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CLOUD

The Official Research Journal of the Information Technology Education Faculty and Students

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About the Journal

CLOUD is the official journal of the student research outputs or capstone projects of the Information Technology Education Program of the University of the Immaculate Conception. This journal is published annually, and is composed of research outputs or capstone projects from three different courses offered under the ITE Program: BS in Computer Science, BS in Information Technology (Specialized in Software Engineering, Multimedia, and Computer Networking), and BS in Information Systems.

Eric John G. Emberda, MIM
Coordinator - IT Development and Incubation Facility
Dean - ITE Program

About the Title

The term Cloud (in Cloud Computing) is used as a symbol for the Internet, based on how it is depicted in computer network diagrams and is an abstraction for the different technological infrastructure it encompasses. The Internet is the most significant output of computing which helped the world harness the power of information. Like the Cloud, the ITE Program is composed of different elements that come together to produce scientific research outputs that help improve the community in the information age.

Eric John G. Emberda, MIM
Coordinator - IT Development and Incubation Facility
Dean - ITE Program

About the Cover

Cloud – an element of nature that brings about a multitude of phenomena all throughout the world. It brings with it, winds that merit change in the landscape, rain that sustains the growth of life, and the ability to influence the weather; be it in our favor or not. Like the cloud, the Internet, a vast network that connects us all on a global scale, acts as a great medium of change in the world and sustenance of life through the numerous technological advancements it brings.

The cover is an illustration of the cloud as a symbol of the Internet. Just as countless clouds gather over the skies and give us benefits a many, such is the purpose of the Internet as it gathers and collates information for various uses that help ease our day to day lives.

Mr. Dustin Hyrel Lim
ITE Program, Faculty
Cloud, Cover Layout Artist

EDITORIAL BOARD

PREFACE

It is with much joy and excitement that a new issue of CLOUD is released. Together with the editorial board members of this journal we are delighted to showcase the research outputs of the faculty and students of the Information Technology Education program of this University. This issue is composed of a compilation of research abstracts, including six selected full-text research papers. As an innovation of the previous issue released, we have grouped the studies into four areas namely:

Educational Technologies

These are research projects that focus on the design and development of innovative applications that aim to improve the quality of teaching and learning with the aid of technology.

Algorithms, Computation Theory, and Applied Computing Technologies

Research projects in this area focus on optimizing the underlying theories, algorithmic foundations, including the implementation and application of information and computing solutions.

Networking Technologies

Research projects in this area are focused (but are not limited) on the design, development, and management of networking infrastructure.

Entertainment and Multimedia Technologies

Research projects under this area involve the application of the fundamental to advanced theories in game design, scientific simulations, use and development of gaming technology and tools that will be used for entertainment and scientific applications.

MS. KRISTINE MAE M. ADLAON
UIC-ITE Research-in-Charge
Editor in Chief
ITE Students' CLOUD

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DEVELOPING A FORM GENERATION LIBRARY FOR CODEIGNITER WITH DOCTRINE OBJECT RELATIONAL MAPPER

Kristine Joy U. Iyo, Faith Andrel C. Macad,
Lyndelle Lianne F. Pangolibay, Exander T. Barrios

ABSTRACT

Web application frameworks are used by web developers to create dynamic websites, web applications, and web services. Frameworks provide libraries for common activities in web development. One such framework is CodeIgniter (CI). A plug-in called Doctrine Object Relational Mapper (ORM) can be used to enable object-relational-mapping. Since in ORM, the model represents the structure of a database table, a CI library can be created to automatically create forms based on the model structure. This study aimed to construct and test a form generation library in CI Framework with the Doctrine ORM plug-in. The proponents of the study used the Constructive Research Method. The results proved that the library reduces coding time for CI developers. The form generation library constructed in this study is a useful tool for web developers.

Keywords: *Model-View- Controller Architecture, Web Application frameworks, CodeIgniter, Object Relational Mapper, Constructive Research method*

INTRODUCTION

Web application frameworks have been a tool in creating dynamic web pages, web applications, and web services. These frameworks aim to reduce overhead by providing libraries for common activities in web development ("Web application framework", n.d.). Hypertext Preprocessor (PHP) is a popular web programming language. There are several frameworks written for PHP. One of these PHP frameworks is CodeIgniter (CI) which is loosely based on the popular Model-View-Controller (MVC) concept. CI is noted for its speed while still providing a sufficient set of libraries for common tasks needed in web development. PHP creator Rasmus Lerdorf spoke at frOSCon in August 2008, noting that he liked CodeIgniter "because it is faster, lighter and the least like a framework." Moreover, CI is known to be easy to learn and has a comprehensive documentation and an active community ("Codeigniter", n.d.). However, CI's Active Record which is used in database queries in CI's models falls short when a project needs its models and database tables to be object-oriented. There are many existing ORM which can be used with CI but one of the well-documented comprehensive ORM is Doctrine. The use of Doctrine with CI provides an alternative for developers to apply an object-oriented structure in creating models and their corresponding database tables. Although Doctrine helps a lot in retrieving, saving, and validating data in the database, it does not save the developer from the tedious task of coding forms for the models in Doctrine. With this in mind, the researchers propose to develop a form generator that will work with Doctrine and will be suitable to use in the CI framework. Since in an MVC pattern, most of the forms match the design of the model, this proposal will eliminate the need for the developer to hand-code the forms for each model.

Objectives of the Study

The general objective of this study is to develop an extension library for CI that will generate forms for Doctrine models. Specifically, the researchers would want to develop a CI Library that will use Doctrine

models to create forms. Also, develop a CI Library that will make use of the built-in forms library of CI. In addition, the researchers would want to develop a CI library that will be able to perfom necessary form validation based on what is specified in the Doctrine models, and lastly, develop a CI library that will allow customization in model-based forms.

Conceptual Framework

The idea of this study is to develop a form generation library for Doctrine models in CI. The output and function of the library will be based upon the Developing a Form Generation Library for CodeIgniter with Doctrine Object Relational Mapper 8 structure of Doctrine, CI and the models in the application. Figure 1.3 shows the diagram of the proposed idea.

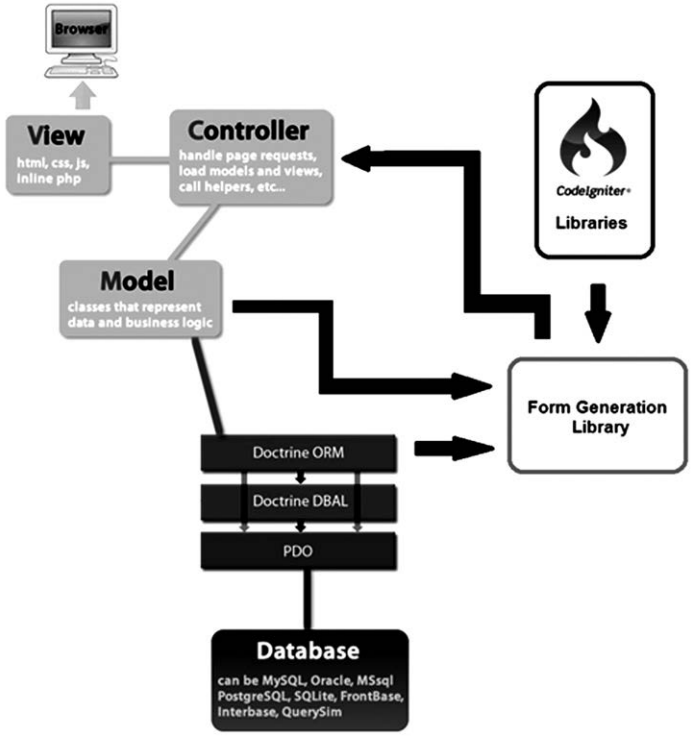

Figure 1. The Conceptual Framework of the Study

The form generation library will contain the necessary functions needed to create forms from the Doctrine models. In order to use the library, the developer must load it in the CI controller and specify the model from which it will base the format for its forms. The developer can also modify the generated form to fit specific functions. After the form is generated, it can then be included in the view Developing a Form Generation Library for CodeIgniter with Doctrine Object Relational Mapper 9 file. When the web page is displayed, it will output the generated form of the model. The form must also have validation processes. Once it is submitted and the data in it is valid, the developer can use a save function to insert it in the database. Moreover, the form generation library can also be used in an update form. This time, an object or a record from the database should also be specified. The values of the object or record will then be the initial values of the generated form. When the save function is called, the database record will be updated with the new values from the form.

METHODS AND MATERIALS

This study have utilized the use of Constructive research method. This method has proven to be very effective in solving a practical relevant problem by constructing an organized procedure based on an existing idea. This research has undergone six major phases.

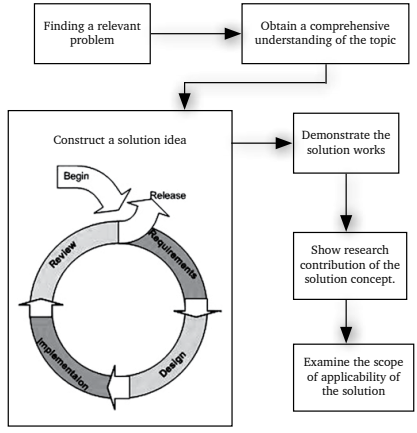

Figure 2. The Diagram for Constructive Research Method

Finding a relevant problem. In this phase, the researchers examined different sources to come up with a very relevant problem in the field of Information Technology. Out of the many sources, the greatest contibutor is the researchers' own experience with PHP, CodeIgniter, and Django. Furthermore, in this phase, the researchers have searched the internet and online forums for more relevant information on the selected problem.

Obtain a comprehensive understanding of the topic. In this phase, the researchers had done an extensive research on the topic and those related to it. Different sources were used by the researchers including internet tutorials and articles, as well as documentations on the software to be used in this study.

Construct a solution idea. During this phase, the researchers examined the gathered information in order to construct a reasonable and feasible solution to the problem being addressed. With regards to the construction of the solution, the researchers have followed the Iterative software process model. The diagram of the process model is presented in Figure 3. The Iterative model starts by implementing software architecture based on the product vision, but it does not attempt to begin with a set of fixed and final requirements. The Iterative Model borrows several features from other process models: Prototyping, the Rapid Application Development, the Incremental and Spiral model. Components of the software are built based on the requirements specified in each iteration. The results are reviewed and further requirements are identified. The process is then repeated (Snyder, 2002).

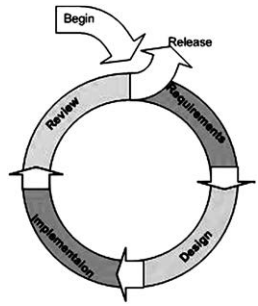

Figure 3. The Diagram of the Iterative Process Model

Demonstrate the solution works. In this phase, the researchers have conducted a User Acceptance Test to the selected respondents to assess the effect of the solution in developing an application with CI.

