

Reengineering Analysis of Business Process System "Read Full Text on Screen" Institutional Repository

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ABSTRACT

Scientific works produced by tertiary institutions are encouraged to be accessed online and openly through institutional repositories. This is motivated by various regulations from the government to prevent plagiarism and fulfil the public's information needs. The Indonesian University of Education Institutional Repository (UPI Repository), managed by the UPI Library during the COVID-19 Pandemic, experienced problems in providing access to limited collection data. Therefore this study aims to conduct a business process engineering analysis on the UPI Repository limited collection service so that it can be effectively and efficiently accessed by UPI academics so that they can contribute to the learning process. The business process reengineering analysis method refers to the System Development Life Cycle (SDLC) approach. The results of the research are that there are additional features in the UPI Repository, namely Full-text reading services, SSO login features, and Full-Text data display on-screen access features. Changes in the design of the business process have resulted in a reduction in the process, namely VPN access, before the UPI Repository. There has been an increase in users of the Read Full Text on Screen service after the new design changes were implemented.

A. INTRODUCTION

Scientific works produced by universities are currently encouraged to be accessed online and openly through institutional repositories. Regulations from the government cause this to prevent plagiarism and fulfil the public's information retrieval needs. The government regulations are 1) Kepmendiknas No. 17 of 2010 concerning the prevention and control of plagiarism in tertiary institutions; 2) Director General of Higher Education circular letter number 2050/E/T/2011 dated 30 December 2011 regarding policies for uploading scientific papers and journals; 3) Director General of Higher Education Circular No. 152/E/T/2012 dated 27 January 2012 concerning Publication of Scientific Work (S1, S2, and S3); 4) Dikti Circular Letter No 1864/E4/2015 dated 15 October 2015 regarding PAK Lecturers (must be traceable online); 5) Dikti Circular Letter No 1753/D2/KP/2016 dated 12 July 2016 concerning Checking Scientific Work Proposals for Promotion of Position/Leveler Rank; 6) DIKTI Circular No. B/565/B.B1/HK.01.01./2019 dated 8 July 2019 concerning Student Scientific Publication Facilities.

Institutional repositories within the scope of tertiary institutions mean a series of services provided by tertiary institutions to members of their community to manage and disseminate digital materials of scientific work produced by tertiary institutions, including those not published or grey literature online or offline. The Institution Repository is an accurate indicator of the quality of a tertiary institution, namely increasing visibility, prestige and public value. (Asadi, et al., 2019; Santoso, 2019; Vincent, 2020).

In general, the condition of institutional repositories in Indonesia can be seen through the RAMA Repository (<https://rama.kemdikbud.go.id>) and Indonesia Onesearch (<https://onesearch.id>). RAMA Repository is a national repository of research reports in the form of theses, final assignments, student projects (diplomas), theses (S2), dissertations (S3) or lecturer/research reports which are not publications in journals, conferences or books (Melinda, Stiawan, & Bardadi, 2021; Stiawan, 2019). Two hundred twenty-one institutions have joined the RAMA Repository, while the institutional repositories incorporated in Indonesia's Onesearch total 10,276 repositories (Utami, 2019). Indonesia Onesearch is a portal developed by the National Library as a one-door search for all public collections from libraries, museums, archives and electronic sources in Indonesia (Asmiati, 2020; Iswara, Oktavilia, & Maulana, 2016; Yenianti, 2019).

The Indonesian University of Education Institutional Repository (UPI Repository) is one of the services provided by the UPI Library. The UPI repository can be accessed via the <http://repository.upi.edu> page. The UPI Library has continued to develop the existing services at the UPI Repository to suit the needs of users and institutions. The UPI Repository, in general, aims to preserve the intellectual assets produced by UPI and ensure that these assets can be accessed continuously and quickly. Intellectual assets currently managed at the UPI Repository include: 1) final student assignments in the form of theses, theses, and dissertations; 2) scientific articles of academicians; 3) proceedings of several seminars and conferences held by UPI.

The COVID-19 Pandemic has affected the services provided by the UPI Library, including the UPI Repository. User access and collection management activities at the UPI Repository are forced to be carried out at home using remote access. The library cannot be physically visited to prevent the spread of COVID-19 (Wahyudi & Mutiari, 2021).

