Application of Emergency Unit Information Systems to Support Hospital Management Systems

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Abstract— The development of technology, especially information technology has penetrated into all fields, one of which is the field of health services. By using information technology, data can be processed more quickly, easily and safely so that services can be provided to the community better and more efficiently. Hospitals as one of the providers of health services for the community, have an obligation to provide quality and affordable health services. The methodology in this study starts from analysis, design, coding, support and test. In the analysis stage an analysis is carried out around non-functional requirements and functional requirements, the design stage includes interface design, table design. The next stage is coding, support and test. The conclusions that can be drawn include that the information system can be implemented properly, before being implemented the system has been tested, the information system can provide good data services to patients, the information system can provide good information regarding action reports and visit reports.

Keywords : technology, patient, hospital

I. INTRODUCTION

The hospital is an important place in carrying out health checks. According to the WHO (World Health Organization) a hospital is an integral part of a medical organization whose function is to provide complete health services to the community both curative and rehabilitative, where the output of its services reaches family and environmental services, the hospital is also a center for training health workers as well as for biosocial research. . [1]

Hospitals as one of the providers of health services for the community, have an obligation to provide quality and affordable health services. Hospitals must have a social function, in addition to their administration, they are also based on human values, ethics and professionalism, benefits, justice, equal rights and anti-discrimination, equity, protection and are oriented towards patient safety. [2]

The development of technology, especially information technology has penetrated into all fields, one of which is the field of health services. By using information technology, data can be processed more quickly, easily and safely so that services can be provided to the community better and more efficiently. [3]

Hospital Management Information System (SIMRS) is a collection of integrated data processing mechanisms so that it is available for the needs of hospital management to achieve its goals. The function of a management information system is to manage organizational management information for transaction processing, control management and decision support systems using computers and/or people as information processes and organizational leaders as people who carry out the control mechanism functions.[4]

The development of technology and information systems that are increasingly rapid at this time can provide benefits in hospital services. The rapid development of information technology has spurred all elements of world society to move faster in the government, health, tourism, economy and education sectors. Hospital information systems can make it easier for hospitals to process data so they can save time, space, and costs. This was done to improve good health services for the community. Especially in terms of data processing. Because good data processing will help the process of health services to the community more quickly and accurately. In addition, aspects of ease of access, speed of service and accuracy of data are things that must be considered by the hospital in providing services.[1]

For registration of emergency room patients, the procedure that applies is that the patient's family registers at the counter by stating the patient data that will be recorded by the counter staff on the registration form and then a patient card is made. Whereas for old patients (who have visited) the registration procedure is that the patient's family submits the patient's card to the emergency room staff and then the emergency room staff records the visit data into the emergency room visit register book. This condition makes the emergency room registration system impractical, because patient data only relies on records on forms and visit register books which can still be lost, tucked away, scattered, difficult to find and present reports.[3]

This hospital already uses computerized assistance by utilizing Microsoft word and Microsoft excel applications in the registration of ER patients, the patient admission process is not automatic, so officers must search first to check patient numbers, this is felt by officers when the search process takes time. Sometimes patients also have to wait to get service at the time of patient registration. This raises problems with the quality of services provided to patients. There may be errors in the processing of patient data which will impede patient care so that it becomes less efficient, and results in difficulties in searching for data because it takes a relatively long time to make reports on patient data.[5]

So far, the processing of patient registration data at Lammamala Hospital has used computer technology. However, there are still problems in terms of patient

registration, because the patient acceptance system is not automatic. So that patient registration first checks the last patient number in the application to determine the patient's registered number. This is felt as an inefficient job because it requires a lot of time and energy. Sometimes patients have to wait a long time to get service due to patient administration factors. This will be a separate problem for hospital patients because patients will experience slow service. And this problem is very detrimental, both to patients and to the hospital management itself. This also occurs in the processing of patient examination data by doctors. Examination data is only recorded on the patient's control card, making it very difficult when information is needed about a patient's medical history because they have to look for patient disease data on a large number of control cards. [6]

