

Information Systems and Databases

**Report 3rd Project Assignment**

**Health care center database**

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Professors: Mário Gaspar da Silva

Francisco Regateiro

Miguel Amaral

Group number 49:

81731 – Catarina Aleixo

81138 – João Ramiro

81567 – José Miragaia

1. **Introduction**

This project consists in a Web-based application to perform some tasks that deal with the database that was populated in the 2nd assignment.

In order to unify the four tasks that will be explained in the following sections, it was created a home page (homepage.php) that has all the possibilities that users have to interact with the health care centre, that is represented in Figure 1.

It was created a php file that contains only the code for connecting to the database, to avoid repeating it in all files, that is called connectDB.php.

* **connectDB.php:**

<html>

<body>

<?php

$host = "db.tecnico.ulisboa.pt";

$user = "ist181731";

$pass = "ahcu2726";

$dsn = "mysql:host=$host;dbname=$user";

try

{

$connection = new PDO($dsn, $user, $pass);

}

catch(PDOException $exception)

{

echo("<p> Error: ");

echo($exception->getMessage());

echo("</p>");

exit();

}

?>

</body>

</html>

* **homePage.php:**

<html>

<body>

<h1><strong><font color= '#66CC00'>Welcome to the Healthcare Centre</font></strong></h1>

<hr/>

<form action="getPatient.php" method="post">

<p>Search for/Insert a patient: <input type="submit" value="Search"/></p>

</form>

<form action="newStudy.php" method="post">

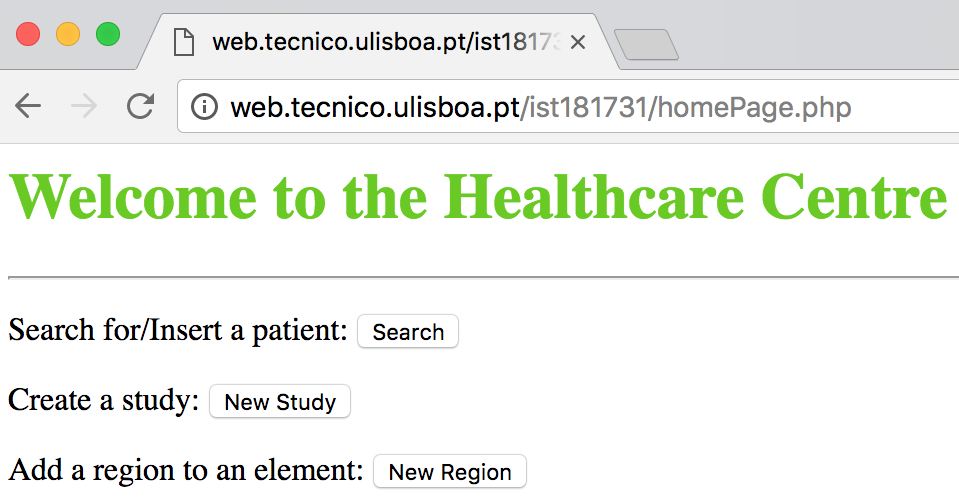
<p>Create a study: <input type="submit" value="New Study"/></p>

</form>

<form action="getRegion.php" method="post">

<p>Add a region to an element: <input type="submit" value="New Region"/></p>

</form>

</body>

</html>

Figure 1 – Home Page

1. **Check patient existence**

The first task consists of searching for a patient, giving all name or a portion of it. If the patient doesn’t exist, then the user can register a new patient, giving the patient name, birthday and address.

The page to search for a patient will be displayed when the user clicks on the search button in the home page. The next page it’s the getPatient.php that has a form that asks for the name the user wants to look for, as it can be seen in Figure 2.

