Automatización de criterios para el reporte de indicado-res de acreditación de carreras de informática y sistemas

Criteria automation for accreditation indicators reporting of computer science and systems careers

Ángel González Santillán
Instituto Tecnológico de Tuxtepec
santillan@ittux.edu.mx

María Isabel Hernández Zágada
Instituto Tecnológico de Tuxtepec
maria.isabel.hernandez.zagada@ittux.edu.mx

Resumen

En el departamento de sistemas y computación que depende directamente de la subdirección académica y estas a su vez de la dirección, para llevar a cabo todas las actividades encomendadas por la academia tales como generar propuestas, ideas e innovaciones, para el diseño y desarrollo de proyectos académicos institucionales en forma conjunta, participativa e integral, a través de la conformación de grupos de trabajo se llevan a cabo reuniones de academia en las cuales se tienen actividades futuras a desarrollar, fundamentadas en las prioridades académicas de la institución y de acuerdo con las políticas y lineamientos de mediano plazo enunciadas en el programa nacional educativo del gobierno federal, de los programas que establezcan la Subsecretaría de Educación e Investigación Tecnológicas, así como las políticas educativas determinadas en el apartado para la Dirección General de Institutos Tecnológicos y los mecanismos de coordinación instrumentados por estas, para el diseño y desarrollo de los pro-gramas institucionales, entre los cuales se establecen los siguientes proyectos académicos: seguimiento curricular, Investigación científica y tecnológica, formación y actualización docente y profesional, proyectos de vinculación y residencias profesionales, apoyos académicos, fortalecimiento del proceso enseñanza aprendizaje, adquisición de material bibliográfico, apoyo al posgrado, apoyo a la titulación.

Palabras Clave: Base de datos, SDLC, Fusión charts.

Abstract

In the Department of systems and computer that reports directly to the academic Department and these in turn from the direction, to carry out the activities assigned by the Academy such as generate proposals, ideas and innovations, for the design and development of institutional academic projects together, participatory and integral, shaped through the creation of working groups are held meetings of Academy in which future activities are to develop, based on the academic priorities of the institution and in accordance with the policies and guidelines of the medium-term set forth in the national education program of the Federal Government, programs that establish the Undersecretary of Education and Technological Research, as well as educational policies determined in the section for the General Direction of Technological Institutes and mechanisms of coordination instrumented by them, for the design and development of institutional programs, among them are established the following academic projects: curriculum tracking, scientific and technological research, training and teaching and professional update, linkage projects and residences professionals, academic support, strengthening the teaching process learning, acquisition of bibliographic material, graduate support, support for certification.

Key Words: Database, systems development life cycle (SDLC), SDLC, Fusion charts

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Introduction

Today the creation of a web system that allows you to automate a statistician of those criteria that have been completed and which not, reported by each head of each criterion accrediting House selfassessment format National Board of Accreditation in Informatics and Computing (CONAIC) is of great importance since a compromise that was established between the accrediting House and the Institute is to report every six months. Therefore, timely information for its correct implementation is of vital importance for all the technological community (body management, teaching, nonteaching, and students) allowing to modify the way of working, making it more efficient and comfortable allowing saving time, Therefore, the project was developed considering chapter I the

problematization speaks of relevant records formation, approach to the problem, objectives and justification. Later, in chapter II illustrates the theoretical framework, in which knowledge of the topics are displayed as life cycle that will allow observing the methodology for the elaboration of a web system, PHP which is an interpreter that works on the server side and allows to make connections and necessary links between interfaces and database, HTML which is a marker language of hypertext, which will allow the generation of interfaces via forms and MySql which is the manager who will give the properties of a database that provides the potential benefits of the access to information.

All these aforementioned activities are conducted within the academy and as can be ob-preserve in each academic project is very important and is even more relevant when it is served at meetings held by members of the Academy of Lic . Computer & Ing. Computer Systems Institute of Technology Tuxtepec. In turn, take these projects is reflected in the criteria for accreditation, which are part of the self-assessment format accrediting CONAIC house (National Council for Accreditation in Infor-matic and Computing), which develop software to enable verification what criteria have been covered to date and which slopes, streamline decision making for the timely delivery semester not only of information emanating from the academy, but also of that which is provided by the offices involved in the institution but that is collected by those responsible for each criterion appointed by agreement at the academy itself.

