A Need Analysis of Innovation In Educational Technology to Increase The Quality of Website Learning In Industrial Revolution Era 4.0 Using Waterfall Method

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Abstract Website is one of the offered courses in university to measure graduate competence in the era of utilization of the digital world. This study aims to analyze all of learners' needs to achieve the desired outcomes. This current study only gives general information about the website. The participants of this study were Lecturers, undergraduate and postgraduate students, and educational practitioner throughout Indonesia using the online form. Data collection techniques used in this study were in depth interview as well as online survey and a need analysis using waterfall method. The result showed that it was necessary for the university to provide various supporting facilities to improve students' competence. This study generated a complete learning innovation which qualifies the needs for students to reach the target output required by the policy makers..

1. Introduction

The technology that exists on today's Website is a major need in a learning process, learning innovation is all done to improve the quality of learners. Website argues that education is a surprisingly neglected sector of activity in research on service design and innovation and that greater attention to education as a service can shed new light on theoretical and methodological issues in service design and innovation research. It shows how a novel reframing of education activity e as networked learning can enrich some critical areas of thinking about the analysis, design and evolution of co-produced services more generally. Finally, it identifies a family of participatory design approaches that are particularly well-tuned to the needs of service innovation[1] because the

application of website learning requires another technology. Incorporating strategies for helping teams to effectively regulate group work and enhance planning processes may result in an increase in students' engagement with learning activities and collaborative processes.[2][3]. In this condition, it is necessary to design a learning that can facilitate the teaching and learning process in the application of information technology [4]. Technology (IT) is increasingly seen as an enabler of business innovation in addition to its contribution to cost savings and increased efficiency. The research identifies a number of practices from benefits-led approaches to IT that contribute to IT-enabled innovation. There is also evidence of organizations developing a new practice of ideation drawing on 'crowd sourcing' and exploiting social media technologies. Existing principles and practices for benefits realization can contribute to innovation, but the practices have to be applied in different ways according to the context. [5][6][7] We explain the different phases and provide a selection of checklist-items to show what type of quality checks are made in order to decide whether the software artifact developed in a specific development phase can be passed on to the adjacent phase, Requirements Engineering, Design and Implementation:, Testing, Release, Maintenace[8][9]. Previous studies have focused more on learning services, collaboration, information technology development and stages, with no one discussing in detail what primary basic needs are required in a learning innovation. [10] To address this research gap, we conducted case studies at several universities that focused on identifying needs in implementing current learning models to keep up with the times in the digital age. The Current Study wants all educational institutions can have a complete guide in knowing the main needs analysis for learning innovation.

2. Method

2.1 Waterfall Model

Waterfall model is a systematic, structured and interconnected model of systematic information system development. Commonly used waterfall model as a method of development is to know in detail the needs of campus parties to be recorded in detail and the stages in the waterfall model are clearly structured. Waterfall method generally has the following stages: 1) Requirements analysis and definition. A Service system for viewing constraints, and objectives defined by the results of consultations with users who are then defined in detail and serve as system specifications in the website. 2) System and software design. Stages of system design that allocates the needs of the system both hardware and software by forming the overall system architecture. The design of software involves the identification and depiction of the basic software systems and their relationships. 3) Implementation and unit testing. At this stage, the design of the software is realized as a series of programs or program units. Testing involves verifying that each unit meets its specifications, all device components used in both hardware and software. 4) Integration and system testing. Individual units of the program or program are combined and tested as a complete system to ascertain whether it meets the needs of the software. After the test, the software can be sent to the customer, in this process is a continuation of previous work, the entire working of the device is activated. 5) Operation and maintenance. This stage is the longest stage. System installed and used. Maintenance, involves rectifying errors not found in the previous stages, improving the performance implementation of the system unit, and improving system services as new requirements [11] [12] [13] The results of data collected online have received approval from respondents for use in this research.

2.2 Study Partipants

Learning innovation in the world of education is one of the key factors in improving the quality of education in the face of industrial revolution 4.0 In this context education becomes a cultural phenomenon that is influenced by social environment. Thus, education should not be static, but education must be able to design not only individual changes but at the same time changes in society and nation comprehensively and sustainably. [14] [15] all respondents are directly involved in the world of education, whether directly or not. Data collection using online form in two stages.

