Asian Journal of Information Technology 10 (7): 259-270, 2011
ISSN: 1682-3915

Evaluation of the Implementation of Indonesian Electronic Journals Citation System Using Regex Technique and PDF Extraction Tool

Riri Fitri Sari and Agung Kurniawan
Department of Electrical Engineering, Faculty of Engineering, University of Indonesia,
Kampus Baru UI, 16424 Depok, Indonesia

Abstract: All research papers produced by researchers worldwide now are based on previous academic publication written by other researchers. Many research papers published in electronic media and new media also refered to previous publications. The advancement of technology makes internet become the most widely used media. Research papers are published in many formats such as in the journal. Relation among journals can be traced through their citations. The number of citation to a journal study can also be calculated to show the contribution of that particular study. In order to know the relation among journal articles published on the internet, a system was designed which can automatically produce a relationship information betwen articles from different journals which are located in different websites. Therefore, in this research we created a mashup in order to extract the web pages and then pick required files automatically. This system produced a database to save the extracted files and then find the relations. The results of the process are shown in a web portal. The interface has functionalities for searching by using the key words inputted by users. As a result, the whole system forms a Mashup. We created an automatic extraction for Indonesian electronic journals system using data from fourteen university e-journal sites. We built the system using PHP language and MySQL database, after carefully studied the algorithm in Openkapow Robomaker. The system can successfully extract information from journal provider's web pages which include special type of PDF pages then save them in database. The system generated finally shows the connection and the relation among the journals. The test result shows the processing time and memory usage evaluation for a random number of files. The evaluation results show that the execution time is dependent on the number of journal series, volumes and number of articles on related e-journal sites. The system has been complemented with some functionalities for the user interface to report the number of the total journal articles extracted automatically from different sites. Some approach such as the use of DOM tree, Regular Expression techniques and PDF extraction tools have been used to improve the system in extracting web pages and getting full journal articles to be processed.

Key words: Web extraction, citation index, journal, regular expression technique, PDF extraction tools

INTRODUCTION

Development of science and technology now can not be separated from many studies previously conducted by individuals or institutions i.e., education institution, private and government. Many publication of research studys, articles, news and journals are published in new media or electronic format. Many publications of research results in the form of technical report documents, study, journals, articles are widely available on the internet. Those documents are easy to acces, many of them are used as reference material or reference for further research of other researchers. Therefore, reference relationhip between documents on the can be evaluated automatically. A new document will refer to an older documents published previously. In order to know the relationship between documents, we need to evaluate the reference part of the full text. Subsequently, we can count how many times a document have been cited. Based on the above mentioned research problem in order to enable the extraction and to implement easier document processing from the web, it is necessary to build a system that automatically extract and process data obtained from the document to search for a relationship between documents. Due to the variation of document on the Internet, the document processed in this research are journal articles in PDF format. The electronic journals used in this study are free access journals which are issued by several educational institutions in Indonesia. The goal of this research is to create a system that can

Corresponding Author: Riri Fitri Sari, Department of Electrical Engineering, Faculty of Engineering, University of Indonesia, Kampus Baru UI, 16424 Depok, Indonesia

help to search relationship between documents obtained from the internet. We implemented the system using PHP language for application program and MySQL database. Some improvement of methodology such as the use of Document Object Model (DOM) tree, Regular Expression extraction and PDF Extraction tools have been conducted. The system can be used to extract information from different sites with different designs automatically. The final version of the system has been put alive in the web.

LITERATURE REVIEW

Web scrapping, web harvesting or web data extraction is a technique to extract the data or information from a website using a particular software application program. Usually application program simulates human exploration of the web using a low-level HTTP or uses full-fledged web such as internet Explorer and Mozilla (Palmer, 2001).

Web Scraping is also associated with a web automation which simulate web browsing activities of people using computer software. Obtaining relevant data from a web page can be performed with scanning effective part of a document such as reference, author, book title, date, etc. Variation of document is possible. For documents with different document format, an automatic identification and process will be conducted by the web extraction system.

One of the methods used in this web extraction technique is the Document Object Model (DOM) which is a breakdown of how an object (text, image, headers, links, etc.) of a web page displayed. DOM defines what attributes are associated with each each object is and how an object can be used. Dynamic HTML (DHTML) relied on DOM to display dynamic web page in the browser after being downloaded.

DOM will convert (parse) an XML document into a hierarchical format (Chen, 2010). In addition, there is another technique to extract the web i.e., Regular Expression or often referred to as Regex. Regex is a formula for finding the pattern of a sentence/string. At low levels regex is usefull to search for a word fragment. At higher level, regex is able to control the data to find, delete and modify it (Li *et al*., 2008).

Mashup: Mashup is a web application that combines data from one or multiple sources into one integrated system or device. Mashup consists of two main parts, namely web applications that provides new services using various sources of available data or data from other sources. An example of Mashup is a cartographic use of data from Google maps to add location information to real-estate data to create a new web service which differs from the existing one (Palmer, 2001).

Citation and citation index: Citation is a reference to a book, article, journal, web page forms or other publications with sufficient details to identify the source of the reference. Citation usually consists of the researchers name, book title or article, publisher, publication year and the URL of the study. There are some standard in writing citation, created and published by various associations or individuals (author) i.e., the Chicago style and Turabian style that is used for all fields. Modern Language Association (MLA) which is used for arts, literary and humanism and American Psycological Association (APA) which is used for psychology, education and other social sciences (Pressmann, 2005). Citation on a scientific study or document have been performed if a particular journal article uses particular findings in that document and this is used as the base for future contribution. Therefore, we will be able to know how often a document is cited, the contribution of the information and its influence or impact to other research. The size of the influence or impact of a document to provide information depends on a number of the citation to the document. Some paid and free citation index services currently exist i.e., Web of Science, Scopus, Citeseer, RepeC, Google Scholar and Publish or Perish.

Web data extraction tools: There exists some open source and proprietory tools that can be used for web data extraction process. Currently there are some tools available to create a web data extraction program with a visual programming environment with features such as reducing script writing for web data extraction i.e., Kapow Mashup Server 6.3 Robomaker, Lixto Visual Developer.

Portable document format: Portable Document Format (PDF) is a file format used for exchanging digital documents, created in 1993 by Adobe systems. PDF is used for representing two dimensional documents in the application software, hardware or operating system independent which is a PDF file consists of a set of descriptions for the two-dimensional layout such as text, type, letters, images and two-dimensional vector graphics. PDF file consists of several objects, like Boolean which represent the value of true or false, numbers, strings, names, array consisting of several objects, dictionaries which are the collection of objects indexed by the name, streams that contain large amounts of data, the null and the object.

Text in PDF is represented in a stream of text element. In the study by Kaplan and Tokunaga (2008), Nanba *et al.* (2000) and Kaplan *et al.* (2009) introduced their research in automatic extraction of citation contexts for research study summarization using Cite-sum. The systems accept a study title as a query and find the citing studys and also classifies extracted information. In this research, we also also proceesed Microsoft Word documents, a word processing software (word processor) from Microsoft. Some free text publications are provided in this format. Word document format (.Doc) is divided into several parts: the header, the storage property and the file information.

