

Information and Communications Technology Intelligence Risk Assessment for Digital Universities

Denchai Panket 

Bansomdejchaopraya Rajabhat University, Bangkok, Thailand, denchai.pa@bsru.ac.th

Montree Chinsomboon* 

Valaya Alongkorn Rajabhat University under The Royal Patronage, Pathumtani, Thailand, montree@vru.ac.th

Kiatikhorn Sobhanabhorn 

Bansomdejchaopraya Rajabhat University, Bangkok, Thailand, Kiatikhorn.So@bsru.ac.th

*Corresponding author E-mail: montree@vru.ac.th

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ABSTRACT: *This document Currently, the technological advance has an important part in developing the university in entering to the digital organization for helping to develop the organization to have the progress and will help to increase the efficiency in the management in every side rapidly via the technology which will have the accuracy and the precision. However, this will have the risk which may give the effect to let the organization create the damage. This will be needed to have to evaluate the technological risk for the organization to plan to cope with the effect that may be happening in the future. The risk management by the intelligent information technology, this is found that from evaluating of the risk with the intelligent information in the information technology for the digital university, this has components which have risk factors that are happened in the university which have both internal factors, external factors, the analysis of the data intelligent for evaluating the risk in the digital university. This has the information and the technology that are important parts in driving for evaluating other risk levels that are happened within the organization from the large database with the in-depth analysis for examining the error and showing the guideline for making the decision in order to create the least effect on the personnel, the student, the stakeholder and the community for bringing to the creation of the digital organization for the education effectively and having the safety sustainably.*

Keywords: Risk assessment, Data Intelligent, Digital University

1. Introduction

As The change of the information technology influences the development of the organization and when this has the happening change, this would be at risk especially for the technological risk in bringing to use for managing in the university. This will create the information technology risk management by using the process of the information technology risk management (ITRM) to be the systematical process in analyzing and managing the information technology risk (Ateş & Güneş, 2018) the university will have the transparency in managing in every side for both the internal control and most of the risk management system will be use by the corporate management for using in the decision making related to the efficiency in the operation in order to attain the organizational goal by using the enterprise resource worthwhile and this will create the highest benefit. By this will have the international standard in the examination(Anyim, 2020) for the technological advancements in the current situation, this can analyze the in-depth information synthesis and this can manage with the artificial intelligence technology for learning the information with the tool from the large database in order to examine and evaluate the risk on the mistake that may be happened in the future correctly and accurately more with the learning process from the behavior of the information (Safhi et al., 2017) the technological management will lead to the development of the organization to be the digital organization which will aim to the success in managing the digital organization for letting the organization to have the efficiency with the sustainability(Shikhnabieva, 2020), (Berdykulova et al., 2020)

2. Literature review

2.1 The risk assessment, the meaning of the risk assessment in the university level

The risk assessment is the risk management which is in the risk management process that is the important key in the strategic management. Most of the risk management is the risk management in every side which has the decision process for creating the neutral of the academic action that is happened within the university for reducing the risk and understanding the nature of the risk that will be happened in the organization (McDonald et al., 2020).

The risk assessment at the university level is the risk management which will have the structure to analyze the important issue in the decision making which will use the enterprise resource to consider for protecting the highest benefit and for reducing the risk that will be happened within the organization (Beecher & Streitwieser, 2019).

The risk assessment is the process for evaluating the safety from the environment which will give the effect on the university for reducing the gap that may give the effect of the threat which will make the university create the damage and will lose the benefit (Dehdashti et al., 2020.)

The risk assessment is the process of using the forecast from the information for developing the strategy in managing within the organization and there is the forecast from external factors outside of the organization (Abaoud, 2020).

The risk assessment and the risk management of the university is the threat that is happened with the educational organization which will have the effect to let the institute to lead the failure in some parts or all parts (Kozlova & Snegurenko, 2019).

The risk assessment is the management for increasing the capacity and managing resources by using the strategy in the risk transfer to another party for avoiding the negative effect that will be happened in the organization (Suroso & Fakhrozi, 2018)

The risk assessment is the assessment that has the efficiency step by step for creating the effect that may be happened in the future (Khalil et al., 2016).

The risk assessment is the analysis from the happening threat from the vulnerability that will create the damage on the enterprise resource for creating the safety with the management of resources efficiently and having the highest effectiveness under the context of the environment of that organization which has the principle and the process step by step (Orozova et al., 2019).