* **getPatient.php:**

<html>

<body>

<h3><strong><font color= '#66CC00'>Search for a Patient</font></strong></h3>

<hr/>

<form action="checkExistance.php" method="post">

<p>Patient Name:

<input type ="text" name="name" require/>

<input type="submit" value="Search"/>

</p>

</form>

</body>

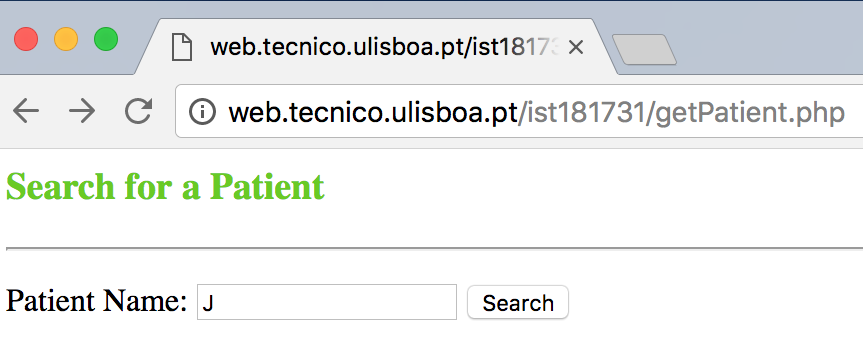
</html>

Figure 2 – Search for a patient

As soon as the user presses the Search button, then the checkExistance.php is executed. In this file, with the portion of the name given, it will be performed a query to search for all the patients that have names that match with the given substring and its presented a table with all the results and a possibility of registering a new patient, either there are results or not, once the results given couldn’t match with the patient that is being searched (that is represented in Figure 3).

* **checkExistance.php:**

<html>

<body>

<h3><strong><font color= '#66CC00'>Check Patient Existence</font></strong></h3>

<hr/>

<?php

require 'connectDB.php'; /\* Connect to database \*/

$name = $\_REQUEST['name']; /\* Get the portion of name that was searched \*/

$findName = "%" . $name . "%";

/\* Prepare query to search for patients that have a name with that substring \*/

$stmt = $connection->prepare("SELECT \* FROM Patient WHERE name LIKE :findName");

$stmt->bindParam(':findName', $findName);

$stmt->execute();

if($stmt == FALSE)

{

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

$nrows= $stmt->rowCount();

/\* If records were found \*/

if($nrows > 0)

{

echo("<table border=\"0\" cellspacing=\"5\" bordercolor='#66CC00'>");

echo("<tr><td bgcolor='#66CC00'><font color= '#FFFFFF'>Patient Number</font></td><td bgcolor='#66CC00'><font color= '#FFFFFF'>Patient Name</font></td><td bgcolor='#66CC00'><font color= '#FFFFFF'>Birthday</font></td><td bgcolor='#66CC00'><font color= '#FFFFFF'>Address</font></td></tr>");

foreach($stmt as $row)

{

echo("<tr><td>");

$patient\_number = $row['patient\_number'];

echo($patient\_number);

echo("</td><td>");

$patient\_name = $row['name'];

echo("<a href=\"getDevices.php?patient\_number=$patient\_number\">$patient\_name</a>");

echo("</td><td>");

echo($row['birthday']);

echo("</td><td>");

echo($row['address']);

echo("</td></tr>");

}

echo("</table>");

}

else

{

echo("<p>Patient not found!</p>");

}

/\* Possibility of registering a new patient \*/

?>

<form action="getNewPatient.php" method="post">

<p><input type="submit" value="Register a New Patient"/></p>

</form>

<?php

echo("<p>Turn to the <a href=\"getPatient.php\">previous page</a></p>");

$connection = null;