For all the life cycle consisting of methodology shall be used: 1. Identification of problems, opportunities and objectives, 2. Determination of the information requirements, 3. Analysis of needs \ system 4. Design the recommended system 5. Development and documentation software, 6. Testing and maintenance of the system, 7. Implementation and evaluation of the system.

Chapter III for the contextual framework that allows to know where the web system was developed, the services offered by the site and its history and nature of the institution was developed. Then, in chapter IV the methodological process ranging from the methodology considering variables hypothesized to measure and how to gather information, and the implementation of the 7 stages of Life Cycle methodology is illustrated, allowing design, development and implementation of web

system. In Chapter V the results, analysis and interpretation are performed once implemented the system, measuring the impact this has on the variables of assumptions and the conclusions that were reached are presented.

DEVELOPMENT

The life cycle of systems development

The life cycle of systems development (SDLC Systems Development Life Cycle) is a methodology that uti-liza to develop a system (in this case will be a web system) from the point of view of a data analyst and the user, who is the end who end up using the system. As found in Kenneth e. Kendall (2005):

The life cycle of systems development (SDLC, Systems Development Life Cycle). The SDLC is a phased approach to the analysis and design whose main premise is that the systems are best developed using a specific activity cycle analyst and the user. (P. 10).

The SDLC includes 7 stages, which will be used for the development of Web System (aca-demic logs). These 7 stages ranging from identification of needs to cover, identify areas of opportunity, to implementation and evaluation of the installed system. As found in (Kenneth and Kendall, 2005, p. 10):

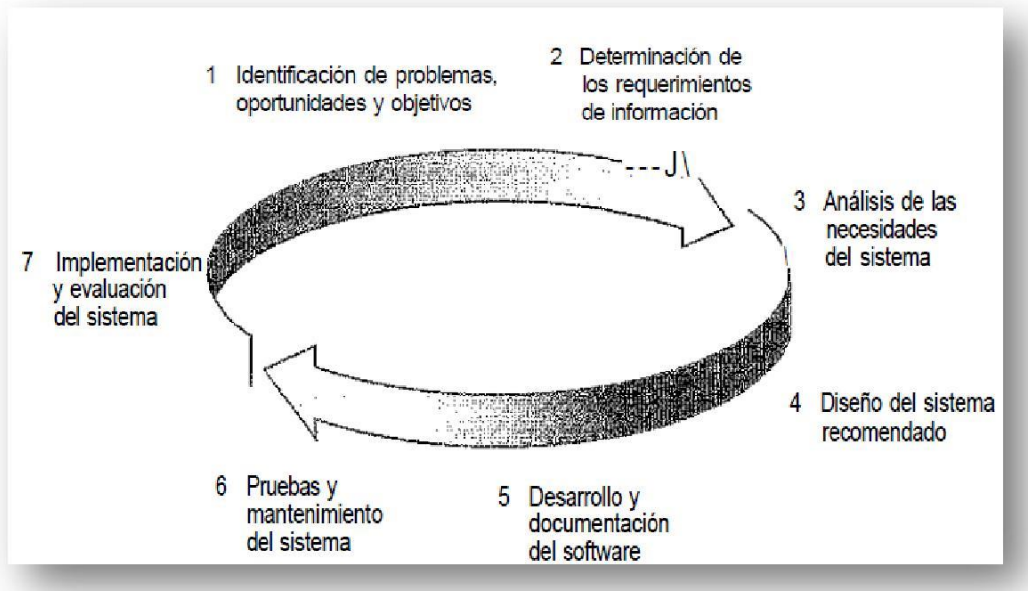

Fig. 1. The 7 stages of development lifecycle Systems.

Identifying problems, opportunities and objectives.

This is one of the first phases of the SDLC and by no means the least important, because in these areas of opportunity and once detected are detected will allow generating overwhelmingly targets whose tendency to cover those problems or needs that predominate in the Institution (Tuxtepec Technological Institute) when gathering information from each of the 11 criteria for accreditation self-assessment format CONAIC.

As you can see, this step is very important because if you do not perform well were to detect opportunities or areas for improvement, the other 6 stages will be affected because they are based on the first phase. As found in (Kenneth e. Kendall, 2005, p. 10), this step is critical to the success of the rest of the project, because nobody likes to waste time working on a problem that was not to be settled.

