

Research article

Learning Management System Innovation for Employee Competency Development

Marsono Marsono, Witra Apdhi Yohanitas*, Ferdinand Manorsa, Nurhuda Firmasyah, and Fahri Ardiansyah

Lembaga Administrasi Negara

ORCID

Witra Apdhi Yohanitas: <https://orcid.org/0000-0002-1963-0307>

Ferdinand Manorsa <https://orcid.org/0000-0001-8182-7859>

Nurhuda Firmasyah <https://orcid.org/0000-0001-6957-4094>

Fahri Ardiansyah <https://orcid.org/0000-0001-9027-5101>

Abstract.

In the era of digital technology, it is easy to find information in order to develop ASN self-competence. Classical training and learning have begun to shift towards digital forms to meet the demands of the COVID-19 pandemic. However, digital learning will make government agencies compete to create their own systems but may cause inefficiencies. The integration of a learning management system is important to implement. In 2021, LAN developed a learning management system that can facilitate and integrate existing systems. This system is an innovative new LAN method to develop ASN competence in a digital learning platform called Multitenance ASN Unggul. This research aimed to examine how to realize and manage this Multi-tenance ASN Unggul platform, and the progress of its system development. Qualitative methods were used. It was found that this platform can facilitate ASN learning through micro-learning; it allows training institutions to create and integrate learning management systems; and it facilitates access for ASN because it is equipped with single sign on (SSO) technology. In conclusion, several challenges remain in the implementation of this innovation, such as that there are already so many diverse LMS systems, there is still a silo effect from government training institutions, there is a misperception of the concept of integration in ASN, and there are concerns about attribution in training implementation. For this reason, it is necessary to carry out further socialization in government training institutions. This system will increase the effectiveness and efficiency of the ASN competency development process in the future.

Keywords: training and learning, Multitenance ASN Unggul, LAN innovation, competence development

Corresponding Author: Witra
 Apdhi Yohanitas; email:
witra_ay@yahoo.com

Published 20 May 2022

Publishing services provided by
Knowledge E

© Marsono Marsono et al. This article is distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use and redistribution provided that the original author and source are credited.

Selection and Peer-review under the responsibility of the ICoGPASS Conference Committee.

1. Introduction

The implementation of human resource competency development is closely related to behavior, attitudes, and performance and is part of the human resource management cycle. Especially if it is associated with the era of digital technology. In the era of

 **OPEN ACCESS**

digital technology, it will be very easy to find information in order to develop ASN self-competence. The organizers of training for ASN are also very dependent on the use of digital technology. This is because classical training and learning has certainly begun to shift towards digital to meet the demands of the COVID-19 pandemic.

The Covid-19 pandemic that has occurred since 2020 has increasingly raised awareness about the benefits of digital technology in developing ASN competencies. Responding to this sudden situation, National Institute of Public Administration (NIPA) implemented flexible and distance learning policies as well as technology integration to support the development of ASN competencies. Throughout 2020 and into 2021, training for ASN was relatively unimpeded thanks to the use of digital technology.

The process of organizing training and learning for ASN so far includes the process of training design, selection of learning models, development of learning materials and implementation scenarios as well as appropriate learning media, classical classroom management, to how to communicate with post-training participants. And the COVID-19 pandemic certainly requires all ASN training and learning providers to be more creative and enter the digital learning era. Therefore, digital learning will make government agencies compete to create their own systems and cause inefficiencies. The integration of the learning management system is certainly very important to implement.

In 2019, in the midst of demands for the development of training and learning patterns for civil servant who are increasingly diversified, NIPA develops an LMS which is named 'ASN Unggul'. This ASN Unggul utilizes many working mechanisms of an LMS which is quite complex but is still limited to the management of one agency or can be called single-tenancy. Existing learning is also still limited to assignments and more on managerial and technical functional competencies. So that the opportunity for civil servant to get training materials that can improve abilities and performance is still lacking. Methods and innovations are needed to provide competency development for all civil servant with more flexibility and variety.

In 2021 NIPA develops a learning management system that can facilitate and integrate existing systems. This system is an innovative new NIPA method to develop civil servant competence in a digital learning platform called ASN Unggul Multi-tenancy. Even so, NIPA as the agency responsible for developing civil servant competencies, has taken advantage of the use of digital technology since 2014 by starting to use the Learning Management System (LMS). However, its use is still minimal.

The development of ASN Unggul into this multi-tenancy model is a response to the many LMS that have been developed by government agencies but are only exclusive to their ASN. In fact, if some of the learning materials made can be accessed easily

by other ASN, of course knowledge will spread more quickly and ASN will be more independent in learning because of the many choices.

LMS is one of the uses of digital technology in terms of facilitating electronic learning or e-learning. In Indonesia, e-learning has been widely used by private companies and BUMN and Ministries, Institutions, and Local Governments. For example, the Ministry of Finance, along with the increasing use of e-learning, NIPA as civil servant training supervisor makes a policy regarding the use of e-Learning in civil servant training through NIPA Regulation No. 8 of 2018. E-learning is a telecommunications technology to convey information on education and training [1] through activities to plan, implement, and assess certain learning processes [2].

The first generation of ASN Unggul (single-tenancy) was built in the midst of the proliferation of using LMS in many government agencies. There is even a government agency may have several LMS for training, even in certain cases one training has its own LMS. On the one hand, this is a sign of the growth of new awareness about the usefulness of technology in competency development. However, such proliferation of LMS can be counterproductive. Of course, this can lead to inefficiency in the use of resources due to the large number of LMS being built and managed, even though LMS can be used together. From the perspective of civil servant who are users, this can cause difficulties to access and use the LMS due to the diversity of interfaces and learning delivery structures in each LMS. In short, the proliferation of LMS creates complexity for users and costly for competency development providers.

At the time of implementation, The initial version of ASN Unggul (single-tenance) was built in the midst of the proliferation of using LMS in various government agencies. In the past, there was even a government agency that could have several LMS for training, even in certain cases one training had its own LMS. On the one hand, this is a sign of the growth of new awareness about the usefulness of technology in competency development. However, such proliferation of LMS can be counterproductive. Of course, this can lead to inefficiency in the use of resources because many LMSs are built and maintained even though LMS can be used together. From the perspective of ASN employees who are users, this can cause difficulties to access and use the LMS due to the diversity of interfaces and learning delivery structures in each LMS. In short, the proliferation of LMS creates complexity for users and costly for competency development providers.

