variables are above 4. Only training and collaboration variables scored above 4. The organizational structure scored the lowest with a score of 3.59. The organizational structure variable focused on how to support the organizational structure that enables the effective use of an agile method. The medium score means that most respondents felt that the organization's current structure has not yet accommodated the Scrum method well.

The second-lowest mean score is organizational culture. This variable explains the involvement of team members in the decision makings in the organization. Many still felt that most decisions were only decided by a few people, such as management (Scrum Masters) or product owners, rather than involving all team members.
| No. | Variables                      | Number of questions | Indicator                  | Pearson Correlation |
|-----|--------------------------------|---------------------|----------------------------|---------------------|
| 1   | Escalation of commitment       | 2                   | FIN_A1_KomitMg             | 0.793 **            |
|     |                                |                     | FIN_A2_KomitMg             | 0.845 **            |
| 2   | Over engineering               | 2                   | FIN_B1_RekaTim             | 0.788 **            |
|     |                                |                     | FIN_B2_RekaTim             | 0.802 **            |
| 3   | Experiences                    | 3                   | FIN_C1_P.P.Software        | 0.804 **            |
|     |                                |                     | FIN_C2_P.Agile             | 0.827 **            |
|     |                                |                     | FIN_C3_P.BSI               | 0.853 **            |
| 4   | Communication                  | 2                   | FTim_A1_Comm               | 0.924 **            |
|     |                                |                     | FTim_A2_Comm               | 0.925 **            |
| 5   | Teamwork                       | 2                   | FTim_B1_KerTim             | 0.795 **            |
|     |                                |                     | FTim_B2_KerTim             | 0.866 **            |
| 6   | Specialization                 | 1                   | FTim_C_Spesi               | 1                   |
| 7   | Sprint Management              | 2                   | FTim_D1_MnSprint           | 0.915 **            |
|     |                                |                     | FTim_D2_MnSprint           | 0.932 **            |
| 8   | Change Resistant               | 3                   | FTim_E1_Resis             | 0.799 **            |
|     |                                |                     | FTim_E2_Resis             | 0.859 **            |
|     |                                |                     | FTim_E3_Resis             | 0.835 **            |
| 9   | Training                       | 2                   | FOrg_A1_Pelat              | 0.785 **            |
|     |                                |                     | FOrg_A2_Pelat              | 0.839 **            |
|     |                                |                     | FOrg_B1_Rekog              | 0.755 **            |
|     |                                |                     | FOrg_B2_Rekog              | 0.801 **            |
| 10  | Recognition                    | 2                   | FOrg_C1_Kual              | 0.767 **            |
|     |                                |                     | FOrg_C2_Kual              | 0.741 **            |
|     |                                |                     | FOrg_C3_Kual              | 0.777 **            |
|     |                                |                     | FOrg_C4_Kual              | 0.756 **            |
| 11  | Quality                        | 4                   | FOrg_D1_SD                | 0.858 **            |
|     |                                |                     | FOrg_D2_SD                | 0.820 **            |
| 12  | Resource                       | 2                   | FOrg_E1_Kolab             | 0.898 **            |
|     |                                |                     | FOrg_E2_Kolab             | 0.773 **            |
|     |                                |                     | FOrg_E3_Kolab             | 0.901 **            |
| 13  | Collaboration                  | 3                   | FOrg_F1_DukMg             | 0.431 **            |
|     |                                |                     | FOrg_F2_DukMg             | 0.574 **            |
|     |                                |                     | FOrg_F3_DukMg             | 0.812 **            |
|     |                                |                     | FOrg_F4_DukMg             | 0.823 **            |
|     |                                |                     | FOrg_F5_DukMg             | 0.793 **            |
|     |                                |                     | FOrg_F6_DukMg             | 0.645 **            |
| 14  | Management Support             | 6                   | FOrg_G1_BudOrg            | 0.822 **            |
|     |                                |                     | FOrg_G1_BudOrg            | 0.825 **            |
| 15  | Organizational culture         | 2                   | FOrg_H_StrOrg             | 1                   |
| 16  | Organizational structure       | 1                   | FOrg_H_StrOrg             | 1                   |
| 17  | Relative advantage             | 5                   | FTek_A1_KeunRel           | 0.729 **            |
|     |                                |                     | FTek_A2_KeunRel           | 0.839 **            |
|     |                                |                     | FTek_A3_KeunRel           | 0.775 **            |
|     |                                |                     | FTek_A4_KeunRel           | 0.804 **            |
|     |                                |                     | FTek_A5_KeunRel           | 0.671 **            |
| 18  | Complexity                     | 2                   | FTek_B1_Kompl             | 0.895 **            |
|     |                                |                     | FTek_B2_Kompl             | 0.894 **            |
| 19  | Compatibility                  | 3                   | FTek_C1_Kompat            | 0.682 **            |
|     |                                |                     | FTek_C2_Kompat            | 0.850 **            |
|     |                                |                     | FTek_C3_Kompat            | 0.885 **            |