DESIGN

The design is important when creating a system (Pressmann, 2005). Good design will produce a system which perform the function and the purpose of the system. Design generally consist of several stages such as clarifying specifications and functions of the system, determining how the system researchs, identifying the requirement the system and determining the tool used to build the system.

The system is a web-based system that functions to search and display citation index of the electronic journals of institutions in Indonesia. The system works by collecting data in terms of articles journals acquired from the higher education institutions portal in Indonesia. For the users, the system will be similar to search engines. User will enter a keyword based on the title or author in the field.

Then, the system displays the search results accordingly. The general frameresearch of the system is shown in Fig. 1. Stages of system design is a development from the previous system which is a web-based system that functions to locate and display the citation index of journals from the institutions in Indonesia. The system researchs by collecting journal articles data derived from 14 Indonesian institutions. From the user perspective, the system will look like search engines where users will enter a keyword based on the title or author on the field. Then the system displays the search results accordingly. In addition from the user perspective the system will display some of the resume data obtained from extraction result.

Extraction system: The new extraction system generally works the same way with the previous system as shown in Fig. 2. The system has been added with some methods for extracting HTML pages and also the extraction of the PDF or the full article page. Some web extraction system using the selection of string and cutting existing data in an HTML page using PHP operation string have been implemented. The system is more efficient in processing and the result is more precise. DOM parsing and regular expression implementation to extract an HTML page have been generating a more precise results using the tagging information. Previously we used PHP script to convert PDF files into a string/text tan can be read and identified. Subsequently we use a tool called pdftotext

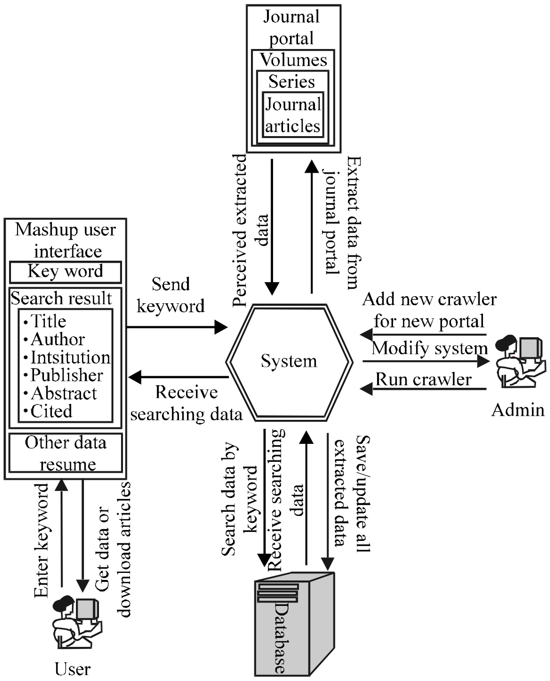


Fig. 1: Frame research of the system

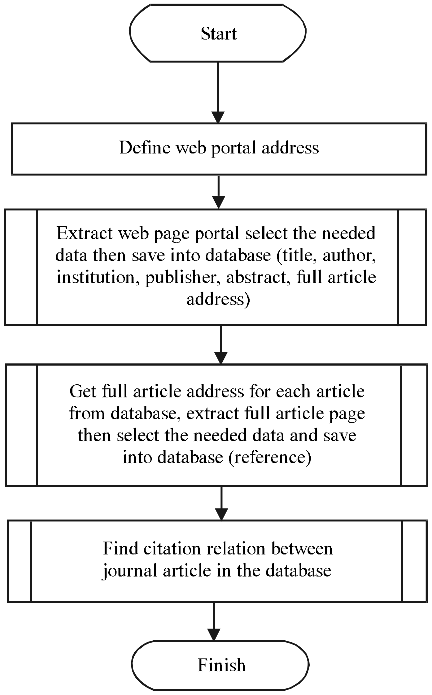

Start
Define web portal address
Extract web page portal select the needed data then save into database (title, author, institution, publisher, abstract, full article address)
Get full article address for each article from database, extract full article page then select the needed data and save into database (reference)
Find citation relation between journal article in the database
Finish

Fig. 2: Activity diagram of the extraction system

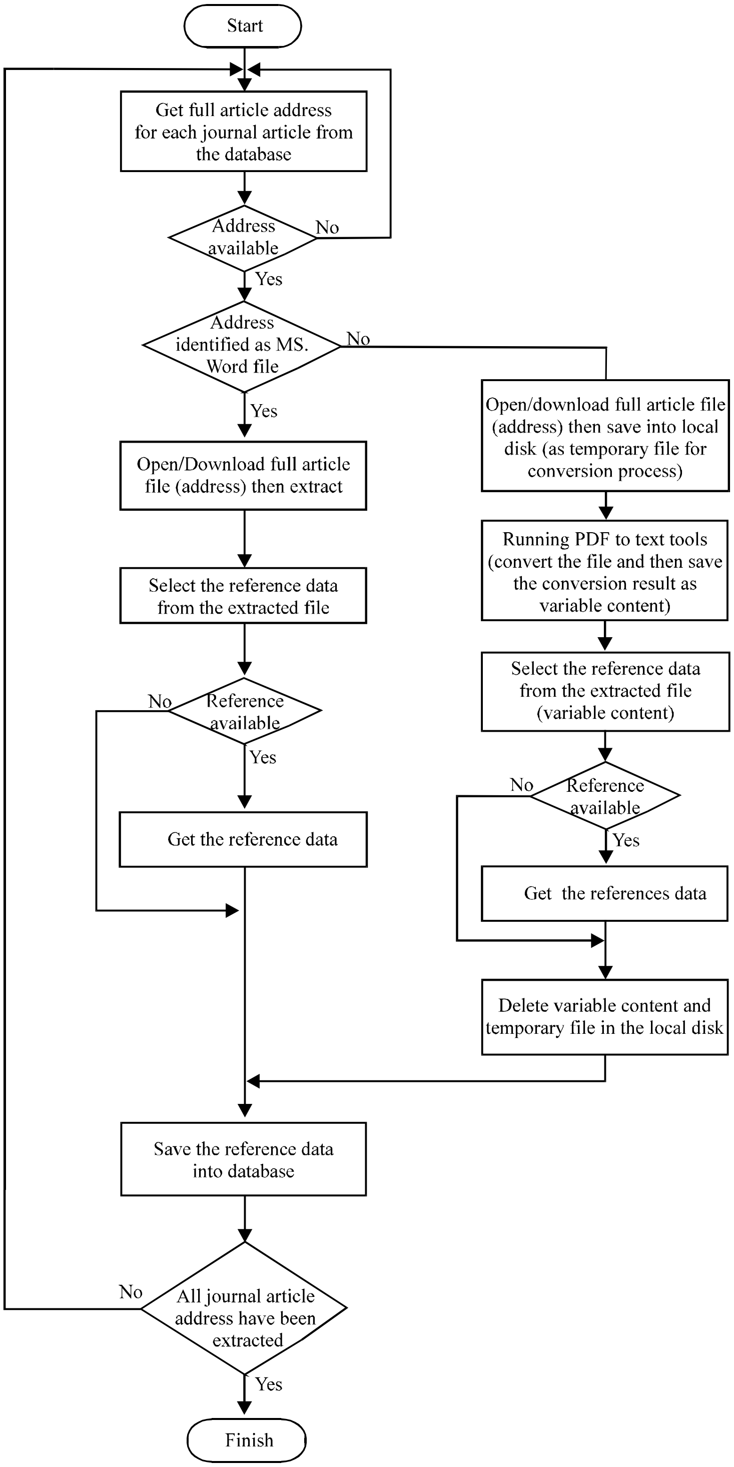

Start
Get full article address for each journal article from the database
Address available
No
Yes
Address identified as MS. Word file
No
Yes
Open/Download full article file (address) then extract
Select the reference data from the extracted file
Reference available
No
Yes
Get the reference data
Open/download full article file (address) then save into local disk (as temporary file for conversion process)
Running PDF to text tools (convert the file and then save the conversion result as variable content)
Select the reference data from the extracted file (variable content)
Reference available
No
Yes
Get the references data
Delete variable content and temporary file in the local disk
Save the reference data into database
All journal article address have been extracted
No
Yes
Finish