ASN Unggul single-tenancy help the process of organizing training and education in LAN. This can be proven from data throughout 2020, ASN Unggulhas facilitated more than 4000 participants in 111 training forces. The nature of the learning system

that is mandatory or assigned, makes ASN who can use it only as assignments, with a combined learning method of synchronous and asynchronous.

ASN Superior Multitenance is an innovation of learning management system developed by LAN in 2021. The development of LMS technology is called innovation because Innovation is an idea, method or object that is considered something new or up-to-date [3] which is the result of developing, utilizing / mobilizing knowledge, skills and experience to create or update new products, processes or systems [4] which can be an organizational mechanism in adapting to a dynamic environment [5]. ASN Unggul Multi-tenancy can be said to be a technological innovation which is one of the eight (8) types of innovations that exist in public administration innovation.

Innovation in public administration is described as ideas, ideas, thoughts, breakthroughs, in the context of reforming the practice and process of government administration, so that it has added value in one or more aspects and or processes of public administration. These ideas must of course have elements of novelty, usefulness, can be adopted/replicated, sustainability and do not conflict with the applicable laws and regulations [6]. This is in line with Agus Dwiyanto (2013) as contained in LAN1⁶ which states that innovation is everything related to new ideas and knowledge and their transformation into outcomes that can create added value in practices and processes, goods and services. service. And in public administration, innovation is every form of transformation of new ideas and knowledge that is able to create added value in one or more aspects and or processes of public administration. This is why, the development of ASN Unggul technology from single-tenancy to multi-tenancy can be called innovation. An innovation consists of several components such as a description of innovation activities, driving factors, inhibiting factors, stages of implementation, and the benefits of an innovation. (6 p8) Therefore, in this paper, we will try to explain the ASN Unggul multi-tenancy as an innovation in developing civil servant competence using this pattern.

1.1. Purpose of Papers

Through the discussion of the Multitenance ASN Unggul which is an innovation of learning management systems in developing ASN competencies, it was found that the aim is to photograph the history of the development of the ASN Unggul platform, identify the driving and inhibiting factors for the development of ASN Unggul and milestones for the development of ASN Unggul.

1.2. Benefit of paper

Based on these objectives, the benefits of writing ASN Unggul Multitenance papers which become an innovation of learning management systems in developing ASN competencies are to describe innovations in learning management systems through:

Information related to the history of the development of the ASN Unggul LMS platform.

The driving and inhibiting factors for the development of ASN Unggul; as well as

Stages/milestones of ASN Unggul development.

1.3. Novelty from Other Research

The writing of ASN Unggul Multitenance papers which is an innovation of learning management systems in developing ASN competencies has a novelty side from other papers that discuss competency development, learning management systems and also e-learning. The novelty is related to LMS innovation by utilizing a multitension model that allows training institutions, both ministries/institutions/regions to create their own LMS. In addition, the integration features offered will encourage effectiveness and efficiency in the implementation of ASN competency development and the creation of LMS. For example, in a paper entitled Competency Development of State Civil Apparatus in the Government of East Kalimantan Province, it is explained that employee competency development is emphasized on three competencies from the side of high leadership and pays more attention to the priorities of local sons and it is considered not optimal implementation because it is limited by budget. Here we have not discussed the use of e-learning as a learning infrastructure.[7]

Furthermore, from the paper entitled Evaluation of the Implementation of E-Learning Learning Models in the Basic Training of Prospective Civil Servants, it is explained that e-learning is an alternative learning model for participants of the Basic Training of Prospective Civil Servants. Implementation through e-learning is considered effective in increasing participants' understanding of the training subjects. However, improvements are needed in terms of e-learning systems/applications, learning facilitators, implementation time, and the need for adaptation of conventional learning elements.[8] Here we focus on the results of a survey of training participants within a certain time who are still using e-learning applications developed by LAN before the establishment of Single Tenance ASN Unggul

Furthermore, from a paper entitled Learning Management System with Collaborative Learning Method Using the Facebook Social Networking Platform, it is explained that

technological developments in 2011 made various E-learning or Learning Management Systems (LMS) developed with various methods and techniques of learning approaches, both Personal Learning and Collaborative Learning. The blog feature on Facebook at that time was considered to be able to make social networking used as an alternative to increase interaction and communication between students so that there was an opportunity to create real collaboration. With serious research, the author develops a Learning management system application with the concept of Collaborative Learning which is integrated with the Facebook platform and works on the application canvas and Facebook tab page.[9] Of course, this research was conducted before the LMS developed rapidly, and now the LMS feature already has various features to facilitate collaborative activities, including the Multitenance ASN Unggul.

2. Literatur Review

In managing human resources, a manager must provide equal opportunities and give clear tasks [10] besides that it can influence the behavior of other people, both individually and in groups (11 p262) so that they can achieve the desired goals. The development of ASN competencies has also been regulated in the Regulation of the Ministry of State Apparatur Utilization and Bureaucratic Reform of the Republic Indonesia Number 38 of 2017 concerning Competency Standards for Civil Servant. There are three competencies written in Article 4 paragraph 2, namely technical competence, managerial competence and socio-cultural competence.

Talking about the development of ASN competence will not be separated from a concept of human resource management (HR). Human resource management is a science of managing human resources in relation to their roles, which is carried out through the process of obtaining, training, appraising, and compensating employees (10 p39), as well as finding, using, maintaining, and developing people (12 p33) through a system that influences employee behavior, attitudes, and performance.[13]

Competence is an ability to carry out work in order to produce the best output through Unggulperformance based on the actualization of knowledge, skills, and behavior. Competence can also describe individual characteristics in carrying out responsibilities, identifying the quality of performance, attitude, communication, and development. Competence is an area of knowledge or skill that is critical for production to outputs .[12]

Competence according to Dubois dan Rothwell ¹², competencies can be divided into four, first is technical competence, namely competence regarding the field that is the main task of the organization. Second is managerial competence namely competencies

related to various managerial abilities needed in handling organizational tasks. Third, social competence namely the ability to communicate needed by the organization in carrying out its main tasks. Fourth, intellectual/strategic competence namely the ability to think strategically with a far-sighted vision.