?>

</body>

</html>

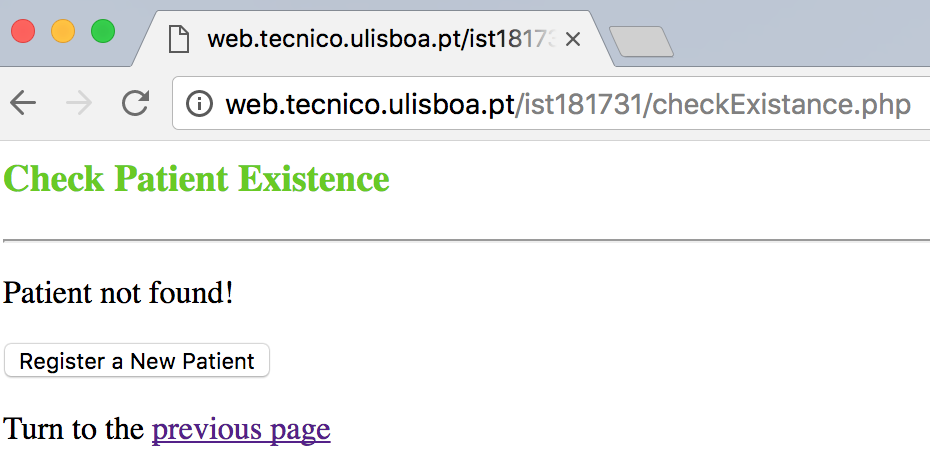
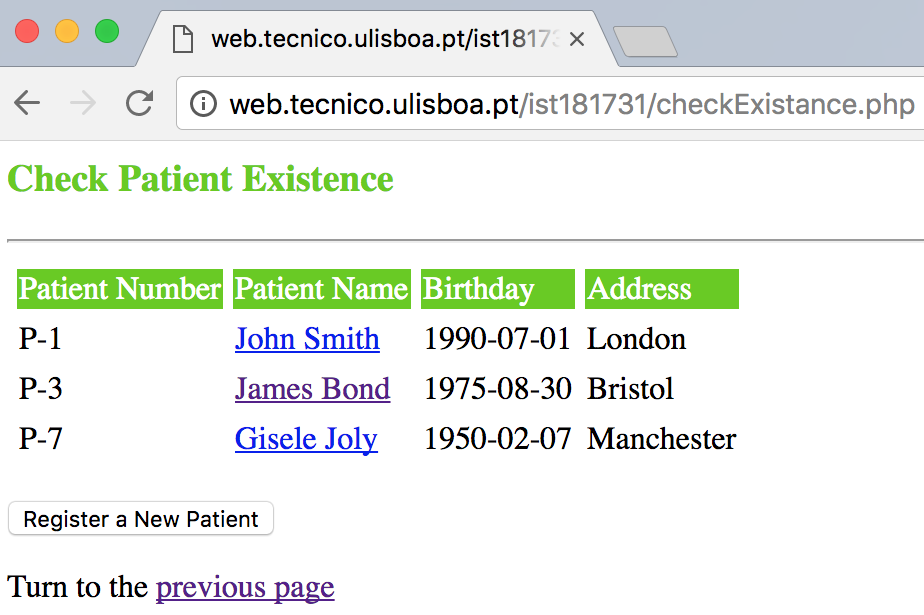


Figure 3 – Display records that contain the substring searched

If the portion of a name doesn’t match with any of the results (if there is one at least), then it’s possible to register a new patient, as well as making another search pressing the link to return to the previous page. In the first case, it will be displayed a web page that contains a form (getNewPatient.php) with three fields: the name of the new patient, birthday and address as represented in Figure 4.

* **getNewPatient.php:**

<html>

<body>

<h3><strong><font color= '#66CC00'>Register New Patient</font></strong></h3>

<hr/>

<form action="insertPatient.php" method="post">

<p>Name: <input type="text" name="newName" required/></p>

<p>Birthday: <input type="text" name="newBirthday" required/></p>

<p>Address: <input type="text" name="newAddress" required/></p>

<p><input type="submit" value="Register"/></p>

</form>

</body>

</html>

Figure 4 – Register a new patient

When the register button it’s pressed, then it will be displayed a web page that confirms the registration (Figure 5). The changes in the database are performed in a file called insertPatient.php.