Fig. 3: Activity diagram of the full article extraction

to convert the PDF file better. The file should be saved before the conversion into a text format. Considering that some of the electronic journal full articles are provided in Microsoft Word format, we make an additional script to allow the extraction of the Microsoft word file. The procedure can be found in Fig. 3.

User interface system: For the user interface system, we designed a space in which additional link to journal providers. Some functions to view the summary of the extracted information has been provided. The data can be viewed based on the list of researchers, their researches and the total number of researches cited, list the amount of research of each institution per year and the number of articles cited, the graphical representation of the the number of articles from each institution and graph the number of articles cited for each institution.

EVALUATION

In the implementation to create a Mashup, the previous system researchs to extract information from the e-journals sites in Indonesian higher education institutions. Testing were conducted by calculating crawler application execution time. The research flow of the crawler can be shown in the flowchart on Fig. 4. Figure 5 and 6 shows some differences in execution time for each site of the journals. To execute the entire script program, the time difference due to the difference in the number of series, number of volume and journal articles for each volume. The difference between the combination of number of series, volume and the journal article may lead to differences in execution time because there will be a difference in the number of web pages opened. In terms of the execution time, the volume and abstract address, there is the time difference caused by the number of web pages that must be opened to get the relevant data that is required which is different for each site. The execution time for the separation of the title, author, institution, publisher, full address of the article and abstract are caused by differences in the format of the display of abstract web pages processed. Other functions in the application system is to obtain the reference from a journal article in which the address has been stored in the database resulting from the application process of the web page extraction functions. Experiment result shows that there are differences in the execution time which is for the time in reading the full page article dependent on the size of the file processed.

Ideally, the larger the file size, the more time required for execution with a note that the data transfer speeds used are the same. The situation in which an execution time is longer for a smaller file size can be caused by the decreased in the speed of data transfer when opening a file. The time for data conversion of the PDF file to get data referenced will depend on the number of streams in the PDF file that is processed or converted until reference data can be obtained. The more file stream, the longer the execution time. The use of memory and file size will affect the amount of memory used. This is related to the use of the variables used as buffers to process the data. The larger the size of the files processed will also increase the memory needed by the application.

Concurent execution of other application will require memory allocation which will cause the addition of the memory usage. This is done by using the command memory_get_usage () in PHP.

User interface performance testing: Testing the performance of the system is conducted by running an application program on localhost. It is the same with the extraction system on the test. The resulted Mashup user interface is shown in Fig. 7. We have performed the extraction of the portal provider of full text online journals, including:

- University of Indonesia (http://journal.ui.ac.id)
- Bandung Institute of Technology (http://proceedings. itb.ac.id)
- Udayana University (http://ejournal.unud.ac.id)
- Petra Christian University (http://puslit2. petra.ac.id/ejournal)
- Gadjah Mada University (http://i-lib.ugm.ac.id/jurnal)
- Diponegoro University (http://eprints.undip.ac.id)
- Islam University of Indonesia (http://journal.uii.ac.id)
- Sriwijaya University (http://digilib.unsri.ac.id/jurnal)
- Muhammadiyah University of Purwokerto (http://jurnal.ump.ac.id)
- Bogor Agricultural Institute (http://journal.ipb.ac.id/index.php)
- Yogyakarta State University (http://journal.uny.ac.id/index.php)
- Andalas University (http://ffarmasi.unand.ac.id)
- University of North Sumatra (http://ejournal.usu.ac.id)
- University Mercubuana (http://research.mercubuana.ac.id)

New extraction system result testing: Testing extraction system is done by counting the number of journal articles that successfully extracted from each portal providers journal. From extraction of the journal provider portals extraction is obtained following data. From the extracted HTML page, it can be found that not all of the journal