In the aspect of developing the competence of civil servants, there are three competencies that must be met, namely first, technical competence, namely knowledge, skills, and attitudes/behaviors that can be observed, measured, and developed specifically related to the technical field of the position. Second, managerial competence, namely knowledge, skills, and attitudes/behaviors that can be observed, measured, developed to lead and/or manage organizational units. Third, socio-cultural competencies, namely knowledge, skills, and attitudes/behaviors that can be observed, measured, and developed related to the experience of interacting with pluralistic societies in terms of religion, ethnicity and culture, behavior, national insight, ethics, values, morals, emotions and principles, which must be fulfilled by every position holder to obtain work results in accordance with the role, function and position.

From a policy perspective, competency development is one of the terms often mentioned in Government Regulation No. 11 of 2017 concerning Civil Servant Management. This means that the development of civil servants' competence has been seen as a necessity, especially to achieve world class apparatus. In Government Regulation No. 11 of 2017 article 203 paragraph 3 it is stated that competency development is carried out by taking into account performance appraisal. Meanwhile, in Government Regulation No. 11 of 2017 article 204, it is stated that competency development is used as the basis for career appointments and appointments.

One of the interesting mandates from Government Regulation No. 11 of 2017 concerning Management of Civil Servants which mentions competency development is the right for every civil servant to develop his potential for at least 20 hours of lessons per year per civil servant based on article 203 paragraph 4. In addition, related to the merit system, Government Regulation No. 11 of 2017 article 134 paragraph 2 letter G also mentions that one of the criteria for the merit system in the appointment of certain functional officers is the existence of planning and providing opportunities for competency development according to the results of the performance appraisal.

Furthermore, Regulation of the Ministry of State Apparatus Utilization and Bureaucratic Reform of the Republic Indonesia No. 38 of 2017 concerning Competency Standards for Positions of Civil Servant is sufficient to facilitate HR management units to map existing competency gaps and job competency standards. However, it only discusses related to managerial and socio-cultural competency standards. The mandate of developing the

competence of Government Regulation No. 11 of 2017 concerning Civil Servant Management has been revealed in NIPA Regulation No. 10 of 2018 concerning Competence Development. The legislation mentions various forms of competency development, both classical and non-classical. However, technical guidelines for implementing competency development still need to be studied and elaborated further.

LMS itself is an application technology to create an integrated training system so that it can prepare, organize, view, report interactions [14] or communicate, collaborate, learn, transfer knowledge, and learn.[15] It can also be said that LMS automates the administration of a training so as to facilitate the learning process. This means that an LMS can handle user management, administrative management on virtual courses, management of communication tools.

Current LMS technology allows users to self-register for a training and choose which lessons to follow. Training managers can also build their own training quickly and easily with a provider / service provider that provides LMS creation services. Technology can provide the ability to create sub LMS from the server of the LMS provider. Take Moodlenesia, for example. This LMS creation service provider makes it easy for users to create their own LMS and act as admin. So that it can determine the appearance of the LMS, delivery model and management. Therefore, if this can be applied by government agencies, it will provide efficiency and savings in the state budget in terms of developing ASN competencies. This technology will be applied in the development of ASN Unggul LMS as well as an innovation in the implementation of competency development in terms of technology. This innovation is also known as ASN Unggul Multi-tenancy.

This multi-tenancy ASN Unggul LMS is a technological innovation developed by LAN to answer the various ineffectiveness of the many LMS developed by Ministries/Institutions/Regional. Technological innovation is the creation or use of new technology that is more effective and able to solve problems.(6 p8) Technological innovation is usually carried out through the introduction of e-government and updating of equipment or devices to support work. Technological innovation begins with the realization that the technology that has been used, so far is not in accordance with the times (16 p27). The use of old technology hinders the implementation of more effective work and cannot meet consumer aspirations.(16 p28)

An innovation consists of several components such as a description of innovation activities, driving factors, inhibiting factors, stages of implementation, and the benefits of an innovation. (6 p8) Therefore, in this paper we will try to explain the multitenancy ASN Unggul as an innovation in developing ASN competence using this pattern.

Learning models are also diverse. One of the learning models that will be used in ASN Unggul Multi-tenancy is microlearning. Microlearning is training that is packaged with a short duration of time and focuses on certain learning so that microlearning can be applied as a stand-alone learning or as part of a learning curriculum. [17] The content on this platform is simple materials developed to support the implementation of daily work. For example, ethics code of civil servant, innovation development, interesting presentation techniques, making interesting power points and so on. In addition, the material developed is presented in an interesting, concise and concise manner, so that it is easily understood by the participants. With the marketplace model and microlearning materials, a more suitable delivery method is self-learning through MOOC (Massive Open Online Course). MOOC allows participants to self-register to the system, self-enrollment to the desired training and participants are free to adjust their learning speed (self-paced) on the ASN Unggul platform. The MOOC system also allows employees to conduct self-assessment of their competency development needs so that mismatches between needs and implementation of competency development can be anticipated.

3. Method

The writing of this research paper was carried out using a qualitative method by explaining the development of ASN Unggul from singletenancy to multitenancy. Qualitative research is a research procedure that produces descriptive data in the form of written and spoken words from people and observable behavior (18 p4). The type of research carried out is case study research by describing the development of a multi-tenance ASN Unggul LMS as a competency development innovation for ASN. In addition, it is done by means of observation where researchers are involved in the development of innovation. Case study is a method carried out by wanting to explore a particular case in greater depth by involving the collection of various sources of information (19 p49). Case studies are carried out to detect problems encountered in implementing learning management system innovations through applied tests of ASN Superiors and socialization to several agencies (government training institutions)