Waterfall method consists of 5 steps that will be focused on the first part is to discuss in detail the necessary needs. In this step of analysis will be discussed again in detail 5 steps waterfall, which

involves directly related components consisting of Internal Campus, Education Authorities, Industri and the general public

3. Result

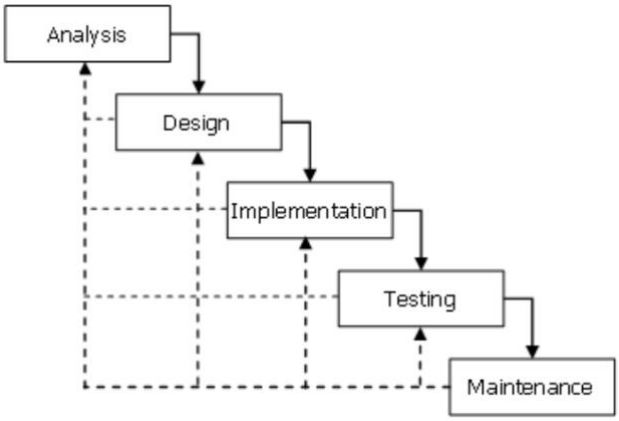
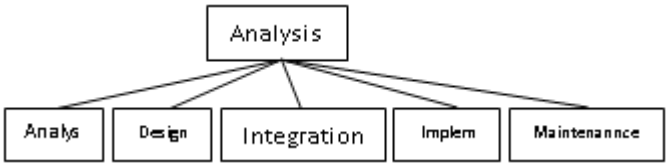


Figure. 1 The Waterfall model Essentially[8]

Waterfall method begins with the analysis of needs, design, implementation, experiments and maintenance. In this stage analysis needs to be broken down again into 5, as shown below:



Fig**ure**. 2 Model of Needs analysis in waterfall method

4. Discussion

Process Requirement analysis using a waterfall model that will require entry of elements involved in educational innovation in the era of industrial revolution 4.0 to produce the following data.

Table 1. Needs of Various Study Programs

Study Program	Do you need a change in order to face the Industrial Revolution 4.0	What were the main needs needed to support the learning of the Industrial Revolution 4.0?	When do you want that change?
Education technology	Yes	Internet Network	right now
Elementary School Teacher Education / Faculty of Education	Yes	computer	right now
Diploma Program 3 of Hyperkes and Work Safety	Yes	Practice first	right now
Islamic economics, accounting, tax	Yes	Complete Laboratory	right now
Postgraduate School of Public Health (FKM) STIKES Mandala Waluya Kendari	Yes	HP n Laptop	right now
English language education	Yes	Highspee Bandwith n Blended Learning	< 5 years
Management study program	Yes	For hardware requirements to easily access the learning needed	< 10 years

Study Program	Do you need a change in order to face the Industrial Revolution 4.0	What were the main needs needed to support the learning of the Industrial Revolution 4.0?	When do you want that change?
Biology Education / Faculty of Teacher Training in Education	Yes	campus needs, wifi available and unlimited use	< 3 years
English education Faculty of Teacher Training and Education	Yes	modern learning tools	right now
Bachelor of Information Systems, Bachelor of Informatics Engineering, Computer Engineering Diploma and Information Management Diploma Informatics Management	Yes	fast internet access	right now
Informatics Engineering / Faculty of Engineering	Yes	really need software and hardware to support college activities	right now
PAI DAN MPI	Yes	lesson study based learning	right now
Informatics Engineering Study Program / Faculty of Engineering	Yes	Skills collaboration	right now
Bachelor of Informatics Engineering Diploma in Accounting Information Systems	Yes	Collaboration of IT lecturers and other department lecturers	right now
Mathematics Education Study Program / Faculty of Mathematics in Natural Sciences (MIPA)	Yes	prepare a reliable workforce	< 3 years
COUNSELING GUIDANCE	Yes	have special skills for mastering new technology	right now
English language education	Yes	requires new technological insights	right now
Management, accounting and development studies	Yes	Less of computers and infocus in supporting learning.	right now
Basic Education STKIP PGRI Metro-Lampung	Yes	human resource improvement program	right now
Department of Agribusiness Management	Yes	potential development through training	right now
Islamic Communication and Broadcasting	Yes	have a network that is connected with cross-workers	right now
Mathematics Study Program	Yes	Supporting devices for student learning	< 5 years
Management	Yes	Program	right now
Mechanical Engineering Study Program, Faculty of Engineering	Yes	potential development through a training system	right now
Early childhood education programs	Yes	think innovation	right now
Informatics Technique	Yes	teach coding to students	right now
Informatics Technique	Yes	multiply the practicum	right now
Tadris Indonesian Language / Faculty of Tarbiyah and Teacher	Yes	preparation of innovative learning systems	< 3 years