The risk assessment is the qualitative assessment with having the form for analyzing and creating the understanding in managing the enterprise resource which will have to use the information and the reason in analyzing the organization to manage with the efficiency (Singh & Joshi, 2017)

This can conclude the meaning of the risk assessment that is the method step by step in managing the organization which is needed to have to use the strategy in the management which will use the information in the analysis to create the understanding in using the enterprise resource worthwhile and create the highest benefit in managing the organization to find the way to solve, avoid, protect the negative effect which will give the effect for the organization to receive the damage with the most efficiency.

2.2 The component of the risk assessment in the university

The risk assessment in the university has the complex component under the regulation, the order, the rule, the environment, resources in working which has the personnel to be the person who will make the decision making to

analyze according to the judgment, the experience, and the ethics. The risk assessment can consider from the information in 3 levels that are.

1) The risk that is happened normally. This can identify to be low risk.

2) The risk that is happened repeatedly. This is the moderate-risk and

3) The risk in systematic education. This is the high risk that will be happened continuously and repeatedly at the level in the internal system of the organization for letting the organization have the safety from the risk (McDonald et al., 2020)

For the risk management in the university in the normal risk level, this is for creating the livelihood and creating the atmosphere which will have a good environment. This has the safety in the university for letting the personnel, the student, the staff, the risk management which will have the component that is the risk from external factors that is the regulation, the order, the rule, the competitor law (Beecher & Streitwieser, 2019)

For the risk assessment in the university, this will have the evaluation level with the needed technology. There is the information analysis since the lowest risk level and there is the safety to the level of the high-risk level. By this has the classification of setting the risk level. The low-risk level will be the green color, the moderate risk level will be the yellow color and for the high-risk level, this will be the red color (Dehdashti et al., 2020)

For the risk assessment in the educational level, this will have to evaluate the relationship, the experience of transferring the knowledge by using the information analysis, and the assessment from the personnel. In the risk evaluation for reducing the cost and using resources under the environment worthwhile, this is needed to have the technology and the network in entering to help in analyzing and deciding for assessing the risk directly and suitably for the organization (Abaoud, 2020)

The risk assessment is the analysis of the information, environmental resources in the organization that is happened from gathering to process and show the result for using in the decision making according to the risk level which will have the high level, the moderate level, and the low level for evaluating the use of resources and controlling the safety of the organization with the computer network technology (Suroso & Fakhrozi, 2018)

The risk assessment in the university will be consist of the computer network technology, the protection detection system, the information protection, the confidentiality, the honesty, the accessibility, the safety of the tool and the information analysis with the decision-making system from the threat with the direct and indirect attack, the active attack, and the hidden attack (Orozova et al., 2019)

The risk assessment is the risk assessment with the low-risk level, the moderate risk level and the high-risk level, which is needed to use the information, the technology, the large size network, and the personnel according to the environment to be according to the required standard for using in analyzing the weakness and the loophole which will create the damage on the enterprise resource. (Singh & Joshi, 2017)

Table 1 components of university risk assessment

University Risk Assessment	(McDonald et al., 2020)	(Beecher & Streitwieser, 2019)	(Dehdashti et al., 2020)	(Abaoud, 2020)	(Suroso & Fakhrozi, 2018)	(Orozova et al., 2019)	(Singh & Joshi, 2017)	Conclusion
external factors								
statute	✓	✓						
environment	✓	✓		✓	✓		✓	✓
ethics	✓							
resource	✓		✓	✓	✓		✓	✓
well-being		✓						
atmosphere		✓						
rival		✓						
cost				✓				
internal factors								
University		✓	✓	✓	✓		✓	✓
organization		✓	✓	✓	✓		✓	✓
personnel	✓	✓	✓				✓	✓
student		✓						
Method								
decide	✓			✓	✓	✓		✓
analyze	✓		✓	✓	✓	✓		✓
compile					✓			
judgment	✓							
experience	✓		✓					
relationship				✓				
risk level								
low risk	✓		✓		✓		✓	✓
moderate risk	✓		✓		✓		✓	✓
high risk	✓		✓		✓		✓	✓
Tools								
data	✓		✓	✓	✓	✓	✓	✓
technology			✓	✓	✓	✓	✓	✓
process					✓			
result					✓			
safety	✓	✓	✓		✓	✓		✓
network				✓	✓	✓	✓	✓
computer						✓		
detection system						✓		
confidentiality						✓		
attack						✓		



Figure 1. Components of University Risk Assessment

2.3 Risk factors in the university

Risk factors that are happened in the university will be as follows.