4. Results and Discussion

The development of ASN competence is one of the government's strategies to accelerate the achievement of the merit system. In addition, competency development is also aimed at reducing the competency gap of civil servants as the backbone of the

bureaucracy. However, the competency development model in the conventional way is seen as less effective and efficient. This is due to a number of weaknesses inherent in the conventional learning model. First, the implementation of education and training for civil servant competency development requires no small cost. The ASN competency development scheme in Indonesia did not change much until 2012. In that year, the ASN competency development scheme was marked by experiential learning applied to leadership training. And this has a positive impact on the work patterns of government agencies. This experiential learning is a learning scheme that connects knowledge with real-world practice [20] or direct experience in the workplace so that it is considered more intelligent.[21]

One of the uses of information technology in the context of developing ASN competencies is through the e-learning method. The development of technology today certainly makes the development of e-learning technology increasingly rapid as well. E-learning can also be the right acceleration in developing ASN competencies. The application of e-learning offers at least three learning methods. First, synchronous, which is a learning method that is carried out at the same time between the instructor and learning participants using the medium of webinars, webcasts, and life chat. Second, asynchronous, which is a learning method that is not carried out at the same time between the instructor and learning. In this case, the medium used is discussion forums, video recordings of instructors, sound recordings of reading materials. Third, hybrid/blended learning, which is a method that combines two synchronous and asynchronous methods. This method is considered effective when starting to adapt to the e-learning system, and allows for merging with conventional classroom methods

The renewal of competency development also occurs in the form of the use of information and communication technology in the learning process which is regulated in LAN Regulation Number 5 of 2018. However, this policy still limits e-learning learning to a maximum of 3 learning hours per day in the form of synchronous sessions (LAN Regulation No. 8 of 2018). Utilization of e-Learning is not carried out in full, but is combined with classical learning.

Utilization of information technology in this case e-learning has been widely used by government agencies. But not yet in the form of a Learning Management System (LMS) scheme that can summarize complex learning activities. Its nature is still simple, such as the use of websites, blogs, social media, and cloud storage that are used to access and download learning materials. Although the use of this LMS is still relatively new, the development of this information system is very far from developing in the midst of the

demands of the world community who want it easy to get knowledge and life skills that are useful for carrying out activities.

In 2019 LAN began to consolidate the use of LMS for the ASN competency development process which is later expected to become a reference standard for the implementation of e-Learning in various government agencies in Indonesia. In addition, it can be a sharing application that will encourage effectiveness and efficiency in terms of implementing competency development in this case related to the learning platform.

ASN Unggul multi-tenance will be able to help connect training providers with ASN. Look for what training or learning you want, search or browse at ASN Unggul, when you find the desired training, it will be directly connected without having to log in again to existing tenants. So the tenants in this multi-tenancy ASN Unggul are training tenants owned by training institutions at the Ministry/Institution/Regional. Likewise, previous trainings that have been highly developed will also become tenants. And each tenant will be able to manage their LMS independently without any LAN intervention. Starting from the interface settings, the provision of learning materials to the structure of the LMS, it can be arranged according to the needs of each tenant. Multi-tenance ASN Unggul is only a platform that will consolidate it in order to make it easier for ASN employees.

The convenience in question is related to data integration so that it is easier for ASN to choose which training to take part in. Then regarding the learning materials, the training period is shorter because the learning materials are in the form of microlearning. This makes it easier for ASN to learn anytime and from anywhere. Then to make it easier for ASN to access the ASN Unggul Platform, the Single Sign On (SSO) feature was added, in which ASN only had to create one account that could be used to access all tenants on the Superior ASN Platform.

ASN Unggul multi-tenance puts forward the spirit of gotong royong which may be considered lost for most people, but in this digital/online learning world, this spirit of gotong royong grows in different forms and will get stronger. Maybe we can contribute to this ASN learning sector if we try to unite to recapture and strengthen the spirit of mutual cooperation (*gotong royong*) to offer or provide quality learning to all ASN employees. The spirit of mutual cooperation in ASN Unggul means that there is a sense of ownership from government agencies that join the ASN Unggul so that they will take the initiative to fill in and add learning content to the ASN Unggul Platform. This means that through the spirit of mutual cooperation in the multi-tenance ASN Unggul, then::

1. ASN Unggul as a market, not an owner, just a market that facilitates owners of existing goods/stores.
2. Ministry/Institution/Regional training institutions are tenants, who can manage their own shops, determine what goods (training) will be sold.
3. Collaboration between ministries/institutions/regional training providers starts with microlearning as its product, namely learning that is more independent and flexible. Why microlearning as the initial product, because microlearning has recently become a preferred learning trend, especially among millennial ASN. Then if the collaboration is considered good enough, you can slowly switch to collaborating in technical and other trainings.
4. As consumers are ASN from all over Indonesia. So this multi-tenance model is very fitting in simulating the marketplace process in the learning process.
5. Strengthening the spirit of mutual cooperation between agencies, especially for agencies that will join the ASN Unggul Platform to fill and add learning content to the ASN Unggul Platform so that the participating agencies also feel that they have the full ASN Unggul Platform.

This multi-tenance ASN Unggul LMS is a technological innovation developed by LAN to address the various ineffectiveness of the many LMS developed by Ministries / Institutions / Regional Governments (Ministries / Institutions / Regions). In the LAN Innovation Directory to explain an innovation, it consists of several components such as a description of innovation activities, driving factors, inhibiting factors, stages of implementation, and the benefits of an innovation. The description will explain the development of the system and the features developed. Benefits and advantages will be explained through what is obtained if this innovation runs smoothly. The stages of implementation will be explained through a series of activities carried out in developing innovation. The driving factors and inhibiting factors will be obtained during the process of testing the application of innovation through socialization to several agencies throughout Kalimantan, Sumatra and several from the Sulawesi province which is carried out online. Therefore, in this paper we will try to explain the multi-tenance ASN Unggul as an innovation in developing ASN competence using this pattern.

4.1. Multitenance ASN Unggul development and features

Basically the Learning Management System (LMS) guarantees wider learning accessibility without having to do face-to-face. LMS is not only structured learning but also has

menus according to the needs of its users. The effectiveness of learning with LMS is also carried out to support learning that does not require face-to-face.

In this pandemic period, where face-to-face learning is greatly reduced in portion, LMS is able to answer these needs. The effectiveness of learning with LMS must be adjusted to the needs and learning objectives. Learning that is knowledge sharing is more appropriate if done using LMS, but practical learning that requires precision and complicated tools is better done with face-to-face learning and in a special place according to learning needs.