Study Program	Do you need a change in order to face the Industrial Revolution 4.0	What were the main needs needed to support the learning of the Industrial Revolution 4.0?	When do you want that change?
Training			
Community Nutrition, Department of Nutrition, Faculty of Public Health, Diponegoro University	Yes	curriculum innovation	< 10 years
English	Yes	Literacy	right now
Early Childhood Islamic Education Study Program / Islamic High School BARUMUN RAYA Sibuhuan	Yes	competent lecturer	< 5 years
Faculty of Information Technology of the Universitas Sembilanbelas November (FTI) USN	Yes	guidance of competent lecturers in the IT field	right now
Political science	Yes	more innovative learning preparation	right now
Faculty of information technology / information systems Information technology department is majoring in information systems	Yes	applied new technological innovations	< 3 years
Faculty of Information Technology. Information system program Information Systems Study Program FTI USN	Yes	computer laboratory equipment	right now
Information Systems	Yes	integrated information system	right now
English Education University HaloUleo UHO	Yes	collaboration in the implementation of new technologies	right now
information systems / computer science	Yes	Training	right now
Education technology	Yes	implementation of the latest technology-based learning	right now

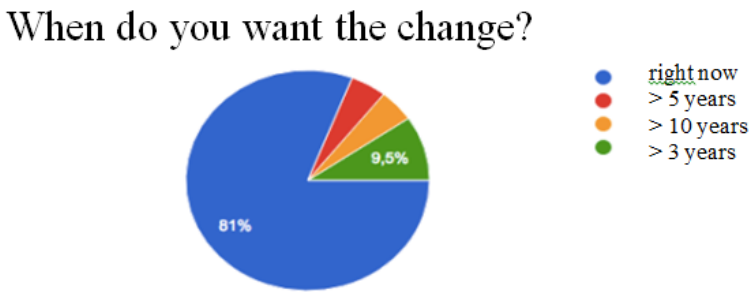


Figure 3. Respondents from all related components

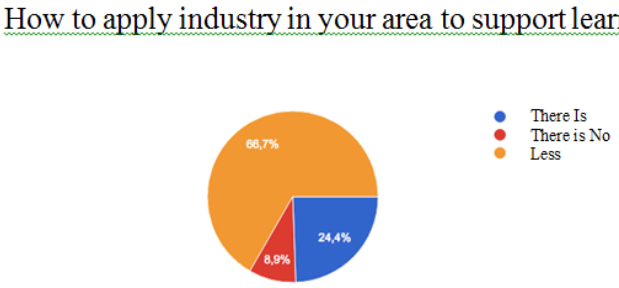


Figure 4. Role Of Industry

Tabel 2 List of Study Program Needs on Industry

Study Program / Faculty	How to prepare your campus public in entering the era of the industrial revolution 4.0	What is expected in the Industrial World to support learning on your campus
Education technology	Not ready	improve IT usage
Elementary School Teacher Education / Faculty of Education	Not ready	develop learning-based industrial programs
Diploma Program 3 of Hyperkes and Work Safety	Not ready	As a place for student practice
Islamic economics, accounting, tax	Ready	Synergize, internships, placement of graduates
Postgraduate School of Public Health (FKM) STIKES Mandala Waluya Kendari	Ready	Provide a place of learning for students so that when finished they can immediately interact well
English language education	Not ready	Support may be in the form of grants to facilitate technology-based learning
Management study program	Not ready	Clearer collaboration
Biology Education / Faculty of Teacher Training in Education	Not ready	Openness of the industrial world in accepting students in visiting practices or research activities as one of the academic activities in the completion of studies.
English education Faculty of Teacher Training and Education	Ready	Create creative media or tools or applications for learning
Bachelor of Information Systems, Bachelor of Informatics Engineering, Computer Engineering Diploma and Information Management Diploma	Not ready	Internships, startup assistance and scholarships
Informatics Management	Ready	Practice
Informatics Engineering / Faculty of Engineering	Not ready	It is expected that the training is in accordance with the existing professional fields as well as professional practitioners and is also

Study Program / Faculty	How to prepare your campus public in entering the era of the industrial revolution 4.0	What is expected in the Industrial World to support learning on your campus
		supported by updated facilities (Laboratorim)
PAI DAN MPI	Ready	PROVIDE SIGNIFICANT CONTRIBUTIONS
Informatics Engineering Study Program / Faculty of Engineering	Not ready	Cooperation in attracting Student graduation