** Correlation is significant at the 0.01 level (2-tailed).
Table 2. Means in individual factor

| No. | Variables                  | Indicator          | Mean Group | Mean per Variables |
|-----|----------------------------|--------------------|------------|-------------------|
|     |                            |                    | Dev (N: 21)| Ops (N: 9) | PO (N: 6) | SM_Mg (N: 5) | Total (N: 41) |
| 1   | Escalation of commitment   | FIN_A1_KomitMg     | 2.71       | 3.44      | 3.50      | 3.00      | 3.02          | 3.33          |
|     |                            | FIN_A2_KomitMg     | 3.43       | 3.89      | 4.00      | 3.60      | 3.63          |
| 2   | Over engineering           | FIN_B1_RekaTim     | 3.52       | 3.67      | 3.50      | 4.20      | 3.63          | 3.83          |
|     |                            | FIN_B2_RekaTim     | 3.90       | 3.89      | 4.17      | 4.60      | 4.02          |
| 3   | Experiences                | FIN_C1_P.P Software| 3.48       | 2.33      | 4.00      | 4.60      | 3.44          | 2.90          |
|     |                            | FIN_C2_P.Agile     | 2.14       | 2.33      | 3.33      | 3.00      | 2.46          |
|     |                            | FIN_C3_P.BSI       | 2.24       | 2.56      | 4.67      | 3.40      | 2.80          |

Table 3. Means in the team factor

| No. | Variables                  | Indicator          | Mean Group | Mean per Variables |
|-----|----------------------------|--------------------|------------|-------------------|
|     |                            |                    | Dev (N: 21)| Ops (N: 9) | PO (N: 6) | SM_Mg (N: 5) | Total (N: 41) |
| 1   | Communication              | FTim_A1_Comm       | 4.29       | 4.56      | 4.33      | 4.80      | 4.41          | 4.43          |
|     |                            | FTim_A2_Comm       | 4.29       | 4.56      | 4.50      | 4.80      | 4.44          |
| 2   | Teamwork                   | FTim_B1_KerTim     | 4.19       | 4.44      | 4.17      | 4.80      | 4.32          | 4.27          |
|     |                            | FTim_B2_KerTim     | 4.14       | 4.44      | 4.17      | 4.20      | 4.22          |
| 3   | Specialization             | FTim_C_Spesi       | 3.95       | 4.22      | 3.83      | 4.40      | 4.05          | 4.05          |
| 4   | Sprint Management          | FTim_D1_MnSprint   | 4.19       | 3.89      | 4.50      | 4.40      | 4.20          | 4.21          |
|     |                            | FTim_D2_MnSprint   | 4.19       | 3.78      | 4.50      | 4.80      | 4.22          |
| 5   | Change Resistant           | FTim_E1_Resis      | 4.05       | 4.22      | 4.00      | 5.00      | 4.20          | 4.01          |
|     |                            | FTim_E2_Resis      | 4.00       | 4.33      | 4.00      | 4.60      | 4.15          |
|     |                            | FTim_E3_Resis      | 3.76       | 3.56      | 3.00      | 4.40      | 3.68          |

Table 5 shows that the means of all variables are below 4. This condition means that most respondents still felt that agile has not yet reached a state that can help them complete tasks quicker and easier or more effectively. This situation indicates that the Scrum methodology is still perceived as a complicated approach.

4. Discussion
This research has identified the challenges faced in adopting Agile using the SACDM approach. The score of each question in the assessment questionnaires is from 1.00 to 5.00. We grouped the level of adoption into four levels. The average means value for the group of Level 3 (L3) is from 1.00 to 2.00, Group Level 2 (L2) is from 2.01 to 3.00, Group Level 1 (L1) is from 3.01 to 4.00, and Group Level 0 (L0) is from 4.01 to 5.00. Level 0 means the best adoption possible that adhere the Scrum guidelines, while Level 3 means the lowest compliance from Scrum guidelines.