In 2019 LAN developed a learning platform or what is commonly called an LMS. The development of this LMS is not due to the absence of LMS, but because too many LMS have been developed. Even one training has its own LMS. By conducting consolidation, the first generation of ASN Unggul was developed or we can call it Single Tenance ASN Unggul . But it is with the aspiration that LAN is the coach of ASN training, not only for LAN needs, but for the needs of ASN throughout Indonesia. So that the LAN coaching function can also be channeled through this online and digital learning service. The first generation ASN Unggul model is still single tenancy. If the analogy is the same as an online shop, which is a shop that sells various kinds of goods to its consumers (the consumer is ASN). And the dominant training is formal training, which is a precondition or mandatory for the position or career of an ASN employee.

In its development, during the implementation of training through ASN Unggul in 2020, coinciding with the covid-19 pandemic, that's where we all really realized how LMS or online learning was very helpful. Throughout 2020 to August 2021, there have been 195 batches facilitated with 38 types of training and the number of participants (most of whom are alumni) is around 6740 people. Maybe because of the pandemic situation, it is also what makes ASN Unggul really used and taken advantage of.

And in 2021, ASN Unggul will be further developed by adopting the marketplace concept with a multi-tenancy model. The term marketplace is not interpreted commercially, but adopts the principle of an easy, flexible, open and secure service that exists in the marketplace and is then applied to the online learning process at ASN Unggul. The purpose of this marketplace is to make Multitenance ASN Unggul a government learning management system that can focus on learning not on training. This means that the development of competence will further the needs of ASN in improving their competence in carrying out their duties in the agency.

The architecture used is multitension where other managers can manage their own learning management system starting from the interface, learning content to learning

management. In addition, the content that will be received by users, in this case ASN, is micro learning, so of course it will be very easy to understand and according to needs.

The delivery method is the Massive Open Online Course (MOOC) so that ASN can register themselves through the Single Sign ON (SSO) system, enter self-enrolment, and manage their own study time (Self Paced).

The training institutions in the ministries/institutions/regions will act as training/ learning providers (training/learning providers) which of course will form a certain management process so that it can be harmonious. Meanwhile, ASN employees throughout Indonesia will become users of multitenancy ASN Unggul. The existing training institutions in the ministries/institutions/regions will be able to build and manage their training in this ASN Unggul as an independent entity.

The Multitenance ASN Unggul infrastructure is developed in the form of a Cloud Service Provider. This is to facilitate the openness of contributions and benefits that are mutualism between elements of the learning system. Cloud Service Providers enable storage and management of very large data. Therefore, the ASN Unggul infrastructure needs to get support from government agencies (ministry) that are authorized in providing storage space and also large system access capabilities. ASN Unggul infrastructure is related to the server and operating system used, data communication network and security side to ensure the integrity of the system as a whole. Of course, this depends on how the ASN LMS will excel in Multitenance in the future.

The implementation of ASN Unggul services, of course, adheres to the multi-tenancy model. With this model, ASN Unggul acts as an intermediary for the supply and demand side of learning. The analogy is the same as a mall that provides a place to sell for tenants and provides access for visitors to shop. Tenants are free to arrange their own shops and goods and buyers are free to search for goods and services according to their needs.

With this multi-tenancy architecture, on the supply side, ASN Unggul provides space for government training institutions to open training and learning that can be managed and adapted to their own needs. On the demand side, ASN employees throughout Indonesia can seek and participate in learning according to their needs provided by government training institutions as tenants. The topology of the multi-tenancy architecture can be seen in Figure 1.

This multi-tenancy architecture allows ASN Unggul to provide learning services with a marketplace model, delivery method using Massive Open Online Course (MOOC) and learning objects in the form of microlearning as shown in table 1

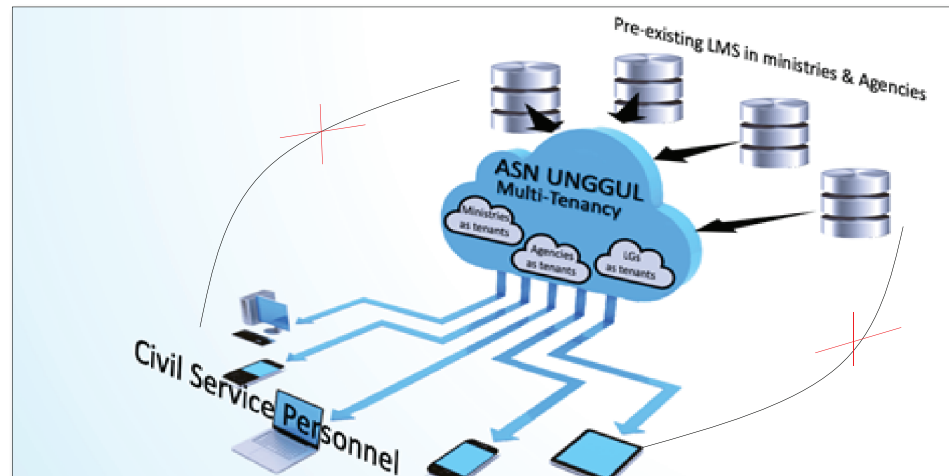


Figure 1: Topology of ASN Unggul multi-tenancy.

