OUTPATIENT INFORMATION SYSTEM AT X BOGOR WEB-BASED CLINIC

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Abstract
The clinic as one of the public service agencies requires the awareness of an accurate and reliable information system, and is adequate to improve its services to patients and other related environments. With such a wide scope of service, of course there are many complex problems that occur in the service process in the clinic. The number of variables in the clinic also determines the speed of information flow required by users and the PHP clinic environment can also be integrated with HTML, JavaScript, Jquery, and Ajax. However, in general PHP is more widely used in conjunction with HTML-type files. By using PHP we can create a dynamic powerful website with the accompanied database management. In addition, the use of PHP, which can mostly be used on many platforms, is one of the reasons why you have to master PHP to become a reliable web development.

Introduction
The information era is a period that involves a lot of information in decision making, both by individuals, companies and government agencies, information has become easier to obtain, has become more varied of course and more useful (Muslihudin, 2016).

Information technology is one of the technologies that is growing rapidly at this time. For example, the use of computers as one of the supporting facilities in the information system can give more results for the output of a system, of course if the system inside has run well.

The clinic as one of the public service agencies requires the awareness of an accurate and reliable information system, and is adequate to improve its services to patients and other related environments. With such a wide scope of service, of course there are many complex problems that occur in the service process in the clinic. The number of variables in the clinic also determines the speed of information flow needed by the user and the clinic environment.

Data processing in clinics is one of the very important components in realizing an information system in the clinic. Manual processing of data, has many disadvantages, in addition to requiring a long time, accuracy is also less acceptable, because the probability of error is very large. With the support of information technology that exists today, the work of data collection by manual can be replaced with an information system using a computer. In addition to being faster and easier, data management is also becoming more accurate. Accurate
information is very useful for making decisions, both for management and others (Sihotang, 2017).

Clinic services rely on information intensively. Information plays a vital role in decision making. Information systems can be used as a strategic means to provide patient decision-oriented services.

Health services in the clinic in the form of outpatient services that include medical services. According to (Hutahaean, 2015) outpatient services without a problem are growing faster than inpatient services. The development of computer-based clinical information systems, simple administrative procedures, is very appropriate if the clinic uses the advancement side of the computer, both software and hardware using computer programs, one of which is by using web programs (Esteria, 2016).

According to the Regulation of the Minister of Health of the Republic of Indonesia Nomor 028/Menkes/Per/I/2011 clinic is a healthcare facility that provides individual health services that provide basic and or specialist medical services, organized by more than one type of health worker and led by a medical personnel. In order to provide the best service to patients, the clinic is expected to be able to provide the necessary information, one of which is through the implementation of medical records.

The clinic has a medical record service procedure that records patient data when the patient starts registering until the patient returns home. Patient registration activities are the first source of data on patient services. Registration officers are required to be able to record patient data so that complete and accurate information can be presented. With the development of evidence-based medicine where data-based medical services are very necessary, the registration activities can be met with the availability of tools that can facilitate work, one of which is by using computerization (Schmidt et al., 2015).

X Clinic is one of the public health service providers. The clinic serves 2 categories of patients, namely general patients and company patients. General patients are residents or communities around the clinic while the company's patients are members of insurance companies that cooperate with the clinic. Arie Clinic provides 2 types of services, namely general practitioner services and Pediatric doctor services. General practitioner and Pediatric services are performed separately with different practice schedules (Huy & Phuc, 2020).

At X Bogor Clinic in the processing of medical record data is still done manually so as to search the patient's medical record number if the patient returns to treatment encounter difficulties and has not carried out the reporting of outpatient registration activities. This affects the speed of patient registration and the resulting information is less than maximum (Arraniri, 2014).

To that end, the author proposed a research topic titled "Outpatient Information System At X Bogor Web-Based Clinic."

**Method**

PHP (Hypertext Preprocessor) is a scripting language especially used for web development. Due to its nature the server side scripting then to run PHP must use a web server.” (Atmaja, 2020).

PHP can also be integrated with HTML, JavaScript, Jquery, and Ajax. However, in general PHP is more widely used in conjunction with HTML-type files. By using PHP we can create a dynamic powerful website with the accompanied database management. In addition, the
use of PHP, which can mostly be used on many platforms, is one of the reasons why you have to master PHP to become a reliable web development (Solichin, 2016).

PHP it also has the advantage of being able to perform the tasks it performs with CGI mechanisms such as retrieving, collecting data from databases, generating dynamic pages, or even receiving and sending cookies. CGI (Common Gateway Interface) is a mechanism that runs on a web server, tasked to serve two-way communication between a web server and a web browser.

And the priority of PHP is PHP can be used in several operating systems, including Linux, Unix, Windows, Mac OsX, RISC OS, and other operating systems (Sri, 2016).

