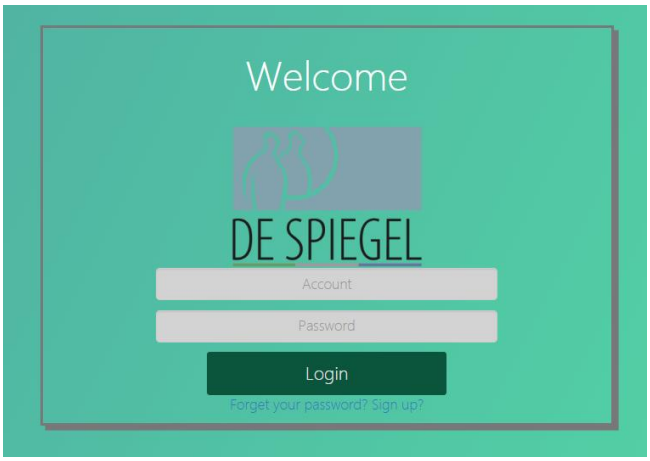
Bachelor of industrial Sciences
KU LEUVEN - Faculty of Engineering Technology, Campus Group T Leuven

DIGITALIZATION OF MANAGEMENT SYSTEM FOR REHABILITATION CENTER DE SPIEGEL



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1 INTRODUCTION

The background of this paper is mainly about solving the problem of the digitization of the personnel and process management in the rehabilitation center 'De Spiegel'. People in the rehabilitation center are mainly divided into two parts, one is the staffs for management, the another one is the patients getting treatment in this center. In the past, all the data are recorded in the form of handwriting, such as personal information, Patient process management, and the interaction of different patients for sharing and encouragement. However, with the rapid development of the Internet, there are many mature and convenient technologies that can be used to digitize the whole process in order to improve efficiency and also for environmental protection. Therefore, our group decided to establish a local website to satisfy this demand and to keep the data of patients safely. My task is mainly about two parts of the whole website, one is the Login page, another one is the progress display page of all the patients. During the process of building the website, the following technologies are mainly used: HTML, CSS, java-script, PHP. (Kolowich, *Web Design 101*) Furthermore, some function libraries are referenced: Bootstrap, jQuery.

Keywords
Digitalization, Local Server, Website, Html, PHP

2 REQUIREMENTS & BACKGROUND

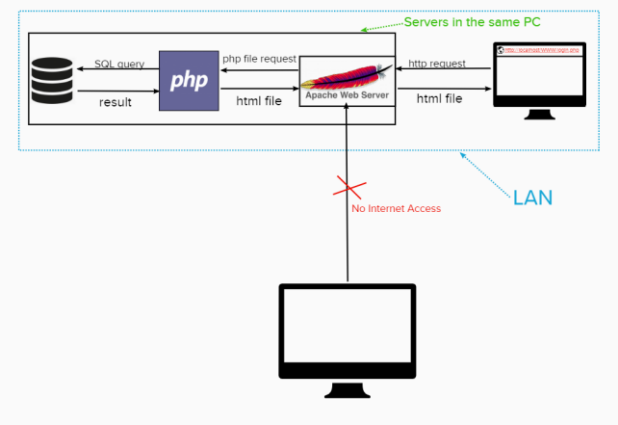
- Intuitive and inspiring
- Easy to operate
- Official
- Safe

Firstly, the process page should clearly demonstrate the current completion state of each patient and has a function to inspire patients for competition slightly.
Secondly, this website should be a very basic tool that can be used by everyone considering our users do not need "nice but not practical" elements. And also the website operation should be quickly mastered for a better user experience considering our customer might not be familiar to digital management in the beginning.
Thirdly, this website is used for a meaningful and serious organization, therefore, the website should has an official style*(This is the feedback that we got after them seeing our first version idea to demonstrate the process by using 'Trees' which is kind of childish).*
Finally, the data used and recorded related to the website should be safely kept in order to protect the privacy of patients. Therefore, a local server without any Internet resources will be used. That means, our database should be put in the server locating in their center and each user can only access to the website through LAN. In addition, all the resources that will be used to establish our website like pictures and function library should be downloaded beforehand and no CDN (Content delivery network) resources can be used.

3 DESIGN & IMPLEMENTATION

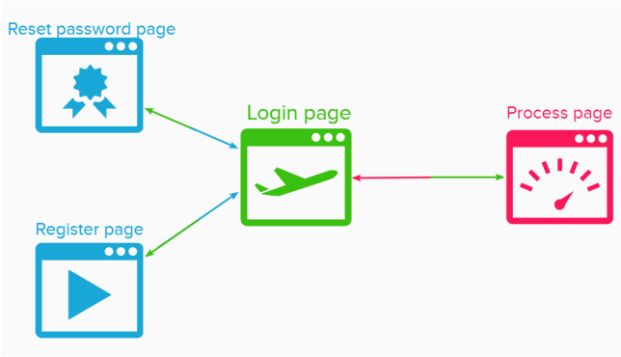
3.1 TOP LEVEL DESIGN

3.1.1 Design of Server



As shown on the graph above, it illustrates how our servers are configured to keep our website safe and efficient.

3.1.2 Design of webpages



As shown on the graph above, it illustrates how the webpages are structured and connected. The main page that our users will firstly meet is the login page, and they will check into the process page after typing in their account and password correctly. However, there are two special situations when our user meets the login page: The first, maybe our user happened to forget his or her password, therefore, a reset password page is necessary to be created. The second, if our user has not created his account, there should be a register page for him to own one account.

3.1.3 Design of animation

For the designs below, it will illustrate how our website visualizes patients' process data.

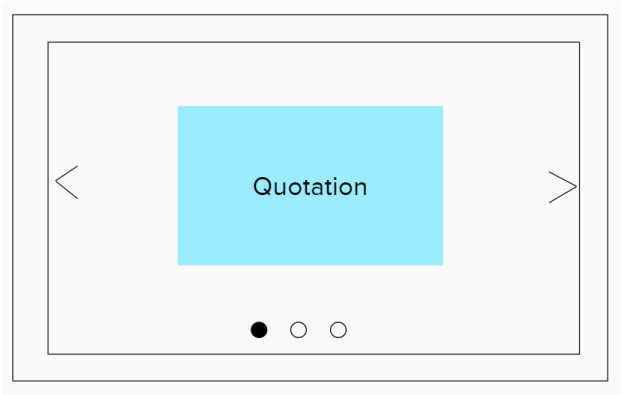
3.1.3.1 Circular Bar

The circle above is a special progress bar, which is divided into four independent parts in order to represent the completion of tasks in different stages for each patient. Each patient will have the same progress bar at the beginning which is totally grey. With more and more tasks completed, the progress of the circle will continue to increase degree and even change color after completing one stage.