A pandemic is one part of a risk that must be responded to as soon as possible by a public sector organization (PSO) such as the UPI Library so that services can still be carried out so that the risks that arise do not interfere with the fulfilment of the mission and duties of the UPI Library. The need for integrated risk management in PSOs has increased in the last decade in line with the uncertainties and risks PSOs face in fulfilling their mission and mandate (Alijoyo, 2020; Demircioglu & Audretsch, 2017; Meyer & Leixnering, 2015).

Access to the UPI Repository collection before the Pandemic consisted of 2 types: collections that can be downloaded freely and restricted. Collections that can be freely downloaded are title files, chapter 1, chapter 3, chapter 5, and the bibliography. Limited collections are chapter 2, chapter 4 and attachment files. Access to restricted collections can only be accessed directly at the UPI Library. Access restrictions are carried out to prevent misuse of collections, such as plagiarism and illegal commercialization.

The problem during the COVID-19 Pandemic was that the UPI Library could not be physically visited offline or physically. The new offline service opened in January 2022 by limiting visitors to only 75 people, and in June 2022, the UPI Library increased the number of visitor quotas to 150 people. This causes restricted collections not to be accessed optimally.

On the other hand, the UPI Repository during a pandemic is the service most needed by users. Users who need Repository Services 91%, while e-journal services are 74%, e-book services are 65%, final assignment services are 54%, user loan-free mail services are 39%, scientific verification services are 30% and finally namely the independent upload service as much as 27% (Johan et al., 2020).

Problems regarding restricted access to the UPI Repository collection are an urgency to redesign the business process. Based on the explanation above, this study aims to conduct a business process engineering analysis on UPI Repository services, especially on business process limited collection access services, so that UPI academics can access them effectively and efficiently.

B. METHODOLOGY

The method used in Business Process Reengineering (BPR) analysis in this study refers to the SDLC approach. Business Process Reengineering (BPR) is an approach to change in business methods which is defined as an effort to fundamentally improve and radically redesign business processes to improve critical efficiency measures such as cost, quality, service, and speed (Gaol, 2016; Rahadhini, 2008; Wisayani, 2014). BPR's analysis of UPI Repository services is expected to reduce risks resulting from the COVID-19 Pandemic so that collections in the UPI Repository can be accessed more effectively, efficiently and safely from abuse of access as well as legal actions such as plagiarism and commercialization. The stages of the research can be seen in Table 1 below:

Tabel 1. Research Stages

No	Stages	Description	Collecting Data Method
1	Business Issues	Conduct an analysis of all problems related to access to the limited collection of the UPI Repository during the Pandemic.	Documentation study through user online complaints through the UPI Library social media.
2	Investigation	Analyze the scope of business process change recommendation solutions that allow it to be carried out in overcoming existing problems	Focus Group Discussion of UPI Repository leaders and managers, Observation of model institutional Repository access, literature studies
3	System Analysis	Conduct a needs analysis for UPI Repository service features/systems by the scope that has been carried out at the investigation stage	
4	Business Process Design and Implementation test	The third stage is developing a system change design based on the system requirements analysis results and conducting a limited implementation test.	
5	Maintenance	make several guidelines for the use of the following development plan so that the BPR that is being carried out can be continuously implemented and developed	

C. RESULT AND DISCUSSION

Business Issues

During the Covid-19 Pandemic, the UPI Library provided UPI Fulltext Repository access services in two ways, namely through the RepoVOS Service (UPI View On Screen Repository) and the Academic Collection Print and Sent Service (CERIA) (Amanda, 2022). The RepoVOS service can be accessed via the UPI Intranet network using OpenVPN, which the UPI STI Directorate facilitates.

Some of the problems identified by the RepoVOS service using a VPN are:

1. Difficulties during the OpenVPN installation process
2. The UPI Repository Data with RepoVOS have not been integrated, so there is UPI Repository data that does not exist in RepoVOS

3. The display loading process takes quite a long time for each page
4. Less clear Display pages

Investigation

The investigation phase was conducted with FGDs attended by the UPI Library management team and UPI Repository managers. The following are some issues that can be used as a reference for making changes to restricted Repository collection access:

1. The UPI repository and RepoVOS are integrated so that there are no differences in data
2. The UPI academic community must be able to access all collections in the UPI Repository through the UPI internet network or outside the UPI internet network.
3. Access to the limited collection at the UPI Repository by UPI academics can only be read "on-screen viewing" and cannot be downloaded.
4. Access to "on-screen viewing" by the academic community is done by first logging in using a Single Sign On (SSO) account
5. Non-UPI academics can access the full text "on-screen viewing" only in the UPI Library environment using a particular PC or the CERIA service.