Figure 3 shows how in overall the Scrum adoption happened in the board of information system, Universitas Islam Indonesia. We discussed the details below.

5. Individual Factors
Our findings on individual factors found that experience is something that needs to be addressed. To address this issue, the team member should work more on various assignments, projects, and teams during a specific time as prescribed by [13]. A high level of experience of the project management
software teams and coaches who teach Agile technical practices can improve the experience part [14]. This finding is similar to the research on Government Entities in the United Arab Emirates that one challenge is that there are no employees who are experienced with agile methods [5].

Table 4. Means in organizational factors

| No. | Variables       | Indicator  | Mean per Variables |
|-----|----------------|------------|--------------------|
|     |                |            | Dev (N: 21) | Ops (N: 9) | PO (N: 6) | SM (N: 5) | Total (N: 41) |
| 1   | Training       | FOrg A1 Pelat | 4.14        | 4.22       | 4.33       | 4.60       | 4.24       | 4.11 |
|     |                | FOrg A2 Pelat | 3.86        | 4.00       | 4.00       | 4.00       | 3.98       | 3.86 |
| 2   | Recognition    | FOrg B1 Rekog | 4.19        | 3.89       | 4.33       | 4.40       | 4.17       | 3.95 |
|     |                | FOrg B2 Rekog | 3.57        | 3.22       | 3.67       | 3.80       | 3.54       | 3.88 |
| 3   | Quality        | FOrg C1 Kual | 4.00        | 3.56       | 3.83       | 4.20       | 3.90       | 3.95 |
|     |                | FOrg C2 Kual | 3.95        | 3.67       | 3.67       | 4.00       | 3.85       | 3.95 |
|     |                | FOrg C3 Kual | 3.95        | 3.89       | 3.83       | 4.00       | 3.93       | 3.95 |
|     |                | FOrg C4 Kual | 4.14        | 3.67       | 4.17       | 4.60       | 4.10       | 3.88 |
| 4   | Resource       | FOrg D1 SD  | 3.86        | 3.56       | 3.83       | 4.20       | 3.83       | 3.88 |
|     |                | FOrg D2 SD  | 4.05        | 3.44       | 3.50       | 4.80       | 3.93       | 3.93 |
| 5   | Collaboration  | FOrg E1 Kolab | 4.48        | 4.33       | 4.33       | 4.80       | 4.46       | 4.41 |
|     |                | FOrg E2 Kolab | 4.29        | 4.11       | 4.50       | 4.60       | 4.32       | 3.88 |
|     |                | FOrg E3 Kolab | 4.38        | 4.22       | 4.50       | 5.00       | 4.44       | 4.44 |
| 6   | Management     | FOrg F1 DukMg | 4.33        | 4.00       | 4.17       | 5.00       | 4.32       | 3.93 |
|     | Support        | FOrg F2 DukMg | 4.19        | 4.22       | 3.67       | 4.60       | 4.17       | 3.93 |
|     |                | FOrg F3 DukMg | 3.43        | 3.78       | 3.83       | 4.40       | 3.68       | 3.68 |
|     |                | FOrg F4 DukMg | 3.43        | 3.78       | 4.00       | 4.60       | 3.73       | 3.73 |
|     |                | FOrg F5 DukMg | 3.67        | 4.11       | 3.83       | 4.40       | 3.88       | 3.88 |
|     |                | FOrg F6 DukMg | 3.81        | 3.78       | 3.33       | 4.20       | 3.78       | 3.78 |
| 7   | Organizational | FOrg G1 BudOrg | 3.71        | 3.56       | 3.33       | 4.00       | 3.66       | 3.65 |
|     | culture        | FOrg G2 BudOrg | 3.52        | 3.56       | 3.67       | 4.20       | 3.63       | 3.63 |
| 8   | Organizational | FOrg H StrOrg | 3.48        | 3.56       | 3.50       | 4.20       | 3.59       | 3.59 |