3.1.3.2 Table

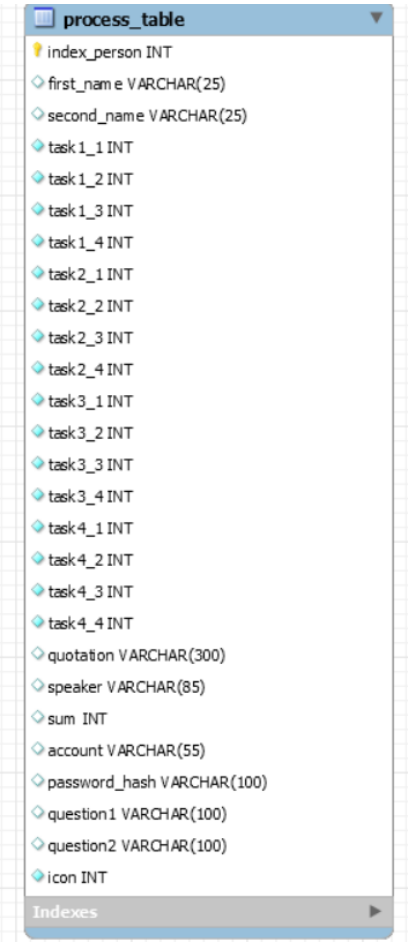
This table and the Circular bar are complementary relations. The most important function of the circular bar is to reflect the general overview of each patient very quickly and intuitively. Then, if someone wants to check the details of one specific patient in detail, this table will help greatly.

3.1.3.3 Carousel



Carousel for this design consists of three pictures with three quotations that will be automatically displayed in loops.(Otto & Thornton) On the other hand, each patient will has his own quotation and the php server can calculate everyone's process completion degree in order to choose the top three patients' quotations to display. There are two factors considered deciding using carousel, the first one is to encourage patients to complete tasks actively, the second one is trying sharing experience from "senior patients" considering people with the same experience understanding each other better.

3.1.4 Design of database



There are few terms that I might need to explain: 1. task, which has three value -1,0,1 to represent waiting to do, in process and finished status respectively. 2.Speaker, that is the person who speak the quotation. 3.sum, that is a generated column which will be the total score of all tasks used to calculate the ranking of each patient by php server, and a detailed explanation about the function of this column will be taken later. 4. question, which is used for users to reset password.

3.2 DESIGN CHOICES

3.2.1 Choice of PHP

When I started to write back-end server code, I did a lot of research to choose which language to use to connect SQL and HTML. During this process, I found that there are three commonly used languages, Java, Python and PHP. The reasons why I chose PHP are as follows:

1. It is the easiest way to setup by using integrated server software like Wampserver, USBwebserver. (WAMP development servers, 2020)
2. There are many mature libraries can be used.

3. Considering that our website is only a very basic one, and there is not much website traffic and complex functions, PHP can satisfy all demands. (Advantages of PHP, 2015)

3.2.2 Choice of Display form

In the first stage of group discussion and feedback, we originally used the idea of “trees” to display everyone's data. However, this method is not readily to achieve ideal images and desired result. Moreover, our customer thought that this “trees” idea is slightly childish, therefore, I chose a more common and intuitive way which is using the combination of process bar and table.

3.2.3 Choice of Database Structure

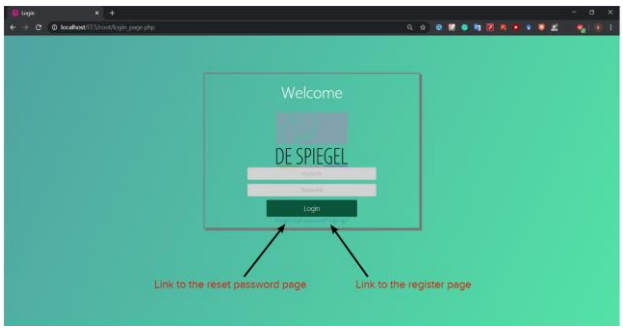
Considering that the process page is a final information integration page whose data actually coming from the other pages. Therefore, here I only use one table just for simulation. And also I used number -1, 0, 1 to represent different status of task for convenience.

3.3 DEVELOPMENT

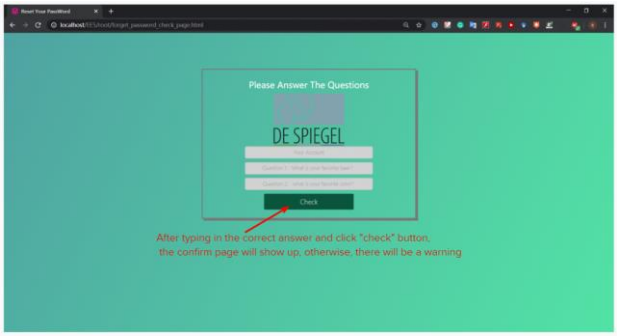
3.3.1 Overview of the real website.

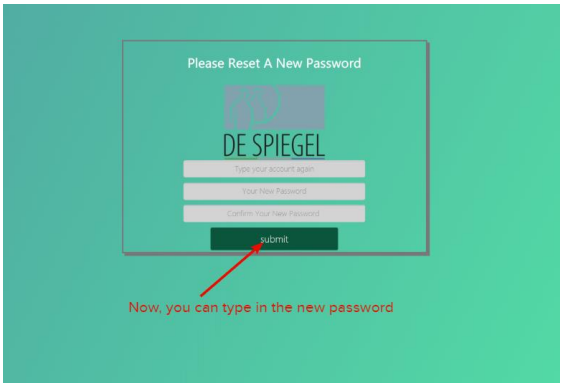
Before going deep into the code, it is better to demonstrate the overview of webpages.

Login-page



ResetPassword-page

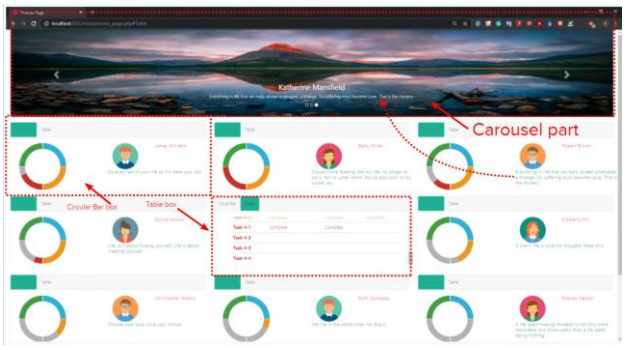




Or warning:

Register-page

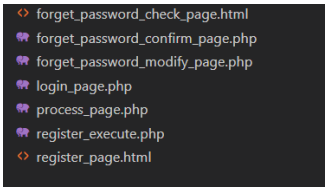
Process-page

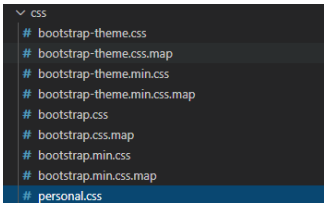


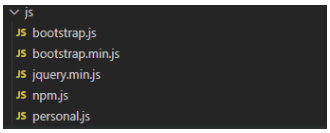
As shown on the graph, there are mainly three parts. Also from the quotation and circular bar, we can both verify that Robert Brown is in the third place currently.