II. RESEARCH METHODS

The methodology in this study uses the System Development Life Cycle (SDLC) methodology. System development life cycle (SDLC) using the V-shaped model with the following steps:

1. Analysis, namely the initial stage of the process of collecting data, identifying problems, proposing problem solving, and analyzing system requirements focused on making digital ANC
2. Design, namely being able to provide the expected design by carrying out a CD (Context Diagram), DFD (data flow diagram), ERD (Entity Relational Diagram), database design, menu structure design and application layer user interface design
3. Coding, namely the results of the design into a form that can be read and understood by a computer
4. Test, namely the program must be tested which is focused on the activity of ensuring that all existing commands have been tried and external functions to ensure that with certain inputs
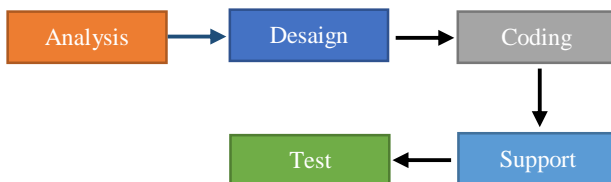5. Support, namely maintenance of data in applications that must be carried out routinely.[7]

Figure 1. System development life cycle (SDLC)

III. RESULT AND ANALYSIS

1. Analysis
   a. Non-Functional Needs
      Non-functional requirements are requirements that are beyond functional requirements which include hardware requirements, namely the need for hardware specifications and software requirements which greatly affect the running of the website with the local network. [8]

1) Core i3-1005G1 Up To 3,4Ghz 2 Core 4 Threads
2) Score BencMark 5125
3) 4GB DDR4
4) SSD 256GB NVMe
5) 14' FHD Windows 11
6) Web Server Apache
7) MySQL
8) Microsoft Edge as a browser
9) The programming language used is PHP

   b. Functional requirements
      The system consists of the Patient menu: used to record patients which includes Patient Fingerprint ID data, BPJS Number, Medical Record Number, Patient Name, Place of Birth, Date of Birth, Age, Gender, Marital Status, Patient Occupation, Name of Husband/Wife, Husband's/Wife's Occupation, Father's Name, Mother's Name, Mother's Occupation, Religion, Province, Regency/City, Sub-District, Village, Address Hamlet RT/RW/Jl. Home, No. Tel ; The ER (emergency room) menu consists of: Medical Actions, Follow-Up to Ranap, Drug List; The Info menu consists of empty or unused rooms, unit drug supplies, hospital dashboards; The Activity Report menu consists of Emergency Room Visits, Action Reports; The Utility menu consists of Download File, User Activity Recap, Change Password, Open Ticket and lastly is the Logout menu.

2. Design
   The design at this stage will display the user interface design and table design
   a. Interface Design
      The ER menu consists of 3 menus, including: Medical Actions, Follow-Up to Ranap, Drug List

Figure 2. ER Menu

The Info menu consists of 3 menus, including: empty or unused rooms, unit drug supplies, hospital dashboard
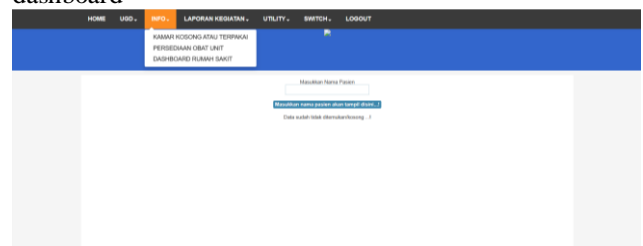

Figure 3. Info Menu

The Activity Report menu consists of 2 menus, including: Emergency Room Visits, Action Reports
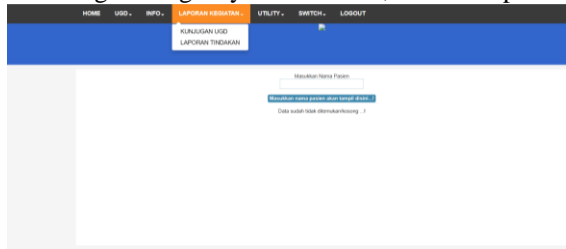

