Utilization of Technology and Perceived Complexity

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Abstract

This study examines the level of utilization of information technology in the education industry through perceived complexity. The study was conducted on 75 human resources who have IT backgrounds in higher education. Data from respondents were obtained through quantitative questionnaires and processed through SPSS to assess the perceived value. The research findings conveyed that the level of indicators in the perceived complexity that needs attention is difficult to understand from a business perspective and difficult to apply from a technical perspective. The study results provide an overview of the education industry in Indonesia in early learning the utility level of HR technology so that the implementation of technology will be able to support organizational performance.

Keywords
Technology, Perceived Complexity, Organizational Performance.

1. Introduction

Information technology is believed to be an important support for organizational growth so that investment is made by organizations to support organizational performance (Chouinard, Wandschneider, and Paterson 2016). All parts of the organization use information technology to accelerate performance and provide the best performance in operations (Cai, Chen, and Bose 2013). In the highest position, information technology is used as a tool to support decisions for entrepreneurs (Freihat 2012; Setiadi et al. 2018). The use of information technology is tailored to the needs of the company, from the operational level to the decision-holder level. This adjustment is considered important so that the implementation of information technology is by company goals and supports organizational performance (Hikmawati, Alamsyah, and Setiadi 2020; Zhao et al. 2014). The development of the company provides new opportunities for the use of more complex information technology. This is associated with the many functions of technology to support organizational performance (Alamsyah et al. 2019). However, some obstacles coexist with the implementation of
information technology, namely the adaptation of human data sources. Where not all human resources have a rapid adaptation to the implementation of information technology, especially for human resources who are unfamiliar with technological developments. This explains that perceived complexity occurs in organizations that experience changes or increases in the implementation of information technology (Setiadi et al. 2018). One industry that uses information technology is higher education (Mariana 2015).

In Indonesia, the lowest to highest education, namely elementary school to university, has adopted information technology (Alamsyah et al. 2019). The information technology used has different variants according to the HR needs in it. In higher education information technology is used to manage academic and non-academic (Kummitha and Majumdar 2015). Especially in universities, information technology is also used by outsiders who have influence, such as students, parents, and the government. In this case, parties outside of higher education entrust all information conveyed through information technology (Alamsyah et al. 2018; Hikmawati and Alamsyah 2018; Mailizar et al. 2020). As with companies in general, the adaptation of information technology in the education industry also has challenges. Especially when there is a company and the development of technology implementation to support higher education performance. The problem phenomenon over the utilization of information technology in the education industry is ultimately able to affect company performance (Kurniawan 2018). So, it needs to be evaluated before and after the implementation of information technology in the education industry.

In previous research studies, many stated that information technology can support higher education performance (Alamsyah et al. 2019). Implementation and evaluation are carried out using various research models. In the end, what is done is to find the main problems faced by human resources in the education industry in the utilization of information technology. Based on a study on the phenomenon of information technology adaptation, this research focuses on examining the utility of information technology based on the perceived complexity faced by the human resources of the education industry. This research is the basis for evaluations that need to be carried out by universities in implementing information technology.

2. Literature Review

2.1. Information Technology in Education

The development of information technology provides the possibility for an organization to continue to develop and provide innovations that can support organizational performance (Kuo 2011). Organizations such as universities no longer use conventional methods in their operations because of many obstacles and sacrificed time wastage (Alamsyah et al. 2019). Currently, universities are thinking about how information technology provides value to support long-term benefits (Wang et al. 2015). And how information technology can be maximized through the effectiveness of innovations that have been implemented (de Jager and Obadamosi 2013). Many theories explain information technology in companies including the education industry (Raffo et al. 2000). Among them are academics and non-academic systems based on information technology. The academic system is known to be used by the education industry in managing data on teachers, students, learning, grades, or what is commonly known as the obligation to manage the obligation of higher education (Naveh, Tubin, and Pliskin 2010). Meanwhile, the non-academic system is related to the management of education management which is usually associated with higher education development, such as marketing information systems (Kurniawan 2018). The two information technologies used to provide opportunities for the implementation of service innovations to stakeholders, including students, parents, and the government.

Information technology continues to develop, and the education industry is no exception. This is due to the increasingly complex and high value of innovation adopted by universities (Kweon et al. 2017). This development certainly needs to be adopted by universities, with the ultimate goal of sustainability or organization (Naveh et al. 2010). Of course, the existence of technology provides an opportunity for the adaptation of existing values in higher education to be more effective. Information technology itself is a tool developed by experts to support individual and organizational operations (Dao, Langella, and Carbo 2011). Because technology is a tool, the choices for information technology vary widely. However, in the end, what determines the choice of information technology is the ease of use and the low perceived complexity of human resources in organizations.