Results and Discussion
A. Design

1. Design Entity Relationship Diagram / ERD

![Design Entity Relationship Diagram / ERD](image)

2. Normalization
   a. Unnormal shape (abnormal shape)

<table>
<thead>
<tr>
<th>Id_Pasien</th>
<th>Name</th>
<th>Adress</th>
<th>Phone</th>
<th>Date_birth</th>
<th>Date_Register</th>
<th>Id_Dftr</th>
<th>Name</th>
<th>Adress</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>P001</td>
<td>Mawar</td>
<td>Bogor</td>
<td>02123452</td>
<td>23-10-1991</td>
<td>12-11-2016</td>
<td>D001</td>
<td>Mawar</td>
<td>Bogor</td>
<td>general</td>
</tr>
<tr>
<td>P002</td>
<td>Budi</td>
<td>Bogor</td>
<td>02144356</td>
<td>21-02-1997</td>
<td>14-11-2016</td>
<td>D002</td>
<td>Budi</td>
<td>Bogor</td>
<td>Bpjs</td>
</tr>
</tbody>
</table>

   b. Normal Shape 1 (1NF)
Table 2
First Normal Shape

<table>
<thead>
<tr>
<th>id</th>
<th>Nama</th>
<th>Alamat</th>
<th>Tlp</th>
<th>Tgl_lahir</th>
<th>Tgl_dftar</th>
</tr>
</thead>
<tbody>
<tr>
<td>P002</td>
<td>Budi</td>
<td>Bogor</td>
<td>02144356</td>
<td>21-02-1997</td>
<td>14-11-2016</td>
</tr>
</tbody>
</table>

c. Second Normal Shape 2NF

Table 3
Second Normal Shape

<table>
<thead>
<tr>
<th>Id_Pasien</th>
<th>Nm_Pasien</th>
<th>Id_Daftar</th>
<th>Tgl_Dftar</th>
<th>Id_Do kter</th>
<th>Nm_Dokter</th>
<th>Id_Rekam</th>
<th>Nm_Pasien</th>
<th>No_Daftar</th>
<th>Nm_pasien</th>
</tr>
</thead>
<tbody>
<tr>
<td>P001</td>
<td>Mawar</td>
<td>D001</td>
<td>12-11-2016</td>
<td>2112</td>
<td>Dr.Reno</td>
<td>RM01</td>
<td>Ana</td>
<td>001</td>
<td>Mawar</td>
</tr>
<tr>
<td>P002</td>
<td>Budi</td>
<td>D002</td>
<td>14-11-2016</td>
<td>2113</td>
<td>Dr.Fery</td>
<td>RM02</td>
<td>Budi</td>
<td>002</td>
<td>Budi</td>
</tr>
</tbody>
</table>

d. NF normalization form from table above

Table 3
NF normalization form from table above

<table>
<thead>
<tr>
<th>Id_Pasien</th>
<th>Id_Daftar</th>
<th>Id_Dokter</th>
<th>Id_Rekam</th>
<th>No_Daftar</th>
</tr>
</thead>
<tbody>
<tr>
<td>P001</td>
<td>D001</td>
<td>2112</td>
<td>RM01</td>
<td>001</td>
</tr>
<tr>
<td>P002</td>
<td>D002</td>
<td>2113</td>
<td>RM02</td>
<td>002</td>
</tr>
</tbody>
</table>

e. Third Normal Shape (3NF)

Table 4
Third Normal Shape

<table>
<thead>
<tr>
<th>Id_Pasien</th>
<th>No_Rekam</th>
<th>Biaya</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>P001</td>
<td>RM01</td>
<td>75.000</td>
<td>75.000</td>
</tr>
<tr>
<td>P002</td>
<td>RM02</td>
<td>80.000</td>
<td>80.000</td>
</tr>
</tbody>
</table>

3. Program View Design
4. Login Menu View Design
a. Main Menu View Design

![Main Menu View Design](image)

Figure 3
Main Menu View Design

b. Registration Menu Display Design

![Registration Menu Display Design](image)

Figure 4
Registration Menu Display Design

c. Medical Record Menu Display Design

![Medical Record Menu Display Design](image)

Figure 5
Medical Record Menu Display Design
d. Patient Report Menu View Design

![Figure 6: Patient Data Report Menu View Design](image)

e. Registration Report Menu View Design

![Figure 6: Registration Report Menu View Design](image)

f. Change Password Menu View Design

![Figure 7: Password Replace Menu View Design](image)
B. Implementation

1. Relationships Between Tables

![Relationships Between Tables Diagram]

2. Database Structure

Patient List Table

Table Name: db_pasiem
Software: mySQL

<table>
<thead>
<tr>
<th>Nama Field</th>
<th>Type Data</th>
<th>Size</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id</td>
<td>Varchar</td>
<td>9</td>
<td>Primary key</td>
</tr>
<tr>
<td>Nama</td>
<td>Varchar</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Alamat</td>
<td>Varchar</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Telp</td>
<td>Varchar</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Tanggal Lahir</td>
<td>Varchar</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Keterangan</td>
<td>Varchar</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Tanggal daftar</td>
<td>Varchar</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