Show research contribution of the solution concept. In this phase, the researchers have examined the effect of the solution and the results of the user acceptance tests. The researchers interpreted and discussed the results in detail and presented it in the document.

Examine the scope of applicability of the solution. In this phase, the researchers drafted the summary of the study, along with the conclusions and recommendations based on the results gathered and examined.

RESULTS AND DISCUSSIONS

After the construction of the form generation library, the researchers integrated it to CodeIgniter and Doctrine to compare the difference between the traditional way of coding in CI versus the coding in CI with Doctrine and the form generation library. Table 1 shows this comparison.

Table 1. CodeIgniter vs. CodeIgniter with Doctrine and the form generation library

Using CodeIgniter	Using CodeIgniter, Doctrine, and the form generation library
In creating forms, the developer has to call form_input,form_dropdown, or other form helper functions for each field.	In creating forms, the display_form function of the form generation library can be called to create a form based on the specified Doctrine model.
In creating forms, the developer has to call form_input, form_dropdown, or other form helper functions for each field.	Using the form generation library's fgl_validation function, the library sets validation based on the description of fields in the specified model.
In saving the form data, the developer has to call $this->input->post() function of the Input Class library to retrieve the POST values of each field.	Using the fgl_save function of the form generation library saves the form data of the generated form into the database.
The functions in the form helper library of CI allow customization such as adding id and class for the CSS style.	The form generation library also allows adding id and class for CSS. Moreover, it allows modifications for the generated form like rearranging the order of the fields, excluding a particular field, etc.

The researchers conducted a user acceptance test on CI web developers after showing them the functionalities of the form generation library. The user acceptance test was composed of three activities: creating a simple form, a form with a foreign key, and a form from an existing record. In the evaluation stage, the testers had used the traditional way and the other way which is to use the Doctrine ORM and the form generation library. The code duration of each method are then recorded. The testers also had rated the efficiency of each method in terms of development, 1 being the least efficient and 10 being the most efficient.

1. **Simple Form**

In this activity the testers were instructed to do the following:

a. Create a table (student) with the following fields: first_name(string), last_name(string), address(string), contact_number(string), year_level(integer), birthdate(date), and valid(Boolean).

b. Add data validation rules to the fields, and make sure that the traditional approach has the same rules with the one using the Doctrine ORM and the form generation library.

c. Create a form corresponding to the created table. Make the address field a textarea. Submitting the form should be able to save the entered data into the database.

Table 2. Coding duration in creating a simple form

Tester	CodeIgniter only (traditional)	CodeIgniter with Doctrine ORM and form generation library	Difference in coding duration
IT Professional	2 minutes 19 seconds	2 minutes 12 seconds	7 seconds
Student 1	11 minutes	8 minutes	3 minutes
Student 2	14 minutes	12 minutes	2 minutes

Table 3. Efficiency rating in creating a simple form

Tester	CodeIgniter only (traditional)	CodeIgniter with Doctrine ORM and form generation library
IT Professional	7	9
Student 1	7	9
Student 2	6	8

2. **Form with Foreign Key**

In this activity the testers were instructed to do the following:

a. Create a table (school) with the following fields: name (string) and location (string).

b. Add a foreign key in the student table. The student and the school tables should have a one-to-many relationship. Note that when using the Doctrine ORM, the tester needs to drop and recreate the student table.

c. Input at least 3 records in the school table.

d. Create a form corresponding to the student table where the foreign key's options contain the records from the school table.

Table 4. Coding duration in creating a form with Foreign Key

Tester	CodeIgniter only (traditional)	CodeIgniter with Doctrine ORM and form generation library	Difference in coding duration
IT Professional	9 minutes 10 seconds	4 minutes 7 seconds	5 minutes 3 seconds
Student 1	11 minutes	6 minutes	5 minutes
Student 2	12 minutes	8 minutes	4 minutes

Table 5. Efficiency rating in creating a form with Foreign Key

Tester	CodeIgniter only (traditional)	CodeIgniter with Doctrine ORM and form generation library
IT Professional	7	10
Student 1	7	9
Student 2	6	9

3. **Form from Existing Record**

In this activity the testers were instructed to do the following:

a. Before performing this exercise, make sure there is at least one record present in the student table.

b. Create a form that has for its initial values the data from an existing record.

c. In the submission form it should be able to update the record in the database.

Table 6. Coding duration in creating a form from existing record

Tester	CodeIgniter only (traditional)	CodeIgniter with Doctrine ORM and form generation library	Difference in coding duration
IT Professional	2 minutes 55 seconds	2 minutes 7 seconds	48 seconds
Student 1	25 minutes	15 minutes	10 minutes
Student 2	32 minutes	21 minutes	11 minutes

Table 7. Efficiency rating in creating a form from existing record

Tester	CodeIgniter only (traditional)	CodeIgniter with Doctrine ORM and form generation library
IT Professional	8	9
Student 1	8	9
Student 2	7	9

CONCLUSION

Evaluation results shows that there is a significant difference between the two coding approaches. Although the form helper functions of CI will not be thoroughly called if the form generation library will be used, it is still important for the developer to be knowledgeable about the form helper functions in order to understand the procedures followed in the functions of the form generation library. Moreover, the developer should at least know the basics of using Doctrine ORM to be able to use the library. The user acceptance test results presented are in favor of the form generation library. This shows the positive effect of the library to the web development of the developers who were respondents to the test.

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WINDOWS EXPLORER INTEGRATION OF FORCE BIN DIP FOR A CUSTOM NETWORK ADAPTER ASSIGNMENT TO WINDOWS APPLICATIONS

Romualdo E. Briosos Jr., Martin Erik B. Fullido,
John Roderick S. Guillermo, Eric John G. Emberda

ABSTRACT

The Internet has become part of many people's lives. Many are relying on the Internet for a variety of reasons including leisure, employment, communication, and education. It also has created alternative means of finding jobs. With the increasing necessity of the Internet, concerns such as slow connectivity should be addressed. This study was conducted to create a way in which multiple Internet connections can be utilized simultaneously without requiring the users to have a technical background. This study employs an applied research approach utilizing an incremental software process model, which provides better support for process iteration, reduction of rework of software, allow early delivery of the system components, and lower the risks of project failure. The programming language used was CSharp, and the resulting software was deployed and tested on a Windows operating system. Broadband connections were used with subscriptions from the three major Internet Service Providers (ISPs).

Keywords: Internet, Computer Networks, CSharp, Windows, Incremental Software Process

INTRODUCTION

In our world today, it is not deniable that a number of people have used the Internet in their daily lives. In the Philippines alone, there has been an increase of twenty five percent (25%) in the past twenty (20) years from 1990 to 2010 (World Bank 2012). People are relying on their Internet connectivity for a variety of purposes: enjoyment, communicating with loved ones, getting educational information, working for a job, and many more (Kraut et. al 2012). The Internet is quickly becoming a part of people's daily lives (Bargh, McKenna 2004). In terms of employment, many have utilized the Internet for providing and acquiring jobs. Elance, a leading online employment provider has posted that there had been over two million jobs posted in their website in the fourth quarter of 2012. This accounted for over forty million dollars ($40,000,000) in freelancer earnings in 2012 alone. The Philippines is included in the top ten list of countries with freelancers (Elance Online Employment Report 2012). The Internet users profile in the Philippines is not limited to jobseekers and employers. In the study conducted by Nielsen (2012), one in three consumers in the Philippines are accessing the Internet.

With this, the problem of sustaining one's Internet connectivity is a big concern. ABS-CBN (2012) has reported that the Philippine Internet connectivity remains slow and expensive. In fact, the Huffington Post (2012) placed the Philippines among the nine (9) countries with the highest percentage of slow Internet connectivity.

With the abovementioned issues, the researchers found the necessity of helping provide a stable Internet connectivity, with the user's existing subscriptions be it through Digital Subscriber Line (DSL), Wireless Fidelity (WiFi), Cable Connection, or Dial Up. A simple survey was conducted in a local setting, and it was found out that eighty one percent (81%) of the respondents like to use multiple Internet connections.

Various solutions exist. One is through a software called ForceBindIP. It is a Windows software that allows the user to choose which Internet connection will be used by a particular software application. It is a command

line utility and has no user interface (Stanway, 2012). The researchers however, find it very inconvenient for the average Internet users to use a command line utility. There is also another from Ehow.com but it is also not a straightforward approach and it involves manually bridging two Internet connections (Uaha 2012). Thus, this capstone project was conceptualized to allow the users to use different Internet connections simultaneously, by utilizing ForceBindIP and integrating it to Windows Explorer.

Objectives of the Study

One of the objectives in creating this project is to allow the users to utilize multiple Internet connections simultaneously, through the simplification of the processes in using ForceBindIP. Furthermore, the researchers also aim to discover the drawbacks in using multiple Internet connections simultaneously.

Conceptual Framework

The idea is to create a software package that integrates ForceBindIP to Windows Explorer which will allow the users to utilize Windows' context menu to select the desired Internet connection to use. This is shown in Figure 1.

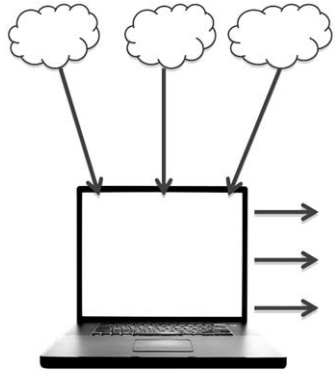

Figure 1. The Conceptual Framework of the Study

METHODS AND MATERIALS

This study employed an applied research approach utilizing an incremental software process model. This provides better support for process iteration, reduction of rework of software, allow early delivery of the system components, and lower the risks of project failure (Sommerville 2006). Each increment have different outputs. Figure 2 shows the Incremental Software Process Model. There were four (4) components delivered:

1. Software component that detects the connected Internet adapters
2. Software component that retrieves the IP addresses of each connected adapter.
3. Software component that adds a registry entry that will list all adapters and integrate ForceBindIP to Windows Explorer context menu.
4. A Graphical User Interface (GUI) that encapsulated all three components and allow the software to run in the background.

All of these components will undergo the four stages of each increment: Analysis, Design, Code, and Test.