Observations were made by observing institutional repositories that provide full-text data services to their users. The Repository observed was the Muhammadiyah University Surakarta Repository (<http://eprints.ums.ac.id>). The repository application used by the UMS Repository is Eprints. The aspect of the repository application used by the UMS Repository is the same as that used by the UPI Repository, namely Eprint Version 3.3.

Based on observations from the UMS Repository, full-text services are provided to users as full-text on-screen viewing services. Users can only read the full text on the screen. Downloadable files are partial. The Fulltext Read feature in the UMS Repository can be adopted because repository users cannot download freely and cannot copy and paste because the full-text display is in the form of an image, so it can minimize misuse of information by UPI repository users.

System Analysis

At this stage, the activities are to determine the features needed by the investigation results or preliminary studies carried out. In the literature study, we see that institutional repositories have several service functions, namely capturing, storing, indexing, preserving, and redistributing university scientific research in digital formats.

The problem of access to restricted collections is related to the function of distributing scientific digital data in the UPI Repository. From the results of the investigation phase, we can see three features that must be added: the read/view on-screen service feature, the SSO login feature, and the Full-Text data display on-screen access feature. Details regarding the function procedure and purpose of each additional feature can be seen in Table 2 below.

Table 2. Requirements for the Addition of View Full Text on Screen Repository UPI Function

No	Function	Feature	Procedure Function	Feature Purposes
1	Digital data distribution	Read full text	Alternative access features to be able to read Full-text digital data	Providing access services to read digital data in full text on the screen
2		SSO login	Restrictions on special access for UPI academics	Limiting data to only UPI academics who can access it
3		Display FullText	Fulltext data display	Displays complete text data on the screen

Business Process Design and Implementation Test

The third stage is to develop a system change design per the system requirements analysis results. Design development includes redesigning the business process flow for a limited collection of full-text read access and redesigning network system data for limited collections.

The flow of the RepoVOS service procedure using a VPN. The flow can be seen in Figure 1 below.

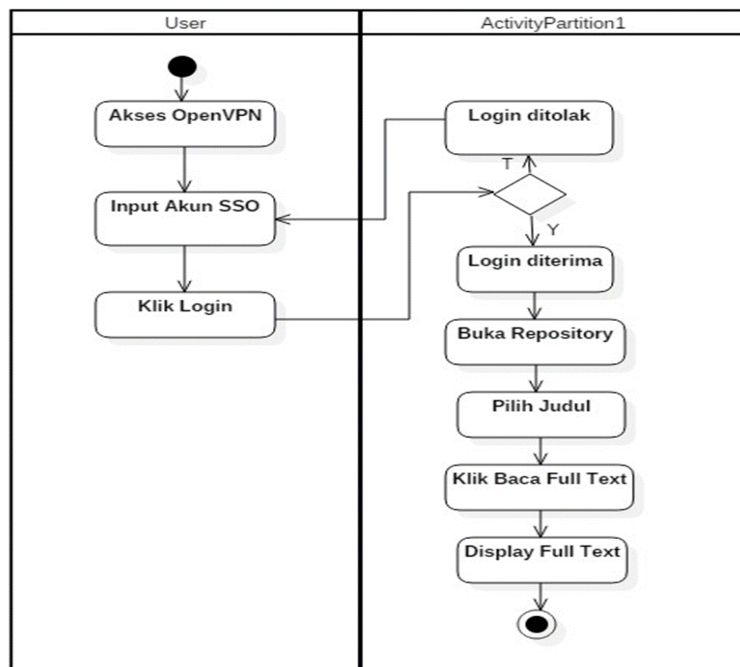


Figure 1. RepoVOS Process using VPN Flowchart

The stages of the RepoVOS service flow via VPN consist of 1) OpenVPN Access; 2) OpenVPN login using SSO; 3) UPI Repository Access; 4) Information search to find the appropriate title; 5) Selecting the Read Full Text menu; 6) Display full text on the screen.

