INTRODUCTION TO DIGITAL VERIFICATION INFORMATION SYSTEM FOR EDUCATION ACCREDITATION AT NATIONAL ACADEMY OF PUBLIC ADMINISTRATION

Quang Quyen Pham

National Academy of Public Administration, Vietnam

Email address: libhuha@gmail.com

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Article info	Abstract:
	Digital transformation is more and more become important in our activities, in which training and education institutions have been assessed the quality standards of curriculum, the essence of the problem is to ensure the maintenance, stable and sustainable development, the development process not only increases in number of curriculum at all levels and training systems but also in quality - showing the overall picture of the whole process. Previously, Hanoi University of Home Affairs (now, merged into the National Academy of Public Administration) conducted quality assessment and obtained certificates in 2 phases: in 2019 and evaluated 3 bachelor's curriculum in 2021. In which, digital verification information system for education accreditation make an important contribution to the success. Aware of the role of the digital verification information system, Head of university let the Information and Library Center to deploy the construction of a centralized digital data space (according to the method deployed digital library) for testing on the principle of autonomy in software, design and administration to ensure sustainable development, process improvement to improve quality, ready to serve for testing all curriculum training through subsequent evaluation cycles. In this article, the author builds an online demonstration system (demo) to serve the experimentation of interested readers.

GIỚI THIỆU GIẢI PHÁP QUẢN TRỊ MINH CHỨNG SỐ PHỤC VỤ KIỂM ĐỊNH CHẤT LƯỢNG TẠI HỌC VIỆN HÀNH CHÍNH QUỐC GIA

Phạm Quang Quyền

Học viện Hành chính Quốc gia, Việt Nam

Địa chỉ email: libhuha@gmail.com

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Thông tin bài viết	Tóm tắt
	Chuyển đổi số đang diễn ra mạnh mẽ trong tất cả các lĩnh vực của đời sống xã hội, trong đó các cơ sở đào tạo đã và đang được đánh giá tiêu chuẩn chất lượng các chương trình đào tạo, thực chất của vấn đề là để đảm bảo duy trì, phát triển ổn định bền vững quá trình phát triển không chỉ tăng về số lượng các chương trình đào tạo các cấp, hệ đào tạo mà còn tăng về chất lượng - thể hiện bức tranh tổng thể về cả quá trình. Tại trường Đại học Nội vụ Hà Nội trước đây (Nay đã sáp nhập vào Học viện Hành chính Quốc gia) đã tiến hành đánh giá kiểm định chất lượng và đạt giấy chứng nhận qua 2 đợt: năm 2019 và đánh giá 3 chương trình bậc đại học năm 2021. Trong đó, giải pháp quản trị minh chứng số phục vụ kiểm định đánh giá chất lượng góp phần quan trọng trong thành công của quá trình đánh giá. Nhận thức được vai trò của hệ thống lưu trữ minh chứng số, Ban chỉ đạo đã lãnh đạo Trung tâm Thông tin - Thư viện của Nhà trường triển khai việc xây dựng không gian số dữ liệu tập trung (theo phương thức đã triển khai thư viện số) phục vụ kiểm định trên nguyên tắc tự chủ về phần mềm, thiết kế và quản trị để đảm bảo phát triển bền vững, cải tiến qui trình nhằm nâng cao chất lượng, sẵn sàng phục vụ cho kiểm định tất cả các chương trình đào tạo qua các chu kỳ đánh giá tiếp theo. Bài viết này, tác giả xây dựng hệ thống minh họa mẫu (demo) trực tuyến phục vụ cho việc thực nghiệm của bạn đọc bài viết có quan tâm.

1. Introduction

Education accreditation aims to carry out the mission of consulting and supervising the assurance and improvement of education quality according to national, regional and international standards [1] Nowaday, it becomes more important and meaningful activities for the development of education institutions and implementing the evaluation cycle to ensure objective and scientific about the development process.

In particular, the preparation work for a batch - an assessment cycle will include many stages with most of the preparation time being long and involving all departments in education institution. Writing a report for the evaluation with evidences for the processes implemented by the education institution is one of the most important pillars, which is decisive for the evaluation results. This is also a problem that education institutions often face difficulties due to the lack of uniformity in the organization of the system. During the operation, it is possible to follow the correct process, ensure the stages, after storing the evidences about the implementation of those activities, it is not yet guaranteed to be smooth and systematic, interconnected,.. Therefore, this is also an important

key in finding solutions that are suitable for the process of improving the quality of education.