* **insertPatient.php:**

<html>

<body>

<h3><strong><font color= '#66CC00'>Confirm Registration</font></strong></h3>

<hr/>

<?php

if($\_REQUEST['newBirthday'] > date("Y-m-d"))

{

echo("<p>Please enter a valid birthday date</p>");

echo("<p>Turn to the <a href=\"getNewPatient.php\">previous page</a></p>");

}

else

{

require 'connectDB.php';

$sql = "SELECT patient\_number FROM Patient";

$result = $connection->query($sql);

if($result == FALSE)

{

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

/\* Assign the next number, of the last one that exists, to the new patient \*/

$patient\_number = "P-" . (($result->rowCount())+1);

$name = $\_REQUEST['newName'];

$birthday = $\_REQUEST['newBirthday'];

$address = $\_REQUEST['newAddress'];

$stmt = $connection->prepare("INSERT INTO Patient VALUES (:patient\_number, :name, :birthday, :address)");

$stmt->bindParam(':patient\_number', $patient\_number);

$stmt->bindParam(':name', $name);

$stmt->bindParam(':birthday', $birthday);

$stmt->bindParam(':address', $address);

$stmt->execute();

if($stmt == FALSE)

{

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

echo("<p>Patient registered!</p>");

echo("<p>Turn to the <a href=\"homePage.php\">Home page</a></p>");

}

$connection = null;

?>

</body>

</html>

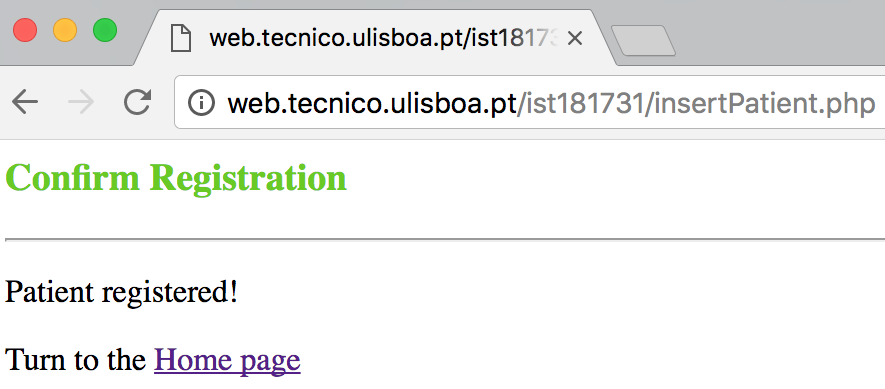


Figure 5 – Confirm registration

1. **Replace Devices**

When the user searches for a certain patient, the result table has a link in the field name. That link (represented in Figure 3) goes to another web page (getDevices.php) that shows not only the devices currently attached to that patient, but also the ones that the patient wore, since the patient was registered in the health care centre, as it can be seen in Figure 6.

* **getDevices.php:**

<?php session\_start(); ?>

<html>

<body>

<h3><strong><font color= '#66CC00'>Devices</font></strong></h3>

<hr/>

<?php

if(isset($\_GET['patient\_number']))

{

require 'connectDB.php';

$patient\_number = $\_GET['patient\_number'];

$\_SESSION['patient\_number'] = $patient\_number;

$stmt = $connection->prepare("SELECT \* FROM Wears WHERE patient\_number='$patient\_number' ORDER BY end\_date DESC");

$stmt->execute();

if($stmt == FALSE)

{

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

$nrows= $stmt->rowCount();

if($nrows > 0)

{

echo("<table border=\"0\" cellspacing=\"5\" bordercolor='#66CC00'>");

echo("<tr><td bgcolor='#66CC00'><font color= '#FFFFFF'>Serial Number</font></td><td bgcolor='#66CC00'><font color= '#FFFFFF'>Manufacturer</font></td><td bgcolor='#66CC00'><font color= '#FFFFFF'>Start Date</font></td><td bgcolor='#66CC00'><font color= '#FFFFFF'>End Date</font></td></tr>");

foreach($stmt as $row)

{

if($row['end\_date'] >= date("Y-m-d H:i:s"))

{

echo("<tr><td><strong>");

$serialnum = $row['serialnum'];

echo($row['serialnum']);

echo("</strong></td><td><strong>");

$manufacturer = $row['manufacturer'];

echo($row['manufacturer']);

echo("</strong></td><td><strong>"); $start\_date = $row['start\_date'];

echo($row['start\_date']);

echo("</strong></td><td><strong>");

