

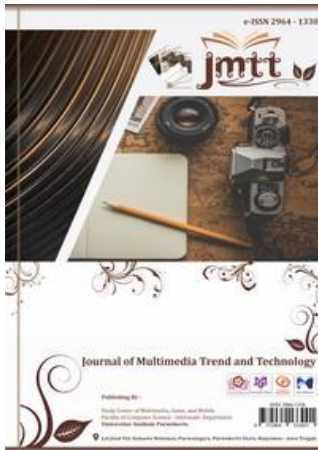
User Experience (UX) on Search Semantic Modeling Using Iterative Process Flow Method

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ARTICLE INFO



History :

Submit on 1 October 2022
Review on 8 October 2022
Accepted on 15 November 2022

Keyword :

Semantic,
Searching,
Archive,
Model

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ABSTRACT

On a website application platform, the search feature is one of the most important things in digging up the information in it. In addition, when compared to the search feature on search engines, searching for information on certain sites will produce more specific information. Semantic Web is a technique that allows content on the Web to be more understandable by computers. The Semantic Web itself is often equated with Web 3.0. These Semantic Web technologies include RDF, OWL, and SPARQL. In this paper the author tries to solve a research object problem in an elementary school in terms of finding diploma information for elementary school students. With the Semantic Web technology, it can make it easier to store and search E-Archive data. If archiving still uses the manual method for storing archives so as to avoid the constraints of difficulty finding archives, errors in storage, damage, to the threat of fire. With the application of semantic Web technology, it can be a solution to quickly store and search diploma archive data in a computerized Diploma E-Archive.

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INTRODUCTION

E-Archives or digital archives are archives that have undergone a physical change from sheets of paper to electronic sheets[1]. Electronic archives are urgently needed to minimize storage space for important data archives in schools. Elementary school is the most basic level of formal education in Indonesia[2]. Elementary school is taken within 6 years. Since 2013 grade 6 students have been required to take the National Examination which affects student graduation to obtain a diploma[3]. An diploma is a certificate of completion of study given to a student who has taken the curriculum (learning plan) for a certain period of time in an education unit, both elementary to university levels[4].

The human need for technology is currently growing drastically and continues to evolve until now and is increasingly global[5]. This can be proven by the many simple to very complicated innovations and inventions. Such as the invention of today's web technologies, which are various, such as Semantic Web technology[6]. On a website application platform, the search feature is one of the most important things in digging up the information in it. In addition, when compared to the search feature on search engines, searching for information on certain sites will produce more specific information[7]. Semantic Web is a technique that allows content on the Web to be more understandable by computers. The Semantic Web itself is often equated with Web 3.0. These Semantic Web technologies include RDF, OWL, and SPARQL[8].

In a search concept there are also many models, one of which is the behavior model. However, this model seems very suitable if applied to search engine platforms globally[9]. Various problems, starting from identifying information needs, planning searches, formulating keywords and following links provided must be faced by web users. Search engines become the foundation of the user to be able to find the desired information[10]. However, each search engine has a different working principle and most users are not aware of this and the result is that the bits obtained are so large and the process of sorting information is also getting more difficult and longer[11].

Search as a conscious action is preceded by identification of information needs and then when it is decided that the search will be carried out on the web, planning regarding the source of information from what search engine to use has already been thought out[12]. However, it was later discovered that there were differences in behavior in seeking entertainment information and coursework[13]. This case also reveals some external difficulties that affect the user search process for example technical glitches such as computer viruses and slow internet access[14]. Another difficulty is the use of the Boolean operator which is actually a useful tool for narrowing or broadening a search if the user knows how it works[8].

Even on global search engines, the platform has a distinctive feature of retrieving information. The technology they use is also much more sophisticated. But behind the sophistication of the technology they use, there are still gaps where users will usually be confused with the information presented. This has an impact on keyword competition[15].