The work of the analyst system is very important because in many occasions, as the saying goes, two heads are better than one, and this meant that as an analyst one must be very objective, accurate. Should not be based on findings of a single person, but in others, because those problems can be detected by someone else, as found in (Kenneth e. Kendall, 2005, p. 10). Often the problems are detected by someone else, and this is the reason for the initial analyst call.

The importance of the analyst in this phase is to identify those opportunities for improvement to enable the development and implementation of the system, obtaining a competitive advantage for the institution to be more objective to detect specific problems. Therefore, this must be a good relationship between managers, users and analysts who are directly involved in that stage.

At the end is expected to get the viability of the system involves the definition and objectives of the problem identified in this case for the operation of the academies of technological institutes. Once

submitted to the government, should decide whether to go ahead or not. This could be for several reasons, for example, in the case of technology may be due to lack of budget, time based on the nature of transaction offices, or quite simply because the solution to the problem is not a system like expected.

Determining the information requirements

Unlike before, this phase is for the analyst is sure the objectives of the institution; in this case, collects information from each of the 11 criteria for accreditation self-assessment format CONAIC and thus confirms and understands the relationship of the users responsible for each criterion (Kenneth e. Kendall, 2005, p. 11). This phase is useful to confirm the analyst's idea of the organization and its objectives.

Here the analyst must detail the functions of the various parts, such as: who (those operating in the accreditation criteria), what (activities are carried out), where (the environment in which they develop), when (develop time), how (the way how the self-assessment procedure performed). The important thing here is to demarcate the reason that the current system is used or perhaps know the reasons why there are proposals to use other methods currently on the market.

All this will allow the analyst to tell from the activities with the collection of information from each of the 11 criteria for accreditation self-assessment format CONAIC, what elements of entry between the personnel involved are generated, the outputs expected, as well as the necessary processing on the respective outputs, and thus improve the proposed system.

Needs Analysis System

After gathering information between users and administrators (in this case teachers and staff management) seen in the previous phase, it is necessary in this third phase an analysis of all this information across the who, what, where, when and how, later to express those ideas but by a flowchart that allows expressing the activities carried out in the process, its inputs and its outputs. This graphic and structured form, ie, capture all that information in a flowchart allows not only

reflect data and actors involved in the process, but also reflect technical data must be con-tuning in system development I desired. As was found in (Kenneth e. Kendall, 2005, p. 11), from the data flow diagrams a data dictionary that lists all data used in the system and their respective specifications is developed.

For the development of these phase one analyst must provide a small proposal system including an overview of the activities in the self-assessment format CONAIC with the elements and actors involved but unlike carry out manually provide the benefits and costs as well as the alternatives offered by the new system contrasting the advantages and recommendations.

Usually, when the analyst makes a proposed system involves one or more recommendations either by the analyst himself by the way how to be more efficient and effective the system or by the administrator. In addition, the analyst should also mention the possible ways to solve the problem or area of opportunity to raise operability progress report CONAIC self-assessment format.

Recommended System Design

In this phase the analyst must use the information gathered in the previous phases to now make the design ranging from those commonly known as (GUIs, Gra-phical User Interfaces) to files or base graphical user interfaces (Screens System) data in which information is stored as found in (Kenneth e. Kendall, 2005, p. 12). The design phase also includes the design of files or databases that store much of the data needed for managers to make decisions in the organization.

This is very important to choose what file type information is stored because they depend much the way how to access it (information) and information from them (files) is removed, all this to meet specifications system detected in previous phases, hence the importance of making the right choice in the type of file being used.

The interfaces on a computer are very important because the better the interface between the user and the computer better strengthens communication and interaction with it. Examples keyboards or mouse are, among others, through more or less sophisticated interfaces, so does the screens and

menus screens that allow good communication between the user and the system, considering of course that the data enter are correct. This means that no erroneous characters that disadvantage the proper functioning of the system and the database are captured; for example, instead of capturing the name of a member of academia, capture his age, etc., as found in (Kenneth e. Kendall, 2005, p. 12). The analyst designed to capture accurate data to ensure that those who enter the system information is correct procedures.

Developing and documenting software

Virtually so far (phase 5), the analyst has helped develop pseudocode and flowcharts based on phases 1 and 2, where all information that may be required for viability and operation of Web system development is collected, however , has not worked with the development of original software is that for the programmer develops is necessary to have as input the above, pseudocode and flowcharts, which are provided by the analyst programmer so that it can, despite the redundancy program the original software (system logs), as found in (Kenneth e. Kendall, 2005, p. 12). The analyst works closely with programmers to develop any original software required.