2.2. Perceived Complexity of Technology

Perceived complexity occurs and is faced by HR in activities in organizations such as universities (Alamsyah et al. 2019). In theory, perceived complexity is the level of innovation in information technology that is considered difficult for human resources to understand and use in organizations (Ehrke, Berthold, and Steffens 2014). The level of technological innovation has differences, starting from the lowest to the highest depending on the value of technology in supporting HR activities (Zhao et al. 2014). However, it needs to be realized that technology continues to develop
in line with the development of organizations such as universities (Alamsyah et al. 2020; Setiadi et al. 2018). There are many demands faced by universities to meet the expectations of stakeholders, so that adaptation to information technology is expected to be more easily resolved.

Many theories are presented to solve problems in the adaptation of information technology implementation, one of which is a technology adaptation model such as the Technology Acceptance Model (Hong and Yu 2018). However, before evaluating information technology, a study is needed related to the initial problems in the utilization of information technology, commonly known as perceived complexity (Setiadi et al. 2018). Perceived complexity is easy to study, where based on previous studies assessed from several criteria, including difficulty to understand technology, difficulty to implement technology, and difficulty to adopt technology (Cai et al. 2013). There are two perspectives from perceived complexity, namely from a business perspective and a technical perspective (Santos-Vijande, González-Mieres, and López-Sánchez 2013), where both have a relationship with each other to support the implementation of information technology.

3. Methods

Examining the research objectives, this research focuses on examining a variable, namely perceived complexity so that research studies focus on human resources (HR) who face perceived complexity. The research was conducted on the education industry in Indonesia with a survey on IT HR in universities. The survey was conducted on 75 IT human resources at BSI University consisting of employees, lecturers, and students, where all IT human resources came from internal universities. At least all human resources have experience in using and working through information technology support. Data from respondents were collected through a quantitative questionnaire to determine the research objective, namely perceived complexity. Where there are indicators that serve as a guide, including difficulty to understand technology, difficulty implementing technology, and adopting technology (Cai et al. 2013). Data from respondents are then processed through weighting of loading factor values and descriptive analysis to determine the research findings.

4. Result and Discussions

Data from respondents obtained as many as 75 data, where all data is filled in perfectly and can be used. Based on the respondents' background, it is known that most of the respondents are Faculty Members with 3 to 5 years of experience in information technology. Examining the respondent's profile results, it is known that the education industry that knows about technology and implements it has a lot (feasible), as well as experience with technology that is classified as adequate, namely over three years. These findings explain that respondents have good feasibility in providing input related to problems in information technology's perceived complexity. Furthermore, from the data, further analysis is carried out, namely the validity and reliability test as well as the weighting of the perceived complexity indicator value.

4.1. Correlation Values and Reliability Statistics

The first data processing results are related to the validity and reliability of the research instrument from the variable perceived complexity. Based on the results of data processing through SPSS, it is known that the correlations that appear in Table 1. Correlation values are the results that can be used to assess the validity of research instruments through the study of Pearson correlation values. It is known that the overall value of perceived complexity is 0.813, 0.905, 0.866, 0.864, and 0.783, from these results it is assessed that all research instruments are acceptable considering the Pearson correlation value is above 0.5. The next result is related to the reliability test (Table 2), where it is known that five indicators of perceived complexity have reliability above 0.7 which explains the received reliability of the research instrument.

<table>
<thead>
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<th>Table 1. Correlation Values</th>
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<tr>
<td><strong>Correlations</strong></td>
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<td>X1</td>
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<td>X1</td>
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<td>X5</td>
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<td>X</td>
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<td>N</td>
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**. Correlation is significant at the 0.01 level (2-tailed).
Based on the results of the validity and reliability test of research instruments, it can be concluded that the research instrument of perceived complexity is acceptable and worthy of analysis. The next analysis is weighting through-loading factor values, which aims to determine the indicators that have the greatest weight or influence on the formation of perceived complexity. If it is known that the greatest value of the problem with perceived complexity, it can easily determine the priority scale that needs to be prepared before the implementation of information technology in the education industry. So that information technology can run well and support organizational performance.