In this case, the storage of diplomas in elementary schools is still done manually by using filing cabinets made of wood equipped with doors that use hinges. Archives are inserted into the archive box which is useful for placing the title of the archive in it. Archiving is done by standing straight. If archiving is still using the manual method for storing important archives. This is very vulnerable to experiencing problems in searching for such a large archive data. It takes a lot of time to search and make mistakes in archiving such as scattered data, as well as damage, ranging from age, termite attack, exposure to water to threats of natural disasters such as fire or flood. to the threat of fire. In the midst of the rapid advancement of information technology today, of course it is very unfortunate when saving and searching files.

METHOD

Based on observations in several elementary schools, the filing of student diplomas is done manually. This is of course very troublesome considering the number of alumni is increasing every year while the facilities and infrastructure for archiving are inadequate. Inadequate facilities and infrastructure for archiving can cause archives to be scattered, lost, or even damaged. The solution flow can be seen in the following figure:

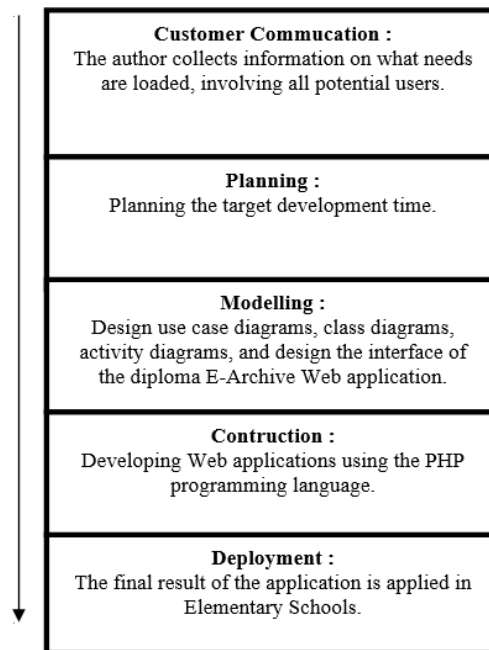


Figure 1, Web semantic model completion flow.

The method used is descriptive method. Descriptive research is a form of research aimed at describing existing phenomena, both natural phenomena and man-made phenomena. The phenomenon can be form, activity, characteristics, changes, relationships, similarities, and differences between one phenomenon and another phenomenon.

RESULT & DISCUSSION

To build this diploma archive search application, an ontology is needed which is a semantic web technology used to represent what knowledge is needed in building the search application. In this search application, an ontology called Ijazah will be formed.

1. Student identity.
2. Student Certificate Number.
3. Student generation year.
4. Certificate issuance date.
5. The name of the certificate holder.
6. Publication Year.

The ontology structure of the diploma has a standard structure as shown in the following figure:

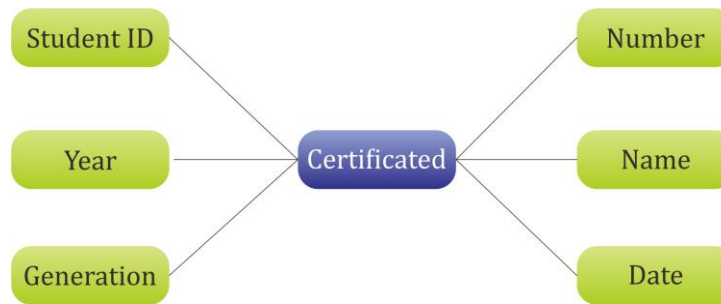


Figure 2, Ontology E-Archive.