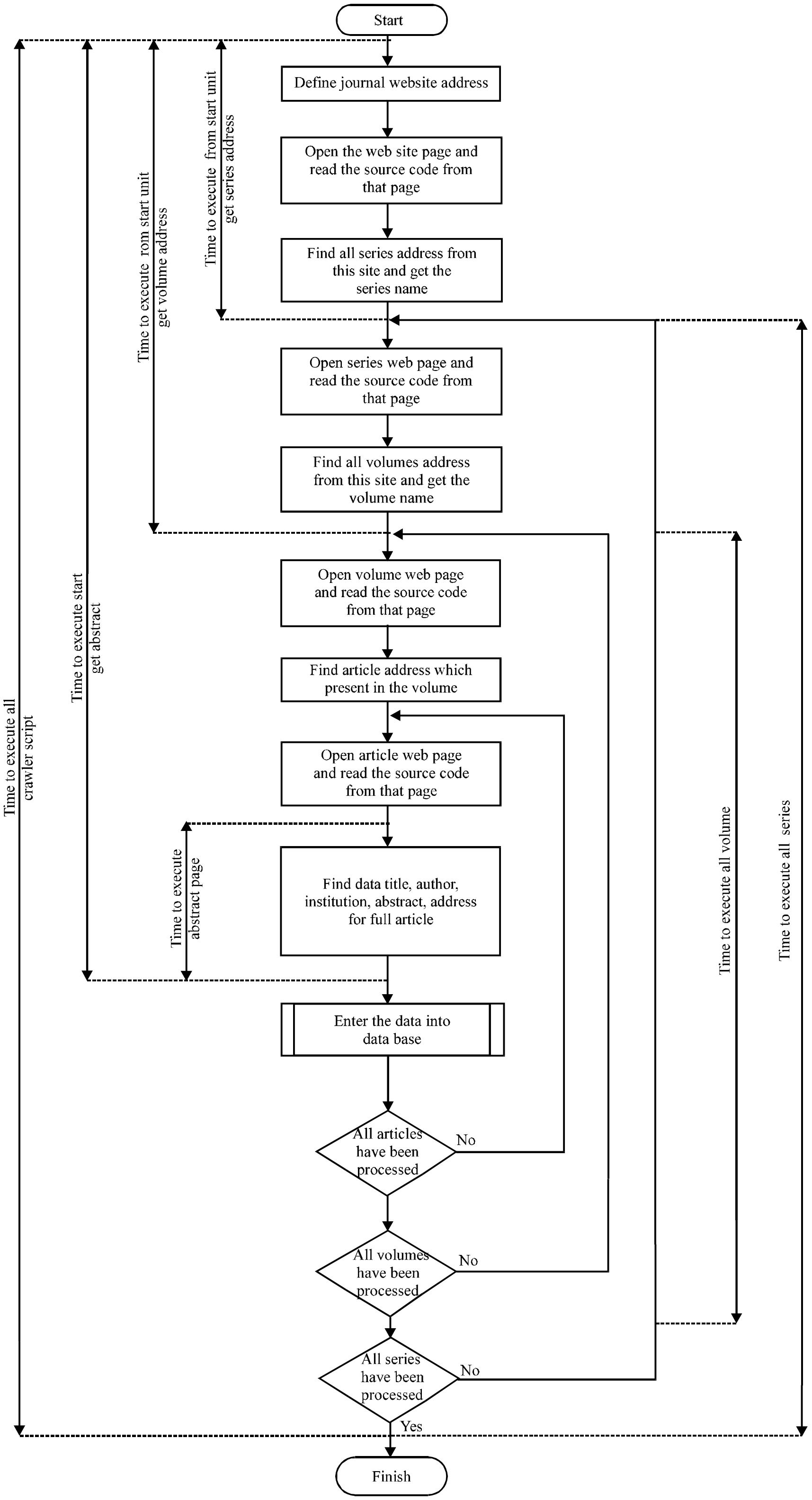

Start
Define journal website address
Open the web site page and read the source code from that page
Find all series address from this site and get the series name
Open series web page and read the source code from that page
Find all volumes address from this site and get the volume name
Open volume web page and read the source code from that page
Find article address which present in the volume
Open article web page and read the source code from that page
Find data title, author, institution, abstract, address for full article
Enter the data into data base
All articles have been processed
No
All volumes have been processed
No
All series have been processed
No
Yes
Finish
Time to execute all crawler script
Time to execute start get abstract
Time to execute rom start unit get volume address
Time to execute from start unit get series address
Time to execute abstract page
Time to execute all volume
Time to execute all series

Fig. 4: Web page extraction function flow chart

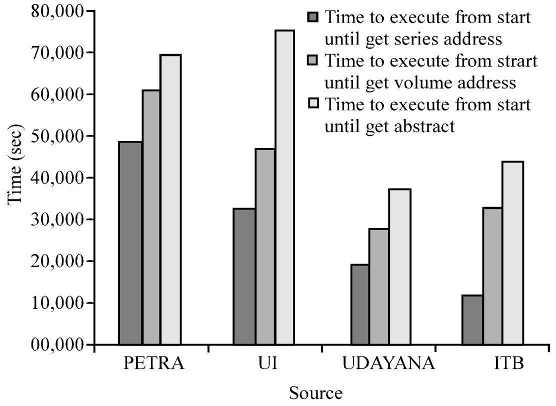


Fig. 5: Execution time of the extraction from web pages home page to get first abstract of the article journal

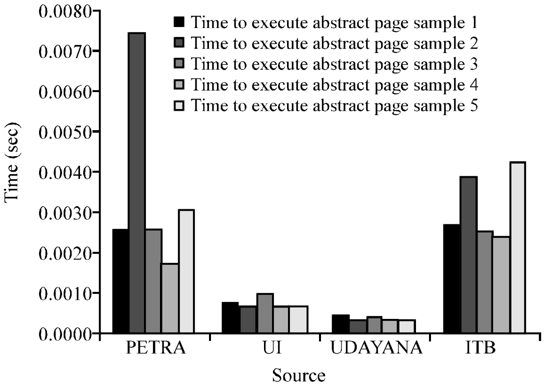
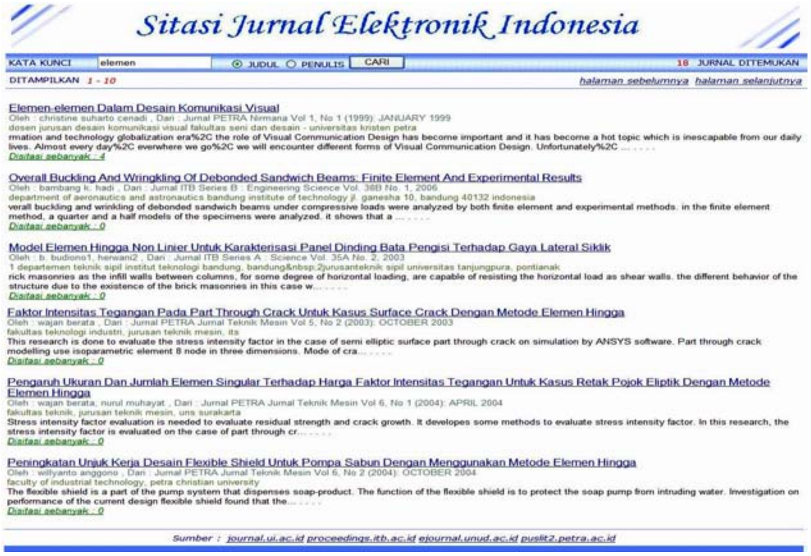


Fig. 6: Execution time of extraction scripts of web page information to obtain title, author, institution and abstract from article journal abstract page

articles can be extracted and inserted into the database. This is because there are some web pages that have different tags (Table 1). Some existing data on the page can not be extracted if obtained data do not match the specification. The extraction process of full page articles in PDF and Microsoft Word is conducted to get the reference from the articles. Table 2 shows the results. It can be noted that some universities provide abstracts of journal articles only and therefore no referencing can be found.

Some of the PDF pages result that is not all full page article (reference) can not be extracted. This is because not all PDF files can be converted by the existing tools (PDFtotext). Some files are encrypted. Some are scan results. Others required payment for full text access. Some files can not be opened even though the address to get a full article has been obtained from the extraction of HTML pages. In addition, not all the pieces of reference data can be extracted well, this is because in one file a full journal article contained more than one reference word. A word searching process starts from the beginning of the file until the end of the file. The system will crop the data from the first word discovered until the last word of the file. This does not happen in the previous system because it starts from the end of the file to the beginning of the file.