Basically, the digital proof management application system for verification includes 3 groups of proof documents:

1. Group of curriculum and learning materials serving the outlines of modules in the training program (including printed and digital learning materials);

2. The group shall store documents and documents proving the activities of the training institution;

3. Group of evidence about the teaching staff - human resources (including salary list, permanent lecturers of industries and fields as well as the profile of the team).

Technical solutions: Agencies and units have been and continue to equip technical infrastructure for the operation of the process of issuing electronic documents with different operating software. In which, mainly buying software and renting server and network infrastructure to serve, the issuance and administration process is met by the software provider as required and is gradually agreeing on the implementation process. However, the function of archiving documents, after being issued and implemented, still faces difficulties and obstacles such as search and retrieval criteria for documents in the system, as well as the lack of tool on the system to automatically collect evidence about a field or topic - in other words, there is no function to automatically collect documents related to an issue or topic to display. when searching. Another technical issue, the data that will grow with the operation will require infrastructure in terms of storage capacity - if rented, it will require funding to ensure the capacity of each stage of development as well. such as limiting the initiative with updating requirements, changing the interface, the function of the system to be timely with reality.

From some of the above analysis and with the process of participating in the accreditation of education institutions of Hanoi University of Home Affairs in 2019; accrediting and evaluating 3 successful university-level curriculum in 2022 (now merged into the National Academy of Public Administration); The author synthesizes and presents it systematically to illustrate the solutions given in the next section of content.

2. Contents

2.1. Some concepts

Host : (or hosting) is an online data storage service. Hosting is split from the server (Physical Server or VPS) to reduce costs. The host can be used to run websites, webmail, software, applications or backup and share data online. Hosting is divided into 2 types Host windows and Host linux [2].

When installing a web server application directly on a computer at work, a unit is called a self-hosted (self-installed host).

An IP address (IP stands for Internet Protocol) is a numerical format for a network hardware, devices that use IP addresses to communicate with each other over an IP-based network such as the Internet [3].

Cyberspace : Virtual space refers to the information-connected environment for people to participate in transmission from anywhere in the world, emphasizing the multimedia information contained in various forms. information that people have used so far but have removed the barriers of space and time - space to access information [4].

Virtual Private Network (VPN) : is a service that connects networks (LANs at offices, branches, etc.) of an enterprise or organization into a single, private network through the provider's shared infrastructure. service level [5].

2.2. Results of accrediting 03 curriculums at Hanoi University of Home Affairs in 2021

Implement an assessment plan outside of 3 undergraduate curriculum of Hanoi University of Home Affairs in November 2021, including: State management, archival studies and cultural management. Due to the complicated situation of the Covid-19 epidemic, the period of external assessment and verification had to be moved from April 2021 to November 2021, in order to respond to the epidemic situation and promote in the spirit of the pandemic. For digital transformation, the Steering Committee decided to direct the Information - Library Center to deploy a solution to build a digital evidence storage system integrated into the University's digital library, grant accounts and decentralize authority for students. The team performs the task of collecting evidence for writing the inspection report from July 2021 (four months before the time of inspection). The number of

6 accounts is granted the right to catalog digital proofs on the system (Each faculty with accrediting training industry is granted 2 accounts for faculty teaching and 1 teaching support officer). In parallel with collecting proof of report writing, the assigned person will digitize and catalog the digital evidence on the system. As the time for accreditation approaches, the revision of the report and the addition of evidence with a large volume of 11 criteria and 50 standards according to Circular 04/2016 of the Ministry of Education and Training requires a moderate increase in speed to update. Update the digital proof to the system at the same time as correctly linking the proof in the inspection report. Each modification of the proof's position entails updating the reference to the proof. Therefore, when storing evidence on the system, this limitation has been overcome because the audit report is automatically updated when modifying the report content. In addition, it is also thanks to the system that the learning materials in the list of materials in the outline of the modules in the accreditation program have been supplemented and updated, including 794 compulsory learning materials, 1,553 reference materials. The number of digital proofs updated to the system covers all 11 standards with 2,218 records, bringing the current total to 16,146 records. Number of accounts granted and decentralized to experts in the inspection team so that experts can view online proofs. Currently, the number of accounts granted and decentralized for lecturers, officials, students and trainees is up to: 21,564 accounts (Figure 1).
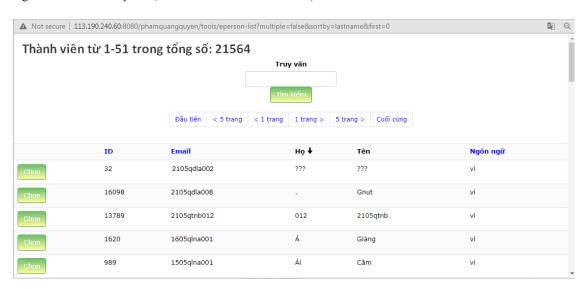