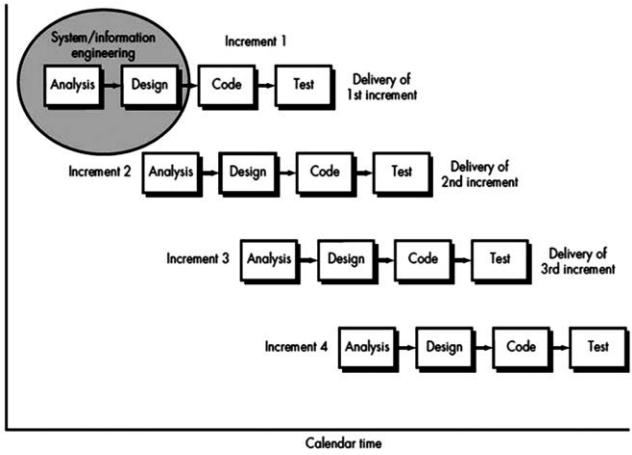

Figure 2. The Diagram for Incremental Process Model

The programming language used was CSharp, and the resulting software was deployed and tested on a Windows operating system. Broadband connections were used with subscriptions from the three major Internet Service Providers (ISPs): SUN/SMART and Globe. In testing the system, the researchers were constrained in using HUAWEI and ZTE USB broadband dongles, and the university's Internet connection via Wireless Local Area Network (WLAN). The following test cases were used:

1. Test the developed application with two different adapters (WLAN and Mobile Broadband).
2. Test the developed application with three different adapters (LAN, WLAN and Mobile Broadband).
3. Test the developed application with two different adapters (LAN and Mobile Broadband).
4. Test the developed application with two Mobile Broadband adapters(Sun Broadband and Globe Tatttoo).
5. Test the developed application with four different adapters (WLAN, LAN, Sun broadband and Globe Tattoo).

RESULTS AND DISCUSSION

Testing Results

After the development of the system, the researchers made the necessary tests using the test cases. This yielded the following results:

Table 1. Testing Result Summary

Test case #	Tester #	Date Tested	Adapters	Applications	Method of Verification	# of Successful Bindings	# of Failed Bindings	% Success
1	1	01/31/13 05:55PM	WLAN, Mobile Broadband	Chrome, Firefox, Skype, Opera and μtorrent	Netstat, Speedtest .net	5	0	100%
1	2	02/02/13 10:20AM	WLAN, Mobile Broadband			5	0	100%
2	1	02/02/13 03:31PM	WLAN, LAN, Mobile Broadband			5	0	100%
2	2	02/02/13 05:27PM	WLAN, LAN, Mobile Broadband			5	0	100%
3	1	02/02/13 8:10PM	LAN, Mobile Broadband			5	0	100%
3	2	02/01/13 12:40PM	LAN, Mobile Broadband			5	0	100%
4	1	02/02/13 02:35PM	Sun Broadband, Globe Tattoo			3	2	60%
4	2	02/02/13 04:30PM	Sun Broadband, Globe Tattoo			3	2	60%
5	1	01/31/13 04:30PM	Sun Broadband, Globe Tattoo, WLAN and LAN			5	0	100%
5	2	01/31/13 04:45PM	Sun Broadband, Globe Tattoo, WLAN and LAN			5	0	100%

Discussion, Conclusion and Recommendation

The researchers were able to successfully integrate ForceBindIP to Windows. Figure 3 shows how the user can choose a specific adapter that will be bound to a specific software application.

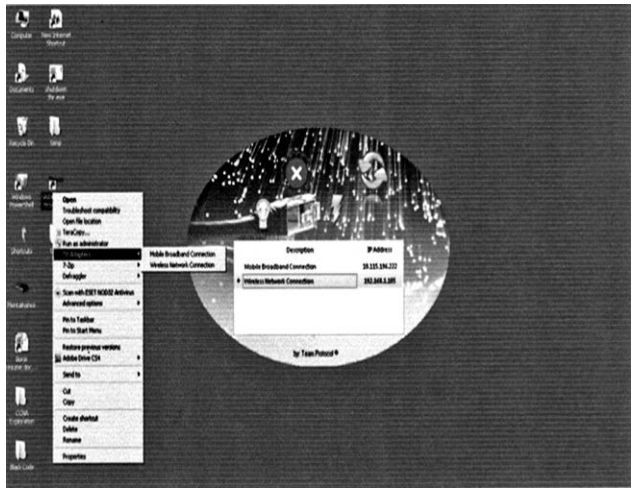

Figure 3. Context Menu Options for Selection of Network Adapter

Figure 4 shows how the system was able to detect all Internet adapters. Figure 5 on the other hand shows how a user can scan for new network adapters by refreshing the system.

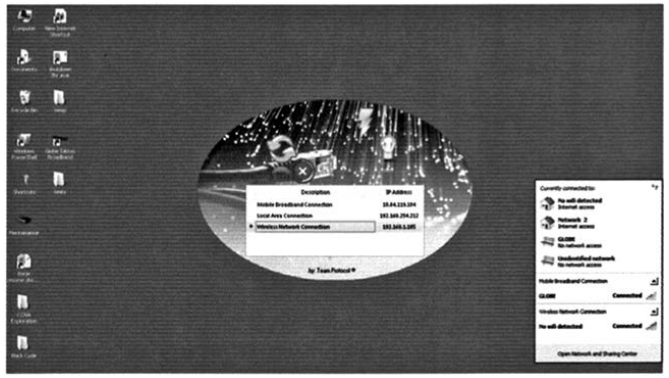

Figure 4. List of Network Adapters

The test results indicated that the ForceBindIP was successfully integrated into the Windows system. The failed bindings were due to certain factors:

1. The connection provided by the ISPhad either fluctuated, or had poor signal.
2. Restrictions made by the specific software application tested such as Internet Explorer and Safari
3. The dongle used, and the USB port

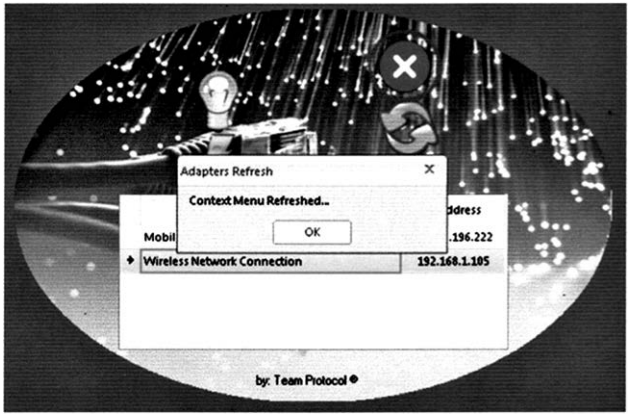

Figure 5. Refresh Feature for Scanning for New Network Adapters

The researchers noticed a drawback in using the developed application.The drawback is when more Internet connections are connected; the WLAN connection's signal is getting weak.

In conclusion, ForceBindIP was successfully integrated into the Windows system and the user was able to manage multiple Internet connections with at most four (4) adapters. With five out of seven applications working well with the developed system, this can definitely help the users utilize the available Internet connections from the different network adapters.

With the experienced minor issues of the developed system, the researchers would like to recommend the following:

1. Finding means to combine the bandwidth from the different adapters for faster and more stable Internet connection

2. Better compatibility to any software application

3. Compatibility to other versions of Windows.

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AN AUTOMATED APPLICATION THAT GENERATES STANDARD THREE-TIER-ARCHITECTURE-COMPLIANT CRUD APPLICATION FROM CREATE TABLE SQL QUERY

Robin O. Agustin, Jeffrey D. Bonajos,
Kareen Ann B. Lastra, Exander T. Barrios

ABSTRACT

A programmer has a different styles and ways in coding a program. In most cases, the style of coding of a programmer could lead to misinterpretation by the other. Nowadays, anyone who aspires to be a programmer will be able to utilize a framework in order to build a system rapidly and efficiently. Thus, a programmer should follow the concepts that conform to the framework standards. Object-oriented programming is a style of coding applied in various web frameworks. Unfortunately, not all the aspirants are well versed of the said coding style. Hence, this study provided a solution that would aid the novice programmers to become proficient of the aforementioned coding style. Furthermore, this enabled them to develop a simple CRUD application through the standard three-tier architecture. Since this is a constructive research, it is necessary to use the 4D software process model in order to achieve the expected output of this study. The application has the capability to convert exported SQL table query into a CRUD application in a standard three-tier architecture format. The researcher-made survey was analyzed in order to determine the effectiveness of the study. It shows that the respondents agree that it is easier to code through OOP compared to procedural programming.

Keywords: *Model-view-controller architecture, CRUD, SQL query, standard three-tier architecture-compliant, object-oriented programming*

INTRODUCTION

A computer programmer has its own preference in coding a program and a possibility to have implications to the software product. Anyone who aspires to be a programmer should have an in depth understanding of programming concepts. Some may find it difficult especially to novice programmers. Aside from the challenges of understanding how to form structured solutions to the problems and how the programs are being performed, novice programmers should also have to learn the commands and rigid syntax that may have seemingly inconsistent or perhaps obscure names (Kelleher & Pausch, 2005). Programming requires good knowledge of abstract concepts. Plenty of students studying in a university have difficulty in learning due to its nature. Additionally, there are often insufficiencies of resources and students experiencing scarcity of personal instructions (Lahtinen, Ala-Mutka, & Järvinen, 2005). Programming is extremely needed skills and could be a rewarding career today. The demand of programmers and student attracted in programming is rapidly increasing. As a result, programming introductory courses have become increasingly sought-after (Robins, Rountree, & Rountree, 2003). Limited tools have developed in order to assist learners in understanding computer programming easily, especially the object-oriented programming paradigms. The researchers of this study developed the automated application that generates standard three-tier-architecture-compliant CRUD application from create table SQL query. It will help neophyte web developers to apply Object-Oriented Programming (OOP) through generation of a simple CRUD application using the standard three-tier architecture model.

Objectives of the Study

The study developed an application that is capable of generating CRUD application create table queries. Moreover, it allows the user to add, update and delete records through the source code generated in the application. The application will equip the novice programmers in developing their own application using the OOP coding style.

Conceptual Framework

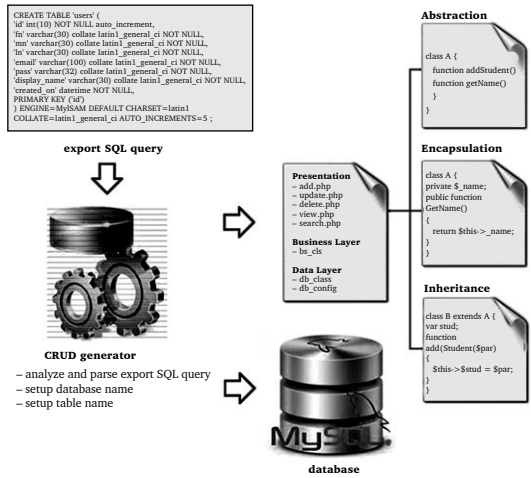

Figure 1. The Conceptual Framework of the Study

Figure 1 illustrates the export create table SQL query as an input to the CRUD generator. After filling the text area, using the create table SQL query, the application will analyze and determine the table name, column name, data type, and the data length. The user can now click the generate button to generate the CRUD application. The code will appear in various text areas, which can also be modified and downloaded. The application utilized the three-tier architecture as the structure model of the generated CRUD code. This also implements the methods and concepts of OOP such as creating classes and objects, data abstraction, encapsulation, inheritance, etc.