The extraction process or reading the contents from Microsoft Word files (under 2007 version) is easier than accessing the PDF file format. This is because there is no data compression. Thus the content of the file can be directly readable with a simple PHP command with the addition of several processes to remove unnecessary characters. In the process to find relationship between journal articles with one another based on data obtained from the extraction HTML pages and full page article that


Sitasi Jurnal Elektronik Indonesia

KATA KUNCI elemen ● JUDUL ○ PENULIS CARI 16 JURNAL DITEMUKAN

DITAMPILKAN 1 - 10 halaman sebelumnya halaman selanjutnya

Elemen-elemen Dalam Desain Komunikasi Visual
Oleh : christine suharto cenadi , Dari : Jurnal PETRA Nirmana Vol 1, No 1 (1999): JANUARY 1999
dosen jurusan desain komunikasi visual fakultas seni dan desain - universitas kristen petra
rmation and technology globalization era%2C the role of Visual Communication Design has become important and it has become a hot topic which is inescapable from our daily lives. Almost every day%2C everwhere we go%2C we will encounter different forms of Visual Communication Design. Unfortunately%2C ... .
Disitasi sebanyak : 4

Overall Buckling And Wringkling Of Debonded Sandwich Beams: Finite Element And Experimental Results
Oleh : bambang k. hadi , Dari : Jurnal ITB Series B : Engineering Science Vol. 38B No. 1, 2006
department of aeronautics and astronautics bandung institute of technology jl. ganesha 10, bandung 40132 indonesia
verall buckling and wrinkling of debonded sandwich beams under compressive loads were analyzed by both finite element and experimental methods. in the finite element method, a quarter and a half models of the specimens were analyzed. it shows that a ... .
Disitasi sebanyak : 0

Model Elemen Hingga Non Linier Untuk Karakterisasi Panel Dinding Bata Pengisi Terhadap Gaya Lateral Siklik
Oleh : b. budiono1, herwani2 , Dari : Jurnal ITB Series A : Science Vol. 35A No. 2, 2003
1 departemen teknik sipil institut teknologi bandung, bandung 2jurusanteknik sipil universitas tanjungpura, pontianak
rick masonries as the infill walls between columns, for some degree of horizontal loading, are capable of resisting the horizontal load as shear walls. the different behavior of the structure due to the existence of the brick masonries in this case w... . . . .
Disitasi sebanyak : 0

Faktor Intensitas Tegangan Pada Part Through Crack Untuk Kasus Surface Crack Dengan Metode Elemen Hingga
Oleh : wajan berata , Dari : Jurnal PETRA Jurnal Teknik Mesin Vol 5, No 2 (2003): OCTOBER 2003
fakultas teknologi industri, jurusan teknik mesin, its
This research is done to evaluate the stress intensity factor in the case of semi elliptic surface part through crack on simulation by ANSYS software. Part through crack modelling use isoparametric element 8 node in three dimensions. Mode of cra... . . . .
Disitasi sebanyak : 0

Pengaruh Ukuran Dan Jumlah Elemen Singular Terhadap Harga Faktor Intensitas Tegangan Untuk Kasus Retak Pojok Eliptik Dengan Metode Elemen Hingga
Oleh : wajan berata, nurul muhayat , Dari : Jurnal PETRA Jurnal Teknik Mesin Vol 6, No 1 (2004): APRIL 2004
fakultas teknik, jurusan teknik mesin, uns surakarta
Stress intensity factor evaluation is needed to evaluate residual strength and crack growth. It developes some methods to evaluate stress intensity factor. In this research, the stress intensity factor is evaluated on the case of part through cr... . . . .
Disitasi sebanyak : 0

Peningkatan Unjuk Kerja Desain Flexible Shield Untuk Pompa Sabun Dengan Menggunakan Metode Elemen Hingga
Oleh : willyanto anggono , Dari : Jurnal PETRA Jurnal Teknik Mesin Vol 6, No 2 (2004): OCTOBER 2004
faculty of industrial technology, petra christian university
The flexible shield is a part of the pump system that dispenses soap-product. The function of the flexible shield is to protect the soap pump from intruding water. Investigation on performance of the current design flexible shield found that the... . . . .
Disitasi sebanyak : 0

Sumber : journal.ui.ac.id proceedings.itb.ac.id ejournal.unud.ac.id puslit2.petra.ac.id

Fig. 7: User interface of system

has been stored in a database, obtained the number of citations for each institution as shown in Table 3. The relationship of searching process between one journal articles (citations) to another, indicates that a journal article can refer to the other journal articles which previously published, beside that it is possible a journal article cited by more than one other article. From the data found know that most of the citations are made to journal articles published by their institution with the same series by series of journal articles that refer.

Table 1: Number of articles extracted HTML

Institution name	Total
University of Indonesia	524
Bandung Institute of Technology	258
Udayana University	1315
Petra Christian University	2176
Gadjah Mada University	10287
Diponegoro University	43
Islam University of Indonesia	271
Sriwijaya University	186
Muhammadiyah University of Purwokerto	45
Bogor Agricultural Institute	176
Yogyakarta State University	105
Andalas University	35
University of North Sumatra	701
University Mercubuana	96

Table 2: Number of PDF full text articles extracted

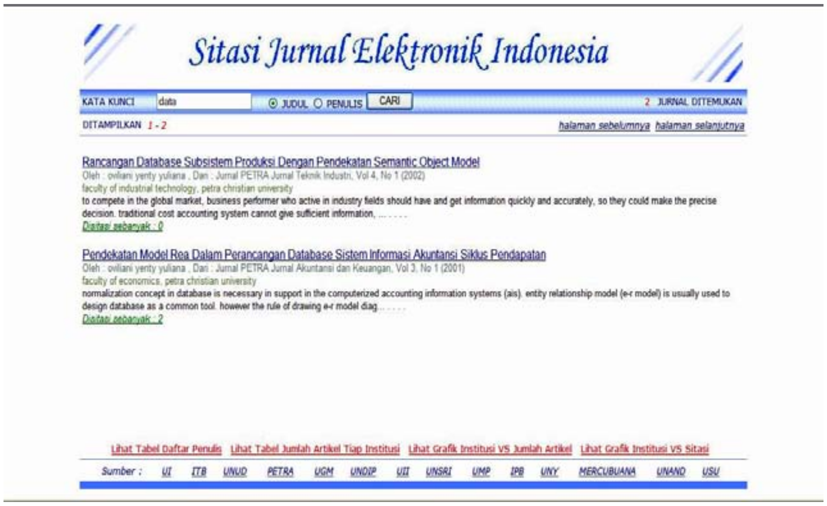
Institution name	Total
University of Indonesia	490
Bandung Institute of Technology	212
Udayana University	944
Petra Christian University	2054
Gadjah Mada University	0
Diponegoro University	45
Islam University of Indonesia	233
Sriwijaya University	126
Muhammadiyah University of Purwokerto	44
Bogor Agricultural Institute	165
Yogyakarta State University	85
Andalas University	0
University of North Sumatra	681
University Mercubuana	84

New user interface system testing: Testing on the user interface system is done by looking at the results/ appearance of additional functions that run and compare it with the data in the database. Testing results show that the additional functions which are added in the user interface system can research well to display the specified data. The result of the user interface system can be shown in Fig. 8.