$end\_date = $row['end\_date'];

echo($row['end\_date']);

echo("</strong></td><td>");

echo("<form action=\"replaceDevices.php\" method=\"get\">");

echo("<input type=\"hidden\" name=\"serialnum\" value=\"$serialnum\"/>");

echo("<input type=\"hidden\" name=\"manufacturer\" value=\"$manufacturer\"/>");

echo("<input type=\"hidden\" name=\"start\_date\" value=\"$start\_date\"/>");

echo("<input type=\"hidden\" name=\"end\_date\" value=\"$end\_date\"/>");

echo("<input type=\"submit\" value=\"Replace\"/>");

echo("</form>");

echo("</td></tr>");

}

else

{

echo("<tr><td>");

echo($row['serialnum']);

echo("</td><td>");

echo($row['manufacturer']);

echo("</td><td>");

echo($row['start\_date']);

echo("</td><td>");

echo($row['end\_date']);

echo("</td></tr>");

}

}

echo("</table>");

}

else

{

echo("<p>Patient never wore any device!</p>");

}

}

else

{

echo("<p>No patient was searched</p>");

echo("<p><a href=\"getPatient.php\">Search for a patient</a></p>");

}

$connection = null;

?>

</body>

</html>

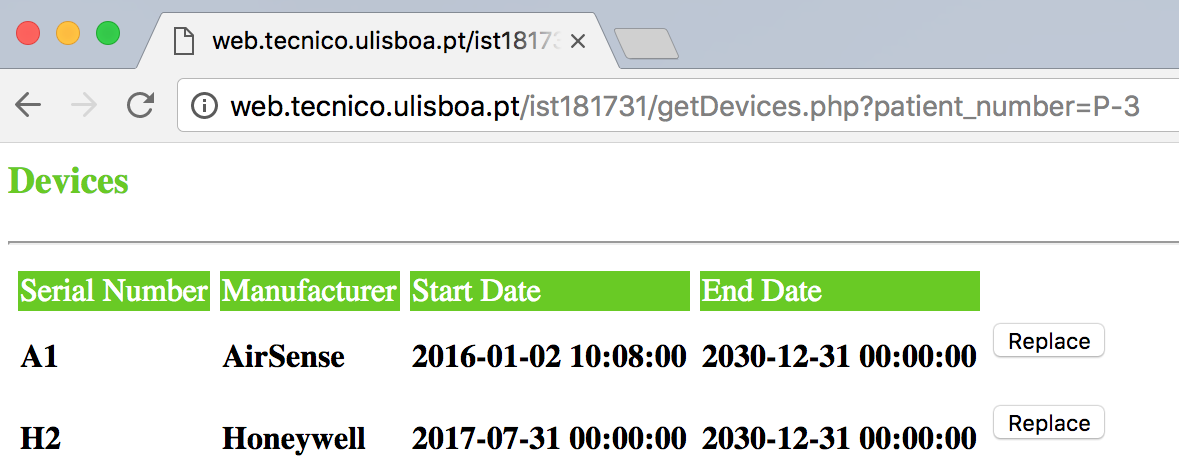


Figure 6 – Devices currently attached to a patient

Each device the patient is wearing at the time has the possibility of being changed by another one of the same manufacturer that is available (replaceDevices.php). The replacement is done by selecting one of the possible devices that are in a drop-down list and by pushing a button called Replace, as represented in Figure 7.

* **replaceDevices.php:**

<?php session\_start(); ?>

<html>

<body>

<h3><strong><font color= '#66CC00'>Replace Device</font></strong></h3>

<hr/>

<form action="insertReplace.php" method="post">

<?php

if(isset($\_GET['serialnum']) && isset($\_GET['manufacturer']) && isset($\_SESSION['patient\_number']) && isset($\_GET['start\_date']) && isset($\_GET['end\_date']))

{

require 'connectDB.php';

$serialnum = $\_GET['serialnum'];

$manufacturer = $\_GET['manufacturer'];

$patient\_number = $\_SESSION['patient\_number'];

$end\_date = $\_GET['end\_date'];

$\_SESSION['serialnum'] = $serialnum;