METHODS AND MATERIALS

The constructive research method was applied in this study since it aimed to solve a practical relevant problem by constructing an organized procedure based on an existing idea. It involves artifact building that unravels a certain problem of a domain in order to generate knowledge concerning how the issues can be solved in principle (Crnkovic, 2010).

Software Process Model

The researchers took advantage of the 4D methodology and applied it in this study. It was used to structure, plan, and control the process of system development. In addition, the methodology comprised of four stages, the Define, Design, Develop and Deploy stage. The researchers had undergone the said stages in order to generate the expected output of this study. The said methodology delivers success through its user-centric, iterative and flexible characteristics, the rationale of selecting the methodology applied in this study.

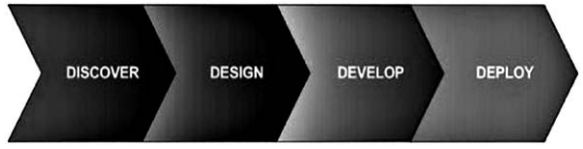

Figure 2. The diagram of the 4D Methodology

During the Define stage, the researchers identified the project roles and objectives. They also identified the resources needed and the roles and responsibilities of each researcher to accomplish the study. System design conceptualization is also part of it where they listed all the possible features and functions of the application and its limitations. Scheduled meetings were set for further discussions and work collaborations.

The Design stage involves functional designing where the researchers made a sketch and flow of the application to improve the intended functionality. Also, non-functional design was done in this stage and the identification of the technical aspect of the design. System architecture formulation was conducted in order to ensure the flexibility of the system's structure. Lastly, the test plan was constructed in order to ensure the effectiveness and efficiency of the functionality.

Throughout the Develop stage, the researchers made sure that the appropriate hardware and software were in place, before deploying the application. Implementation of the layout and design of the application's frontend and the backend happened in this stage. Furthermore, the code reviews, documentation, user and acceptance testing, application integration and functionalities were executed in accordance to the plan outlined in the Define stage.

Finally, the Deploy stage is where the researchers assured the application's integration, functionalities of each module. They identified the possible support, enhancements, bug fixes and the evaluation of the deployed application.

RESULTS AND DISCUSSION

The standard three-tier CRUD application developed was tested and consulted from trusted and knowledgeable individuals in the field of information technology. The researchers were able to find solutions on how to generate an exported create table SQL query to a standard three-tier architecture format. Using the different tools the researchers were able to meet the specified requirements of this study. The application is capable of converting exported SQL table query to a CRUD application in a standard three-tier architecture format. By filling in the text area with the exported create table SQL create table query, the application will analyze and determine the column name, data type, and the data length. After clicking the generate CRUD button, the code will appear in various text areas which can also be modified and downloaded. The code generated is in a standard three-tier architecture format. In order to support the effectiveness of this study, the researchers conducted a survey to 20 selected ITE students. The following questions in the survey form were asked to the said students.

Table 1. Sample Questionnaire

Capabilities	5	4	3	2	1
1. The application is capable of convering exporter SQL table query to a standard three-tier-architecture CRUD APPLICATION.					
2. The application is capable of generating a source code that allows the users to add records.					
3. The application is capable of generating a course code that allows the users to update records					
4. The application is capable of generating a course code that allows the users to view records view records.					
5. The application is capable of generating a course code that allows the users to delete records.					
6. The codes generated are easy to follow.					
7. The application helps to highlights the relevance of OOP.					
8. It is more easier to code using OOP than the traiditional or procedural way of coding.					

Table 2. Survey Result

		Capabilities							
		1	2	3	4	5	6	7	8
Respondents	**1**	4	4	4	4	4	4	3	**4**
	2	4	4	5	5	4	5	5	**4**
	3	5	5	5	5	5	5	4	**5**
	4	4	4	4	4	4	4	3	**3**
	5	5	5	5	4	4	4	5	**5**
	6	5	5	5	5	5	4	5	**5**
	7	5	5	5	5	5	5	5	**5**
	8	4	5	4	4	4	5	5	**4**
	9	5	4	4	5	5	4	5	**4**
	10	3	3	3	4	3	3	3	**5**
	11	5	5	5	5	5	5	5	**5**
	12	5	5	5	5	5	3	4	**4**
	13	5	5	5	5	5	5	5	**5**
	14	5	5	5	5	5	5	5	**5**
	15	5	5	5	5	5	5	5	**5**
	16	4	5	5	5	5	5	4	**5**
	17	4	5	5	5	5	4	4	**5**
	18	5	4	4	4	5	4	3	**4**
	19	5	5	5	5	5	5	5	**5**
	20	5	5	5	5	5	4	4	**5**
	∑	**92**	**93**	**93**	**94**	**93**	**88**	**87**	**92**
	∓	**4.6**	**4.65**	**4.65**	**4.7**	**4.65**	**4.4**	**4.35**	**4.6**

Table 3. Likert Scale Descriptive Equivalents

Scale	**Description**
4.51 – 5.00	Excellent
3.51 – 4.50	Very Satisfactory
2.51 – 3.50	Satisfactory
1.51 – 2.50	Needs Improvement
1.00 – 1.50	Poor

Table 4. Survey Result

Capabilities	Mean (∓)	Description
1. The application is capable of converting exported SQL table query to a standard three-tier-architecture CRUD application	4.6	Excellent
2. The application is capable of generating a source code that allows the user to add records.	4.65	Excellent
3. The application is capable of generating a source code that allows the user to update records.	4.65	Excellent
4. The application is capable of generating a source code that allows the user to view records.	4.7	Excellent
5. The application is capable of generating a source code that all ows the user to delete records.	4.65	Excellent
6. The code generated are easy to follow	4.4	Very Satisfactory
7. The application helps to highlights the relevance of OOP.	4.35	Very Satisfactory
8. It is easier to code using OOP than the traditional or procedural way of coding.	4.6	Excellent

The findings that have been enumerated are based on the evaluation of the application developed. It helped the It helped the researchers foresee the effectiveness of the application. Through the survey being conducted, the researchers were able to identify the significant result. The application was able to generate CRUD in a standard three-tier-architecture format using the exported create table SQL queries. The application was able to highlight the relevance of OOP. It is also evident that the respondents agree that it is easier to code using OOP than the traditional or procedural way of coding.

CONCLUSIONS

The study concludes that the application is capable of converting exported SQL table query to a CRUD application in a standard three-tier architecture format. Through filling out the text area with the exported create table SQL create table query, the application analyzed

and determined the column name, data type, and the data length. After clicking the generate CRUD button, the code will appear in various text areas which can also be modified and downloaded. The code generated is in a standard three-tier architecture format. Based on the researcher-made survey, the respondents agree that it is easier to code using OOP than the traditional or procedural way of coding.

RECOMMENDATIONS

In order to enhance more the capability of the application, the researchers recommends enhancing the presentation layer to make it more appealing. The comments must be included in the generated codes for better readability for novice programmers. It is also recommended that the application can accept multiple tables. Finally, add a CSS folder to be used for the presentation layer.

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LEARNING APPLICATION TOOL FOR K TO 12 LANGUAGE ART SUBJECT

Christine Carol Ansing, Elmar Jane H. Barquin, Ferdinand L. Odtojan, John Marco M. Pitlo

ABSTRACT

Philippines' K to 12 curriculums quite differs from the foreign countries. Part of the country's curriculum is the Mother Tongue for grades one to three. It is where teachers will use a dialect specific for the region. Particularly in Davao Region, Cebuano is used as the medium of instruction for different subjects excluding English and Filipino subjects. Mother tongue today is a challenge for the K to 12 teachers. Even without the mother tongue, the demand of teaching materials is rapidly increasing in order to be effective in conveying instructions to the students. In this study, the researchers were able to developed a possible solution to help meet the demand and to increase productivity. The lessons are pre-programmed in the application accompanied with a question and answer feature for student evaluation purposes.

Keywords: *K to 12, Cebuano, learning application tool*

INTRODUCTION

Formal education is a global basic commodity in order to uplift socio-economic status of an individual. It is also acknowledged as being instrumental in synchronizing various forms of knowledge bases and creating a social structure for societies that can lead to social, economic and political sustainability (Owour, 2008). However, due to cultural differences, every country has their particular educational learning style in order to conform to their customs and standards. Nowadays, most of the country adopted a learning system that unifies the process of erudition. The popularly known K to 12 educational learning system had been integrated to almost every country to adapt the educational changing needs of the society. Basically, the K to 12 system provides one year in Kindergarten and twelve years of basic education (Cabansag, 2014). In the Philippines, the system was implemented in 2012 and is moving towards global standards in secondary education and affixing high value to kindergarten (Okabe, 2013). Through the K to 12 learning system, various tools and methods were incorporated as part of the teaching strategies to ensure the effectiveness of conveying knowledge and information to the students. As such, educational podcasting through the use of an iPod touch (Banister, 2010), improving academic achievement through videoconferencing and telecommunications (Cavanaugh, 1999), and Internet-based GIS to stimulate geographic awareness of every K-12 classrooms (Baker, 2005). Furthermore, these methods and tools are substantial to ease the pain of the teachers in working out for the learning materials. Mostly, the teachers uses the technology for their classes to increase productivity and construct learning materials that will enhance class interaction. Presently, numerous teachers are adept and keen to use educational technology. Hence, the question is no longer whether the teachers will use a technology into their classrooms, but rather to effectively incorporate various technology applications into their classrooms (Cheung and Slavin, 2011). In this study, the researchers developed an application that will aid teachers in preparing learning materials for K to 12 education that focuses on the language art subjects. It is an interactive application that enables teachers to prepare pre-programmed lessons and present it to students visually that can captures

attention. Moreover, the teacher can evaluate their students through the question and answer feature within the application.