Of course when the flowcharts, pseudocode, Graphical user interfaces (GUI, Graphical User Interfaces) are designed no syntax errors are detected because the role of the analyst is just that, set the inputs and outputs of the process of reporting activities carried out in Based on the self-assessment format CONAIC paper. In saying on paper, it is implied that based on the language of flowcharts, pseudocode and user interfaces, the analyst is using the corresponding language the programmer used to develop the original software. That is the true role of the programmer: design, code and eliminate possible syntax errors in the original software. As found in (Kenneth e. Kendall, 2005, p. 12), programmers play a key role in this stage because design, code and eliminate syntactic errors computer programs.

Testing and System Maintenance

Something very important at this stage (6), once it has completed the original software, is to try it, but more importantly try so that the problems detected are not as expensive to the same screening

process. To not need to be expensive at first instance the original software created so try the same developer, only the disadvantage that you can have is that the programmer in the same task of creating original software and not doubting your experience; detect syntactic lines and perhaps improve the validation of some user interfaces (screens) because the nature of the programmer is just that and not to have direct contact with people who will use it, so once the programmer finished testing the system is recommended that system now (original software) analyst try it because it was he who gave ideas, inputs, outputs, process development that users and administrators manual academies technological institutes operate . The analyst knows and is gathering the experiences of users interacting in a real way in this process. However, it is advisable to get closer to the reality of objectivity when this system is tested to be fed with real data of users and administrators to thereby increase the precision in detecting problems.

But what the analyst done while the programmer works in the original software? While the developer is reading and translating user interfaces, flowcharts and pseudocode provided by the analyst himself, this is responsible for progressively develop the appropriate manuals can be manuals, handbooks administrator, supervisor manuals, etc. The analyst is the one with the collection of the demands and needs of those who work directly with the process. When the Web system with these phase (6) develops future delivery system maintenance information and, therefore, if there be changes to the system to update the appropriate manuals, so here the task persists between analyst and the developer respectively. As found in (Kenneth e. Kendall, 2005, p. 13). System maintenance information and documentation begin at this stage and are performed routinely throughout his life.

Implementation and evaluation system

In this last phase participate directly programmer and analyst, because once I finished the Web information system and after being tested by them is due to implement. This refers to conduct a planning system prior to today, if that were the case, and if there is no system before migrating simply carry out a planning as one system. Although this step is carried out between the programmer and analyst, directly responsible is only the analyst.

It should be noted that although in this last phase evaluation information system is presented, does

not mean that the other phases are not evaluated. In fact, since Phase 1 assessments of various kinds are made, for example, in phase 1 feasibility of the system, etc. is evaluated. This phase has been controversial, so that only the system implementation is evaluated, without discarding the previous phases in which, as already mentioned, the focus is evaluation.

It is very important to note that although there are 7 stages not always the fact finished a stage and move 3 does not mean that one can not return to the stage or stages before it can actually be many reasons why one can back 1, 2 or more phases, ranging from information wrong reasons as interpreted by the analyst, to misinformation provided by operating with the report of activities carried out on the basis of self-assessment format CONAIC as applicable, is it actually work developing a system is cyclical.

Development and implementation of software

At this stage the necessary software that meets the specifications of the above steps are developed. The organization of files on the system will be located as follows:

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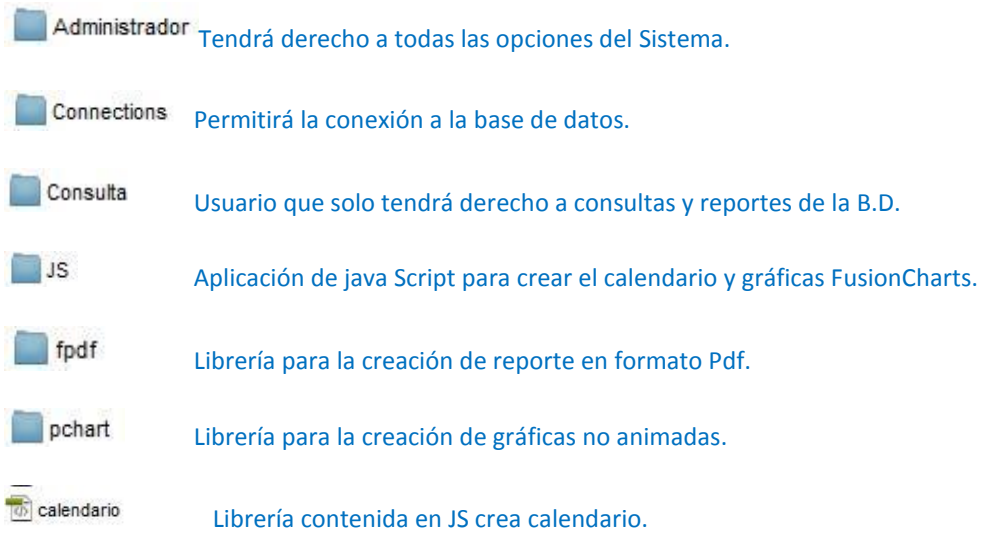
At this stage the necessary software that meets the specifications of the above steps are developed. The organiz ativos ation of files on the system will be located as follows:



FusionCharts Librería contenida en JS crea gráficas animadas .swf

To control access to the system there are two ways of doing this, one that will be in administrator mode which may be the president, secretary or department head academia, accessing a folder Administrador and another member of academia accessing the folder Consulta the first will have all the rights and privileges in the system and the second single queries and reports giving limited to modify, delete or discharge information. The way to authenticate is as follows:

Fig. No. 1. Menú de autentificación.

For the development of the previous interface corresponding table to registered users consult only allowing access to authorized system administrator, as shown in the following code:

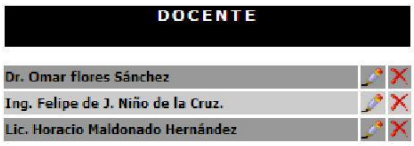
```
$LoginRS__query=sprintf("SELECT usuario, clave, nivel FROM usuarios WHERE usuario=%s AND clave=%s",
GetSQLValueString($loginUsername, "text"), GetSQLValueString($password, "text"));
```

Once the user is authenticated and allowed access to the system, entitled according to their permissions to the system options. Taking into account that has all the rights and privileges of the system, the code of the forms that will be the interface between the user and the database was developed, these sentences are the same that apply to all forms of insertion, only vary fields and variables referred to, as applicable. To insert have the following code that includes the variables forms of databases.


```
<form action="<?php echo $editFormAction; ?>" method="post" name="form1" id="form1">
  <p> </p>
  <table align="center">
    <tr valign="baseline">
      <td width="58" align="right" nowrap="nowrap" class="inserta_tablas1"><strong>Docente:</strong></td>
      <td width="192" class="inserta_tablas2"><input type="text" name="ubicacion" value="" size="75" id="ubicacion"/></td>
    </tr>
    <tr valign="baseline">
      <td align="right" nowrap="nowrap" class="inserta_tablas1"> </td>
      <td class="inserta_tablas2"><input type="submit" value="Insertar registro" onclick="return Ubicacion();"/>
        <label>
          <input type="reset" name="button" id="button" value="Restablecer" />
        </label></td>
    </tr>
  </table>
  <input type="hidden" name="MM_insert" value="form1" />
</form>
```

Fig. No. 2. Form and embed code.

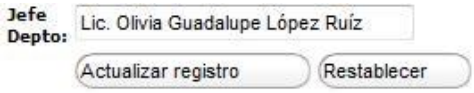
In the case of a query previously stored information in a database has the following form, it displays by default the data in a table, that is, here you will not put any data to find only displays your total content as seen in figure # 3.




```
      <td colspan="3"><h3>docente</h3></td>
      </tr>
    <?php $contador = 0; $contador1 = 0; $contador2 = 0; ?>
    <?php do { ?>
      <tr>
        <td width="350" <?php if ($contador++ % 2) { echo 'class="color"'; } else { echo
'class="color1"'; } ?>><?php echo $row_Ubicacion['ubicacion']; ?></td>
```

Fig. No. 3. Form and query code.