Table 5. Means in technology factors

| No. | Variables    | Indicator  | Mean per Variables |
|-----|--------------|------------|--------------------|
|     |              |            | Dev (N: 21) | Ops (N: 9) | PO (N: 6) | SM (N: 5) | Total (N: 41) |
| 1   | Relative      | FTek A1 KeunRel | 3.71        | 4.11       | 3.83       | 3.60       | 3.80       | 3.89 |
|     | advantage     | FTek A2 KeunRel | 3.95        | 4.11       | 3.83       | 4.20       | 4.00       | 3.95 |
|     |              | FTek A3 KeunRel | 3.90        | 3.78       | 3.83       | 4.00       | 3.88       | 3.88 |
|     |              | FTek A4 KeunRel | 3.76        | 3.78       | 3.83       | 3.80       | 3.78       | 3.78 |
| 2   | Complexity    | FTek B1 Kompl | 3.52        | 3.44       | 3.00       | 3.80       | 3.46       | 3.60 |
|     |              | FTek B2 Kompl | 3.76        | 3.56       | 3.50       | 4.20       | 3.73       | 3.73 |
| 3   | Compatibility | FTek C1 Kompab | 3.48        | 3.00       | 3.00       | 3.40       | 3.29       | 3.33 |
|     |              | FTek C2 Kompab | 3.67        | 3.56       | 3.33       | 4.40       | 3.68       | 3.68 |
|     |              | FTek C3 Kompab | 3.57        | 3.67       | 3.17       | 4.40       | 3.63       | 3.63 |

Meanwhile, in the commitment variable's escalation, a notification is necessary to prevent management from continuing assigning resources to projects that show signs of failure. The Scrum team should notify the issue sooner to limit the waste of resources [13]. Over-engineering should also be avoided to limit additional software features and functions that the customer must not require [15].
5.1. **Team factors**

This construct shows the best performance, with average means score greater than 4.0. Communication is one of the main factors for the success of the product [10]. Communication and collaboration of people in the organization greatly affect the quality of Scrum. Development team members are cross-functional experts who have considerable experience in all technical roles. On top of that, they also require considerable social skills to facilitate communication and collaboration with other team members [16].

To improve the teamwork, the board of information system, Universitas Islam Indonesia, extensively used agile software support such as Jira and Confluence to document the work. The use of the software helps to overcome the recurring problems in teamwork. To improve the work’s effectiveness, the organization prepares each team member to specialize in something, e.g., UI/UX engineer, back-end engineer, front-end engineer, site reliability engineer, and security engineer. The specialization is achieved through extensive training and weekly TechTalk updates. Sprint management is also managed well to monitor and manage the sprint [13].

5.2. **Organizational factors**

Organization factors are still big homework for the board of information systems, as most of them scored less than 4. More training is needed to improve both individual and group [13]. Lack of training can trigger problems such as ignorance about the importance of meeting in Scrum. As collaboration is one of the values mentioned in the Agile Alliance's Manifesto, this organization needs to collaborate with more stakeholders to lessen the problems encountered in adopting agile [17]. [18] explain that customers play a significant role in software projects' success with their role as customer collaboration, customer satisfaction, and customer commitment.

Another organizational factor that is also important is to match the remuneration, the rewards, and the benefits with the productivity levels of workers [13]. The team member will be pleased more if the acknowledgment of their contribution is recognized. This, in turn, can improve the quality of the developed software, so it meets business and user expectations. Organizational behavior and culture, such as an open environment and collegial (less hierarchical structure), also play an important part in enabling innovation adoption. To improve the organization's culture, the organization should also focus on human aspects [19] so that a conducive situation can emerge.

![Fig. 3. Challenges in Agile Adoption](image-url)
5.3. Technological factors
The overall average means score in technological factors is less than 4. This indicates that the organization needs to pay more attention to these variables. The relative advantages of Scrum have not been felt yet to its maximum potential. Scrum should be able to contribute positively to each individual and the organization itself [14]. Due to unfamiliarity since the organization's Scrum adoption is still relatively new, the Scrum is perceived to be complex and slightly incompatible with the existing culture.

6. Conclusion
This research has shown how SACDM model can help understand agile adoption challenges in higher education in Indonesia with specific case studies in the Board of Information System, Universitas Islam Indonesia. From the discussion part, the communication problem is addressed well with the help of Scrum. It helps overcoming the recurring problems in teamwork. Overall, the Scrum approach helps to improve the software development cultures in the organization. The Board of Information System, Universitas Islam Indonesia, seems to adopt the approach well. However, some issues persist, especially in improving the experience variable by having more variety in the projects and providing more training. This study itself is without limitation. The questionnaires are only distributed in one organization. Thus, biased answers are unavoidable. A further study is needed in a different scenario, such as in start-ups, where Scrum adoption is far more prevalent.

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