New extraction process testing: Testing the extraction process is done by comparing the time of extraction operation process between the new system that have been developed and the previous system. The calculation of operating times for HTML extraction system can be shown in Fig. 9-13. After the testing process is conducted, we obtained the comparison of the graph of the operating time as shown in Fig. 14 and 15. From these

Table 3: Total citation of each institution

Institution name	Total
University of Indonesia	0
Bandung Institute of Technology	3
Udayana University	34
Petra Christian University	100
Gadjah Mada University	68
Diponegoro University	1
Islam University of Indonesia	1
Sriwijaya University	11
Muhammadiyah University of Purwokerto	0
Bogor Agricultural Institute	2
Yogyakarta State University	1
Andalas University	0
University of North Sumatra	21
University Mercubuana	6

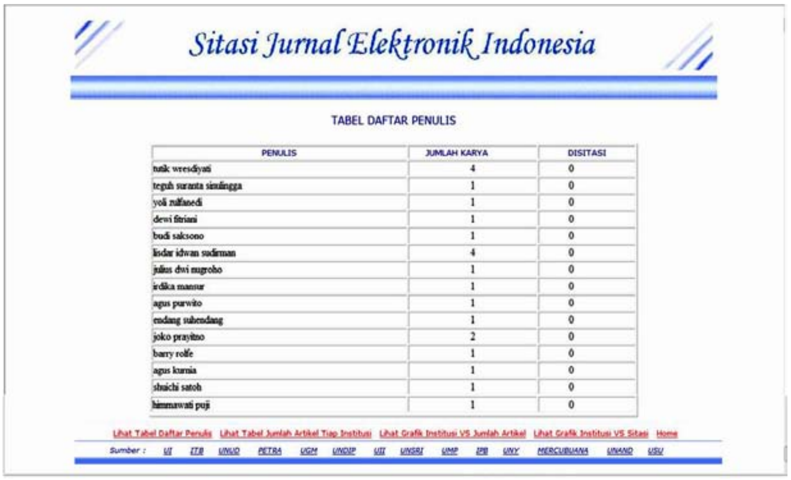


Rancangan Database Subsistem Produksi Dengan Pendekatan Semantic Object Model
Oleh : ovliani yenty yuliana , Dari : Jurnal PETRA Jurnal Teknik Industri, Vol 4, No 1 (2002)
faculty of industrial technology, petra christian university
to compete in the global market, business performer who active in industry fields should have and get information quickly and accurately, so they could make the precise decision. traditional cost accounting system cannot give sufficient information, ...
Disitasi sebanyak : 0

Pendekatan Model Rea Dalam Perancangan Database Sistem Informasi Akuntansi Siklus Pendapatan
Oleh : ovliani yenty yuliana , Dari : Jurnal PETRA Jurnal Akuntansi dan Keuangan, Vol 3, No 1 (2001)
faculty of economics, petra christian university
normalization concept in database is necessary in support in the computerized accounting information systems (ais). entity relationship model (e-r model) is usually used to design database as a common tool. however the rule of drawing e-r model diag... . . . .
Disitasi sebanyak : 2

Lihat Tabel Daftar Penulis
Lihat Tabel Jumlah Artikel Tiap Institusi
Lihat Grafik Institusi VS Jumlah Artikel
Lihat Grafik Institusi VS Sitasi
Sumber :
UI
ITB
UNUD
PETRA
UGM
UNDIP
UII
UNSRI
UMP
IPB
UNY
MERCUBUANA
UNAND
USU

Fig. 8: Display of the main page



Sitasi Jurnal Elektronik Indonesia

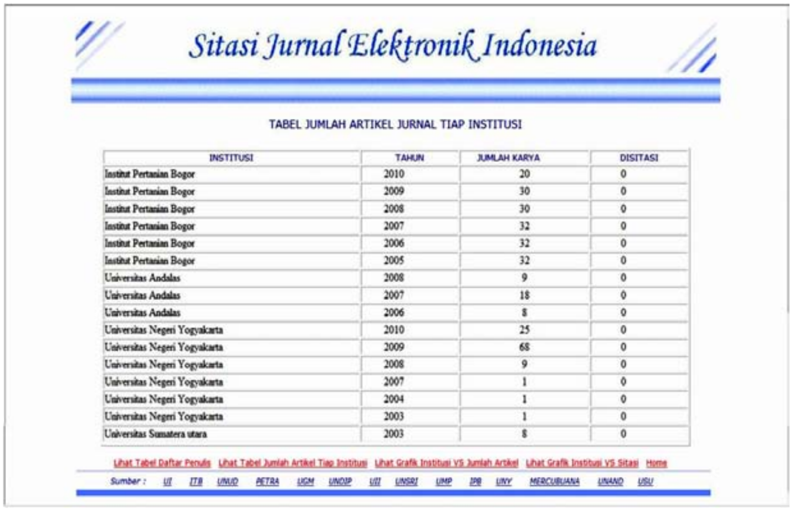
TABEL DAFTAR PENULIS

PENULIS	JUMLAH KARYA	DISITASI
tutik wresdiyati	4	0
teguh suranta sinulingga	1	0
yoli zulfanedi	1	0
dewi fitriani	1	0
budi saksono	1	0
lisdar idwan sudirman	4	0
julius dwi nugroho	1	0
irdika mansur	1	0
agus purwito	1	0
endang suhendang	1	0
joko prayitno	2	0
barry rolfe	1	0
agus kurnia	1	0
shuichi satoh	1	0
himmawati puji	1	0

Lihat Tabel Daftar Penulis Lihat Tabel Jumlah Artikel Tiap Institusi Lihat Grafik Institusi VS Jumlah Artikel Lihat Grafik Institusi VS Sitasi Home

Sumber : UI ITB UNUD PETRA UGM UNDIP UII UNSRI UMP IPB UNY MERCUBUANA UNAND USU

Fig. 9: Display page list of the author and the amount of research



Sitasi Jurnal Elektronik Indonesia

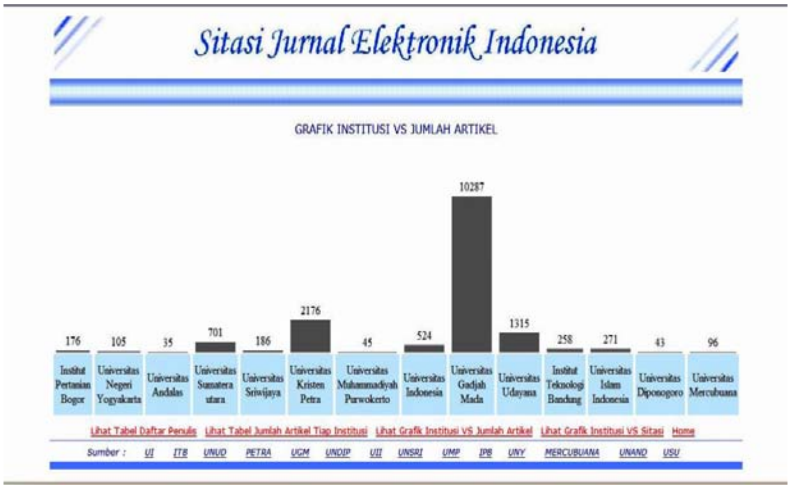
TABEL JUMLAH ARTIKEL JURNAL TIAP INSTITUSI

INSTITUSI	TAHUN	JUMLAH KARYA	DISITASI
Institut Pertanian Bogor	2010	20	0
Institut Pertanian Bogor	2009	30	0
Institut Pertanian Bogor	2008	30	0
Institut Pertanian Bogor	2007	32	0
Institut Pertanian Bogor	2006	32	0
Institut Pertanian Bogor	2005	32	0
Universitas Andalas	2008	9	0
Universitas Andalas	2007	18	0
Universitas Andalas	2006	8	0
Universitas Negeri Yogyakarta	2010	25	0
Universitas Negeri Yogyakarta	2009	68	0
Universitas Negeri Yogyakarta	2008	9	0
Universitas Negeri Yogyakarta	2007	1	0
Universitas Negeri Yogyakarta	2004	1	0
Universitas Negeri Yogyakarta	2003	1	0
Universitas Sumatera utara	2003	8	0