For general risk factors, First, is the responsibility, the facility, and the physical security of the educational institute.

Later, the university must have the confidence in keeping the school-record and the success of the student, the political risk. The educational institute where has received the support from the government, this may create the risk from the change of the political leader. By this will have the executive and the board of the institute who will have to build the political risk to acquire the in-depth information for reducing the political risk, the investment risk in the risk management. The chief executive of the educational institute will have to understand the context, consider about the effect that is happened from receiving the decision-making process (Beecher & Streitwieser, 2019)

Risk factors in the university have factors from both internal factors and external factors. Internal factors will be from the uncertainty in the quality of the high education level. The manufacturing of graduates isn't matched with the requirement of the market. There is the high cost of the tuition fee. The public relations have lacked the efficiency. The support is lacked the motivation for the staff in the university. There is the change of the organizational structure. The teaching tool isn't modern. And there are external factors which create the risk from the economic recession, the competition between universities, the budget from supporting agencies is reduced. This must reduce the budget to support the research of the public agency. There is solving of the law in the education that isn't conform to the environment of the education (Kozlova & Snegurenko, 2019)

This can conclude that risk factors are happened in the university from internal factors and external factors. Factors are coming from the responsibility, the political risk, the investment risk in the risk management. The manufacturer of graduates that aren't matched with the requirement of the market, the high tuition fee, the public relations, the support that is lacked the motivation for the staff in the university, the change of the organizational structure, the teaching tool that isn't modern, the competition between universities, the budget from supporting agencies, the solving of the law in the education that isn't conform to the environment of the education.

2.4 The data intelligent,

The meaning of the data intelligent is the data intelligent in the information analysis in other forms for being able to show new viewpoints from the number of the bigdata. (Dash Wu, 2020)

The data intelligent is the process in the new form that will help in the decision making which is came with the development of the algorithm from the information and the artificial intelligence by there is the decision process from much information to create the efficiency and create the benefit. (Kim et al., 2020)

The data intelligent is the large size information that can analysed and use the benefit and can bring to use in the management by this is needed to have the tool in entering to help. By there is the process of acquiring of the information. There is using of the technique and the information management method for planning and operating according to the condition. There is the analysis to manage with the information and the engineering for using to create the new knowledge (Denzler & Kaufmann, 2017)

The data intelligent is the topic related to the management, the change in the information to be the knowledge for letting that information to have the value. There is the interaction between the information wisely according to the context for using in learning the information and the perception of the knowledge of the information that is available from the large size information (Safhi et al., 2017)

The data intelligent has the management of the information which is the picture from the analysis to create the picture for analysing automatically wisely. By this can imitate or create the new picture from learning of the large size information which is available via the process of creating the relationship of the information and this will create the meaning of the new automatic model information with the information of the artificial intelligence technology (Zhang & Yang, 2019)

Hence, the meaning of the data intelligent is the analysis of the information in other forms for being able to see the new viewpoint from the large size information that will help in the decision making which is came from the development of the algorithm from the information and the artificial intelligence which will be able to analyse and use the benefit by this is needed to have the tool in entering to help in managing the information for planning and operating to have the interaction between information wisely according to the context. The data intelligent may have the management of the information that is the picture. By this can imitate or create the new picture via the artificial intelligence technology.

2.5 The process of managing the data intelligent

The process of the data intelligent is the process in searching the information that can operate automatically from the information set. By this is needed to have the statistical method and the algorithm in searching the information wisely for setting the form and the relationship for helping to create the knowledge and perceive the information that is understood within the large database. By this will use the method to detect the anomaly that is came from the invasion of the information. There is the interesting method to connect the relationship between other variables according to the situation and the time of the information. There is the data clustering method from the information analysis with the learning from the tool (Machine learning) there is the method of the hierarchical classification of the information according to the basic information. And there is the estimation of the relationship of the data variable by the method of adjusting to be suitable with the equation of the information set for using in creating the model of the information each other (Safhi et al., 2017)

The management of the data intelligence is the new form of managing the information for use to facilitate by having the management of the information for separating the category, the classification systematically for giving the information to have the suitability for bringing to use with the technological advance. This is needed to have the step in working to aim in managing the information technology from the large size information to show the workflow in each step for having not to create the mistake from much information. This is needed to manage the intelligence information in the digital form. There is using of other artificial intelligence technologies in entering to help in the management efficiently. (Channgam et al., 2019)

Therefore, intelligent data is a process of finding data requiring statistical methods. and the formatting and correlation algorithms provide a comprehensible perception of information within a large database by correlating the relationships between variables and the method of segmentation of the data obtained by learning the data (Machine learning).