Figure 4. Activity Report Menu

The Utility menu consists of 4 menus, including: File Download, User Activity Recap, Change Password, Open Ticket
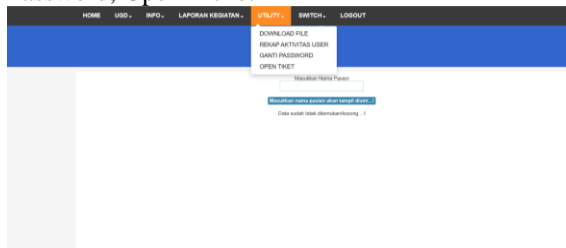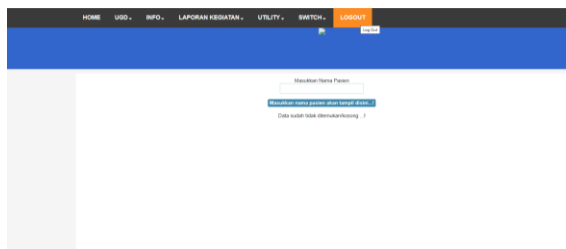

Figure 5. Utility Menu

Figure 6. Logout Menu

b. Desain Tabel
CREATE TABLE `ugd_bhppasrajal` (
  `noresep` varchar(25) NOT NULL,
  `kddokter` varchar(5) NOT NULL,
  `dokanestesi` varchar(5) NOT NULL,
  `dokanak` varchar(5) NOT NULL,
  `jnsoperasi` varchar(25) NOT NULL,
  `kdkamar` varchar(5) NOT NULL,
  `noreg` varchar(25) NOT NULL,
  `norm` varchar(15) NOT NULL,
  `tgllunas` date NOT NULL,
  `tglcpo` date NOT NULL,
  `jamcpo` time NOT NULL,
  `totbeli` varchar(10) NOT NULL,
  `totalbyr` varchar(10) NOT NULL,
  `totdisc` varchar(10) NOT NULL,
  `bayar` varchar(10) NOT NULL,
  `totlaba` varchar(10) NOT NULL,
  `jasaresep` varchar(10) NOT NULL,
  `jasaadmin` varchar(10) NOT NULL,
  `unit` varchar(2) NOT NULL,
  `cetak` varchar(1) NOT NULL,
  `lunas` varchar(1) NOT NULL,
  `iduser` varchar(15) NOT NULL,
  `ip` varchar(15) NOT NULL,
  `modify` date NOT NULL
) ENGINE=MyISAM DEFAULT CHARSET=utf8;

INSERT INTO `ugd_bhppasrajal` (`noresep`, `kddokter`, `dokanestesi`, `dokanak`, `jnsoperasi`, `kdkamar`, `noreg`, `norm`, `tgllunas`, `tglcpo`, `jamcpo`, `totbeli`, `totalbyr`, `totdisc`, `bayar`, `totlaba`, `jasaresep`, `jasaadmin`, `unit`, `cetak`, `lunas`, `iduser`, `ip`, `modify`) VALUES ('OJ10GCAB2212041336', '30019', '30192', '', 'gips', '', 'RJPXVH221204101787', '131297', '2022-12-04', '2022-12-04', '13:35:00', '', '320300', '0', '320300', '323285', '', '', 'ok', 'Y', 'L', 'ok', '192.168.88.43', '2022-12-04')

ugd_bhppasrajal is the billing of the patient's total consumables

Figure 7. Table ugd_bhppasrajal

ugd_bhppasrajaldet is the billing details for patient consumables

Figure 8. Table ugd_bhppasrajaldet

ugd_bhprajal is billing for total hospital consumables

Figure 9. Table ugd_bhprajal

ugd_bhprajaldet is a billing detail for hospital consumables

Figure 10. Table ugd_bhprajaldet

ugd_aksirj is the total cost of the action

Figure 11. Table ugd_tindakanrj

ugd_aksirjdet is the cost breakdown of the action

Figure 12. Table ugd_tindakanrjdet

Sugd_aksirjtemp is a temporary total cost of an action to store temporary entry data