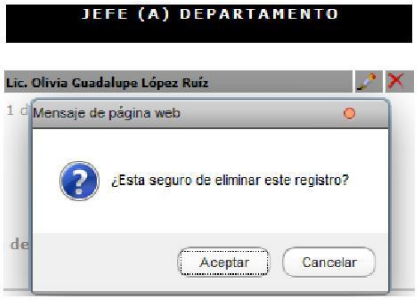
As can be seen in the above figure, there is an icon that also provides the option to modify. Likewise, it is not for others to mention that this same statement applies to all modifications made to the tables of the database to which you want to change any information previously cap-tured, which are worth discussing is the value to be changed will take it directly from line position, therefore automatically displays the value but with the option to change, as shown in Figure No. 3:




```
<form action="<?php echo $editFormAction; ?>" method="post" name="form2" id="form2">
  <table align="center">
    <tr valign="baseline">
      <td width="32" align="right" nowrap="nowrap">Jefe Depto:</td>
      <td width="200"><input type="text" name="area" value="<?php echo htmlentities($row_DetailRS2['area'], ENT_COMPAT, 'utf-8'); ?>" size="32" /></td>
    </tr>
    <tr valign="baseline">
      <td nowrap="nowrap" align="right"> </td>
      <td><input type="submit" value="Actualizar registro" onclick="return Area();"/>
        <label>
          <input type="reset" name="button" id="button" value="Restablecer" />
        </label></td>
    </tr>
  </table>
  <input type="hidden" name="MM_update" value="form2" />
  <input type="hidden" name="id_area" value="<?php echo $row_DetailRS2['id_area']; ?>" />
</form>
```

Fig. No. 4. Form and code modification of specific record.

As you can see in the figure above also exists an icon that provides the option to remove, in the same way is not for others to mention that this same statement applies to all modifications made to the tables in the databases in you want to remove any information previously captured. It is worth commenting that the value taken directly to eliminate the position where the line is taken,, so automatically show a window for the selected operation is confirmed, as shown in Figure No. 5:




```
if ((isset($_GET['recordID'])) && ($_GET['recordID'] != "")) {
  $deleteSQL = sprintf("DELETE FROM area WHERE id_area=%s",
                       GetSQLValueString($_GET['recordID'], "int"));
```

Fig. No. 5. Form and disposal code to a specific record.

In developing the fpdf code generation library for .pdf files were used as shown in Figure No. 6.

SEP
SECRETARÍA DE EDUCACIÓN PÚBLICA

Subsecretaría de Educación Superior
Dirección General de Educación Superior Tecnológica
Instituto Tecnológico de Tuxtepec

Relacion de Criterios por docente

Lic. Informatica

Docente	No.	Criterio	Recomendacion	Acción realizada	Atendido	Fecha	Observaciones
Lic. Ma. Isabel Hernández Zágada	1	La información relativa a esta categoría corresponde al objetivo general, objetivos específicos y perfil de egreso que pretende alcanzar el programa, misma que debe ser ampliamente difundida	Colocar la información del perfil del egresado y objetivo del programa en la página institucional y colocar dicha información en lugares visibles de la institución para el área de Lic.	a) Se recomienda hacer difusión del perfil del egresado y el objetivo del programa, tanto en la página Institucional como en lugares visibles dentro de la Institución.	Si	2011-10-05	1.Fotografia de la estructura con la lona que contenga el objetivo y perfil del egresado de la carrera. 2. Link de la página donde se encuentra publicado el objetivo y el link del egresado.

Fig. 6. Report .pdf assistance of teachers.

For the generation of the previous format the following code that uses the above library (fpdf) was used, per-mitiendo obtain real-time information at the time it is captured via web within or outside the institution and be stored in a file reading. This also allows portability of reports. The code is as follows:

```
<?php
 require('../../fpdf/fpdf.php');
 require('clasepdf.php');
 $pdf=new PDF('L','mm','Letter');
 $pdf->AddPage();
 $pdf->SetFont('Arial','B',12);
 $pdf->MultiCell(0,2,"Relacion de Criterios por docente",0,'C');
 $db = mysql_connect("localhost", "root", "");
 mysql_select_db("activos",$db);
 $pdf->MultiCell(0,7,"",0,'C');
 $pdf->Ln();
 $result = mysql_query("SELECT * FROM `actas`  order by folio",$db);
  $pdf->MultiCell(0,7,"Lic. Informatica",0,'C');
 $conta=1;
 $pdf->SetFont('Arial','B',8);
 $pdf->SetFillColor(230,230,0);
 $pdf->Cell(40,7,utf8_decode ("Docente"),1,0,'C',1);
 $pdf->Cell(7,7,utf8_decode ("No."),1,0,'C',1);
 $pdf->cell(40,7,("Criterio"),1,0,'C',1);
 $pdf->cell(40,7,("Recomendacion"),1,0,'C',1);
 $pdf->Cell(40,7,utf8_decode ("Acción realizada"),1,0,'C',1);
 $pdf->cell(20,7,utf8_decode ("Atendido"),1,0,'C',1);
 $pdf->cell(20,7,("Fecha"),1,0,'C',1);
```