Then, the author tries to design RDF. RDF design is done to store information from books in the library. The RDF will store information from each book in the form of book title, book author, book publisher, book category, year of book publication, number of books, book classification, book origin, book master number, book shelf and book description. The RDF form created will look like the following:

```

<rdf:RDF
xmlns:Description="https://domain.sch.id/archive.owl#"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:ns1="http://www.w3.org/2020/vcard-rdf/3.0#"
xmlns:owl="http://www.w3.org/2020/07/owl#">
<rdf:Description rdf:about=" https://domain.sch.id/ontologies/archive.owl
#certificated">
<ns1:isA>Certificated</ns1:isA>
<ns1:hasNumber>Number of Certificated !</ns1:hasNumber>
<ns1:hasName>Certificated Holder</ns1:hasName>
<ns1:hasID>Student ID</ns1:hasID>
<ns1:hasYear>Year of Certificated</ns1:hasYear>
<ns1:hasDate>Date of Certificated</ns1:hasDate>
<ns1:hasGeneration>Generation</ns1:hasGeneration>
</rdf:Description>
</rdf:RDF>
  
```

After the RDF which is used to store information from each book is formed, then to retrieve information from the RDF a SPARQL query is required. For its application in this search application, SPARQL select query is used to display the above information. Below is one of the SPARQL queries used:

```

select ?certificated ?number ?name ?id ?year ?date ?generation?
WHERE {
?x vcard:hasCertificated ?certificated .
?x vcard:hasNumber ?number .
?x vcard:hasName ?name .
?x vcard:hasID ?id .
?x vcard:hasYear ?year .
?x vcard:hasDate ?date .
?x vcard:hasGeneration ? generation .
FILTER regex (?certificated, "keyword", "i") || regex (?number, " keyword ", "i") ||
regex (?name, " keyword ", "i") || regex (?id, " keyword ", "i");
  
```

Next is to design the interface design. This user interface is made responsive with HTML 5 and the PHP programming language. The designs shown in this paper are (1) Dashboard, (2) Search, (3) Search Results, (4) User Functions. Explanation of each is in the following picture:

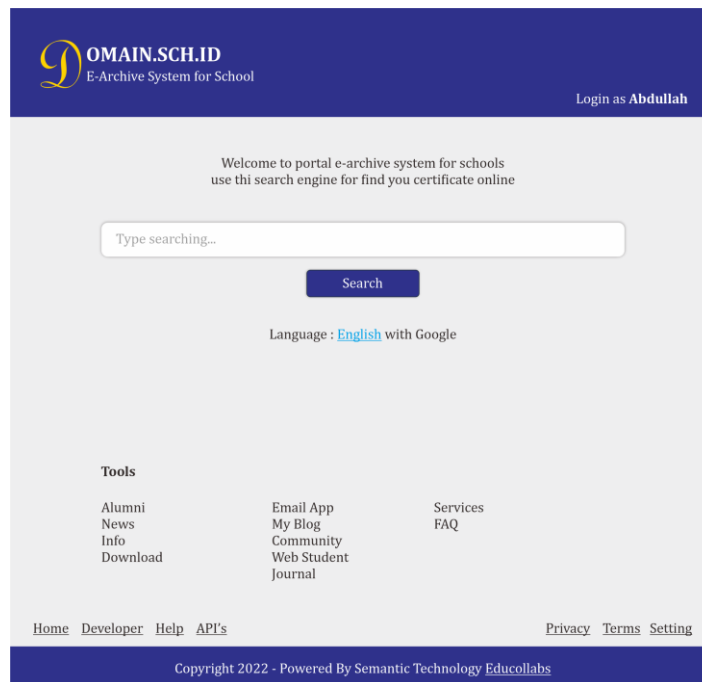


Figure 3, Interface Dashboard.

This dashboard will appear when the user accesses and logs in as a student or parent. This design is designed to be easy to understand each part of the feature other than the search.