Lihat Tabel Daftar Penulis Lihat Tabel Jumlah Artikel Tiap Institusi Lihat Grafik Institusi VS Jumlah Artikel Lihat Grafik Institusi VS Sitasi Home

Sumber : UI ITB UNUD PETRA UGM UNDIP UII UNSRI UMP IPB UNY MERCUBUANA UNAND USU

Fig. 10: Display page list of the institutions and the number of articles



Sitasi Jurnal Elektronik Indonesia

GRAFIK INSTITUSI VS JUMLAH ARTIKEL

Lihat Tabel Daftar Penulis Lihat Tabel Jumlah Artikel Tiap Institusi Lihat Grafik Institusi VS Jumlah Artikel Lihat Grafik Institusi VS Sitasi Home

Sumber : UI ITB UNUD PETRA UGM UNDIP UII UNSRI UMP IPB UNY MERCUBUANA UNAND USU

Fig. 11: Graph of the number of page views of each institution’s article

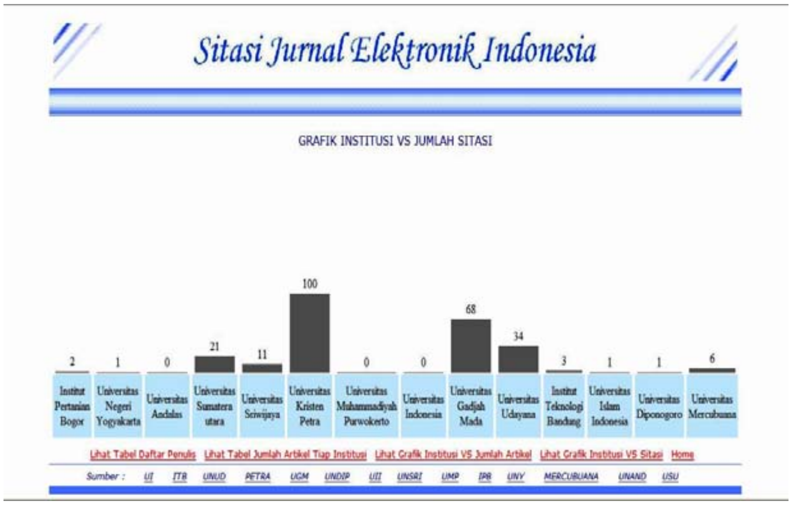

Sitasi Jurnal Elektronik Indonesia
GRAFIK INSTITUSI VS JUMLAH SITASI
2
1
0
21
11
100
0
0
68
34
3
1
1
6
Institut Pertanian Bogor
Universitas Negeri Yogyakarta
Universitas Andalas
Universitas Sumatera utara
Universitas Sriwijaya
Universitas Kristen Petra
Universitas Muhammadiyah Purwokerto
Universitas Indonesia
Universitas Gadjah Mada
Universitas Udayana
Institut Teknologi Bandung
Universitas Islam Indonesia
Universitas Diponogoro
Universitas Mercubuana
Lihat Tabel Daftar Penulis
Lihat Tabel Jumlah Artikel Tiap Institusi
Lihat Grafik Institusi VS Jumlah Artikel
Lihat Grafik Institusi VS Sitasi
Home
Sumber :
UI
ITB
UNUD
PETRA
UGM
UNDIP
UII
UNSRI
UMP
IPB
UNY
MERCUBUANA
UNAND
USU

Fig. 12: The number of citations of each institution

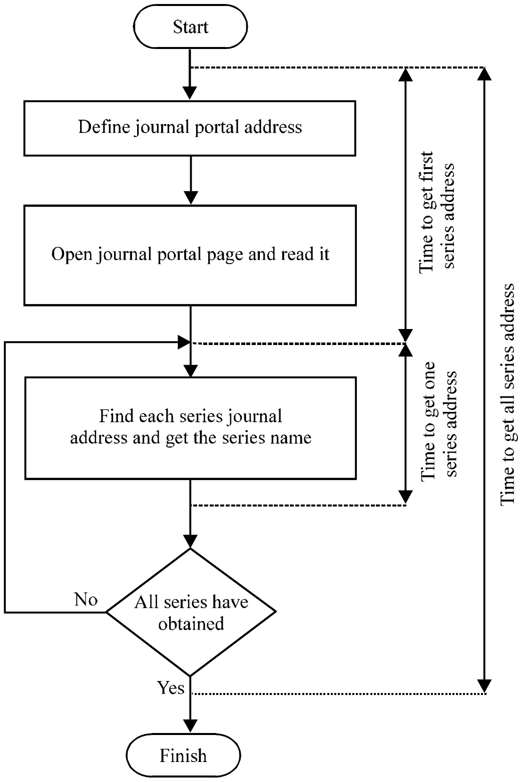

Start
Define journal portal address
Open journal portal page and read it
Find each series journal address and get the series name
All series have obtained
No
Yes
Finish
Time to get first series address
Time to get one series address
Time to get all series address

Fig. 13: Flow diagram of the extraction system testing of HTML

figures it can be found that the extraction using DOM methods have a longer processing time than the manual method (string operation). This occurs because by using DOM method there are more calls functions and also there are searching processes and distribution processes of

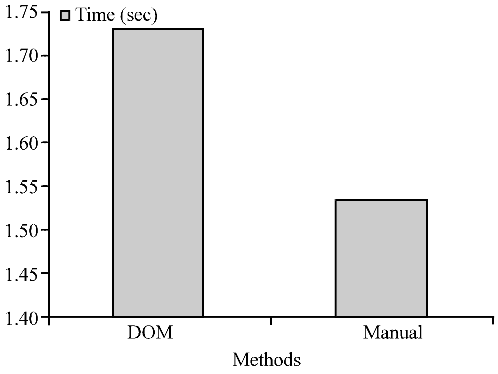


Fig. 14: The average time to obtain address of the first series

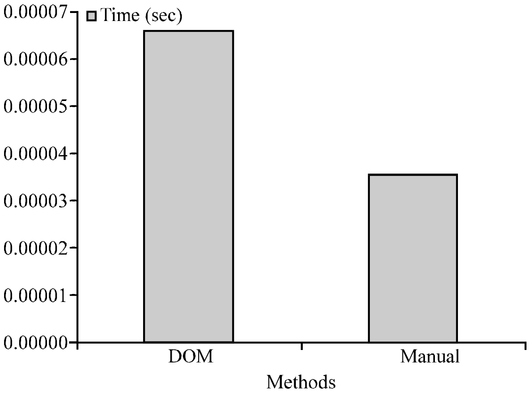


Fig. 15: The average time to obtain a series of addresses

objects displayed by a web page. When using the manual method (string operation) there is no call function required because data process cutting is done directly Fig. 16. Extraction system of fullarticle (PDF) testing it