In the above code the fpdf library and configuration messages that have the file that is generated is observed; Furthermore, the connection to the database required to retrieve the information stored in its tables and then query criteria required to retrieve the specific information is set is generated. So far some result is not displayed, because only the function library was declared, was connected to the database and made the query, in this same way the

generation of other reports is made.

```
while ($fields = mysql_fetch_array($result))
    {

        if($conta%2==0)
         $pdf->SetFillColor(230,230,0);
        else
         $pdf->SetFillColor(230,235,230);


         //*****************************************************************

            // Primero me guardo las coordenadas donde comienza la celda multilinea.
               $y1 = $pdf->GetY();
               $x1 = $pdf->GetX();

         //Docente
            $pdf->MultiCell(40,7,utf8_decode ($fields['acti']),1,'L',1);
```

In the above code the deployment of information is taken from the database previously, to deploy a while we used a nested loop if else, placing the names of the fields containing the database in their respective tables is observed . This is for generating the table requesting CONAIC format.

```
$result = mysql_query("SELECT * FROM `actas`  order by folio",$db);
```

In the above code the query is shown to the contrary to the previous case, ie, when the assists meet the condition of NO. The output format and deployment of the table is the same as above. Thus, only changing the conditions of consultation and design Pdf format report as required, is as output formats requested by the user are obtained.
In the case of report generation graphics Bookseller used:

1. FusionCharts

Bookseller (FusionCharts) was used to generate graphs in real time, but unlike the previous not ex-behaved to paste into a document Pdf, just stuck directly on the screen of the system to effect consultation, as seen in following figure:

Fig. 7. Report teachers for career.

To generate all graphs of this type (FusionCharts) in the system is declared at first library to use, all that varies between a graphic and other is the type of query that is to be performed, depending on the type of report that is request. Moreover, both the connection, library name, format, layout, font size, etc., remain the same. Seller's statement is as follows:

```
include ("../../JS/Functions.php");
require_once("../../JS/FusionCharts.php");
```

After the declaration of variables are initialized:

```
$intTotalAnio1 = $valores1["total1"];
$intTotalAnio2 = $valores2["total2"];
$strXML = "";
```

Then proceed to define the characteristics of the text or caption on the x axis, as shown below:

```
$strXML = "<chart caption = 'Total de docentes por area' bgColor='#CDDEE2'
baseFontSize='12' showValues='1' xAxisName='L.I
I.S.C.' >";
```

After placing the legend proceeds to display the values that contain each bar and their respective colors, as shown in the following code:

```
$strXML .= "<set label = '$_POST[periodo]'  value ='".$intTotalAnio1."' color =
'EA1000' />";
$strXML .= "<set label = '$_POST[periodo2]'  value ='".$intTotalAnio2."' color =
'EA1000' />";
```

It remains to display the graphic finished with respetivas characteristics of size, as shown in the following code:

```
echo("<center>");
echo renderChartHTML("../../imagen/Column3D.swf", "",$strXML, "ejemplo", 400, 400,
 false);
echo("</center>");
```

After the programming interfaces provided all based on previous stages, rehearsals were held in the structure of the design and coding, to eliminate syntactic or semantic errors in the system.

The documentation on the good use for enhanced system performance is paramount, so they were designed
2 manual:

1. Administrator (Head of Department, Coordinator accreditation) Manual.

2. A member of academia.

CONCLUSIONS

Once the analysis, development and implementation of the system the system is completed, we will proceed to check the variables by means of a questionnaire mentioned above before applying the SDLC (Questionnaire) methodology.