$\_SESSION['manufacturer'] = $manufacturer;

$\_SESSION['end\_date'] = $end\_date;

$\_SESSION['start\_date'] = $\_GET['start\_date'];

$stmt = $connection->prepare("SELECT serialnum FROM Device WHERE serialnum <> :serialnum AND manufacturer = :manufacturer AND serialnum NOT IN(SELECT serialnum FROM Wears WHERE serialnum <> :serialnum AND manufacturer = :manufacturer AND TIMESTAMPDIFF(SECOND, end\_date, CURRENT\_TIMESTAMP()) <= 0)");

$stmt->bindParam(':serialnum', $serialnum);

$stmt->bindParam(':manufacturer', $manufacturer);

$stmt->execute();

if($stmt == FALSE)

{

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

$nrows= $stmt->rowCount();

if($nrows > 0)

{

?>

<p>Devices available:

<select name="serialnum">

<?php

foreach($stmt as $row)

{

$serialnum=$row['serialnum'];

echo("<option value=\"$serialnum\">$serialnum</option>");

}

?>

</select>

</p>

<input type="submit" value="Replace"/>

<?php

}

else

{

echo("<p>No devices of that manufacturer are available at the current time!</p>");

echo("<p>Turn to the <a href=\"getDevices.php?patient\_number=$patient\_number\">previous page</a></p>");

}

}

else

{

echo("<p>No patient was searched</p>");

echo("<p><a href=\"getPatient.php\">Search for a patient</a></p>");

}

$connection = null;

?>

</form>

</body>

</html>

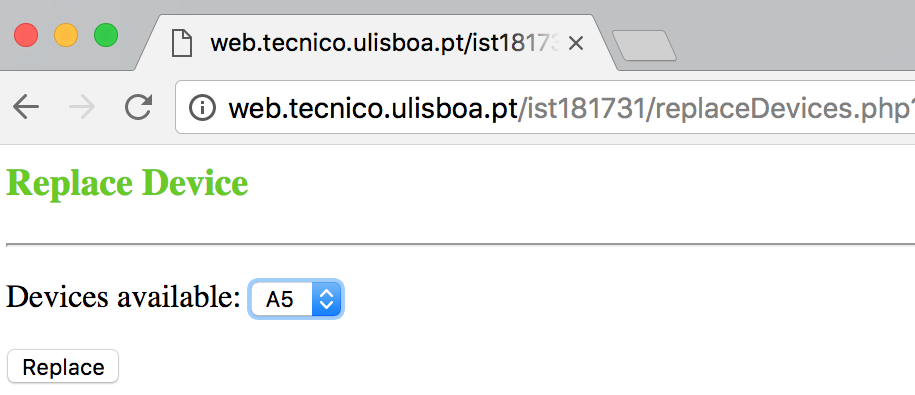
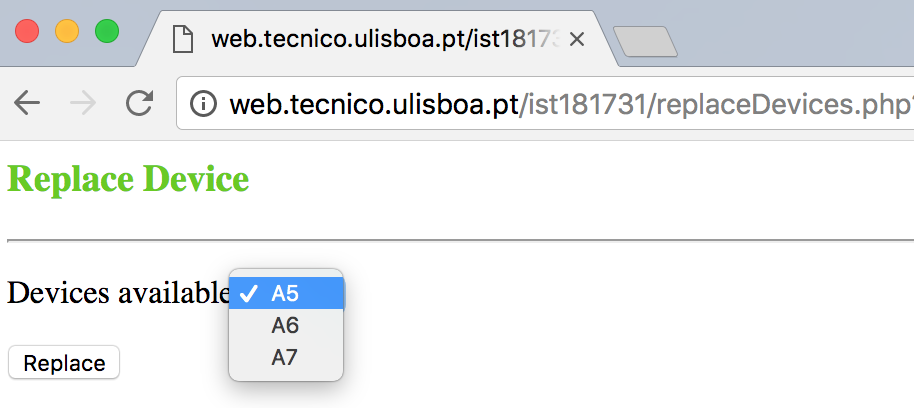


Figure 7 – Devices available to replace

In the insertReplace.php file the first thing that has to be done is to check if the both new periods already exist in table Period. In order to clarify which periods have to be inserted, let’s consider two devices A and B, in which A is being replaced by device B. So, the first period that has to be checked is the period that is going to be used to update the record about device A in table Wears. If the replace is being done today, the period is [start\_date of device A, today]. The other period is the one that it’s needed to insert the new record in table Wears about device B that is [today, end\_date of device A]. If the periods don’t exist, then they will be inserted.