3.3.2 Code explanation.

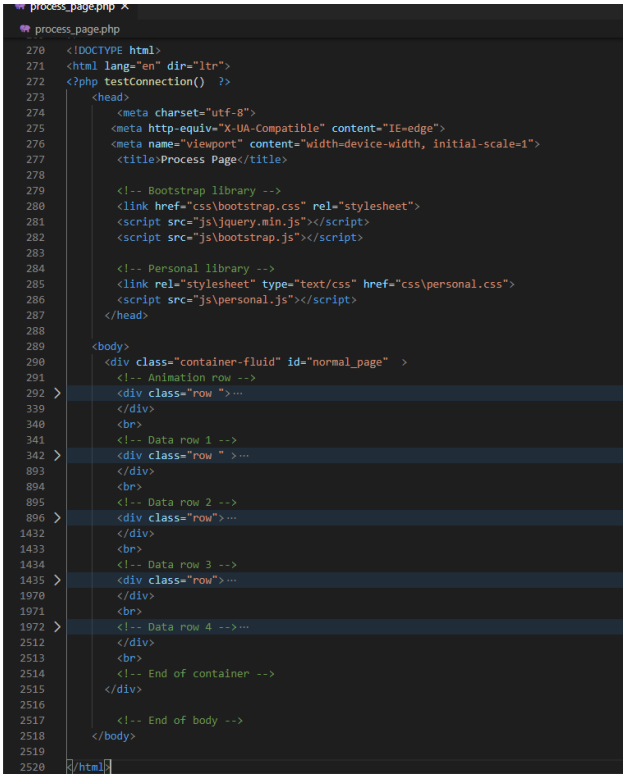
Before explaining the code, it is necessary to show the structure of the code files. And here it is shown below, except for these files, there are also one java script file ”personal.js”and one CSS file named ”personal.css” which are written by myself.







Process page code Structure.



This is the structure of my process page, here I used a container-fluid and grid structure which are referenced from bootstrap library. By using the container-fluid structure, it can ensure that my page can be applied to devices with different resolutions and automatically adjust its layout when zooming in or out, so as not to cause chaos of the overall structure. By using the grid class from the bootstrap library, it makes my entire page more structured and easier to manage and modify.

Firstly, I divided the whole page into four rows, the first row is for Carousel part. The left three rows have the similar structure, each row will also contain three columns for three users display box.

Then, the implementation of some functions achieved will be explained:

The drawing of circular bar:

For the circular bar, it is generated by four div boxes separately, and each box will have one quarter curve. There are four steps to generate a complete circle. The first step is to use the “border” attribute of CSS to generate a square with a colorful border and cut it using width and height attributes. The second step is to use CSS attribute “border-radius”, set it into 50%, accordingly the border will become an arc. The third step is to use the CSS to rotate 45 degrees to put the arc into right place (Top left, bottom left, top right, bottom right). The fourth step is to stitch the four squares together correctly.

```
<div class="square">
    <div class="c1"data-toggle="tooltip" title="phase 1"></div>
</div>
<div class="square">
    <div class="c2"data-toggle="tooltip" title="phase 2"></div>
</div>
</div>
<div class="curve-box">
<div class="square">
    <div class="c4"data-toggle="tooltip" title="phase 4"></div>
</div>
<div class="square">
    <div class="c3"data-toggle="tooltip" title="phase 3"></div>
</div>
</div>
```

```
.c4{
    width: 160px;
    height: 160px;
    border:20px  solid #b6b2b2 ;

    border-bottom:20px solid #c9302c;
    position: absolute;
    bottom:0;
    left: 0;
    border-radius: 50%;
    -webkit-transform : rotate(45deg);
    -moz-transform : rotate(45deg);
    -o-transform : rotate(45deg);
    transform : rotate(45deg);
}
```


```
<div class="c4"data-toggle="tooltip" title="phase 4"></div>
```

In addition, there is one small tip function if users’ mouse put over the arc, a small label will show up to remind user which phase does this arc represent. And it is achieved by using a Jquery function with label “tooltip” to introduce.

The degree of circular bar:

In summary, the degree of each arc of one circular bar is decided by the data from table. Here a step by step explanation will be given:

```
function calculateDegree(id1,id2,stage)
{
    var num=0;
    var degree=0;
    for(i=1;i<5;i++)
    {
    var obj= $("#mn"+id1+"-"+id2 +"-2").find(".Task-"+stage+"-"+i)
    .find(".d"+ stage + "-" + i+ "-3");
    if(obj.css("display") != "none")
        {
            num++;
        }
    }
    degree=(-45)+(num/4)*90
    return degree;
}
```

```
function changeCircularBar()
{
    //id1 is the row number
    for(id1=1;id1<5;id1++)
    {
        //id2 is the column number
        for(id2=1;id2<4;id2++)
        {
            for(var i=1;i<5;i++)
            {
             var degree=0;
             degree=calculateDegree(id1,id2,i);
            var obj=$("#mn"+id1+"-"+id2 +"-1").find(".c"+i);
            obj.css(
            {

                "font-size":"200%",
                "-webkit-transform" : "rotate("+degree+"deg)",
                "-moz-transform" : "rotate("+degree+"deg)",
                "-o-transform" : "rotate("+degree+"deg)",
                "transform" : "rotate("+degree+"deg)"
            }
          );
        }
        }

    }
}
```

```
//the entrance of all Jquery function execution
$(document).ready(function(){

    changeCircularBar();

});
```

First of all, the first step is to calculate how many degrees each arc needs to be displayed. This degree is determined by the number of finished items in the table. Simply speaking, the more finished tasks this phase has, the higher the completion degree of the arc will be. Here, I use the “find” function of jQuery, which can quickly find the object that I need without looking for it layer by layer.

```
$("#mn"+id1+"-"+id2 +"-2").
```

is used to find the specific table

```
).find(".Task-"+stage+"-"+i)
```

is used to find the specific task in this table

```
find(".d"+ stage + "-" + i+ "-3");
```

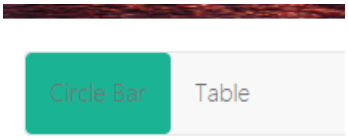
is used to find the “Finished” term under this task. Here I use the attribute “display” to count the number, and I will explain it later in the “table” part. In short, the circular bar will get the data from table during the front-end operating period. And the table will get the data from the Mysql database during the php executing period. Considering each stage has four tasks , therefore, a for-loop is needed to get the final sum result.

```
for(i=1;i<5;i++)
```

Secondly, function” changeCircularBar” will go through four stages and change them separately. As shown on the second graph of this section above, id1 and id2 can specifically find a person or a circular bar. Then the third parameter will be used to set the status of each stage(arc) separately. One more thing that might need to be explained is that four rotating function are used for different browsers like chrome, IE.

Thirdly, this is the entrance of Jquery functions so that the function will start to execute after the page is generated in default. The reason I set this entrance is based on fact that my website is established from a static page so I need to make sure there is no conflict between page creation and style change.

Switch between different pages



Obviously, there is a toggle button on the upper left side of each patient's box to quickly change between bar and table view. Considering this is also an interactive action, hereby I wrote a java-script function.

```
//Function for change content of each patient
function changeContent(id1,id2,id3){
    for(i=1;i<3;i++){
        document.getElementById('mn'+id1+'-'+id2+'-'+i).style.display='none';
        document.getElementById('m'+id1+'-'+id2+'-'+i).style.backgroundColor = "#f8f8f8";
    }
    document.getElementById('m'+id1+'-'+id2+'-'+id3).style.backgroundColor = "#1ab394";
    document.getElementById('m'+id1+'-'+id2+'-'+id3).style.borderRadius = "4px";
    document.getElementById('mn'+id1+'-'+id2+'-'+id3).style.display='block';
}
```

```
            </div>
        <div id="mn1-2-2"style="display:none">
            <div class="row">
                <div class="row pre-scrollable">
                    <div class=" col-md-11 col-md-offset-1 tas
```

```
class="col-md-4  data_box" >
av class="navbar navbar-default" role="navigation">
  <ul class="nav navbar-nav">
    <li><a id = "m1-2-1" class="active active_background" href="#Circle Bar" onclick="changeContent(1,2,1);">Circle Bar<
    <li><a id = "m1-2-2" href="#Table" onclick="changeContent(1,2,2);">Table</a></li>
```

At the beginning of loading the page, the table part is set to invisible and the circular bar is active both in default. Whenever the button “Table” is clicked, ”changeContent” function will be triggered. And the color of the button will be changed, content display will also be changed.