Variable a medir: Acceso a las Interfaces del Sistemas Web vía remota.	**Respuestas**	
1. ¿La inserción de criterios de acreditación del conaic, documentación del criterio, usuarios se pudo llevar acabo dentro y fuera de la institución de manera remota?	1☐ Sí	2☐ No
2. ¿La modificación de criterios de acreditación del conaic, documentación del criterio, usuarios se pudo llevar a cabo dentro y fuera de la institución de manera remota?	1☐ Sí	2☐ No
3. ¿La eliminación de criterios de acreditación del conaic, documentación del criterio, usuarios se pudo llevar a cabo dentro y fuera de la institución de manera remota?	1. Sí	2. No
4. ¿La búsqueda de criterios de acreditación del conaic, documentación del criterio, usuarios se pudo llevar a cabo dentro y fuera de la institución de manera remota?	1. Sí	2. No
5. ¿Los reportes de docentes-criterios, criterios atendidos (PDF y gráficas)se pudo llevar a cabo dentro y fuera de la institución de manera remota?	1. Sí	2. No
5. ¿Se redujo cosiderablemente el tiempo de localización de la información de tu participación en los criterios de acreditación como docente a como se hacía antes de utilizar el sistema Web?	1. Sí	2. No
6. ¿Se redujo cosiderablemente el tiempo de localización de la información de los criterios desarrollados como docente a como se hacía antes de utilizar el sistema Web?	1. Sí	2. No
7. ¿Se redujo cosiderablemente el tiempo de localización de la información en tu participación de redacción de criterios cumplidos como docente a como se hacía antes de utilizar el sistema Web?	1. Sí	2. No
8. ¿Se redujo cosiderablemente el tiempo de localización de la información en la generación de reportes pdf elaborados como docente a como se hacía antes de utilizar el sistema Web?	1. Sí	2. No
9. ¿Se redujo cosiderablemente el tiempo de localización de la información en la generación de reportes docentes-criterios, criterios atendidos (PDF y gráficas)como docente a como se hacía antes de utilizar el sistema Web?	1. Sí	2. No
11. ¿Te fue fácil buscar la información de tus datos como docente a como se hacía antes de utilizar el sistema Web?	1. Sí	2. No
12. ¿ Te fue fácil buscar la información en las participaciones de redacción de criterios como docente a como se hacía antes de utilizar el sistema Web?	1. Sí	2. No
13. ¿ Te fue fácil buscar la información de tu criterio como docente a como se hacía antes de utilizar el sistema Web?	1. Sí	2. No
14. ¿ Te fue fácil buscar la información de los criterios que te fueron asignados como docente a como se hacía antes de utilizar el sistema Web?	1. Sí	2. No
15. ¿ Te fue fácil buscar la información en la generación de reportes de docentes-criterios, criterios atendidos (PDF y gráficas)antes de utilizar el sistema Web?	1. Sí	2. No
16. ¿Consideras que la toma de decisiones sobre docentes-criterios (PDF y gráficas), facilitan la toma de decisiones al responsable sobre el total de criterios alcanzados al contar con este tipo de reportes?	1. Sí	2. No
17. ¿Consideras que la toma de decisiones sobre criterios atendidos (PDF y gráficas), facilitan la toma de decisiones al responsable sobre el total de criterios alcanzados al contar con este tipo de reportes?	1. Sí	2. No
18. ¿Consideras que la toma de decisiones sobre docentes-criterios (PDF y gráficas), facilitan más la toma de decisiones al docente, presidente y secretario de academia sobre el total de criterios cumplidos?	1. Sí	2. No
19. ¿Consideras que la toma de decisiones sobre docentes-criterios (PDF y gráficas), facilitan la toma de decisiones para regularizar los criterios que no se han cubierto al contar con este tipo de reportes?	1. Sí	2. No

20. ¿Consideras que la toma de decisiones sobre docentes-criterios atendidos (PDF y gráficas), ayudarán a tener a la mano información mas rápida para la toma de desiciones?	1☐ Sí	2☐ No

Nombre	Resultados
1. Jefe Depto. de Sistemas y Computación.	20
2. Presidente de Academia de Lic. Informática e Ing. Sistemas Computacionales.	20
3. Secretario de Academia de Lic. Informática e Ing. Sistemas Computacionales.	20
4. Docente (Integrante) de la Academia de Lic. Informática e Ing. Sistemas Computacionales (Asignatura).	20
TOTAL	80

80 / 4= 20.

20 25 30 35 40

SÍ cubre las necesidades. Cubre al 50% NO cubre las necesidades.

It is observed that by automating the activities of procedure academies in the Technological Institute of Tuxtepec, access times and location information decreases from anywhere, inside and outside the institution, which meets the needs for which was created, allowing, among other things: reduce time in locating information, return easier decision making and seek information, all in real time.

Upon completion of the project shows that the variables of silver hypothesis at first, such as interfaces, web system and report generation, all in real time and distance (in red), showed a significant positive outcome to meet the needs for which they were created. However, it is necessary to maintain a permanent feedback and continuous improvement in the procedures manual.

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