Conceptual Framework

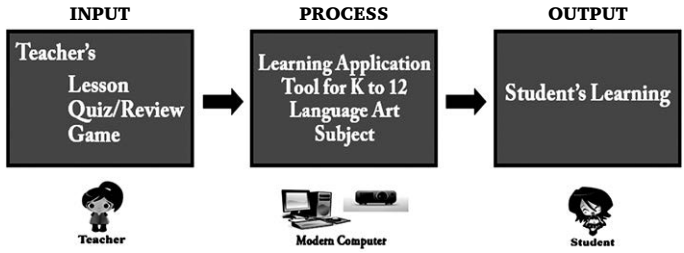

Figure 1. The Conceptual Framework of the Study

The researchers propose an application of an interactive speech synthesis in Language Art Curriculum in K to 12. It is function base on is the users input. It analyzes text utterance compose of words.

Objective of the Study

The objectives of this study is to develop a learning application tool for the grade one pupils under the K to 12 language art subjects such as English, Filipino and Mother Tongue Language subjects. Moreover, the application should enable the teachers to minimize the preparation of learning materials by creating pre-programmed lessons. Lastly, the application should be interactive in order to capture the attention of the students.

METHODS AND MATERIALS

Research Design

The researchers used experimental research to determine the

possible effect of technology to the learning of the local pupils and its contribution to the local teachers. With this research, the researchers used experimental-survey research method to determine the grade one teachers and students who were having difficulties in teaching the Language Arts Curriculum subjects.

Research Procedure

This study investigated how teachers and pupils adjust to the changes in education and to identify the problems that arise during the first year implementation of Enhanced K to 12 Curriculum in the Philippines. The researchers conducted a research survey on Davao Jones Academy to determine those teaching skills and the researchers gathered data about what was the impact to the students about changing its curriculum whether the students were compatible in those kinds of teachings. The following steps will be followed in order to gather data appropriate and exact:

- Gathered data about the background and the impact of K to 12 to the students about the positive and negative comments to K to 12.

- Researched about Language Art of the subjects that has been dictated in the scope and limitation about Mother Tongue, English, Filipino and the lesson related on the Language Art Subjects.

- After researching about the Language Art of the subjects, the researchers decided to make a Learning Application Tool using the programming language VB.NET, Adobe Soundbooth CS5 and Adobe Photoshop CS5.

- After the implementation, the researchers planned to conduct an evaluation of the application from the pupils and teachers by letting the teacher use the system in his/her class.

Process Model

The researchers choose the Incremental Process Model in which the progress of the research were shown through a flowing steadily downwards. Through this model, the researchers were able to undergo necessary stages in order to successfully complete the proposed study. Below is a graphical representation and a detailed discussions of the researchers' activities in every stage of the said model.

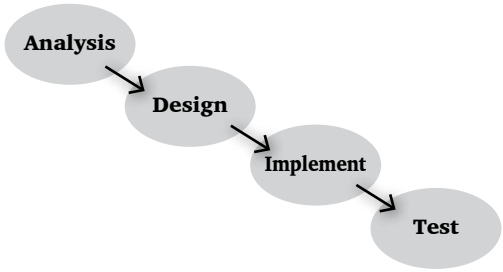

Figure 2. The diagram of the Incremental Process Model

Design Procedure

Analysis

In the first phase, the researchers researched about the necessary and useful needs in the implementation of the topic Learning Application Tool for K to 12 Language Art Subjects. In this phase, the researchers also researched about the K to 12 Curriculum backgrounds, and what were the subjects to be discussed and applied in the system.

Design

In the second phase, the researchers constructed a scheme that will show as a solution for acquiring problems during the making of the system. The researchers created a conceptual design to be able to meet the systems requirements and specifications for the system.

Mechanics

a) Main Menu
b) An Interface appeared were the lessons: alphabet, vocabulary and quiz bowl.
c) After clicking the Alphabet word, the three language art subjects: English, Filipino and Mother Tongue appeared.
d) After the user finished the lesson, the application will go back to main menu and can proceed to the quiz bowl menu.

Implementation

In the third phase, the researchers implemented the system with the desired programming language used and computer vision, images, and the recorded words. In order to achieve this phase, researchers designed the structure of the systems and listed all the functionalities of the system, then second, the researchers programmed the application and for the testing of teachers, the researchers assisted the teachers on how the system will be used and explained to them the functionalities of the system. Third the researchers will release the application, since it was an open source application; anyone can able to download the game from the net.

Testing

In the fourth phase, the researchers conducted a system testing at Davao Jones Academy to see what were the systems lack and none-useful outputs by User Acceptance Testing or UAT for teachers and pupils. The researchers generated evaluations after the testing of the system.

RESULTS AND DISCUSSION

According to the survey, the researcher found out the teacher often encounters difficulties/challenges in teaching the students base on K to 12 curriculum. Sometimes, the student shows interest to go to

school and more attentive to and participative in class. According to the respondent, 41%-60% of the pupils seem attentive and participative. During class, pupils show in Mathematics, English, Filipino and Computer subject. Mother-Tongue Subject shows difficult to teach follows by Filipino and Mathematics subjects. For the respondent, teachers need more visual presentation and lack of resources, such as books and modules are the possible factors/reasons why pupils can do not show interest in their lessons. K to 12 Curriculum is more laborious that the BEC curriculum. During classes, teachers are using flash cards, visual aids, blackboard and chalk. They spend 2 to 3 hours per day in preparing their visual aids and 20 to 30 minutes per day for writing their lessons on the blackboard. Cartolina, manila paper, and pentel pen are the materials that are mostly use for the visual aids. A teacher must also use different kinds of teaching method during classes. According to the respondent, technology will be helpful for the teacher during classes since nowadays some pupils are more interested in learning the lesson if the teacher uses multimedia and computers. Through the survey, the researchers decided to focus on the Language Art Subjects to help the teachers teach those subjects and to catch the attention of the pupils, they will be more participative and attentive during classes.

CONCLUSIONS

After series of experimentation, tests and analysis about the learning application tool built by the researchers they came up with the following conclusions: The Learning Application Tool was helpful for the teachers and catches the attention of pupils during the K to 12 curriculum and were able to answer the statements of the problem cited. The Learning Application Tool was effective tool for teaching the three languages focused in the K to 12 curriculum. Since the survey results showed it helped the teachers of not wasting their time in preparation of their lessons. For the pupils, they found this learning application interesting, so they learn and on the other hand they enjoy. The developed application was advantageous to the teachers because it helped them improved their teaching techniques to support better

education with the K to 12 curriculum. It saved the teacher's time in preparing their visual aids. On the other hand, it will be disadvantageous for the teachers because it focused only on the basic lessons of the Language Art Curriculum (English, Filipino, and Mother-Tongue) and on the three lessons; Alphabets, pronunciation and vocabulary.

The learning application tool style method was effective for teaching. Based on the evaluation results in page 39 and as what the researchers observed, pupils are interested, participative and attentive during the using of the leaning application tool. The teacher wanted to have visual presentations and through this they can have it with a game to catch the attention of the pupils.

RECOMMENDATIONS

On the other hand, there are some features that are not included in the created application. The researchers would suggest the following features to their future researchers:

Add another lesson; alphabet, pronunciation and vocabulary

The researchers will recommend feature to the future researchers because the researchers just focus on the three lessons of language art subjects and it will helpful to the teachers if another lessons will be added.

Add games in each lesson; alphabet, pronunciation and vocabulary

The researchers challenging the future researchers to add this feature because kids nowadays love games and it help this to catch their interest for better learning.

Add animation

The researchers are challenging the future researchers to add this feature because it will make more interesting and attractive to the pupils.

Make it more interactive with the pupils

The researchers challenging the future researchers to add this feature so that the pupils can use the application individually and make them explore the application on their own.

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A COMPARATIVE STUDY OF THE COMPUTER USAGE MONITORING METHODS IN THE ITE PROGRAM OF UNIVERSITY OF THE IMMACULATE CONCEPTION

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ABSTRACT

In a typical computer laboratory setup, like that of the University of the Immaculate Conception, it is difficult for teachers to move around every now and then just to monitor the students while doing the activity. One strategy for better classroom management is to use computer-aided tools that monitor students' activities especially while in these laboratories. The purpose of this comparative study is to examine whether or not the teachers and students of the university are aware of the existing monitoring tools and to determine which monitoring tool is preferred by the teachers. The researchers compared the monitoring features of LanSchool, a third-party software, with that of the monitoring features of Active Directory Domain Controller. In the course of the study, the researchers tested the two monitoring tools by performing actual prohibition and authorization of identified software applications and websites. The results of the test shows that both monitoring tools are effective in helping the faculty manage the class better. The researchers were able to conclude that, in the UIC setting, LanSchool is preferred by users because of the ease of installation, configuration and use. It is important to note however that LanSchool is easier to bypass.

Keywords: *Computer laboratory, classroom management, computer-aided tools, monitoring tools, LanSchool, Active Directory Domain Controller*

INTRODUCTION

In today's generation, computers have paved the way for learning and education of students. It has been used as an integral element of learning in many different ways to enhance knowledge and application. Computers and other technology can also help the educators to improve their teaching and maximize the learning and the potential of their students to comprehend.

Computers and its resources in classrooms are dedicated for educational purposes. Therefore it should only be used according to its purpose which is to educate and help students learn and understand better in class. But somehow the real purpose of these computers is compromised. In some cases, students would be accessing social networking sites, play games, or even download contents from the internet and install applications that may cause harm to the computer.

According to Tinio (2002), a number of schools in Davao City are using computers for learning purposes. In a typical day, students perform many different computer activities. Due to this, a tracking system for computer usage activities would be significant.

The Information Technology Education Program (ITE-Program) of University of the Immaculate Conception is recognized as the Center of Development (COD) in Information Technology. As such, efforts to provide students sufficient media and avenue to learn have been put in place. This however would require the teachers to facilitate the students for optimum results. One good way to better facilitate the students is the use of a monitoring tool for better.

In an interview with Mr. Federic Lucenio, UIC's Network Administrator, he mentioned that at present, the current monitoring systems that are available in the school's laboratories are the Active Directory (AD) Domain Controller and LanSchool. Although the Active Directory Domain Controller is not yet configured, it could monitor computer activities and set permissions to allow/restrict applications in network computers and block access to certain websites. LanSchool on the other hand has been of

significant help in the monitoring of students' activities and is being used by instructors for demonstrations and to set restrictions.

The proponents of this study see the need to conduct this research to assess and compare the monitoring capabilities of Active Directory and LanSchool. This would allow the school to implement the better, if not best, way of monitoring students' learning activities.

Objective of the study

The general objective of this study is to compare and contrast the monitoring capabilities of Active Directory Domain Controller in Windows Server 2008 R2 and a third party monitoring software LanSchool. Furthermore, the study aims to achieve the some specific objectives. First is to determine the different factors that should be considered in selecting a computer monitoring system for networked computers. Second is to differentiate Active Directory Domain Controller and LanSchool. Third is to cite the advantage and disadvantage of choosing each setup over the other. Last is to determine which of the two monitoring application is preferred by network administrators and teachers.