Figure 1: Total number of accounts that have been created

2.3. Technology infrastructure to deploy solutions

Hardware solution: Based on the existing infrastructure at the Information Center - Library,

Hanoi University of Home Affairs (before January 1, 2023) (hereinafter referred to as the Center) including:

- One 35MB fiber optic ADSL Internet connection line with static ip address is available to serve the network for function rooms of the University;

- One high-configuration computer to serve as a server to install digital proof management software infrastructure;

The installation, construction, and development of systems based on directly on the computer configured at the Center (self-hosted), proactive about the system, updating data, decentralizing, administering.

Software solutions: including an integrated system of free open source software (FOSS):

- Linux operating systems and environment utilities to run server applications: Apache tomcat, apache ant, apache maven,.. tools that support to convert to international standards and cataloging mass (this solution is intended to provide a response to the current prevalence of educational institutions, which is not storing digital evidence on a regular basis, updating regularly and treating it as an activity). regular and continuous operation of departments, units and affiliated units) - This is also one of the tasks that need to be implemented as a regular task of the whole system in education institutions that need to be overcome. to improve the quality of higher education in general

and be ready for the next accreditation period of the development process.

- The digital collection management application software has been custom-designed according to the structure of components for storing digital proofs for testing DSpace (full written as Digital Space) is open source software running on web application to manage digital information resources. DSpace, jointly developed by HP and The MIT Libraries, has been in development since 2002 and is now widely used by different organizations of countries around the world in creating digital data storage space on the Internet. network field. DSpace software is used to build a digital space and support the online collaboration of the participating parties, storing, retrieving information and disseminating digital information data formats: Including: specification data and accompanying full-text data files. Because it is open source, it completely allows further development,

extending the limit of creativity for different purposes of using digital space [6].

2.4. Designing the spaces stored in the system

After installing the above software into a system, next is to design digital proof storage spaces, create accounts and assign permissions for members to participate in the planning of departments for auditing assess the quality, update data (digital materials) to the system as assigned in the plan. For the case of a large number of proofs, it is possible to preprocess the data, then automatically update it to the system (this method requires advanced processing techniques from the system administrator - within the framework of this article). The author does not give details). Specifically, 3 spaces (Figure 2) will be designed to update the following 3 types of digital materials:

Figure 2: The interface of the home page of the digital verification information system

Regarding the source of digital proof, it is mainly digitized (scanning printed documents), then fine-tuning the raw data, optical character recognition (OCR: Optical Character Recognition) to ensure the proof is updated to the system. The system will be indexed for full-text search (search by any content contained in documents and evidence).

2.4.1. Digital space for coursewares

This space is for units such as the Department of Training Management or specialized faculties to update curriculum during the evaluation and accreditation phase into the system. Libraries and resource centers update course materials in course outlines with space for printed

resources at the library, or to update digital materials, or both. The design of the data entry form for accounts that

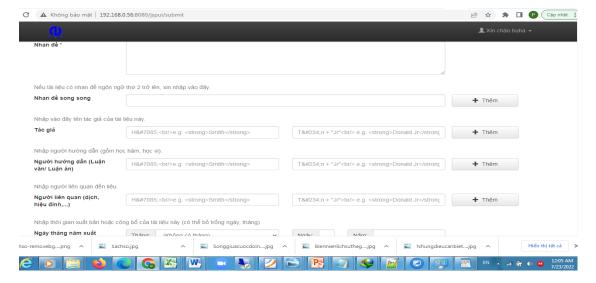perform data updates in this area is a form that contains data fields for books and periodicals (Figure 3).

Figure 3: Input form for books, magazines, theses,..

Digital documents include different forms of information stored in digital form, mainly in text form (text) and divided into document types such as books, newspapers, electronic magazines (books, newspapers, digital magazines) or forms produced in administrative and office activities such as documents.