TABLE 1: The Main Features of ASN Unggul

Architecture	Service Model	Delivery Methods	Learning Objects
Multi-Tenancy	Multi-Tenancy	MOOC	Microlearning
Single installation on platform LMS master	Serving the training centers as well as civil servants ASN	Self-system registration (SSO)	Curative
Creating numerous LMS tenant	Rich in subjects and variety	Self-learning registration	Developed by cross organizations
Self-managing	Access for 24 hours /7 days a week	Self-learning paced	Shared utilization across respective organization
Customized/ self-branding		Digital	Accessibility for all Certificates/Badgcivil servant

With this multi-tenancy architecture, ASN Unggul can provide a flexible learning model and ASN employees can independently register for a training and start learning according to their pace and opportunity. Thus, ASN Unggul is at the same time transformed into a learning market place for ASN. The developed topology has the advantage of being able to accommodate various LMS integration scenarios. First, ASN Unggul can produce ready-to-use LMS quickly. The LMS that was born was immediately fully integrated with ASN Unggul. This facility is intended for government agencies that do not yet have an existing LMS or wish to build a new one. Second, ASN Unggul can accommodate legacy LMS, namely LMS that already exist in various government agencies. For legacy LMS based on open source Moodle, it can be directly integrated like the LMS that was born by ASN Unggul. However, for non-Moodle legacy LMS, special data integration and exchange efforts are required

The development of ASN Unggul Multitenance is one of the stages of the Roadmap for the development of ASN Unggul. To create a reliable money LMS, of course, it is done in stages. The following is a broad roadmap of the development of superior ASN learning management innovations:

1. Design and Build a ASN Unggul LMS in 2019. At this time, the initial stage of development of a superior ASN is expected to be an LMS for ASN in Indonesia. In addition to developing the LMS, various learning videos for basic ASN training were also developed
2. Utilization of ASN Unggul with a single entity architecture in 2020. At this time the superior ASN that was built began to be used by LAN for various trainings. In addition, learning materials for level two leadership training were also developed.
3. Multitenance ASN Unggul Development in 2021. During this period, a ASN Unggul LMS is developed which allows creating new LMS in one system and allows integration with LMS that have the same platform. In addition, learning materials that are multitension are also developed.
4. ASN Unggul as a national general application in 2022. At this stage the LMS of ASN uguul will be developed into a national application that can integrate LMS from various government training institutions. For this reason, policy advocacy is carried out to make ASN Unggul as a sharing platform between government agencies.
5. ASN Unggul as an Intermediary LMS in 2023. At this stage the ASN Unggul LMS has been able to integrate, mobilize, migrate and harmonize government agency training.
6. ASN Unggul as ASN learning marketplace in 2024. At this stage ASN Unggul has functioned like a marketplace where ASN can search and get quality learning to all existing LMS government training institutions.

4.2. Driving Factors for the Development of ASN Unggul

There are several driving factors that have led to the development of ASN Unggul based on developing trends and current needs, including:

1. (a) i. The existence of the COVID-19 pandemic demands that we learn to adapt quickly, so that after the COVID-19 pandemic, what we have learned needs

- to be intensified. So that the use of e-learning or LMS facilities later is not just a compulsion, but it has become a necessity and has become an integral part of a competency development design in normal situations.
- ii. The demand for flexibility in various learning processes. People no longer want to be stuck with various conditions that make the learning process complicated. They want to be more flexible, able to decide for themselves when, where and how they learn.
 - iii. In terms of learning objects, there is a new wave in learning tastes today, especially among millennial ASN. We can see that they are more happy with microlearning, which is a learning object that is focused, short, to the point, and can be completed in 1 minute, 5 minutes or maybe 10 minutes at most. There are take aways that they can immediately use and apply in real life.
 - iv. The direction of government policy tends to be to simplify, integrate, consolidate various kinds of learning resources and facilities.

With these 4 tendencies, there is no other way, even though the ASN Unggul has good performance, it still needs to be developed even better. Among other things, the transformation from the current onsite installation (installation on one server) to a cloud system so that it can be accessed simultaneously without having to install applications again. Then from the previous single-tenancy to multi-tenancy, exactly simulating from an online shop to a marketplace. So in the future there will be many tenants (many shops), in this case represented by government training institutions and accessed by consumers, namely all ASN, with learning needs that are certainly diverse. Then also from learning resources that were previously centered in one place to become distributed and ASN Unggul becomes an intermediary (intermediary) that bridges the needs of ASN who want to learn with learning service providers (government training institutions) who do have a lot of learning resources that need to be offered to ASN. Furthermore, from serving only participants to serving both parties, namely participants and organizers. Also, from what was previously dominated by structured formal training, they have begun to try to adopt a micro learning model that is more independent in nature. And from a stand-alone system to an integrated and consolidated system.

4.3. Inhibiting Factors for the Development of ASN Unggul

To synergize and consolidate the system is certainly not as easy as turning the palm of the hand, there are many challenges to be faced. This can be summarized during the

socialization to government training institutions. Therefore, the inhibiting factors for the development of ASN Unggul are as follows:

1. (a)
 - i. The proliferation of existing LMS is numerous and varied, as previously explained, there is even a case where one training has its own LMS. On the one hand, this is a positive symptom that now we have realized how important the role of LMS in supporting the learning process is. But on the other hand, this creates its own burden, especially from budget efficiency, which is certainly difficult to achieve under such conditions.
 - ii. There is still a silo effect, where all training organizers consider their LMS to be the best. This is understandable because it is like they give birth to themselves, develop themselves, they maintain and use all this time. Of course, it is not easy to move and leave what they have built so far.
 - iii. There is a misperception that system integration means losing control over the development, operation and maintenance of the LMS.
 - iv. Concerns about attribution, namely, if integrated with a system, it will lose identity or lose the branding of the organizations and individuals involved. So that what will be better known later is an integrated LMS. Now with the multi-tenance ASN Unggul model, this is just a myth. We can provide a way out together so that the dreaded effects do not have to occur.

4.4. Stages/ Milestones of ASN Unggul development

Multinational ASN as an innovation management system for ASN competency development is of course carried out in stages to ensure complete results. Some of the steps that have been and will be carried out in the process of developing ASN Unggul include:

1. The year 2019, was the initial year for the initiation of the development of the ASN Unggul LMS with a single Entity Architecture. At this stage, a single-tenance ASN Unggul LMS was produced which at that time was still trying to explore the basic training materials for Civil Servant Candidates (CPNS) as a pilot project.
2. In 2020, the implementation and utilization of the Single Tenance ASN ASN LMS will begin to support basic education and training programs for Civil Servant Candidates (CPNS), Administrator Leadership Training Program (PKA) and Supervisory Leadership Training (PKP) and Level I and II Leadership Training. This is in line with the government's policy in dealing with the COVID-19 pandemic, which emphasizes the form of online teaching and learning activities.