Knowing from the tools to show the results in a new form of data management to systematically categorize the data, it is suitable for use by displaying the workflow at each step to avoid errors. It is necessary to manage intelligence information in a digital format, using various artificial intelligence technologies to help manage it effectively.

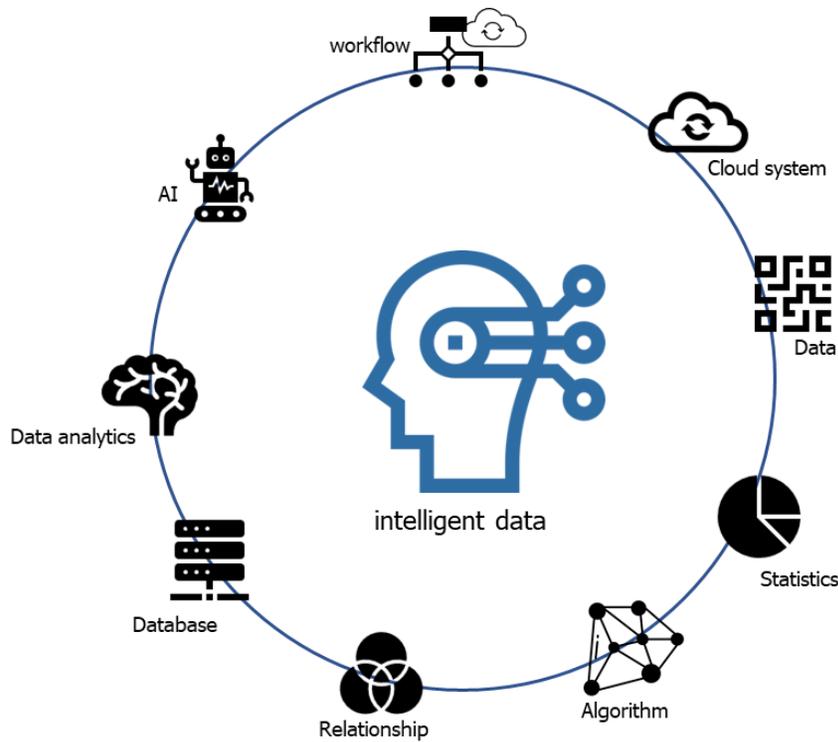


Figure 2. Intelligent data

2.6 Digital university

The meaning of the digital university, the digital university is the development of the system and the education agency to have the change in the digital by there is bringing of the information, the technology, and the guideline of the advance in the technology information for increasing the efficiency of the management under the reason of the development in every side to be the digital. (Lezer et al., 2020)

The digital university is the development in the viewpoint that is happened from the development to be in the form of the digital way. By this will use the method of the usability in the new form. This will develop the university to be in the form of the learning society. The society of the understanding which will connect via the modern technology for both in the current technology and the technology that will be happened in the future. (Bilyalova et al., 2020)

The digital university is the planning and the development of the system to manage and set the educational system to have the modernity with the digital tool that can integrate and conform to the environment of the economy and the society for creating the advance and this will create the innovation that will build the sustainability for the organization. (Rozhkova et al., 2020)

For the entrepreneur in the digital academic, this is the development which will create the digital in the ecosystem of the university that will create various benefits by bringing the new modern technology to develop to be the digital platform. And there is the development of the innovation which will have the benefit on the university (Secundo et al., 2020)

Hence, for the digital university, there is the development of the organization to be in the digital form with the instruction in the new form for the learning ecosystem. There is the creation of the innovation and the society for the

understanding which will connect via the technology by bringing the information, the technological planning and the development of the management system and there is setting of the educational system for increasing the efficiency of the management under the reason of the development in every side to be the sustainable digital for the organization and the component of the digital university.