TestConnection function

```
function testConnection()
{

    $servername = "localhost";
    $username = "root";
    $password = "Zs0692840";
    $account=$_POST["account"];
    $password=$_POST["password"];

    $mysqli =new mysqli($servername, $username, $password,"ee5_db");

    if ($mysqli->connect_error) {
    die('Connect Error (' . $mysqli->connect_errno . ') '
            . $mysqli->connect_error);
    }
    $task= "password_hash";
    $sql = "SELECT $task FROM ee5_db.process_table where process_table.account= '$account' " ;
    $result = $mysqli->query($sql);
    $row = $result->fetch_assoc() ;
    $hash=$row[$task];
    if (password_verify($password, $hash)) {
        $mysqli->close();
    }
    else {
       die("Wrong password, please try again!");
    }
}
```

This function will be the first function executed in php server to make sure the security of privacy. If the password_hash is not correct, the php will stop working and output a warning ”wrong password”.

changeDisplay function

```
<tr class="Task-1-1">
    <td ><strong >Task-1-1</strong></td>
    <td><div class="d1-1-1"<?php changeDisplay(1,1,1,"Waiting To Do")?>;> Complete</div></td>
    <td><div class="d1-1-2"<?php changeDisplay(1,1,1,"In Process")?>;> Complete</div></td>
    <td><div class="d1-1-3"  <?php changeDisplay(1,1,1,"Finished")?>;> Complete </div></td>
</tr>
```

```
function changeDisplay($index,$stage,$num,$taskname)
{
    $servername = "localhost";
    $username = "root";
    $password = "Zs0692840";

    $conn = new mysqli($servername, $username, $password,"ee5_db");

    // detect connection
    if ($conn->connect_error) {
        die("Connection failed: " . $conn->connect_error);
    }
```

```
    $task= "task". $stage . "_" . $num ;
    $sql = " SELECT $task FROM ee5_db.process_table where process_table.index_person =$index" ;
    $result = $conn->query($sql);

    $row = $result->fetch_assoc() ;
    $status =  $row[$task];

    if($taskname=="Waiting To Do")
    {
      if($status<0)
    {
        echo 'style="display: none;"';
    }
    $conn->close();
    }
    if($taskname=="In Process")
    {
      if($status<1)
    {
        echo 'style="display: none;"';
    }
    $conn->close();
    }
    if($taskname=="Finished")
    {
      if($status<2)
    {
        echo 'style="display: none;"';
    }
    $conn->close();
    }
```

As shown on the graph above, each content on the table will be decide by the php server with sql query to display or not. In the changeDisplay function, firstly, ther is a SQL query for the value of the task (-1,0,1) to determine what state it is and if it should be displayed or not.

Here, it is necessary to explain the function of “waiting to do”. The setting of this parameter is considering the influence of holidays or some special situations. For example, if someone has a long vacation or asks for leave for a long period, the display of “waiting to do” should be empty. If it is a short vacation or short period leave, the value of this item will be displayed as complete. In addition, for the normal situation, every patient will directly enter “In process” stage after finishing the last task and the “Waiting to do” item will automatically be set as complete in default.

getFullName function&&getIcon function

```
    <div class="col-md-7">

        <div class="patient" ><?php getFullName(1)?> </div>
    </div>
      </div>
```

```
$sql = " SELECT first_name FROM ee5_db.process_table where process_table.index_person =$index" ;
$result = $conn->query($sql);
$row = $result->fetch_assoc() ;
$firstName=$row['first_name'];

$sql = " SELECT second_name FROM ee5_db.process_table where process_table.index_person =$index" ;
$result = $conn->query($sql);
$row = $result->fetch_assoc() ;
$secondName=$row['second_name'];

echo "" .$firstName. " ".$secondName. "";
}
```

```
    <div class="row" >
    <div class="col-md-5">

        <img src="img/patient-<?php getIcon(1)?>.png" class="patient" >
    </div>
    <div class="col-md-7">
```

These are the functions used to get the patient name and Icon from the database, a standard database query and an “echo” function will be executed to generate a complete webpage.

fetchQuotation && fetchSpeaker function

```
$task= "quotation";
$sql = " SELECT $task FROM ee5_db.process_table where process_table.index_person =$index" ;
$result = $conn->query($sql);
$row = $result->fetch_assoc() ;

echo $row[$task];
}
function fetchSpeaker($index)
```

```
$task= "speaker";
$sql = " SELECT $task FROM ee5_db.process_table where process_table.index_person =$index" ;
$result = $conn->query($sql);
$row = $result->fetch_assoc() ;

echo $row[$task];
}
```

These are the functions used to get the patient quotation and speaker from the database, a standard database query and an “echo” function will be executed to generate a complete webpage.

GetRankQuotation function

This is the algorithm that to determine who are the top three patients in completion currently. After get the ranking of each person, this function will fetch out the corresponding quotation and speaker then place them at the correct positions.

```
function getRankQuoation($rank,$type)
{


    $servername = "localhost";
    $username = "root";
    $password = "Zs0692840";

    $conn = new mysqli($servername, $username, $password,"ee5_db");

    // detect connection
    if ($conn->connect_error) {
        die("Connection failed: " . $conn->connect_error);
    }


    $task= "SELECT index_person,RANK() OVER(ORDER BY sum DESC) as ranking FROM ee5_db.process_table" ;
    $sql = $task;
    $result = $conn->query($sql);
```

This is the first part of the function, a standard connection to the database and a sql query are created. After My sql server execute corresponding statement, it will return a column called ranking to display each patients’ ranking as shown below, this is the place where the “sum” Colum could be used as I introduced before in the “3.1.4 Design of database”.

index_person	ranking
2	1
1	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
18	10
23	10
10	12
11	13
12	14

Then there is a while-loop to fetch all rows of data and three if-statement inside are used to record the index of the top three patients who finish tasks the most.

```
//get the index of each person with specific ranking
while($row = $result->fetch_assoc()) {
  if($row["ranking"] ==1 )
  {
     // echo  "index1: " . $row["index_person"] ;
     $rank1=$row["index_person"];
     // echo "<br>";
  }
  if($row["ranking"] ==2 )
  {
     // echo  "index1: " . $row["index_person"] ;
     $rank2=$row["index_person"];
     //echo "<br>";
  }
  if($row["ranking"] ==3 )
  {
    //  echo  "index1: " . $row["index_person"] ;
     $rank3=$row["index_person"];
     // echo "<br>";
  }
}
```