As for the design of the network architecture system can be seen in Figure 2 as follows:

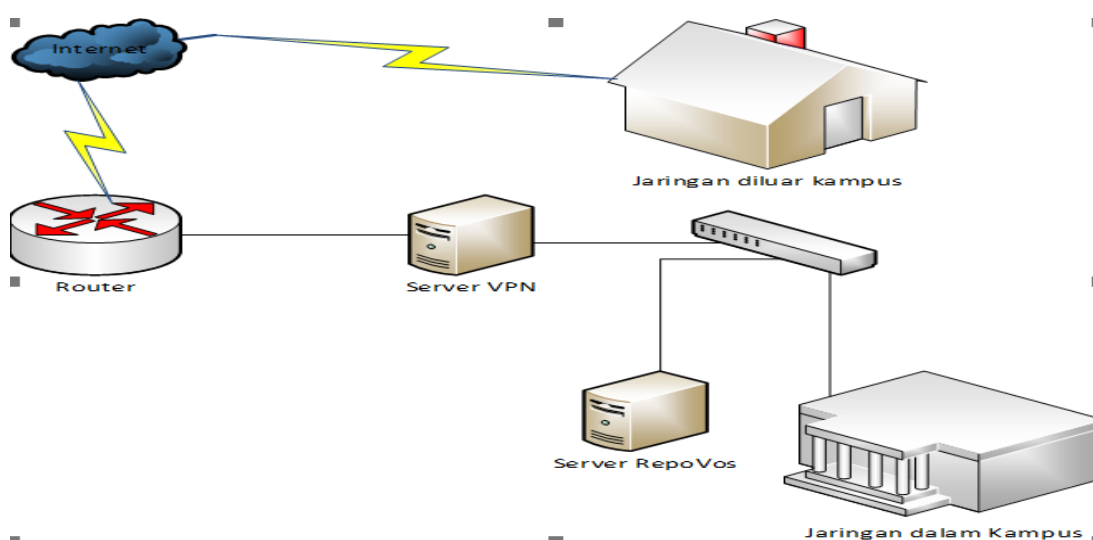


Figure 2. Full text read access network architecture using VPN

The results of implementing RepoVOS using a VPN from January 2022 to April 2022 can be seen in Table 3.

Tabel 3. RepoVOS user data using VPN

No	Bulan	Jumlah
1	Januari	300
2	Februari	387
3	Maret	402
4	April	198
Total		1287

The result of the redesign is to access the UPI Repository limited collection service. The first thing is integration between the UPI Repository and the RepoVOS service so that access to the Reading Fulltext on-screen Viewing service on the UPI Repository can be accessed through various networks without using a VPN service.

The applications required for the integration process are Ubuntu 18.04 LTS operating system, PHP version 7.2, MySQL database application version 5.7, and ImageMagick application version 6.9.7.4. To solve the display problem that needs to be clarified, the activity is editing the script on the ImageMagick application to adjust the display resolution of full-text data.

The result of redesigning the full-text read access for the limited collection of the UPI Repository. It can be seen in Figure 5. The process flow includes 1) SSO login; 2) UPI Repository Access; 3) Searching for information to find the appropriate title; 4) Selecting the Read Full Text menu; 5) Displaying full text on the screen. Reduced activity is carried out, namely without access to OpenVPN first, for the second design network system can be seen in Figure 3.