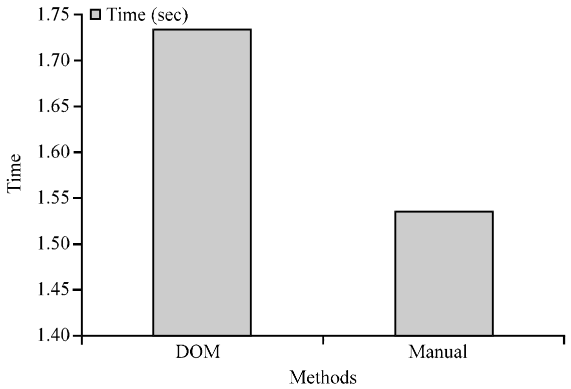


Fig. 16: The average time to obtain entire series addresses

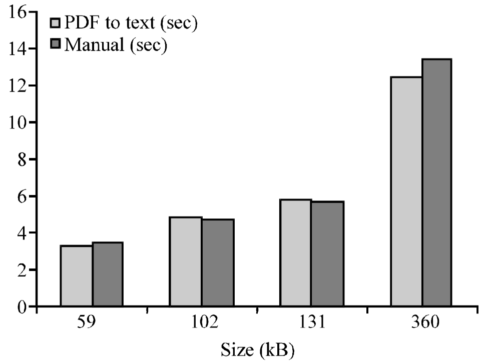


Fig. 17: Comparison of the average time for PDF extraction

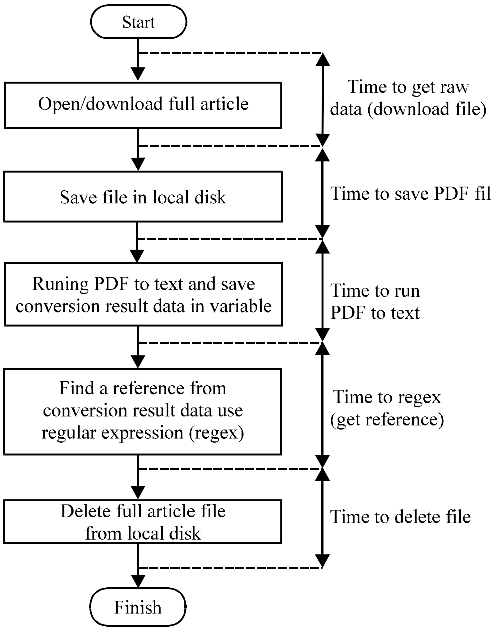

Start
Open/download full article
Time to get raw data (download file)
Save file in local disk
Time to save PDF fil
Runing PDF to text and save conversion result data in variable
Time to run PDF to text
Find a reference from conversion result data use regular expression (regex)
Time to regex (get reference)
Delete full article file from local disk
Time to delete file
Finish

Fig. 18: Flow chart PDF extraction system testing using PDFtotext

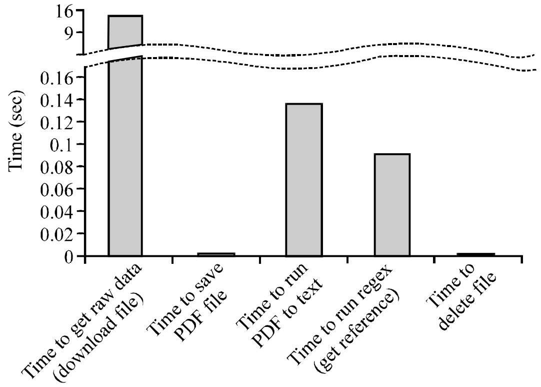


Fig. 19: The extraction process time used for PDF to text conversion

done by comparing the time of the extraction process between pdftotext and manually using PHP script by executing four files full article with a different size. Comparison of the time of the operating process can be shown in the the Fig. 17. From the Fig. 18 it is shown that there is no significant operating time difference between using pdftotext and manually (script). Where conversion in the manual system (script) done by uncompress on each stream which is on file reading while for systems using pdftotext process sequence operation can be viewed at the following flow chart. After testing the PDF extraction system using pdftotext, known that execution time of each process as shown in the Fig. 19. From Fig. 19 it is shown that the longest operation time of extraction process using PDF to text (except time to downloading files) is the process of converting files PDF to text (running PDF to text) then the searching process reference data using a regular expression.

CONCLUSION

After the design, implementation, testing, analysis the applications which has been conducted with the information extraction from electronic journal portal and built a mashup some conclusions can be drawn. Each portal electronic journals universities have different characteristic, so it requires PHP based script for each portal. Data from each web page conducted with identify location of data and used tag. The results test and measurement system show that the more number of articles journal and number of combinations of series and volumes on the site of the journal will require more time to extract all needed data from that site. The bigger file size extracted in PDF extraction the application will need more memory. Larger data size will entered into database will require more time and memory. In general, the system can research well and can show the relation between journal articles. Future development of the system can be conducted to add the ability to extract PDF file below version 1.4 and adding the number of electronic journals site to be extracted.

The new develop system show that extraction system which is made by using Regular expression syntax and DOM parsing produce better required piece of data than using string operations although, with a longer operating time. Use of Regular Expressions and DOM makes it easier and less time in the development extraction scripts than using string operations. Use PDFtotext tool for extracting full article files needed a temporary storage place to save the downloaded file then converted it into text format by the tool. The longest time in PDFtotext extraction process is the conversion of PDF to text (running PDF to text) and search for reference data using regular exptression. And type PDFtotext tool will be different for different OS. The process of reading Microsoft Word files (under 2007) is more easily compared with the PDF format file because no data compressed. Not all journal articles which have been extracted have all the required datas, like as title, authors, institutions, publishers, abstracts and full address of the article. Not all reference from full article journal can be extracted because the files is encryption and scan results. Most of the citations are made to journal articles that published by author institution.

ACKNOWLEDGEMENT

Researchers thank the Directorate General of Higher Education, Ministry of National Education of Republic of Indonesia for funding this Project through Hibah Kompetensi 2010 Research Grant.

REFERENCES

Chen, S.C., 2010. PHP Simple HTML DOM Parser. http://simplehtmldom.sourceforge.net/index.htm.

Kaplan, D. and T. Tokunaga, 2008. Sighting Citation Sites: A Collective-Intelligence Approach for Automatic Summarization of Research Papers using C-Sites. Proceedings of ASWC 2008 Workshop. http://tanaka-www.cs.titech.ac.jp/publication/archive/633.pdf.

Kaplan, D., R. Iida and T. Tokunaga, 2009. Automatic extraction of citation context for research paper summarization: A coreference-chain based approach. Proceedings of the Workshop on Text and Citation Analysis for Scholarly Digital Libraries, ACL-IJCNLP, Aug. 7, Suntec, Singapore, pp: 88-95.

Nanba, H., N. Kando and M. Okumura, 2000. Classification of research papers using citation links and ciation types: Toward automatic review article generation. Proceedings of 11th SIG/CR Workshop, pp: 117-134.

Palmer, S.B., 2001. The semantic web: An introduction. http://infomesh.net/2001/swintro/.

Pressmann, R.S., 2005. Software Engineering: A Practitioners Approach. 6th Edn., McGraw-Hill, New York.

Li,Y.R. Khrisnamurty, S. Raghavan and S. Vaithyanathan, 2008. Regular expression learning for information extraction. Proceedings of the Empirical Methods in Natural Language Processing Cnference, Oct. O8, Honolulu, HI USA., pages 21-30.