After getting the top three indexes, function will invoke two functions that are already explained before to fetch corresponding quotation and speaker then echo them into the html page.

```
  //start to search quatation of each person
  if($rank==1)
    {
      if($type=="quotation")
      {
         $quotation=fetchQuotation($rank1);
      echo  $quotation;
      }
      if($type=="speaker")
      {
       $speaker=fetchSpeaker($rank1);
       echo $speaker;
      }

    }
    if($rank==2)
    {
      if($type=="quotation")
      {
         $quotation=fetchQuotation($rank2);
         echo  $quotation;
      }
      if($type=="speaker")
      {
       $speaker=fetchSpeaker($rank2);
       echo $speaker;
      }
    }
```

```
        if($rank==3)
        {
          if($type=="quotation")
          {
             $quotation=fetchQuotation($rank3);
             echo  $quotation;
          }
          if($type=="speaker")
          {
           $speaker=fetchSpeaker($rank3);
           echo  $speaker;
          }
        }
}
```

```
  <!-- Wrapper for slides -->
  <div class="carousel-inner  " role="listbox">
    <div class="item active header-1 ">
      <img src="img/header-1.jpg" alt="...">
      <div class="carousel-caption">
          <h3><?php getRankQuoation(1,"speaker")?></h3>
          <p><?php getRankQuoation(1,"quotation")?> </p>
      </div>
    </div>
    <div class="item header-2">
      <img src="img/header-2.jpg" alt="...">
      <div class="carousel-caption">
          <h3><?php getRankQuoation(2,"speaker")?></h3>
          <p><?php getRankQuoation(2,"quotation")?> </p>
      </div>
    </div>
    <div class="item header-3">
      <img src="img/header-3.jpg" alt="...">
      <div class="carousel-caption">
          <h3><?php getRankQuoation(3,"speaker")?></h3>
          <p><?php getRankQuoation(3,"quotation")?> </p>
      </div>
```

Here is the html code part where all the data from Mysql will be displayed.

Login page

```
<form class="form" action="process_page.php" method="post">
    <input type="text" class=" form-control log  " name="account" placeholder="Account">
    <input type="password"  class="form-control log" name="password" placeholder="Password">
    <button type="submit" id="login-button">Login</button>
</form>
<div class="text-center p-t-12">
    <a class="txt2" href="http://localhost/EE5/root/forget_password_check_page.html">
        Forget your password?
    </a>
    <a class="txt2" href="http://localhost/EE5/root/register_page.html">
        Sign up?
    </a>
```

For the login page, a simple form is used to get the user's account and password. And two href links are used to connect register page and reset password page. It should be noted that the verification of account and password is not carried out on login page, but on the process page through the testConnection function as explained previously.

Register page

```
<form class="form" action="register_execute.php" method="post">
        <input type="text" class=" form-control log  " name="account" placeholder="Account">
        <input type="text" class=" form-control log  " name="password" placeholder="Password">
        <input type="password"  class="form-control log" name="question1" placeholder=" Question 1:   what is your favorite beer?  ">
        <input type="password"  class="form-control log" name="question2" placeholder="Question 2:   what is your favorite color?  ">
<button type="submit" id="login-button">Submit</button>
```

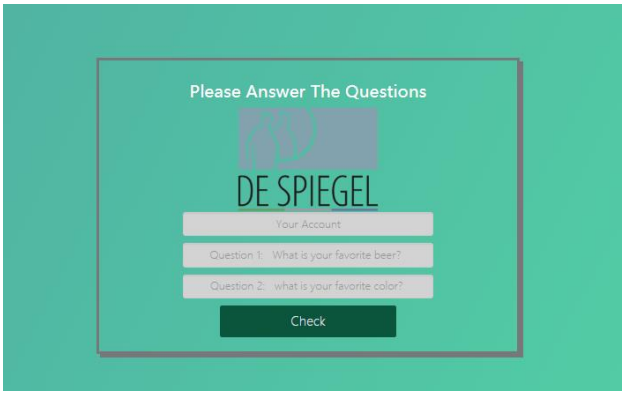
After clicking the “Sign up” button on the login page, one register html file will be shown. With a similar structure

as login page, there is a form with four input used to upload the necessary information one user need to create an account. For question1&2, they are used to verify user's identity for resetting password therefore a text form "password" is used to make it invisible. After clicking the submit button, all the information and input will be passed to register_execute.php file.

For the register_execute.php file as shown above, the most important function of it is to hash encrypt the password in database using hash algorithm. Here I use a php default function" password_hash". Every time a user registers a new account, the password entered will not directly be recorded by the database but instead by a serial of hash character which is unidirectional and irreversible, so even if the password of the database is stolen, the safety of corresponding account can also be guaranteed().

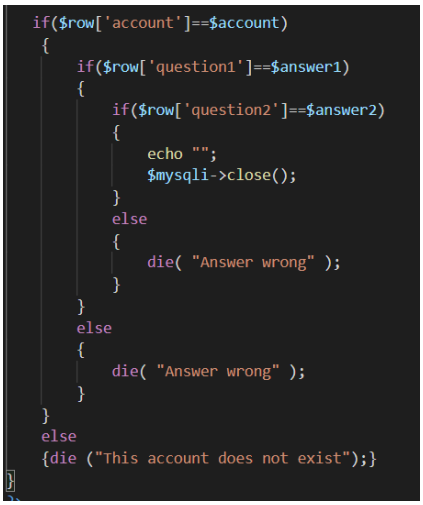
Reset password page

After clicking the "forget password" button on the login page, one html file will be shown as shown below.



All the user input information in the above form will be input to the forget_password_modify_page.php file for verification.

In the first part of the forget_password_modify_page.php file, a standard database connection and query are created as normal.



Then there will be some verification for the account, question1 and question2. As long as one of them is not correct, the PHP script will stop running and output a corresponding warning. If all the verification is passed, user will be redirected to the final change page" forget_password_confirm_page.php".

In this part, the php script will hash encrypt the input password and submit it into the database if the first time input and the second time input of password are equal.

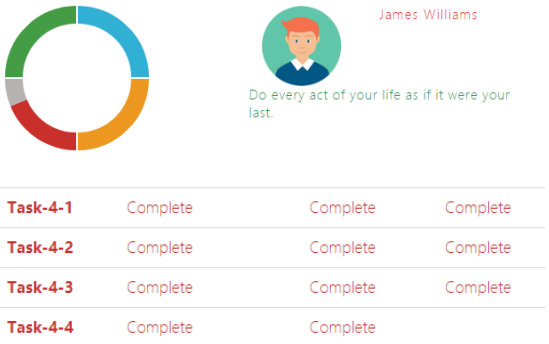
4 TESTING

4.1 Test of circular bar and table

In this section, the data of task columns in the database will be changed to test whether the corresponding progress bar and table will change correctly.