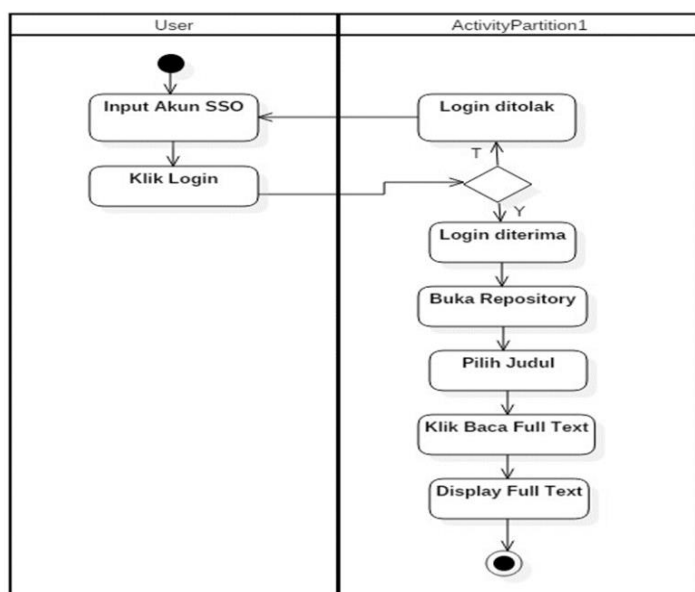


Figure 3. RepoVOS Process without VPN Flowchart

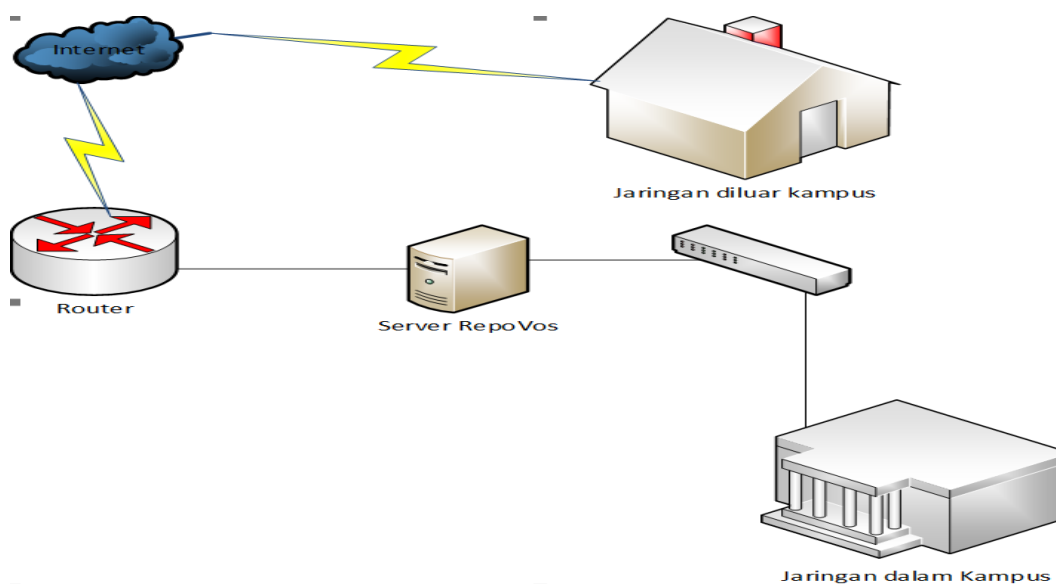


Figure 4. Full text read access network architecture without VPN

Next is the implementation test. The results of the second design implementation test were carried out for two months, namely from May 2022 to June 2022. There was a significant increase from the previous results. The following is the user data for the UPI full-text repository reading access service, as seen in Table 4.

Tabel 4. Access user data to read full text using VPN

No	Bulan	Jumlah
1	Mei	3277
2	Juni	5090
Total		8367

The results of the second implementation test showed increased users of the UPI Repository reading full-text service. In the first design, users accessing the UPI full-text reading service repository averaged 322 users per month. In contrast, in the second design, users accessing the full-text reading service increased to an average of 4183 users per month.

Maintenance

The maintenance phase of the activities carried out ensures that the designs that have been made can be used continuously and function properly. For this to be achieved, several user manuals have been prepared, and open consultation and complaint services have to find out user needs that can be carried out for further development. For a guide on how to access the full-text reading service, you can access it via the UPI Central Library Youtube channel.

D. CONCLUSION

Business Process Reengineering (BPR) is a method that an organization can use to optimize business processes to be more effective and efficient and achieve the organization's goals. From the results of the BPR analysis on limited collection access to the UPI Repository library, it can be concluded that from the results of the investigation stage, it is necessary to add three features to the UPI Repository, namely the on-screen reading/viewing service feature, the SSO login feature. The Full-Text data display on-screen access feature. Whereas from the test results, design changes effectively increased users of limited collection access services through various internet and intranet networks.

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