3. In 2021, the development of the ASN Unggul LMS will begin to become a multitenancy architecture platform. Subsequently, a multitenancy ASN Unggul LMS trial was started by involving several agencies as Pilot Projects. The delivery model offered is the Massive Open Online Course (MOOC) and learning objects in the form of microlearning. Here, learning has begun to be mapped that can be developed using the microlearning method.
4. In 2022, there is a plan to improve the LMS ASN Unggul by implementing multitenancy features, data integration with system-relevant competency development, building SSO, developing data analysis, machine learning, mapping micro learning needs, developing microlearning content.
5. In 2023, the plan is to make LMS ASN Unggul a national marketplace by integrating and consolidating LMS-LMS system resources in each agency, developing micro-learning content, curating, and disseminating learning with learning resources/contents,
6. In 2024, making the LMS ASN Unggul into a place/national marketplace for learning and competency development for ASN in Indonesia, by collaborating with each agency and integrating it into the e-Govt Electronic-Based Government System (SPBE).

This stage of the development of ASN Unggul can of course be readjusted in accordance with changes in competency development policies and policies on the implementation of education and training methods that are applied. The technological development of the LMS application and the required features can also change the priority scale for the development of this Multitenance ASN Unggul .

4.5. Advantages and Benefits of Multitenance ASN Unggul

ASN Unggul multi-tenance has 2 main advantages, such as: 1). Being able to create a complete LMS with various ready-to-use features in a very short time (within 3 minutes at most depending on network speed), a ready-to-use LMS can be created and ready to be filled with various kinds of learning materials; 2). Able to integrate various levels of LMS which have been owned by almost all government training institutions so far.

The main benefit of ASN Unggul Multitenance when viewed from the training provider is the ease of immediately deploying learning materials. Operators do not need to wait for the construction of the LMS in advance, which of course requires time and money and is complicated to build. Because the LMS can be made in a matter of time because

it is enough to duplicate the LMS Master that has been provided by the Multitenance ASN Unggul system. The required resources are shared between the ASN Unggul (LAN) managers and the Ministry/Institution/Regional training organizers so that they are more efficient and cost effective. Reporting and analytics can also be consolidated to obtain more strategic macro data and information.

In addition, learning can be personalized according to needs. In addition, there will be synergies and collaborations between government agencies that provide training at the Ministries/Institutions/Regions and managers of ASN Unggul (LAN) more to the use of digital technology. With Multitenance ASN Unggul , training providers at Ministries/Institutions/Regions and ASN Unggul (LAN) managers can work together at the online level (digital level). It can even train and become a place to compete in a healthy and positive manner, for example if there are microlearning materials that are almost similar but are found in various agencies. This is due to the large number of learning and training materials that are cross-sectoral. In the end, all training providers in the Ministries/Institutions/Regions who are members of the Multitenance ASN Unggul can offer these materials. The rating system that exists in the application features can determine which material is more popular. Of course, every training provider in the Ministry/Institution/Region will want to be more popular so that it can appear on the front page of the LMS. Monitoring also becomes simpler because data can be more consolidated, decision making can be faster and for users and for organizers it is not necessary to take too long to understand the system, but can focus directly on deployment and the learning process.

The presentation of learning materials is also more diverse. Where the learning method in micro learning will be applied to increase the usability of the learning materials developed. Learning participants in this case will be presented with several options for developing their competencies first through the mandatory method, which is in accordance with the agency's assignment. The second method is independent learning, where ASN will be able to search for required competency development materials and register and study independently. Technical delivery of material will be more diverse with the existence of micro-learning where learners will only communicate with machines. However, the choice of synchronous, asynchronous and blended learning models will still exist, if there is a training provider at the Ministry / Institution / Region who makes it.

Based on the discussion that has been explained above, of course this Multitenance ASN Unggul really deserves to be called an innovation in the learning management system. Because it will be able to integrate existing LMS and even create a separate

LMS that is directly connected to the data. With that in mind, learning management for the development of ASN competencies will be more closely monitored and have more variety and choices in accordance with the competencies to be developed. The driving factor is the motivation in itself to be able to perfect the Multitenance ASN Unggul to be better. While the inhibiting factors are challenges that must be resolved together, both technologically and from policy.

5. Conclusions and Recommendation

The development of digital technology allows us to obtain any information needed to improve our performance as employees (ASN). The development of digital technology will bring the development of digital literacy and become an intermediary medium for literacy practices that can produce print-based texts. This makes it easier to find the sources of knowledge needed.

6. Conclusions

The current source of learning is not only based on one source/direction, but must be encouraged so that the current generation can get it from several sources/various directions. In addition, the implementation using classical methods can also be encouraged to be non-classical. Therefore, digital literacy can be a process of developing competence that comes from several sources and is carried out non-classical and utilizes technological developments. There are various ways to do it, especially since the Covid-19 pandemic occurred. Employees are required to develop technology where employees can still develop our knowledge even though there is no class even through anything, anyone and anywhere. With the explanation regarding the development of the ASN Unggul and its features, the supporting and inhibiting factors as well as the stages of development of the ASN Unggul that have been presented previously, it can be concluded briefly that:

1. The Multitenance ASN Unggul system has features that can integrate other LMS and also create new LMS. This system will increase the effectiveness and efficiency of the ASN competency development process in the future. This system is still in the process of being perfected and needs further testing and thorough socialization so that the benefits are felt by involving training institutions of government agencies.