Before change:

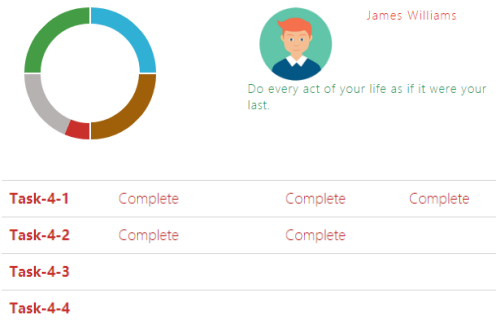
task4_2	task4_3	task4_4	quotat
2	2	1	Do eve
2	2	2	Clouds



Task-4-1	Complete	Complete	Complete
Task-4-2	Complete	Complete	Complete
Task-4-3	Complete	Complete	Complete
Task-4-4	Complete	Complete	

After the change,

task4_1	task4_2	task4_3	task4_4
2	1	-1	-1
2	2	2	2
2	2	1	-1



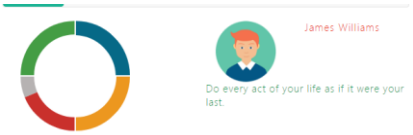
Task-4-1	Complete	Complete	Complete
Task-4-2	Complete	Complete	
Task-4-3			
Task-4-4			

According to the change of the database, the completion of the fourth stage task by “James Williams” should be reduced by 50%, and the progress bar and table display are both correct correspondingly.

4.2 Test of changing quotation

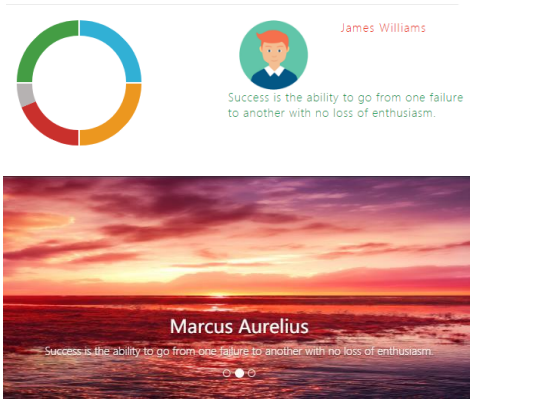
Before change:

index_person	first_name	second_name	quotation
1	James	Williams	Do every act of your life as if it were your last.



After change:

index_person	first_name	second_name	quotation
1	James	Williams	Success is the ability to go from one failure to another with no loss of enthusiasm.

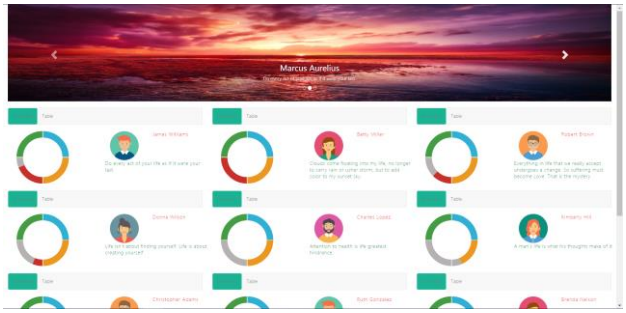


If the quotation of “James Williams” is changed in the database, it is shown that the patient's information box and the carousel at the top will both be changed automatically.

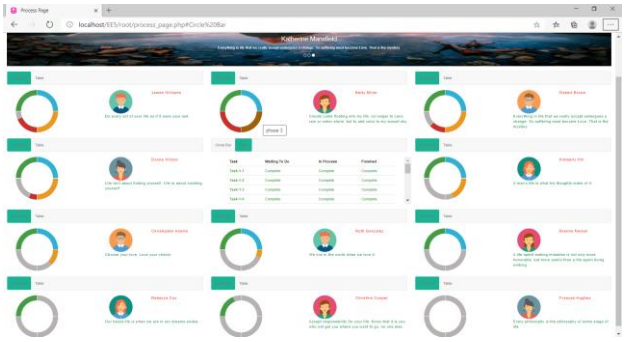
4.3 Test of browsers and scales

In this section, different browsers and different page scales will be tested to determine whether our web pages work properly.

Display by Chrome:

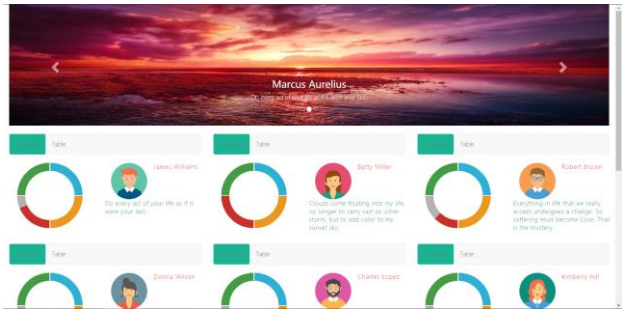


Display by Microsoft Edge:

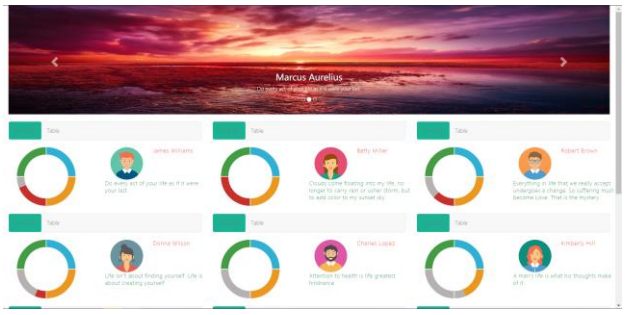


Display by different scale:

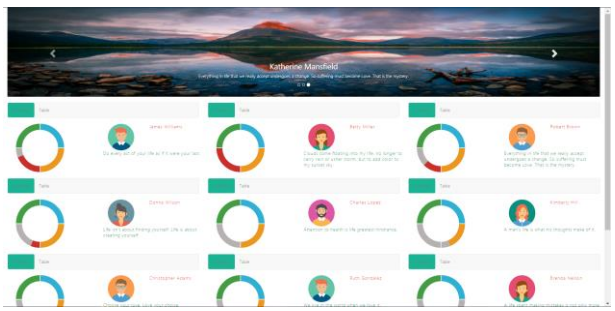
100%



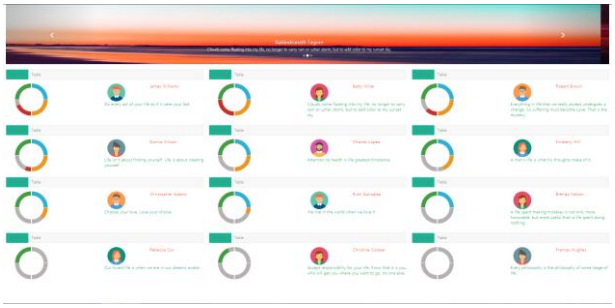
90%



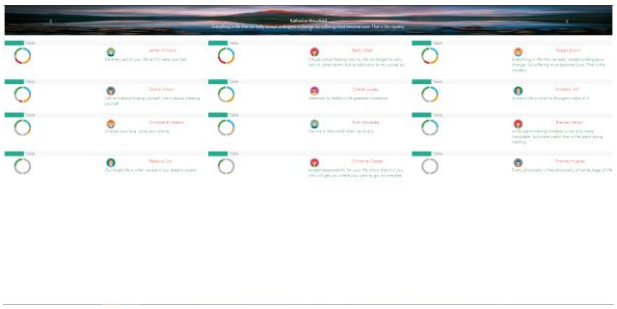
75%



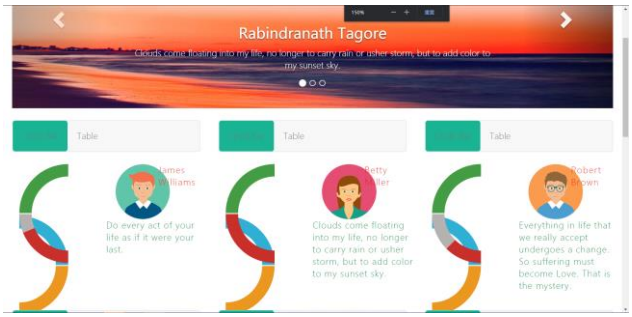
50%



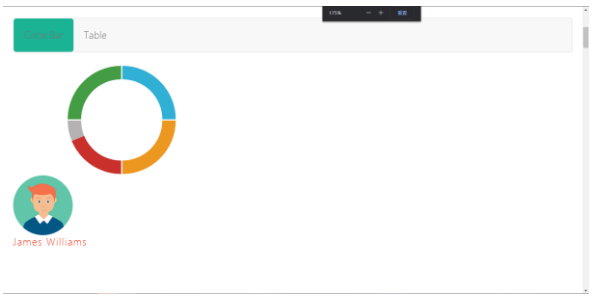
25%



150%



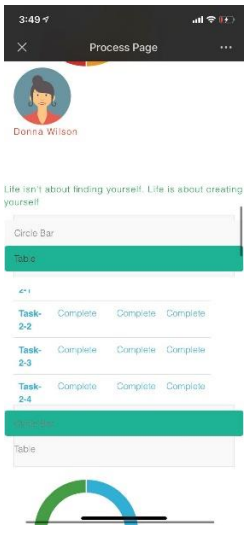
175%



During the test, I encountered a situation that the shape of the circular bar will change abnormally only when the

scale is 150, and it will return to normal again when the scale continues to increase. Moreover, when scale is too large, although it does not affect the display of data, it will affect the beauty of the page accordingly like the graph of 175%

4.4 Test by mobile phone



Although there is no problem in function, however there is also a small flaw by using mobile phone, that is, the overall page does not look very beautiful, as it was designed at the beginning. Specific solutions for future version will be discussed in the conclusion section

4.5 Test of changing password

Here I will use Betty's account as a reference. At first, her password is Miller, and then there is a correspond hash sequence code in the database. In the test, I will reset the password to Miller, and then check whether the hash code has changed and whether I can log in with the new password (new hash sequence code, but actually the same password)

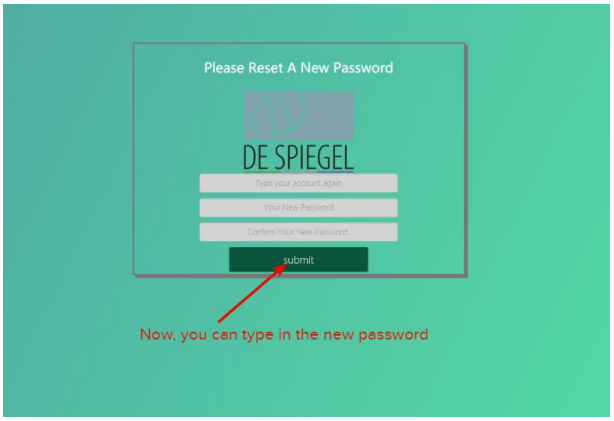
Before change:

account	password_hash
Betty	$2y$10$W6n2W/GlzFS5nmmJkvhUteUhgLaQ0JB5ey6rAlcb2SAeVfqKIGG0m
NULL	NULL

After change:

account	password_hash
Betty	$2y$10$84/aQYFKUXD3xa2exkKi8edtq/BJySwbJjHvgIwdMj4MTapGBwCHO
NULL	NULL

And I had logged in the website using the new password successfully which mean there should be no problem about changing password function.



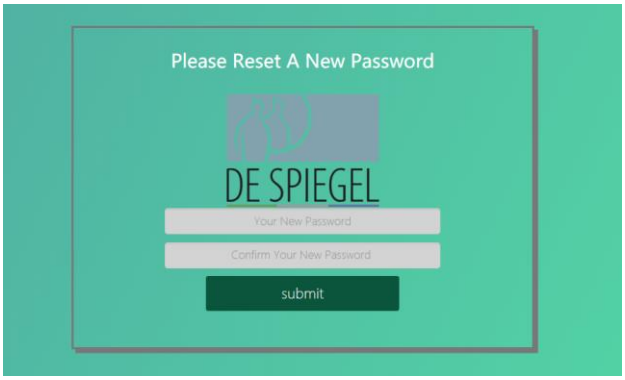
In the process of testing, I found one interesting bug by accident. The following page after answering two correct questions can modify other people's accounts by inputting different accounts, however my original purpose of having a second account input form is to double verify the identity of the user. After finding out, I modified the code and corresponding page as below:

```
}
function transferAccount()
{
    $account=$_POST["account"];
    echo $account;

}
?>
```

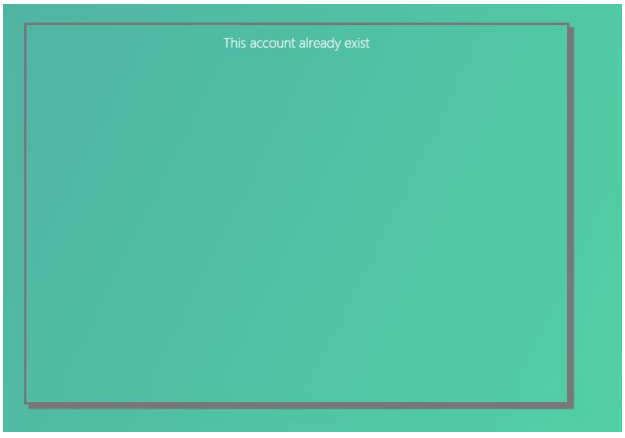
--

```
<form class="form" action="forget_password_confirm_page.php" method="post">
<input type="text"  style="display:none" class="form-control log" name="account" value=<?php transferAccount(); ?>>
<input type="password"  class="form-control log" name="password1" placeholder="Your New Password">
```

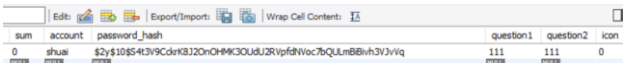


4.6 Test of register a new account

First, an existing account will be created. The test result shows that the account already exists and the registration is not completed.



Then I will register a new account that doesn't exist in the database and log in to check whether it will be successful.



sum	account	password_hash	question1	question2	icon
0	shuai	$2y$10$S4t3V9CdxrK8J2OnOHMK3OUdU2RVpfdNVoc7bQULmBiBivh3VJvVq	111	111	0

After that, I logged in successfully, and the result showed that everything was working fine.

5 CONCLUSION

According to the requirements of customers, our website basically meets the four requirements shown in the second part above, but for some reasons, some problems still exist, but they do not affect the realization of basic functions or can be solved for future work.

1. Not resizable

The first problem is to resize the number of users. As the HTML code of the process page shows, there are 12 information boxes for 12 patients. If there are more than 12 patients, the data will not be displayed. However, this 12 number is decided based on the feedback given by our customers because their maximum capacity is around twelve patients for normal situation . If it is really necessary to realize the resizable function, a dynamic webpage can be made by using php function to generate the html code but not by writing static page in advance.

The second problem is that the task quantity of each stage is not resizable. This problem is because process page is mainly used to display data and there is almost no data input within itself. Therefore, without any support from other people's webpages and databases, here i can only use tasks stored in the database as template. Future solution:
1: Connecting other people's database (task-list) to obtain corresponding real parameters.
2: Generating the corresponding HTML code through PHP function instead of using the static page written in advance as the framework
For example, getting the number of tasks from database, then executing php function with a while loop to generate html code considering all the information boxes have the same structure and parameters.