2.7 Elements of a digital university

The digital university is consisted of 5 components. By this will have the first part of the component. This has the student, the personnel, the community. After that, the component is the basic information that can render the digital information with the flexible information technology. Later, this is the part of the service for letting the student and the personnel to be able to access to the safe information, the network, the in-depth analysis, and other data bases for studying and developing oneself all the time. Besides, this will have the component, the increasing of the efficiency of the information technology within the organization that can connect more conveniently. By this will have to consider about the stakeholder, the creation of the motivation. And the last component, this is the smart technology (Lezer et al., 2020)

The university is consisted of the digital platform which will have the file information via the service with the information technology that is safe for developing the organization to have the progress. This will have the application, the program, the network, the tool, the artificial intelligence technology, the information, the database, the advanced data assessment system, the child element which will help to contribute to let the university to develop continuously and has the efficiency (Bilyalova et al., 2020)

The digital university is consisted of the stakeholder for both internal and external of the university. There is the personnel, the staff, the student and the community. There is the service of the basic information that is the creation of the data area, the network system which will support the conservation in the digital form. There is the internal intelligent system within the university including the service in facilitating in each sub agency in the university. After that, for the component in the part in using resources for increasing the capacity of the university to create the highest efficiency, the digital market, the management in the digital form, the digital interaction, the safety system for creating the good image via the information system, the information management system for managing the university (Rozhkova et al., 2020)

The component of the entrepreneur in the digital academic will be consist of the stakeholder, the student, the personnel, and the people. For the tool, this is consisted of the digital information technology, the insight, the supporting system, the intelligent system, the network system, the service which has entered to operate and make the decision to solve the problem (Secundo et al., 2020)

The digital university is the design of the activity which will aim to use for creating the success. There is the information technology, the data intelligent system, the in-depth information analysis system, the management system, the network system, the management innovation, the service, the safety technology, the personnel, the student, the stakeholder, the community, the society for using as the tool in developing the university to be the digital university with the good quality (Shikhnabieva, 2020)

For the development to be the digital university, this must receive the development in the main system and the auxiliary system of the environmental ecosystem of the university with the digital in the service form. This is consisted of the digital information, the information technology system, the network system, the digital management system, the enterprise resource planning system (ERP), the customer relationship management (CRM), the learning management system (LMS) (Popova et al., 2020)

For the development to step forward to the being of the digital university, this will have to develop the digital strategy for bringing to use in the organization. By this will have the in-depth information analysis all around in the form of the primitive university to step forward to the being of the digital university which will have the safety technology to render the network system for the user of the technology to create the confidence and the culture in the information technology with the good quality (Berdykulova et al., 2020)

The digital university will be consisted of the student, the instructor, the person who receives the benefit and the impact, the information technology, the artificial intelligence technology, the intelligent system, the digital technology, the network system of the large size information. This is the part to drive the university for changing to the management

and the service in the digital form in the dimension of the viewpoint and the in-depth information, the technology dimension, the dimension of the digital culture for being the digital university (Perez Gama et al., 2018)

Table 1 composition of the digital university

Digital University	(Lezer et al., 2020)	(Bilyalova et al., 2020)	(Rozhkova et al., 2020)	(Secundo et al., 2020)	(Shikhnabieva, 2020)	(Popova et al., 2020)	(Berdykulova et al., 2020)	(Perez Gama et al., 2018)	Conclusion
stakeholder									
Student	✓		✓	✓	✓			✓	✓
Personnel	✓		✓	✓	✓			✓	✓
Stakeholder	✓		✓	✓	✓			✓	✓
Community	✓		✓	✓	✓				✓
Main part									
Information	✓	✓	✓	✓	✓	✓	✓	✓	✓
Method									
Service	✓	✓	✓				✓	✓	✓
Motivation	✓								
Digital strategy							✓		
In-depth analysis	✓	✓		✓	✓		✓	✓	✓
Technologie culture							✓	✓	
Tools									
Technologie	✓	✓	✓	✓	✓	✓	✓	✓	✓
Database	✓	✓	✓	✓	✓	✓	✓	✓	✓
Platform		✓							
Application		✓							
Program		✓							
Network	✓	✓	✓	✓	✓	✓	✓	✓	✓
Artificiel intelligence technologie assessment system		✓						✓	
Chat system			✓						
Digital marketing			✓						
Digital interaction			✓						
Security system	✓	✓	✓		✓		✓		✓
Information system	✓	✓	✓	✓	✓	✓	✓	✓	✓
Information management system			✓						
Support system				✓					
Intelligent system	✓		✓	✓	✓			✓	✓
Digital management system					✓	✓			