2. Some of the things that support multi-tenance ASN Unggul into learning management system innovations are the existence of the covid-19 pandemic that requires us to learn to adapt quickly, demands for flexibility in various learning processes, there is a new wave in learning tastes today, especially among millennial ASN, the direction of government policies tend to want to simplify, integrate, consolidate various kinds of resources
3. Some of the obstacles that hinder multitenance ASN Unggul into learning management system innovations are the proliferation of many and diverse LMS, the existence of silo effects from government training institutions, misperceptions about the concept of integration in Multitenance Unggul ASN and concerns about attribution in training implementation.
4. In its development, the ASN Unggul is carried out in stages where at the beginning of its development it was still a single-tenance LMS with basic training materials for Civil Servant Candidates (CPNS). And in the following year ASN Unggul single tension began to be implemented while also preparing several strengthening materials for Administrators Leadership Training Program (PKA) and Supervisory Leadership Training (PKP) and Level I and II Leadership Training. It was only in 2021 (currently) that a multi-tenance ASN Unggul was developed with a Massive Open Online Course (MOOC) delivery model and learning objects in the form of microlearning. Here, learning has begun to be mapped that can be developed using the microlearning method. Where in the following year will continue to improve the ability of LMS ASN Unggul such as the existence of SSO, develop data analysis, machine learning, make ASN Unggul into a national learning platform and integrate LMS other government agencies so that in the end ASN Unggul becomes an integrated Electron-Based Government System

7. Recommendation

Some suggestions that can be given for further research in the context of realizing the implementation of ASN Unggul Multitenance which is an innovation of learning management systems are as follows:

1. This research can still be continued by other researchers by paying attention to the stages of developing ASN Unggul and how to evaluate the implementation of the Massive Open Online Course (MOOC) and learning objects in the form of microlearning in Multitenance ASN Unggul .

2. Multitenance ASN Unggul still needs to be socialized in a massive and structured manner so that its benefits can be more felt. In addition, each training institution can work together to develop material content that can be presented to ASN by taking into account the need for competency development to improve ASN performance and training to improve ASN life skills in facing the challenges of the times.
3. Furthermore, it is necessary to carry out further monitoring of the implementation of this innovation so that it can be used for all ASN in Indonesia as well as policy rules so that Ministry/institution/regional training institutions can synergize to develop learning materials in Multitenance ASN Unggul .
4. The development of ASN Unggul in the future requires an integration commitment from all stakeholders, both central and regional agencies, to join as tenants. Furthermore, this tenant will autonomously manage the integrated LMS and present learning content that will be enjoyed by ASN throughout Indonesia.
5. It is necessary to compile and stipulate regulations to the leading sector related to the management of an integrated learning system that allows all institutions to be fully involved.
6. ASN Unggul can also be integrated with other information data systems related to the development of ASN competencies to be able to see the extent or level of competency development of ASN.
7. The development of ASN Unggul requires adequate facilities and infrastructure to accommodate all ASN in Indonesia to be involved in an integrated learning system.

Acknowledgment

This paper is a piece of knowledge that we can summarize on the research that we have carried out from 2019-2021. The authors would like to thank our colleagues at the Center for Competency Development Technology – National Institute of Public Administration as the research team and administration team of the ASN Unggul platform development activities. from 2019 to 2021. Especially to the Head of the Competency Development Technology Center, Mr. Muhammad Firdaus and also the General Coordinator of the Competency Development Technology Center, Mr. Rudy Masthofani. Where this research study from our work unit is charged to the NIPA budget which is managed by the work unit.

References

- [1] Sun P, Tsai R, Finger G, Chen Y, Yeh D. What drives a successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education*. Amsterdam: Elsevier Ltd; 2008. <https://doi.org/10.1016/j.compedu.2006.11.007>
- [2] Alias NA, Zainuddin AM. Innovation for better teaching and learning: Adopting the learning management system. *Malaysian Online Journal of Instructional Technology*. 2005;2:27-40.
- [3] Van den Ban AW, Hawk HS. *Agricultural extension*. London: Lackwell Science; 2005.
- [4] Clark J, Guy K. *Innovation and competitiveness*. Viena: Technopolis; 1997.
- [5] Hurley RF, Hult G. Innovation, market orientation, and organizational learning: An integration and empirical examination. *Journal of Marketing*. 1998;62:42-54.
- [6] Lembaga Administrasi Negara. *Direktori inovasi administrasi negara*. Jakarta: LAN; 2014.
- [7] Sartika D, Kusumaningrum M. Pengembangan kompetensi aparatur sipil negara di lingkungan pemerintah provinsi kalimantan timur. *Jurnal Borneo Administrator*. 2017;13(2):131-149. <https://doi.org/10.24258/jba.v13i2.310>
- [8] Rahman MA, Rustan A, Hidayah K. Evaluasi penerapan model pembelajaran e-learning pada pelatihan dasar calon pegawai negeri sipil. *Jurnal Borneo Administrator*. 2020;16(1):101-116. <https://doi.org/10.24258/jba.v16i1.656>
- [9] Tampubolon H, Sembiring S, dan Muchtar MA. Learning management system dengan menggunakan metode collaborative learning. *Jurnal Dunia Teknologi Informasi*. 2012;1(1):1-6.
- [10] Dessler G. *Human resources management*. 15th ed. Wall S, Surette B, editors. London: Pearson Education Limited; 2017.
- [11] Thoha M. *Perilaku organisasi: Konsep dasar dan aplikasinya*. Jakarta: Raja Grafindo Persada; 2012.
- [12] Dubois DD, Rothwell WJ. *Competency-based human resource management*. Stern DJK, Kemp LK, editors. California: Davies-Black Publishing; 2004.
- [13] Noe RA, Hollenbeck JR, Gerhart BA, Wright PM. *Fundamental of human resource management: Gaining a competitive advantage*. 6th ed. New York: McGraw Hill Education; 2016.
- [14] Rasyid MUHA, Setiawardhana S. Evaluation management system berbasis web untuk mendukung penilaian tes onliene. Paper presented at: Seminar Nasional Aplikasi Teknologi Informasi; June 17th 2006; Yogyakarta, Indonesia.

- [15] Babo R, Azevedo A. Higher education institutions and learning management systems. Hershey: IGI Global; 2012.
- [16] Lembaga Administrasi Negara. Handbook inovasi administrasi negara. Jakarta: LAN; 2014.
- [17] Allen A. Microlearning: The building blocks of personalization. Salt Lake City: Allencomm; 2015.
- [18] Moleong LJ. Metodologi penelitian kualitatif. Bandung: Bandung Remaja Rosdakarya; 2011.
- [19] Raco JR. Metode peneltlan kualltatif jenis, karakteristik, dan keunggulannya. Jakarta: Gramedia Widiasarana Indonesia; 2010.
- [20] Kolb DA. Experiential learning experience as the source of learning and development. 2nd ed. New Jersey: Pearson Education; 2015.
- [21] Dewey J. Experience and education. New York: Touchstone; 1938.