2.4.2. Digital space for administrative documents

This space focuses on storing and updating digitized proofs, which are documents and process files that deal

with work procedures in the operational areas of the training institution during the evaluation cycle. For the first time doing the preparatory work, the account will be granted and authorized to the members who are assigned the task of responsible for the proof of documents - records to update the data. proof to the system. The information entry form for this space is designed according to the data fields of document management n (Figure 4).
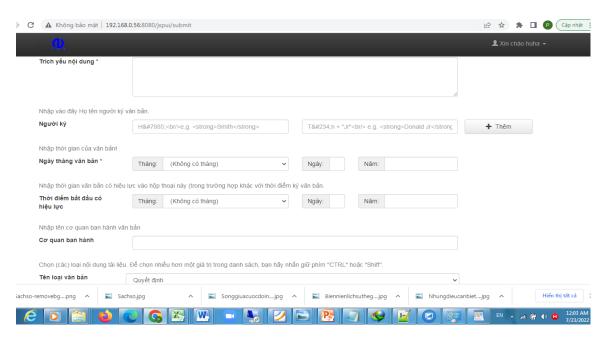

Figure 4: Input form for entering administrative documents

At the end of each audit (especially after the first audit), this space needs to continue to be deployed to update regularly because accounts are granted and authorized for members to perform tasks. Administrations of units under and under the training institution (teachers of specialized faculties, administrative officers of functional departments,..) update documents and dossiers to handle jobs up. system to serve the digital storage and retrieval of information about the operation of the work arrays of any time, any period, any field of activities in the training institution in a convenient way and fast.

2.4.3. Digital space for lecturer and official

The digital space is for updating the list of permanent lecturers and officials in the units according to the training institution's salary list during the accreditation cycle. During the first preparation for the process of welcoming the inspection team, granting accounts and assigning permissions to the person assigned according to the implementation plan to collect evidence and update the evidence into this area (usually, the The staff organization will do the updating of this proof).
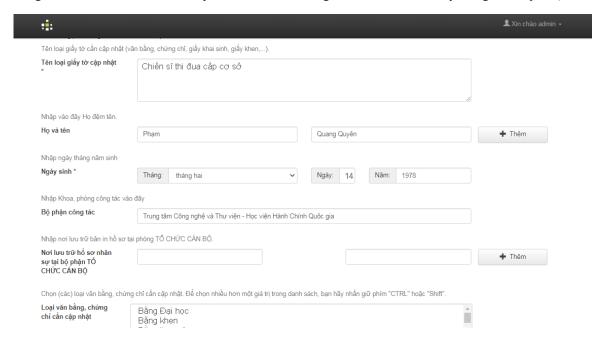

Figure 5: Input form for updating lecturer's and officials' profile - human resources

At the same time, design collections to store individual records of each teacher and employee to update information about the training and retraining process (updating newly completed diplomas and certificates, certificates of merit, etc.) certificate of merit in the year,..) (Figure 5). For the storage area of individual teachers, officials, and employees (diplomas, certificates, resumes,..) will be limited (only some accounts are allowed). permission to view details of diplomas and certificates as prescribed).

2.5. Assessment of system capacity

The system is integrated with additional storage space for verification evidence, which are documents, operational records of the University's units, list of staff, resumes, scientific background of the team put into operation. Regular operation from the beginning of 2021 to now has an average of 1,600 document records

per year, taking up an additional capacity of about 4GB. The current infrastructure is using a 4TB hard drive and storing digital documents on the system pointing to a NAS hard drive to be ready to support expansion of storage space. With the current level of use, the system is enough to store digital proofs for the Academy over the next 10 years.

In terms of updating digital proof data to the system for writing inspection reports, it has optimized human resources and significantly shortened the implementation time, especially the deadline.

Minimize technical errors in the updating process: for the verification of 03 branches, each faculty has mobilized 15 officials to participate in the implementation, but only 1 officer needs to update the data on the list of proofs. The preparation plan lasted for 1 year, but due to the complicated epidemic situation,

it was difficult to implement. Thanks to the system and add-ons, it was shortened with 2 months to update the proof on the system and link the proof to the inspection report.

Especially, after the evaluation period, the system really brought into play its role and meaning for the purpose of testing, which is to contribute positively to improving quality and efficiency. The storage of operational results is more complete and complete, the digital proofs on the system can promote its value during operation, for example, at the end of the administrative year, regulations, Regulations have been searched by the staff to refer to the standards for the annual evaluation and emulation of themselves and the unit. Therefore, recently, the number of users using the system has increased more and more, the total number of uses up to now is 1,516,236 (at 23h25, on 11-4-2023).

3. Conclusion

Evaluation and accreditation of higher education is one of the cyclical and periodic activities to perfect and improve the quality of universities, education institutions and graduate schools. It is an important measure of the reputation of a training institution nationally, regionally and internationally. This activity in recent years has been widely deployed throughout training institutions in Vietnam. Digital verification information system is well implemented, becoming a regular task of administrative officers in the tasking units will be updated will be one important content of improving the quality of the activity evidences, while contributing to the success of each validation cycle. The article summarizes the solution that has successfully

served at Hanoi University of Home Affairs and now, it is continuing to be implemented at the National Academy of Public Administration.

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