Digital University	(Lezer et al., 2020)	(Bilyalova et al., 2020)	(Rozhkova et al., 2020)	(Secundo et al., 2020)	(Shikhnabieva, 2020)	(Popova et al., 2020)	(Berdykulova et al., 2020)	(Perez Gama et al., 2018)	Conclusion
Enterprise Resource Planning (ERP)						✓			
Customer Relationship system (CRM)						✓			
Learning Management System (LMS)						✓			
Management innovation					✓				

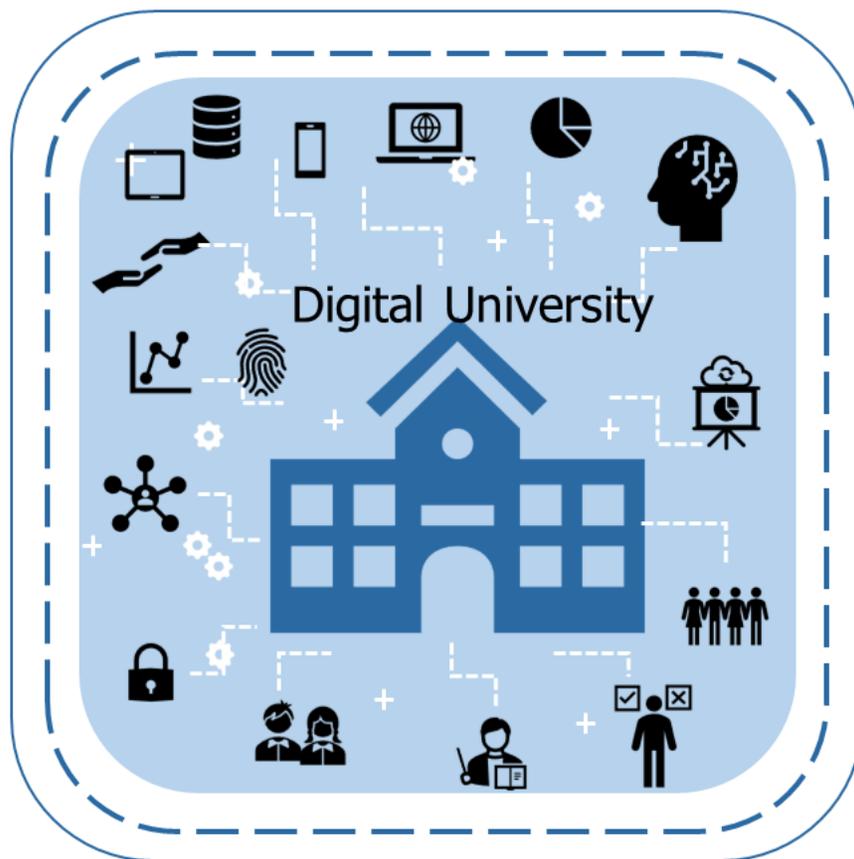


Figure 3. Elements of the Digital University

Table 3 summary Description

Studies Themes	Description	References
Risk assessment	Risk assessment is necessary to analyze information in order to manage the organization in order to find solutions, avoid them, and prevent the negative impacts of both internal and external factors that cause damage to the organization as efficiently as possible.	(McDonald et al., 2020), (Beecher & Streitwieser, 2019), (Dehdashti et al., 2020), (Abaoud, 2020), (Kozlova & Snegurenko, 2019), (Suroso & Fakhrozi, 2018), (Khalil et al., 2016), (Orozova et al., 2019), (Singh & Joshi, 2017)
Data Intelligent	All forms of data enable decision-making with data-driven algorithms and artificial intelligence innovations.	(Dash Wu, 2020), (Kim et al., 2020), (Denzler & Kaufmann, 2017), (Safhi et al., 2017), (Zhang & Yang, 2019), (Channgam et al., 2019)
Digital University	Digital organization for learning Innovation and a digital society Driven by personnel and technology for sustainable digital management for the university.	(Lezer et al., 2020), (Bilyalova et al., 2020), (Rozhkova et al., 2020), (Secundo et al., 2020), (Shikhnabieva, 2020), (Popova et al., 2020), (Berdykulova et al., 2020), (Perez Gama et al., 2018)