After that, it will be inserted a new record and updated another one in table Wears, which corresponds to updating record A with the new period [start\_date of device A, today] and inserting a new record for device B with period [today, end\_date of device A]. If any error occurs, then a message with a confirmation of the replacement it will be displayed (Figure 8).

* **insertReplace.php:**

<?php session\_start(); ?>

<html>

<body>

<h3><strong><font color= '#66CC00'>Replacement Confirmation</font></strong></h3>

<hr/>

<?php

require 'connectDB.php';

$connection->beginTransaction();

$patient\_number = $\_SESSION['patient\_number'];

$oldSerialNum = $\_SESSION['serialnum'];

$oldManufacturer = $\_SESSION['manufacturer'];

$oldStartDate = $\_SESSION['start\_date'];

$oldEndDate = $\_SESSION['end\_date'];

$currentTimeDate = date("Y-m-d H:i:s");

$sql = "SELECT \* FROM Period";

$result = $connection->query($sql);

if($result == FALSE)

{

$connection->rollback();

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

$newPeriodExists = 0; /\* To check if the period of the new current device exists \*/

$updatePeriodExists = 0; /\* To check if the period of the replaced device exists \*/

foreach($result as $row)

{

if($currentTimeDate == $row['start\_date'] && $oldEndDate == $row['end\_date'])

{

$newPeriodExists = 1;

}

}

if($newPeriodExists == 0)

{

$stmt = $connection->prepare("INSERT INTO Period VALUES (:start\_date, :end\_date)");

$stmt->bindParam(':start\_date', $currentTimeDate);

$stmt->bindParam(':end\_date', $oldEndDate);

$stmt->execute();

if($stmt == FALSE)

{

$connection->rollback();

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

}

foreach($result as $row)

{

if($oldStartDate == $row['start\_date'] && $currentTimeDate = $row['end\_date'])

{

$updatePeriodExists = 1;

}

}

if($updatePeriodExists == 0)

{

$stmt = $connection->prepare("INSERT INTO Period VALUES (:start\_date, :end\_date)");

$stmt->bindParam(':start\_date', $oldStartDate);

$stmt->bindParam(':end\_date', $currentTimeDate);

$stmt->execute();

if($stmt == FALSE)

{

$connection->rollback();

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

}

/\* Updates the end date of the replaced device to the current date \*/

$stmt = $connection->prepare("UPDATE Wears SET start\_date = :oldStartDate, end\_date = :currentTimeDate WHERE patient\_number = :patient\_number AND start\_date = :oldStartDate AND end\_date = :oldEndDate");

$stmt->bindParam(':currentTimeDate', $currentTimeDate);

$stmt->bindParam(':patient\_number', $patient\_number);

$stmt->bindParam(':oldStartDate', $oldStartDate);

$stmt->bindParam(':oldEndDate', $oldEndDate);

$stmt->bindParam(':serialnum', $oldSerialNum);

$stmt->execute();

if($stmt == FALSE)

{

$connection->rollback();

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

$newDevice = $\_REQUEST['serialnum'];

$stmt = $connection->prepare("INSERT INTO Wears VALUES (:start\_date, :end\_date, :patient\_number, :serialnum, :manufacturer)");

$stmt->bindParam(':start\_date', $currentTimeDate);

$stmt->bindParam(':end\_date', $oldEndDate);

$stmt->bindParam(':patient\_number', $patient\_number);

$stmt->bindParam(':serialnum', $newDevice);

$stmt->bindParam(':manufacturer', $oldManufacturer);

$stmt->execute();

if($stmt == FALSE)