3. Registration Table

Table Name: db_registrasi
Software: mySQL

<table>
<thead>
<tr>
<th>Nama Field</th>
<th>Type Data</th>
<th>Size</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id Daftar</td>
<td>Varchar</td>
<td>9</td>
<td>Primary key</td>
</tr>
</tbody>
</table>
4. Medical Records Table

Table name: db_rekammedis
Software: mySQL

<table>
<thead>
<tr>
<th>Nama Field</th>
<th>Type Data</th>
<th>Size</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id rekam</td>
<td>Varchar</td>
<td>3</td>
<td>Primary key</td>
</tr>
<tr>
<td>Id daftar</td>
<td>Varchar</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Tanggal rekam</td>
<td>Varchar</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Diagnosa</td>
<td>Varchar</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Biaya</td>
<td>Varchar</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Jam rekam</td>
<td>Varchar</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>keterangan</td>
<td>Varchar</td>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

5. Table Doctor

Table name: db_dokter
Software: mySQL

<table>
<thead>
<tr>
<th>Nama Field</th>
<th>Type Data</th>
<th>Size</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id dokter</td>
<td>Varchar</td>
<td>5</td>
<td>Primary key</td>
</tr>
<tr>
<td>Nama</td>
<td>Varchar</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>alamat</td>
<td>Varchar</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Telp</td>
<td>Varchar</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>keterangan</td>
<td>Varchar</td>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

6. Table Recipe

Table name: db_resep
Software: mySQL

<table>
<thead>
<tr>
<th>Nama Field</th>
<th>Type Data</th>
<th>Size</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id rekam</td>
<td>Varchar</td>
<td>10</td>
<td>Primary key</td>
</tr>
<tr>
<td>Nama obat</td>
<td>Varchar</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Dosis</td>
<td>Varchar</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Jumlah</td>
<td>Varchar</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Satuan</td>
<td>Varchar</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>keterangan</td>
<td>Varchar</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

7. Table User
Name table : db_user
Software : mySQL

Table 10
User Table Structure

<table>
<thead>
<tr>
<th>Nama Field</th>
<th>Type data</th>
<th>Size</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id user</td>
<td>Varchar</td>
<td>5</td>
<td>Primary key</td>
</tr>
<tr>
<td>Nama user</td>
<td>Varchar</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Level</td>
<td>Varchar</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Username</td>
<td>Varchar</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Password</td>
<td>Varchar</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td>Varchar</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Tgl created</td>
<td>Varchar</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

8. Main Menu View, Program Input and Output
   a. Login Menu View

   Figure 9
   Tampilan Menu Login

   b. Main Menu View

   Figure 10
   Main Menu View
c. User Menu view

![User Menu View](image1)

**Figure 11**
User Menu View

d. Doctor Menu View

![Doctor Menu View](image2)

**Figure 12**
Doctor Menu View

e. Patient Menu View

![Patient Menu View](image3)
Outpatient Information System at X Bogor Web-Based Clinic

Figure 13
Patient Menu View

f. Registration Menu View

![Registration Menu View](image1.png)

Figure 14
Registration Menu View

g. Medical Record Menu View

![Medical Record Menu View](image2.png)

Figure 15
Medical Record Menu View
h. Patient Data Report Menu View

Figure 16
Patient Data Report Menu View

i. Patient Print Report Menu View

Figure 17
j. Registration Report Menu View

![Registration Report Menu View](image)

**Figure 18**

k. Print Registration Report Menu View

![Print Registration Report Menu View](image)

**Figure 19**  
Print Registration Report Menu View

l. Change Password view

![Change Password view](image)

**Figure 20**
Change Password Menu View

9. Compile Program / Program End Result
   a. Prepare PHP program is changed in format.exe.
   b. Click start select exeoutput for PHP, after the initial view of exeoutput for PHP
      appears, select New Application.
   c. The first step of the welcome view click next
   d. The second step in the view "source folder path specify the location of the desired
      PHP project is changed to a file.exe at c:/xampp/htdocs/yanti then click next
   e. The third step in the index page view determines the index file of the project that has
      been created earlier. Index PHP, then click next.
   f. The fourth step in the output view of the file specify the location of the output, file, exe,
      c:/yanti/yanti.exe.
   g. The fifth langakah on the file output display gives the application title of the project
      created earlier in the application title, yanti, then click finish.
   h. After we finish doing some configuration, click compile your application, wait until
      the process is complete in compile.
   i. The application can be run.

Conclusion
Based on the results of the application program that has been done, it can be concluded
and proposed some suggestions that: 1) With the database in this application program, data
processing and storage of patient registration reports can be easily quickly and accurately. 2)
The application program is equipped with a storage button so it is not easily lost and is very
easy to duplicate/ back up. 3) This application program data security is very maintained because
there is user creation and password creation.

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