Conceptual Framework

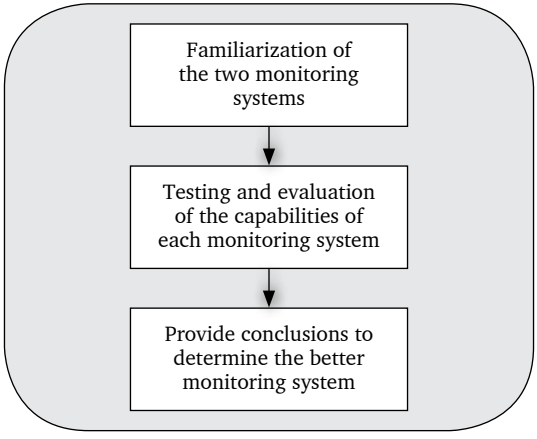

Figure 1. The Conceptual Framework of the Study

Figure 1 shows the processes that the researcher would undergo to determine which monitoring system should be implemented in the computer laboratories of UIC. First, the researchers would have to be familiar with the two monitoring systems. Then, the researchers would have to test and evaluate the monitoring capabilities of both systems. This should be done carefully so that both the pros and cons of each system can be observed. Lastly, the researcher should analyze the results of the test and determine which monitoring system would best help in the monitoring of students' learning activities.

METHODS AND MATERIALS

Research Method

As the researchers aimed to determine the better monitoring system to be used in the computer laboratories of UIC, Comparative research method was used in this study. This method aims to make comparison of two or more things and discovering something about one or the entire thing being compared. The proponents have collected and gathered the necessary data, did some practical tests with both systems for comparison and analyzed the results.

Design Procedure

Specifically, the researchers have taken the following steps in the conduct of this study:

The researchers thought of the efficiency of the monitoring process in the computer laboratories of UIC. The researchers proposed for a comparative study to evaluate the monitoring systems implemented in the computer laboratories. The proponents identified the significance of the study and determined the scope and delimitation of the study. After the proposal's approval, the researchers gathered all the necessary information about the use of monitoring systems in computer

laboratories. Specifically, they looked into both Active Directory and LanSchool. The researchers then tested both systems to see their capabilities in the monitoring process. After testing and evaluating the two systems and its capabilities, the researchers interpreted the results for comparison. The researchers had findings which helped them determine which system would do better in the monitoring process. The researchers then summarized all that have transpired in the conduct of the study and have formulated the conclusion.

Testing Plan

The researchers tested both systems and looked into the following factors:

- Ease of the installation process – The group considered this factor to be tested because the installation often times halted by errors and misconfiguration.

- Ability to restrict selected software – The group also considered this factor because as students have their activities in the laboratory, there are instances that they are not supposed to open application software.

- Ability to restrict selected website – As website offers students variety of information, the group decided to include this factor because students are often restricted in accessing websites while having their laboratory activities.

RESULTS AND DISCUSSION

Results

The researchers found out that some of the results were not consistent or did not come out as expected due to some factors such as instability of the network, the use of low-end hardware, and minor misconfiguration problems in the setup. The following tables would show the result of the tests that were conducted.

Table 1. Test Cases on Active Directory / Domain Controller

Test Case No.	Description	Result
1	Installation of Active Directory	Successful
2	Restricting “Calculator.exe” in Active Directory	Successful
3	Allowing “Calculator.exe” in Active Directory	Successful
4	Blocking www.yahoo.com in Active Directory using Wildcard	Successful
5	Allowing www.yahoo.com in Active Directory	Successful
6	Bypassing Website filter using UltraSurf Proxy	Failure
7	Bypassing Website filter using HideMyAss Proxy Website	Successful
8	Bypassing Website filter using Webproxy Proxy Website	Successful

As shown in Table 1, Active Directory / Domain Controller yielded acceptable results in the installation, application blocking/allowing, and website blocking/allowing. The system was tested further by adding test cases wherein proxy services were used to bypass web filtering. The first proxy (UltraSruf) that was tested failed to bypass the web filtering of Active Directory. On the contrary, the two other proxies (HideMyAss and WebProxy) that were tested successfully bypassed the web filtering. This

was because both were web application rather than desktop application. Proxy websites are browser-based proxies that changes and adds extensions to the original URL which allows it to bypass web filtering in Active Directory. This makes it difficult to be detected and restricted.

Table 2. Test Cases on Active Directory / Domain Controller

Test Case No.	Description	Result
1	Installation of LanSchool teacher's console	Successful
2	Installation of LanSchool students' console	Successful
3	Restricting "Calculator.exe" in LanSchool	Successful
4	Allowing "Calculator.exe" in LanSchool	Successful
5	|Blocking www.yahoo.com in LanSchool	Successful
6	Allowing www.yahoo.com in LanSchool	Failure
7	Bypassing Website filter using UltraSurf proxy application	Successful
8	Bypassing Website filter using HideMyAss Proxy Website	Successful

Table 2 shows the results of the tests conducted with LanSchool. While blocking an application in LanSchool, the researchers noticed a slight delay in the process. It would take LanSchool about three (3) seconds before closing a blocked application. This is attributed to the reason that LanSchool would have to scan the processes in the task manager of the pc to check if the blocked application is running. If it finds the application in the current processes, it then closes the application and notifies the user on the bottom right part of the screen that it is blocked by the teacher.

Similar with the test for AD, the researchers also added test cases wherein proxy services were used to bypass web filtering. However, it can be observed that the same results were generated. Only two out of three proxy services were able to bypass the filtering of LanSchool.

CONCLUSION

The results of the test may not necessarily show the comparative advantage of each system as both yielded the same results. However, as the test was conducted, observations were made by the researchers. These in turn was used as bases in formulating the conclusion.

As Active Directory would require more time for proper installation and a thorough setting up for better results, LanSchool is preferred by the teachers since LanSchool would not require as much of the technical work but would still be able to monitor students' activities. As long as you have the application installed and running in the network then the monitoring would be a lot easier. Furthermore, LanSchool has been made available in all the laboratories.

In terms of handling restrictions, LanSchool is at par with Active Directory. However, although it was successful in most test cases, it is easier to bypass LanSchool. Editing the registry of your computer for example would allow you to already access restricted applications. This reason makes a properly configured Active Directory / Domain Controller more stable and reliable for network administrators and laboratory users.

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THE APPLICATION OF GENETIC ALGORITHM TO DIET MANAGEMENT SIMULATION FOR THE OBESE PERSON

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ABSTRACT

The study generally promotes health awareness for the obese person through the diet management system simulated in an android phone. It opened the possibility of combining available open-source applications of android phones in maximizing its purpose. The application of the genetic algorithm to this study had contributed significantly to achieve a favorable result. The researchers find that the algorithm applicable for this study since it returned a satisfactory result particularly in giving the expected amount of food for each BMI and health condition.

Keywords: *Genetic algorithm, health, Obese, Diet Management, Android application*

INTRODUCTION

Weight gain and fat storage have been viewed as signs of health and prosperity throughout the human history. Today, gain weight and obesity are posing a great threat to health and is now prevalent to most of the countries in the world. It is a chronic disease affecting both children and adults (WHO, 2000). In the United States, it has been identified as an epidemic for more than two decades and it is increasingly growing (Wellman, N. S., & Friedberg, B., 2002). Various applications had been proposed to diminish the said epidemic in the field of information technology. These solutions are trying to maximize the available tools in order to manage one's health. The application PmEB is a mobile application for monitoring real time caloric balance. The application is said to be feasible and usable for self-monitoring weight management (Tsai et. Al, 2007). Another application called SapoFit, a mobile ubiquitous computing application to control obesity. It aimed to design, construct and validate a mobile health system to monitor and assess a diet (Rodrigues, J. J. et. Al, 2012). Finally, the StepUp application, a step counter mobile application to promote healthy lifestyle.

The purpose of the application is to give a user a quantitative measure of daily activities, increase health awareness, to understand the significance of exercise and facilitate the integration of daily regular exercise (Khalil, A., & Glal, S., 2009). These mobile applications intervention would increase physical activity of a person and further reduce weight. It is convenient, potentially cost-effective and wide-reaching weight management strategy intervention delivered by smartphone (Carter et al., 2013). On the other hand, diverse methods applied in every health monitoring applications to ensure its effectiveness and usability. Specifically, a genetic algorithm is a widely used method for various application regardless of its purpose. It is a search heuristic that mimics the process of natural selection. This heuristics routinely used to generate useful solutions to optimization and search problems (Mitchell, 1996). In this study, the researchers proposed an application for diet management particularly for the obese person. It aimed to prove the appropriateness of the said algorithm into this kind of application.

The study also measures the effectiveness of the genetic algorithm to achieve a favorable results.

Conceptual Framework

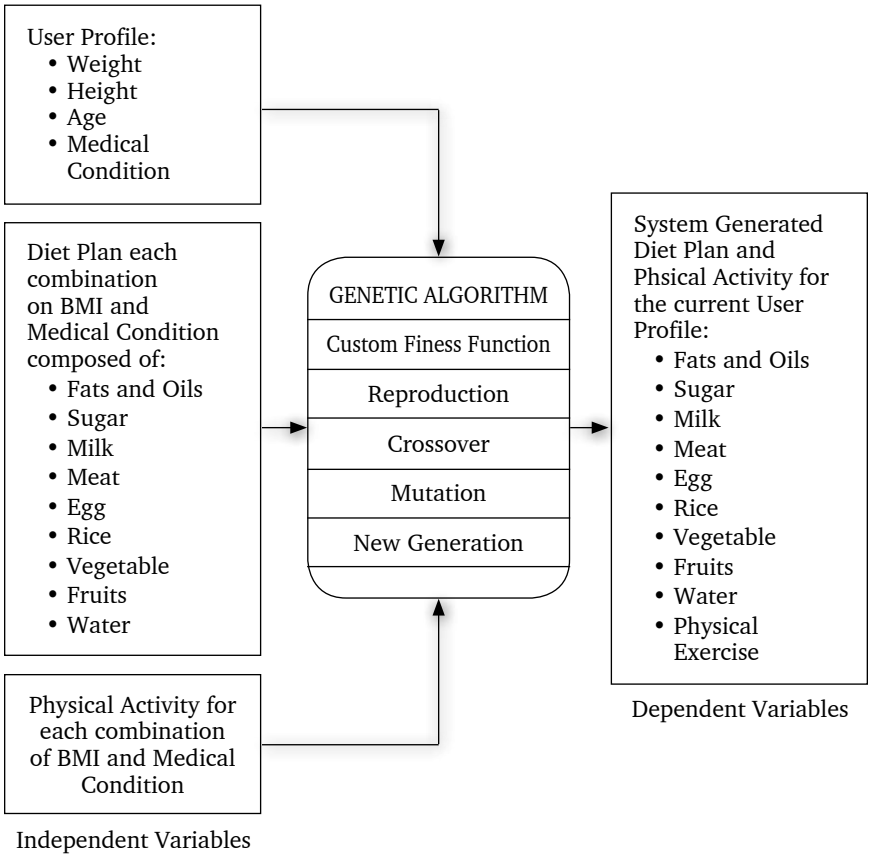

Figure 1. The Conceptual Framework of the Study

Applying the principles of the genetic algorithm through a simulation of an obese diet management is very significant. This allows obese person in managing their food intake and properly guide them

for proper diet. Figure 1 shows the workflow of the study where the application of the genetic algorithm is the primary subject. The user profile such as weight, height, age and medical condition are fueled.