2. Image scaling problem

During the process of testing, I found that when scale is set to 150%, the layout of circular bar will be disordered, mainly because the layout of div boxes are disordered. Although it has no influence on the display of large screen like TV and small screen like mobile phone, the best way to ensure a better adaptability is to use SVG technology to draw the whole circle in order to ensure the integrity of the circular bar.

3. Competition is absolute

As mentioned in the previous explanation, the top three patients are calculated according to the total completion degree, which will be unfair to the new patients and may cause the result of decreasing enthusiasm. Therefore, there is also another plan to score the four stages separately. Finally, four patients would be selected so that their quotation can be displayed by the carousel.

6 REFERENCES

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3. Best WAMP development servers as of 2020. (2013, March 26). Retrieved from https://www.slant.co/topics/529/~best-wamp-development-servers
4. Advantages of PHP: GoodWorkLabs: Big Data: AI: Outsourced Product Development Company. (2015, May 26). https://www.goodworklabs.com/6-advantages-of-php/
5. JacksonDec, W. (n.d.). Why salted hash is as good for passwords as for breakfast. Retrieved from https://gcn.com/articles/2013/12/02/hashing-vs-encryption.aspx
6. Demo_video.https://kuleuven.mediaspace.kaltura.com/media/Shuai-Zhang-EE5-demo.mp4/0_qivvncun
7. Gitlab. https://gitlab.groept.be/shuai.zhang/ee5.git

7 APPENDIX

7.1 Complete structure of process page

```
<body>
  <div class="container-fluid" id="normal_page"  >
    <!-- Animation row -->
    <div class="row ">···
    </div>
    <br>
    <!-- Data row 1 -->
    <div class="row " >
        <div class="col-md-4 data_box " >    ···
        <div class="col-md-4  data_box" >      ···
        <div class="col-md-4  data_box" >      ···
    </div>
    <br>
    <!-- Data row 2 -->
    <div class="row">
        <div class="col-md-4  data_box" >      ···
        <div class="col-md-4  data_box" >      ···
        <div class="col-md-4  data_box" >  ···
    </div>
    <br>
    <!-- Data row 3 -->
    <div class="row">
        <div class="col-md-4  data_box" > ···
        </div>
        <div class="col-md-4  data_box" >      ···
        </div>
        <div class="col-md-4  data_box" >      ···
        </div>
    </div>
    <br>
    <!-- Data row 4 -->
     <div class="row"  >
        <div class="col-md-4  data_box" > ···
        </div>
        <div class="col-md-4  data_box" >      ···
        </div>
        <div class="col-md-4  data_box" >      ···
        </div>
    </div>
    <br>
    <!-- End of container -->
  </div>

    <!-- End of body -->
</body>
```

7.2 Complete table in database

index_person	first_name	second_name	task1_1	task1_2	task1_3	task1_4	task2_1	task2_2	task2_3	task2_4	task3_1	task3_2	task3_3	task3_4	task4_1	task4_2	task4_3	task4_4
1	James	Williams	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
2	Betty	Miller	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	Robert	Brown	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	-1
4	Donna	Wilson	2	2	2	2	2	2	2	2	2	2	2	2	2	1	-1	-1
5	Charles	Lopez	2	2	2	2	2	2	2	2	2	2	2	2	1	-1	-1	-1
6	Kimberly	Hill	2	2	2	2	2	2	2	2	2	2	2	1	-1	-1	-1	-1
7	Christopher	Adams	2	2	2	2	2	2	2	2	2	2	1	-1	-1	-1	-1	-1
8	Ruth	Gonzalez	2	2	2	2	2	2	2	2	2	1	-1	-1	-1	-1	-1	-1
9	Brenda	Nelson	2	2	2	2	2	2	2	2	1	-1	-1	-1	-1	-1	-1	-1
10	Rebecca	Cox	2	2	2	2	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
11	Christine	Cooper	2	2	2	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
12	Frances	Hughes	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

quotation	speaker	sum	account	password_hash	question1	question2	icon
Do every act of your life as if it were your last.	Marcus Aurelius	31	James	$2y$10$vtB7daJMj3dM/UkYkS16AOCjDVSC/a4laC/7vsBDirO8wR.13d0ADe	Westmalle	blue	1
Clouds come floating into my life, no longer to carry rain or usher storm, but to add color to my suns…	Rabindranath Tagore	32	Betty	$2y$10$84/aQYFKUXD3xa2exkKl8edtq/BJySwbJjHvgIwdMj4MTapGBwCHO	Jupiler	red	2
Everything in life that we really accept undergoes a change. So suffering must become Love. That i…	Katherine Mansfield	28	Robert	$2y$10$gjk1hfvuhHLG4plFK922gucYz9noel5f5CERQv4MTmz.VD9qktyvC	Jupiler	brown	3
Life isn't about finding yourself. Life is about creating yourself	George Bernard Shaw	25	Donna	$2y$10$nCT0KAfV4TllaxT/WhV1UucWOA8inVcfujBUZwytVZbA2E/AbuJ0a	Westmalle	pink	4
Attention to health is life greatest hindrance.	Plato	22	Charles	$2y$10$Kv7gagtBUdSFOd3OXpx2E.ye7/SIQWwF8LhGZeCNjYD/KVLU0efxm	Jupiler	purple	5
A man's life is what his thoughts make of it.	Marcus Aurelius	19	Kimberly	$2y$10$jvS0UrS7I2BD8SDhSn5c/ODalgUCZg7g9h/bS/9hcoZSu4w26aYaO	Westmalle	red	6
Choose your love, Love your choice.	Thomas S. Monson	16	Christopher	$2y$10$FMrj7Y.LRJMzgT1EJ9apVuigwV0Tq6Asz1hEjpJjyH57noJM3WGmi	Orval	black	3
We live in the world when we love it.	Rabindranath Tagore	13	Ruth	$2y$10$FtCy/12WYsh/hczVB1t2TuD8yYuiUmFqRc5/pi0RmugaBuZJjCJvy	Jupiler	grey	1
A life spent making mistakes is not only more honorable, but more useful than a life spent doing not…	George Bernard Shaw	10	Brenda	$2y$10$BfoaFb2jzFqbblFBFNyJF.O6aL9QFd4aDslIoSmPnjTglph8F0Geq	none	none	2
Our truest life is when we are in our dreams awake.	Henry David Thoreau	-2	Rebecca	$2y$10$3MxvmcY8JoQORkyapHst0OiFayezkF3STmJGSLymZChpnqvwfRolG	Duvel	sunshine	6
Accept responsibility for your life. Know that it is you who will get you where you want to go, no on…	Les Brown	-5	Christine	$2y$10$8W/8NbbBr1xyfuzqP72Kf.ZuBP7Xoii4xhaq.WFIzOgvVMjy8KytG	Westmalle	yellow	2
Every philosophy is the philosophy of some stage of life.	Friedrich Nietzsche	-15	Frances	$2y$10$f3vNCtHJHOiay3n4XEk06ugx0yuRpUlKVmOIX10f7bgdgv7SrKpK	Duvel	black	4