<table>
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<th>Reliability Statistics</th>
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<tbody>
<tr>
<td>Cronbach's Alpha</td>
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<tr>
<td>N of Items</td>
</tr>
<tr>
<td>0.901</td>
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<tr>
<td>5</td>
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### 4.2. Analysis of Loading Factors
Following are the results of the weighting through-loading factor values shown in Table 3, where it is easy to know the largest to the lowest weights that affect the formation of perceived complexity. There are five indicators studied, namely difficulty to understand technology with a perspective of business and technical, difficulty implementing technology with a perspective of business and technical, and difficult to adopt technology. Based on the results of data processing, it is known that the difficulty to understand in business perspective has the highest loading factor value, the second is from the difficulty to implement in a technical perspective. These findings explain that there is a level of difficulty in understanding technology from the business level and implementation from the operational level. These two things need to be a consideration that needs to be evaluated before implementing information technology. Meanwhile, the issue which is not of concern is the level of difficulty to adopt technology, which means that there are fewer problems in adaptation related to information technology to support work. More details on the value of loading factors are shown in Table 3 so that the level of attention of organizational management can be evaluated in facing the perceived complexity of information technology.

<table>
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<tr>
<th>Indicators of Perceived Complexity</th>
<th>Load. Factors</th>
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<tr>
<td>Difficulty to understand (business perspective)</td>
<td>0.917</td>
</tr>
<tr>
<td>Difficulty to understand (technical perspective)</td>
<td>0.772</td>
</tr>
<tr>
<td>Difficulty to implement (business perspective)</td>
<td>0.854</td>
</tr>
<tr>
<td>Difficulty to implement (technical perspective)</td>
<td>0.903</td>
</tr>
<tr>
<td>Difficulty to adopt of technology</td>
<td>0.649</td>
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</tbody>
</table>

### 4.2. Analysis of Perceived Complexity
The level of acceptance of information technology for each human resource in the education industry has differences. Based on the previous findings in Table 3, two indicators need to be prioritized. The first is related to the level of difficulty to understand from a business perspective and the second, the level of difficulty to implementation from a technical perspective. Meanwhile, the lowest level that could be abandoned is the difficulty level to adopt the technology. Difficulty to understand is an understanding of technology in the education industry at the highest level. Usually, in management decision-support information systems, this is naturally considered difficult because the data from management decision support systems come from all academic systems from all management lines. So that more effort is needed in making and understanding the system. This finding is in line with previous studies that sometimes top management has difficulty carrying out operational activities related to information technology (Asontis and Kostagiolas 2010; Bhandari, Hassanein, and Deaves 2008; Pi, Liao, and Chen 2012). Even though the information needed is very important and supports organizational performance. Next at the operational level of concern is the difficulty in implementing indicators, which is more on the implementation of technology that is usually done in the academic system.

The teaching staff believed that sometimes difficulties occur if there is an improvement in the academic system implemented in the middle of the teaching system. Because teaching staff such as lecturers are accustomed to using the old system even though they have a background in information technology. This is due to the refusal to learn new things and, most importantly, the lecturers' age who support their low understanding of new technology. These findings are in line with previous studies on HR behavior in understanding technology, which is more influenced by HR's character (Listiana et al. 2019; Riyanto et al. 2018; Siswanto, Shofiati, and Hartini 2018).
Through understanding the acceptance of human resources in information technology, management, in this case, universities, can prioritize evaluation priorities. So that the implementation of information technology is in line with the vision and mission of higher education and provides innovation value for the organization. This research provides value for management in Indonesia's education industry in the implementation of information technology as part of innovation and support for organizational performance. Through the findings in this study, it is hoped that information related to perceived complexity faced by HR in organizations can be input before implementing technology. In the future, there will be many challenges faced by organizations related to information technology, so that internal and external support from the company is needed.

6. Conclusions
This research aims to examine perceived complexity in the education industry for evaluating the utilization of information technology. The main goals of the organization can be achieved in improving organizational performance because of information technology support. The study results found that there are five indicators studied in perceived complexity, namely difficulty to understand and implement technology with a business and technical perspective, also difficulty to adopt the technology. The research findings conveyed that perceived complexity is dominated by two sides, namely, difficulty understanding from a business perspective and difficulty implementing from a technical perspective. Meanwhile, the thing that is not the main issue in perceived complexity is difficult to adopt. The research findings can be used as input for the education industry's most common organizations in evaluating the implementation of information technology. This research does not discuss the impact of perceived complexity technology on organizational performance so that the next research position becomes a recommendation to be continued.

References


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