Objectives of the Study

Generally, the objective of this study is to create a diet management simulation applying the genetic algorithm in an android environment for proper diet, fitness and leisure of an obese person. Specifically, this study determined if the fitness function formulated be able to approximate the correct criteria for appropriate diet management for obese. This study aimed to determine also how genetic algorithm can be applied to create a diet management for the obese person. Lastly, to determine the accuracy of genetic algorithm's implementation to diet management for the said type of person.

METHODS AND MATERIALS

Research Method

In this study, an experimental type research was applied. The concept of the method is that it allows the researchers to manipulate, control and measure any changes in other variables. Independent variable in this study pertains to the application of the Genetic algorithm in the diet management simulation for the obesity of an obese person. The extent of the use of the Genetic algorithm is to implement the diet management. In this case, adjustments made to the implementation of the algorithm in the diet management were also reflected to the obesity of a person. Experimental research is generally divided into five phase namely: identifying a research problem, planning an experimental research study, conducting the experiment, analyzing the data and writing the paper/presentation describing the findings. Each phase generated an output that contributed to the completion of the research procedure.

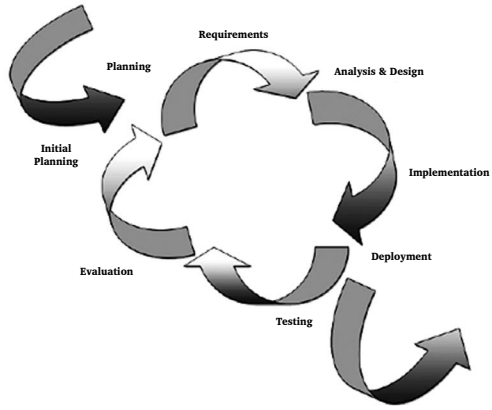

Figure 2. Iterative Software Process Model

The iterative development is a cyclic software development approach in software engineering. It combines the benefits of both prototyping and waterfall process model to address weakness of the waterfall process model. It allows software developers to work on the project in increments. Each increment adds a functional capability to the system until the entire system is being accomplished.

Requirements Phase

This is the phase where researchers listed the functionality and its entirety. The members of the team were initially given with their roles and the scope of their participation in the project. There are four members in the team and each member had their corresponding task.

Design Phase

This phase marked the beginning of the technical development of the application. Members of the group gathered to discuss technical issues/concerns related to the project. Software architecture and other

components to build and meet the application requirements were brought to the table. The algorithm was further discussed as this laid the foundation of the program flow. Initially, the programmer listed the modules that we should be working on, the framework/technique in creating the code as well as the SDK that he will be using. The graphics team on the other hand, work on the initial appearance of the diet management and discussed on the tools that they will be using to create or enhance the graphics.

Implementation and Testing Phase

What was planned during the Design phase is implemented. Team members worked on their tasks respectively. Completion of individual task was integrated for testing. Outputs of this phase were versions of the application that was recursively enhance in terms of graphics, program flow based on the algorithm.

Review Phase

In this phase, the application is evaluated. The current functionality is reviewed to either propose change or additional software requirement. What was discussed during the design phase is brought again to see whether the application worked as expected. If improvements can be done, these things will be carried on the next iteration of the design phase. The whole process continues until all application requirements are met. The good thing about this process model was that it offered opportunities for change. This gave chance for researchers to enhance graphics, recode the program flow based on the algorithm. This helped the researchers in testing the software quality of the application.

Flow of Genetic Algorithm

1. Initialize population
2. Encode each string to binary format

$$\sum_{t=0}^{\beta} \gamma_i 2^t$$

3. Compute for the fitness value of BMI f(x) and Health Condition f(y) using the function:

$$f(x) = \frac{1}{1 + |BMI_T - BMI_A|}$$

$$f(x) = \frac{1}{1 + |HC_T - HC_A|}$$

where: BMI_T = Target BMI
BMI_A = Actual BMI
HC_T = Target Health Condition
HC_A = Actual Health Condition

4. Select parents based on Roulette Wheel Selection formula:

$$Pi = \frac{Fi}{\sum_{i=0}^{n} Fi}$$

5. Perform crossover between two parent strings that are most fit
6. Perform mutation
7. Select next generation of strings
8. If criteria have been satisfied, end program. Else go to step 1

The user must fill out the necessary information such as age, height, weight, gender and current health condition. The system will process the data to identify the current body state of the user, whether normal, underweight, overweight or obese. The role of the algorithm is to process the user's input data and identify right food to eat by an obese person, the needed amount of food intake and suggest the exact time for exercise. It started with population initialization where health condition, food serving and user's BMI are being preprocessed. Encode the said data and represent it as a binary format. Subsequently, the algorithm will compute the fitness value of BMI and health condition. Once the it is done, it will select the parents based on roulette wheel selection formula and perform the crossover between two parent strings that are most fit. Afterwards, perform the mutation in order to maintain diversity on the child strings being produced. The algorithm then will select the generation of strings and once the selection is done the criteria has been satisfied.

RESULTS AND DISCUSSION

The Genetic Algorithm played an important role in diet management system which is to generate the right food to eat by an obese person. It is the basis of the system as well as the user to determine the BMI of the person, the needed amount of food intake if a certain obese person has a condition and the suggested amount for exercise.

Table 1. Test Case for Expected Outcome

Test Cases		Expected Outcome										
HCON	BMI	Fats	Sugar	Meat	Egg	Milk	Vegetables	Fruit	Rice	Water	Physical Activity	Total
Diabetes	Underweight	360	160	164	86	170	48	120	1500	8	30	2646
Gout	Underweight	360	160	164	86	170	48	120	1500	8	30	2646
Hypertension	Underweight	360	160	164	86	170	48	120	1500	8	30	2646
Normal	Underweight	360	160	164	86	170	48	120	1500	8	30	2646
Diabetes	Normal	270	100	123	86	170	48	80	1200	8	60	2145
Gout	Normal	270	100	123	86	170	48	80	1200	8	60	2145
Hypertension	Normal	270	100	123	86	170	48	80	1200	8	60	2145
Normal	Normal	270	100	123	86	170	48	80	1200	8	60	2145
Diabetes	Overweight	135	100	41	86	80	48	160	700	8	90	1448
Gout	Overweight	225	100	123	86	170	48	120	700	8	90	1670
Hypertension	Overweight	90	20	41	86	250	48	160	600	8	90	1393
Normal	Overweight	270	100	123	86	170	48	80	1200	8	90	2175
Diabetes	Obese	135	100	41	86	80	48	160	700	8	120	1478
Gout	Obese	225	100	123	86	170	48	120	700	8	120	1700
Hypertension	Obese	90	20	41	86	250	48	160	600	8	120	1423
Normal	Obese	270	100	123	86	170	48	80	1200	8	120	2205

Table 1 shows the recommended Kcal in every health condition and body mass index (BMI) of the user. The selection of the parent is that Genetic algorithm (GA) will generate and find the two parents with the highest score. Subsequently, the two parents with the highest score, the GA will perform crossover to meet the strings that are most fit. In mutation, there is a less probability of interchanging the mate. This was done to maintain diversity on the child strings produced in every mutation. The researchers prepared a test that would record the users BMI with the health condition. Changes were recorded in every BMI with the health condition on how the GA generate satisfactorily.

Table 2. Test Case for the Actual Outcome

Test Cases		Actual Outcome										
HCON	BMI	Fats	Sugar	Meat	Egg	Milk	Vegetables	Fruit	Rice	Water	Physical Activity	Total
Diabetes	Underweight	270	100	123	86	170	48	80	1200	8	60	2145
Gout	Underweight	270	100	123	86	170	48	80	1200	8	60	2145
Hypertension	Underweight	270	100	123	86	170	48	80	1200	8	60	2145
Normal	Underweight	270	100	123	86	170	48	80	1200	8	60	2145
Diabetes	Normal	270	100	123	86	170	48	80	1200	8	60	2145
Gout	Normal	270	100	123	86	170	48	80	1200	8	60	2145
Hypertension	Normal	270	100	123	86	170	48	80	1200	8	60	2145
Normal	Normal	270	100	123	86	170	48	80	1200	8	60	2145
Diabetes	Overweight	270	100	123	86	70	48	80	1200	8	60	2145
Gout	Overweight	270	100	123	86	170	48	80	1200	8	60	2145
Hypertension	Overweight	270	100	123	86	70	48	80	1200	8	60	2145
Normal	Overweight	270	100	123	86	170	48	80	1200	8	60	2145
Diabetes	Obese	135	100	41	86	80	48	160	700	8	90	1448
Gout	Obese	225	100	123	86	170	48	120	700	8	90	1670
Hypertension	Obese	90	20	41	86	250	48	160	600	8	90	1393
Normal	Obese	270	100	123	86	170	48	80	1200	8	90	2175

Table 3. Test Case Results for the Accuracy

HCON	BMI	Accuracy
Diabetes	Underweight	4 out of 10
Gout	Underweight	4 out of 10
Hypertension	Underweight	4 out of 10
Normal	Underweight	4 out of 10
Diabetes	Normal	10 out of 10
Gout	Normal	10 out of 10
Hypertension	Normal	10 out of 10
Normal	Normal	10 out of 10
Diabetes	Overweight	4 out of 10
Gout	Overweight	4 out of 10
Hypertension	Overweight	3 out of 10
Normal	Overweight	9 out of 10
Diabetes	Obese	9 out of 10
Gout	Obese	9 out of 10
Hypertension	Obese	9 out of 10
Normal	Obese	9 out of 10

RECOMMENDATIONS

The researchers recommend the following to enhance and to make this study more significant:

- To give the exact type of food depending on its nutrients needed in carbohydrates, protein, fats and calories.
- The user will input a type of food and the application will generate if that food is healthy to eat.
- To identify the proper food for those people who have allergies.
- If the person has multiple conditions the GA will still generate to its accurate food serving.
- Since the food servings were already identified by their health conditions and body mass index (BMI), it is recommended that the user can distribute the calculated amount of food servings for breakfast, lunch, and dinner.