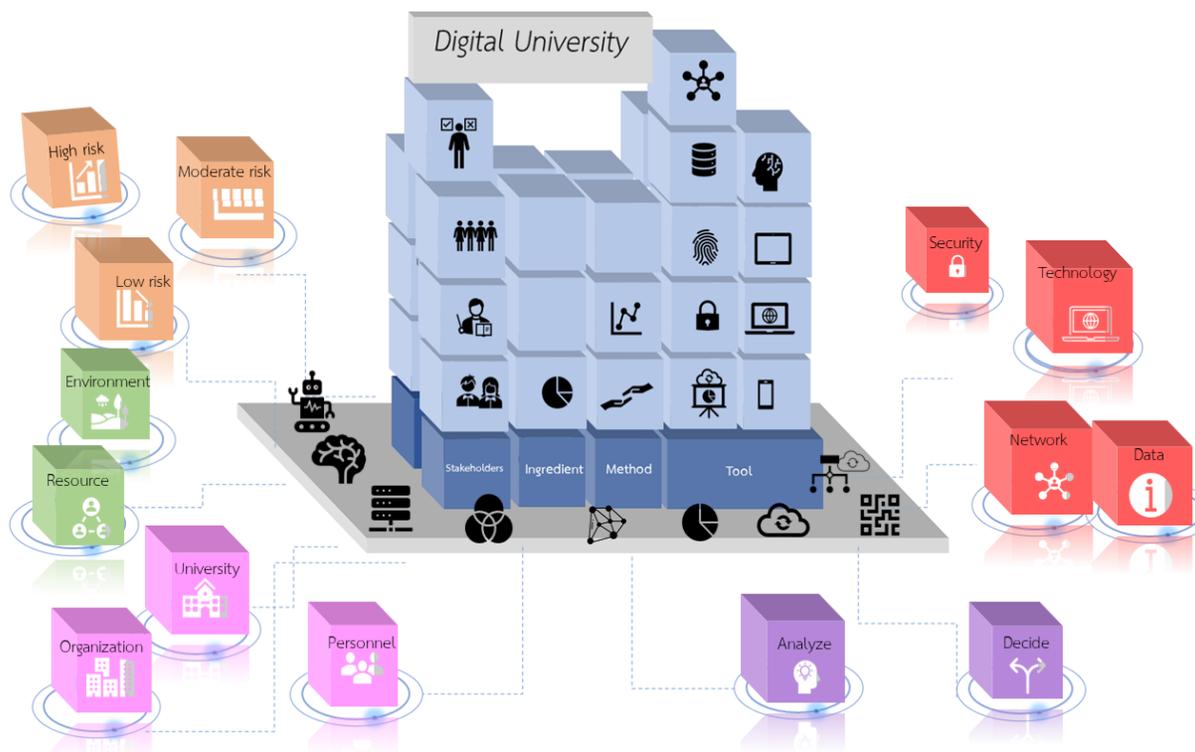


Figure 4. Information and communications technology intelligence risk assessment for Digital universities

3. Conclusion

The risk assessment with the data intelligent in the information technology of the digital university which will have the component for 3 parts. By the first part, this is the risk assessment which will have to consider about internal factors and external factors that has the environment, the resource of the organization. By this will use the management method from the synthetic analysis and there is using of the decision-making process for assessing the risk level that is the high-risk level, the moderate risk level and the low risk level which will give the effect to let the organization to create the damage with the digital tool that has the information technology, the network, and the safety technology. After that, in the later component, this is the synthetic analysis of the large size information with the data intelligent that has the process in managing the scientific information. And this will create the idea in developing the process to solve the problem that can explain step by step clearly for protecting the mistake in analyzing the information on the large size information with the connecting method via the system that can learn from the information with the artificial intelligence technology and the component of the digital university that has the personnel, the student, the community, the stakeholder in the risk management that is happened in the digital organization by having the information as the important part in driving via the process of analyzing the in-depth information with the technological tool, the database, the network, the safety system, the information technology system, the intelligent system for bringing to the development the university to be the digital organization with the sustainability.

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