Figure 13. Table ugd_tindakanrjtemp

ugd_aksirjtempdet is a temporary action cost breakdown for temporary data entry

Figure 14. Table ugd_tindakanrjtempdet

3. Coding
    Program code is the process of translating the system design into a programming language. Programming languages use PHP, Javascript and Jquery. By using a MySQL database to manage data.[9]

    Coding of data.caripasien.php :
    Pencarian   data pasien :

```php
<?
include ("../../config/fungsi_include.php");

$today=date('Y-m-d');
//pencarian nama
echo "<font face=verdana size=2px></font>".$key=$_GET['searching'];

$data = mysql_query("SELECT * FROM sis_regtpprj A INNER JOIN sis_mspasien B ON A.norm=B.norm WHERE B.nama LIKE '$key%' OR B.norm LIKE '$key' ORDER BY A.id");
$ada_hasil=mysql_num_rows($data);
if($ada_hasil){
    echo "<table class='table table-bordered'><tr><th>NO</th><th>TANGGAL</th><th>NO REG</th><th>NORM</th><th>NAMA</th>

    <th>UMUR</th><th>PELAYANAN</th><th>BIAYA</th><th>PILIH</th></tr>";
    $warna1 = "#E1E1E1";
    $warna2 = "#FCFBF3";
    $row_count = 0;
    while($p=mysql_fetch_array($data)){
        $lewat = selisihhari($p[tglmasuk]);
        if($lewat<=$limitdata){

            $row_warna = (($row_count % 2) == 0) ? $warna1 : $warna2;
            $row_count++;
            $no++;
            $poli= f_joinpoli($p[jnslayanan]);

    $crbayar=j_crabayar($p[crabayar]);

    $tglmasuk=tglDMY($p[tglmasuk]);

    $alamat=substr($p[alamat],0,40);


    $qry=mysql_query("SELECT * FROM kasir_invoicerj WHERE noreg='$p[noreg]'");

    $t=mysql_fetch_array($qry);

    $jumlah=buatrp($t[tagihan]);

    $vorskot=buatrp($t[titipuang]);

    $alamat=substr($p[alamat],0,40);

            echo "<tr>
            <td bgcolor='$row_warna'>$no</td>
            <td bgcolor='$row_warna'>$tglmasuk</td>
            <td bgcolor='$row_warna'>$p[noreg]</td>
            <td bgcolor='$row_warna'>$p[norm]</td>
            <td bgcolor='$row_warna'>$p[nama]<br>$alamat</td>
            <td bgcolor='$row_warna'>$p[tahun] th, $p[bulan] bl, $p[hari] hr</td>
            <td bgcolor='$row_warna'>$poli</td>
            <td bgcolor='$row_warna'><div align='right'>$jumlah<br>$crbayar</div></td>
            <td bgcolor='$row_warna'><div align='center'>";
            echo "<input type=button class='btn btn-primary' value='PINDAH KE RANAP'

    onclick=\"window.location.href='?module=followupranap&act=confirm&noreg=$p[noreg]';\">";
            echo "</td></tr>";
        }
    }
    echo"</table>";
}else{
    echo"<br><b>Data sudah tidak ditemukan/kosong ...!</b>";
}

?>
```

4. Support
   Support can be done by backing up data regularly, not giving system access rights to other unauthorized people, extending passwords for system access, using anti-virus.

5. Test
   The test is done by testing each menu against its function. The menus being tested included the Patient Menu, Emergency Room Menu (Medical Actions, Follow-Up to Ranap, Medication List), Info Menu (Empty or unused rooms, Unit drug supplies, hospital dashboard), Activity Reports Menu (ER visits, Emergency Reports). Actions), Utility Menu (Download File, User Activity Recap, Change Password, Open Ticket), Logout Menu.

IV. CONCLUSION

1. The information system can be implemented properly, before being implemented the system has been tested
2. Information systems can provide good data services to patients
3. The information system can provide good information regarding action reports and visit reports

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