{

$connection->rollback();

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

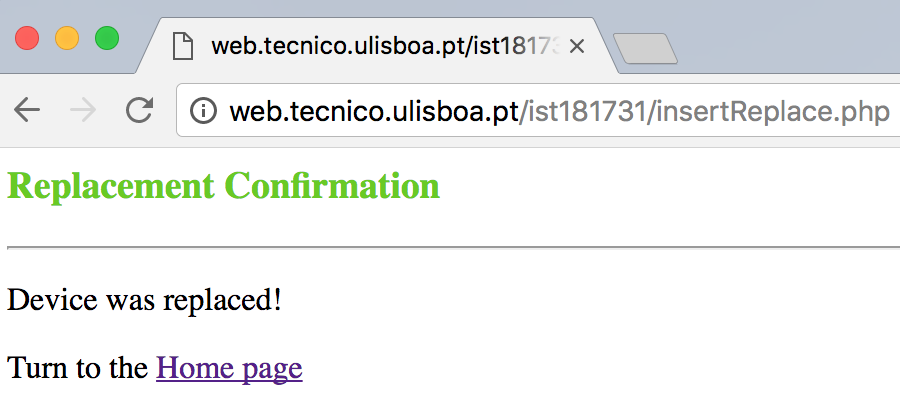
exit();

}

$connection->commit();

echo("<p>Device was replaced!</p>");

echo("<p>Turn to the <a href=\"homePage.php\">Home page</a></p>");

 $connection = null;

?>

</body>

</html>

Figure 8 – Confirmation of the replacement

1. **Create a new study/new series**

The user can also create a new study filling a form with the request number, description, date, a doctor and the serial number and manufacturer of the device that will be used (newStudy.php). The web page is represented in Figure 9.

* **newStudy.php:**

<?php session\_start(); ?>

<html>

<body>

<h3><strong><font color= '#66CC00'>New Study</font></strong></h3>

<hr/>

<form action="insertStudy.php" method="post">

<?php

require 'connectDB.php';

?>

<p>Patient Number:

<select name="patient\_number">

<?php

$sql = "SELECT \* FROM Patient";

$result = $connection->query($sql);

if($result == FALSE)

{

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

foreach($result as $row)

{

$patient\_number = $row['patient\_number'];

$patient\_name = $row['name'];

echo("<option value=\"$patient\_number\">$patient\_number | $patient\_name</option>");

}

?>

</select>

</p>

<p>Request Number: <input type="text" name="request\_number" required/></p>

<p>Description: <input type="text" name="description" required/></p>

<p>Study Date: <input type="text" name="study\_date" required/></p>

<p>Doctor:

<select name="doctor\_id">

<?php

$stmt = $connection->prepare("SELECT doctor\_id FROM Doctor;");

$stmt->execute();

if($stmt == FALSE)

{

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

foreach($stmt as $row)

{

$doctor\_id = $row['doctor\_id'];

echo("<option value=\"$doctor\_id\">$doctor\_id</option>");

}

?>

</select>

</p>

<p>Device:

<select name="serialnum">

<?php

$stmt = $connection->prepare("SELECT serialnum, manufacturer FROM Device WHERE (serialnum NOT IN(SELECT serialnum FROM Wears WHERE patient\_number <> :patient\_number)) OR (serialnum IN (SELECT serialnum FROM Wears WHERE patient\_number = :patient\_number))");

$stmt->bindParam(':patient\_number', $patient\_number);

$stmt->execute();

if($stmt == FALSE)

{

$info = $connection->errorInfo();

echo("<p>Error: {$info[2]}</p>");

exit();

}

foreach($stmt as $row)

{

$serialnum = $row['serialnum'];

$manufacturer = $row['manufacturer'];

echo("<option value=\"$serialnum\">$serialnum | $manufacturer</option>");

}

?>

</select>

</p>

<p><input type="submit" value="Add New Study"/></p>

<?php

echo("<p>Turn to the <a href=\"homePage.php\">Home page</a></p>");

$connection = null;

?>

</form>

</body>

</html>