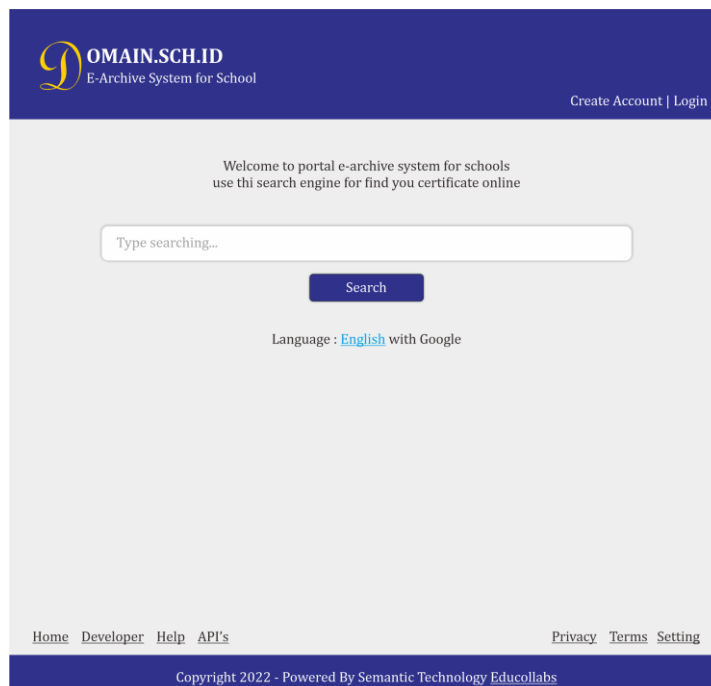


Figure 4, Interface Searching.

The design of the search field is designed to be similar to global searches such as Google, Yahoo, and the like. The goal is to make the user more familiar with what has been frequently used.



Figure 5, Search Result.

The design of search results is designed to be similar to global search results like search engines in general. The goal is also to make users more familiar with what has been used frequently.

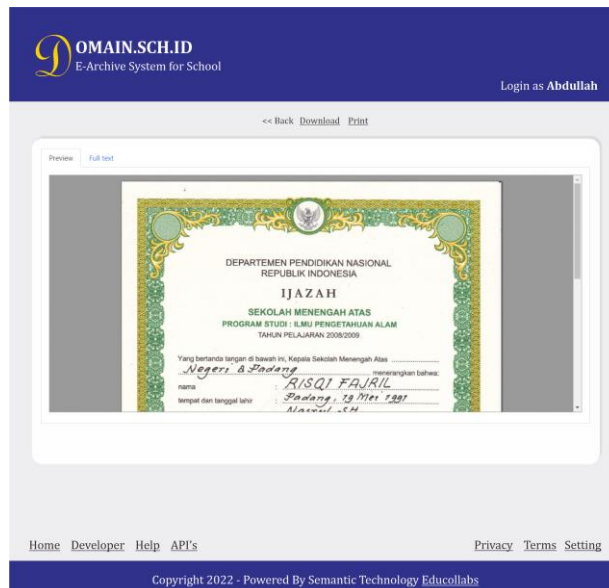


Figure 6, User Function.

Functional design for the user, besides the user being able to find out information about the diploma archive, the user can also display PDF files and can reprint them.

With the formation of a website platform using semantic web technology, information about diplomas will be more effective and in accordance with what is sought. Users will be more flexible when they want to retrieve the certificate archive if it is lost at any time. This feature can also be used by users without having to be online, such as for example a company that wants to know someone's educational background. The difference is only when the user logs in, the print feature can be used, otherwise it's only limited to viewing it.

CONCLUTIONS

The use of Semantic Web technology, which is currently widely used in search engines, is urgently needed. Currently for school information on global search engines there is very little information. It would be nice if each school provided services for users in terms of finding the legality of education for the users themselves. With the formation of the semantic pattern that the author has discussed, this will really help users to find educational identity, and not have to worry about losing their diplomas.

For future research, it would be even better than developing this semantic technology with a combination of crawls, and several methods of collecting information data such as input from the users themselves. If it is possible for the entire school website to use this semantic web technology, then all information on the legality of one's education can be easily known, so there will be no more falsification of official certificates.

Acknowledgement

The author would like to thank all parties who have provided support both morally and materially. And also those who have provided opportunities for higher education collaboration research programs through the Ministry of Education and Culture grant program in 2022.

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