Bachelor of Informatics Engineering Diploma in Accounting Information Systems	Not ready	Give the broadest internship opportunities.
Mathematics Education Study Program / Faculty of Mathematics in Natural Sciences (MIPA)	Not ready	Material and non-material collaboration
COUNSELING GUIDANCE	Ready	Inovasion
English language education	Ready	Digital literacy
Management, accounting and development studies	Not ready	Absorb graduates and fund student entrepreneurship programs
Basic Education STKIP PGRI Metro-Lampung	Not ready	Collaborative integration exists
Department of Agribusiness Management	Ready	The existence of a real link is not just the concept level
Islamic Communication and Broadcasting	Not ready	Its role is the same as the Government
Mathematics Study Program	Not ready	More able to compete in the future
Management	Not ready	Providing financial assistance to improve E-Learning Education System facilities and infrastructure
Mechanical Engineering Study Program, Faculty of Engineering	Not ready	involved in the development and development of product innovation and production innovation
Early childhood education programs	Not ready	High-access network
Informatics Technique	Not ready	Colaboration
Informatics Technique	Ready	Competence of graduates
Tadris Indonesian Language / Faculty of Tarbiyah and Teacher Training	Not ready	Provision of facilities and infrastructure
Community Nutrition, Department of Nutrition, Faculty of Public Health, Diponegoro University	Ready	Apprenticeship place, training practice facilitation, research collaboration and community service
English	Not ready	Colaboration

Study Program / Faculty	How to prepare your campus public in entering the era of the industrial revolution 4.0	What is expected in the Industrial World to support learning on your campus
Early Childhood Islamic Education Study Program / Islamic High School BARUMUN RAYA Sibuhuan	Not ready	Graduates who can compete
Faculty of Information Technology of the Universitas Sembilanbelas November (FTI) USN	Not ready	the use of paperless should be combined continuously other than that support from stakeholders should not be half-measures in supporting the procurement of faculty facilities
Political science	Not ready	Technology Transfer
Faculty of information systems	Not ready	Can be a scholarship donor to outstanding students
Faculty of information technology / information systems	Ready	Improve the quality of learning
The information technology department is majoring in information systems	Not ready	Become a scholarship donor for outstanding students
Faculty of Information Technology. Information system program	Not ready	Complete infrastructure in learning
Information Systems Study Program FTI USN	Not ready	It is hoped that the industry will provide assistance in the form of funds or facilities needed by the campus to be ready to enter the era of the industrial revolution 4.0
Information Systems	Not ready	collaboration and collaboration support
English Education University HaloUleo UHO	Not ready	Facility Support
information systems / computer science	Not ready	material and the newest trend
Education technology	Not ready	Jobs in the industry relate to learning on campus

This research is one of the five other parts related to educational innovation in learning

5. Conclusion

This needs analysis using this waterfall method by involving all related elements in learning innovation so as to summarize the overall things that are needed both physically and non physically.

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