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EDUCATIONAL TECHNOLOGIES

DEVELOPING AN APPLICATION FOR MONITORING STUDENT ACADEMIC RECORDS

Joshua B. Belarmino, Louralin Jenn G. Fetalvero, Joseph Al C. Javier, Exander T. Barrios

One of the responsibilities of the teachers is to monitor the performances of the students based on their scholastic achievements. However, there are some issues encountered by teachers that need to be addressed such as, having a hard time on some activities including: grouping his/her students due to its large number, recording class participation during class discussion and monitoring their students' individual performance. To somehow help the teachers solve this problem, the researchers decided to make an application to monitor student academic records by automating the method of recording class participation, applying a class record feature to determine the grades of students and classify them as to who are the fast or slow learners. Experimental research method and Spiral process model were used throughout the study. This method is done by comparing two variables in relation to the changes of the other. The researchers conducted a survey in UIC ITE faculty to assess how the application affected their way of monitoring students' records. Researchers concluded that application for monitoring student academic records is an effective tool for monitoring students in a certain class.

Keywords: *Class Monitoring application, Experimental research method, Spiral process model*

PEPITO ANG MATINONG DRAYBER: AN EDUCATIONAL GAME IN LEARNING TRAFFIC RULES AND REGULATIONS FOR ANDROID

Jo Anne M. Aranton, Hazel Anne C. Jimenez, Kristine Angelie C. Plaza, Eric John G. Emberda

Issues reported involving violations of traffic rules and regulations in different places had been rampant recently. These violations are sometimes a result from poor knowledge about traffic rules and regulations of the vehicle drivers. The researchers of this study were then motivated to develop an educational game in learning traffic rules and regulations using an Android based phone that will serve as an add-on tool in learning and teaching the different traffic rules and regulations. To achieve both the general and specific objectives of the study, the researchers employed the Experimental research method and had been guided with Iterative Software Development process model. For the development of the game, the researchers had used Lua as the programming language, Adobe Illustrator and Photoshop CS6 for the interface, and Corona SDK for the emulator. After the testing and evaluation of the game, the researchers were able to conclude that the respondents were able to learn about traffic rules and regulations using their Android mobile phones. The researchers were able to receive positive feedbacks from their chosen respondents.

Keywords: *Educational Game, Traffic Rules and Regulations, Experimental research method, Iterative software development process model*

THE HERO ADVENTURER: AN EDUCATIONAL OFFLINE 2D GAME APPLICATION ABOUT DR. JOSE RIZAL'S ADVENTURE

Liza May D. Anuada, Anlord R. Bahaya,
Jean Cecilia V. Coronel, Eric John G. Emberda

Dr. Jose Rizal, the Philippine national hero, a significant person that have played an important role in the history of every Filipino. In the University of the Immaculate Conception, some students find it less challenging, and even to the point, less appreciated to study the Life and the works of Dr. Jose Rizal. Most of the students are more interested in looking at their gadgets while having classes. Indeed, we can't stop the advancement of technology. Because of the rampant use of technology, people are becoming more dependent in using it. Researchers were then motivated to develop an educational game as a tool to add knowledge to the students about the life and works of Dr. Jose Rizal. Also to let the students of Information Technology Education program who are currently taking the subject be aware of the contribution of Dr. Jose Rizal. The researchers were guided with the Exploratory research method and had utilized the Iterative software process model for the game development. Adobe photoshop CS5 and Adobe Illustrator CS5 were used in designing the interface of the game. Adobe Flash CS5 and Actionscript 3 as the primary programming language. A researcher made survey questionnaire were administered to the randomly selected set of respondents. After the testing and evaluation of the game, the researchers then conclude that the educational video game is indeed helpful.

Keywords: *Educational Game, Life and Works of Dr. Jose Rizal, Adobe photoshop CS5, Adobe Illustrator CS5, Adobe Flash CS5 and Actionscript 3, Exploratory research method, Iterative software process model*

DEVELOPING TOME OF KNOWLEDGE TO ENHANCE EARLY GRADERS' COGNITIVE SKILLS WHILE LEARNING MUSIC, ARTS, PHYSICAL EDUCATION, AND HEALTH (MAPEH)

Ricky Jay D. Fernando, Laura P. Jarmin,
Stanley E. Layno, Eric John G. Emberda

To implement an interactive quiz game that will enable learning of MAPEH subject be more exciting is the very goal of this study. The game will act as a learning tool that will help in solving the problems that teachers face in expanding a child's vocabulary. The application can make the students be more determined in learning the subject in advance. Furthermore, it will enhance their cognitive skills as they think, remember, and learn the possible things that their teacher had asked them to remember, one example would be music. In each phase of the study, Music, Arts, and Physical Education, the students or players need to have some reviews in order for them to answer the questions being asked. The Experimental research method was employed in the study and was guided with the Spiral process model in the development.

Keywords: *Music, Arts, Physical Education, and Health (MAPEH), Experimental research method, Spiral process model*

BATANG JUAN: AN EDUCATIONAL SOFTWARE FOR PRESENTING PHILIPPINE VALUES AMONG FILIPINO CHILDREN

Aivey Dianne V. Dimaano, Joemer B. Ordoño,
Heinrich Keziah M. Vicente, Kyle Jurg S. Millan

As technological advancements mushroom, the Filipino youth is exposed to greater challenges most of which uproot the solid foundation of values and virtues. This statement is alarming because this reflects the current situation of the Filipino children. At their young age, the presence of Filipino values in them is slowly diminishing which the researchers thought it to be very alarming. With this, the researchers were motivated to develop an educational software application that aims to promote Filipino values through stories and games among the Filipino children. The Experimental research method was employed in the conduct of the whole research, guided with the Iterative software process model for the development of the software. With the aid of the following technological tools, Adobe Photoshop CS5 for the design of the characters and the game interface, and Adobe Flash CS3 for the animation, the researchers were able to create the software application. The result of the experiment shows that the multimedia approach proves to be an effective learning tool for students.

Keywords: *Philippine literature, Filipino Values, Visual Multimedia approach, Experimental research method, Iterative software process model*

STUDENT ATTENDANCE MONITORING GPS APPLICATION USING ANDROID MOBILE PLATFORM

Brylle John D. Fidelino, Von Peter Austin P. Nabatar,
Kent Ian A. Virrey, Joseph Brylle N. Cambronero

Some schools and universities have its own and unique process of checking student attendances. Some do it manually while some uses advanced technology like computers, biometrics, and etc. In the case of University of the Immaculate Conception wherein a huge number of students are enrolled, monitoring of students' attendance during events is a tedious job. The purpose of this study is to create an Android application that will automate the process of the attendance monitoring. The study's main goal in developing the application is to minimize the time needed to completely monitor the attendance of student attendees whenever school activities are held. The researchers were guided by Experimental research method. In the development of the application, the researchers implemented Iterative/Incremental Model which included the need for understanding the Android platform as a whole, and undergoing the process of developing the Android application itself. The results of the system evaluation suggests that the application was able to monitor students' attendances within the premises of the activity conducted. In conclusion, the application would function best when used outdoor as GPS coordinates are difficult to determine in indoor places.

Keywords: *Android application, Android platform, Global Positioning System, Experimental research method, Iterative/Incremental Model*

AN APPLICATION FOR MONITORING AND INQUIRING OF STUDENTS' ACADEMIC RECORD WITH AUTOMATIC NOTIFICATION FOR THE PARENTS

Kleoffe T. Artillo, Sherry Amor U. Galindo,
Khristel Joy V. Ramos, Ceasar Ian P. Benablo

The academic success of students in school is not solely attributed to their own efforts. More often than not, a parent that monitors and supports is behind every student success story. It is therefore important that parents are able to monitor student's academic performance to better guide students. The main purpose in conducting this study is to help parents and guardians be updated with their children's performance in school especially in academic matters. The researchers chose Developmental Research Method as a guide in the conduct of the study. The Short Messaging Service-based application was developed using Microsoft Visual Studio 2010 as the development environment. For students with failing grades, parents will automatically receive a notification. The application was then tested through the formulation of test cases. In conclusion, the researchers believe that through the application, parents monitoring of student's performance was made better. Knowing that students have failing grades, parents can immediately act accordingly.

Keywords: *Academic performance, Short Messaging Service, Microsoft Visual Studio 2010, Developmental Research Method*

INTEGRATING OPEN OFFICE WRITER, CALC, AND IMPRESS WITH SENDING FILE VIA ELECTRONIC MAIL

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Herlee Ann Marie L. Loreto, Christian N. Ruela,
Ceasar Ian P. Benablo

The use of computer-aided tools in any office to do tasks has made significant difference in terms of work throughput. Most computers available at present allows multiple windows to be concurrently opened. Despite the advantage it is supposed to give the users, this actually is confusing to many. While some knows how to view different windows simultaneously, most people find it difficult to shift from one window to another and vise versa. The main objective of this study is to determine whether the integration of different office application software would be beneficial to users. The researchers created an integrated OpenOffice application wherein Writer, Calc, and Impress applications have been rolled into one. The application only runs in Windows XP, Vista and 7 operating systems. In the course of the study, the researchers used descriptive research method and were guided by iterative/incremental model in the development of the application. The test conducted revealed that with the integrated OpenOffice application, the time consumed in opening several windows was reduced significantly.

Keywords: *Computer-aided tools, office application software, OpenOffice, operating systems, Descriptive Research Method, Iterative/ Incremental Model*

PSEUDOCON: A PSEUDOCODE TO C CODE CONVERTER FOR LEARNING C

Christian Clovis C. Marilao, Alysa Ken D. Pural, Ariel TNT C. Yanong Jr., John Kevin C. Yu, Eric John G. Emberda

C programming languges has been around for decades and is still ranked at the top of the programming languages used and studied today as described by Sawyer (Sawyer, 2012). It has become the lingua franca of computer programming. Novice programmers tend to make mistakes in syntax and semantics. The researchers were then developed to develop PseudoCon: A Pseudocode to C Code Converter for Learning C. The researchers chose to follow the experimental pre-test and post-test research method and have been guided with the Iterative Development Model for the development of the application. Testers of the application who evaluated the program found Pseudocon to be efficient. The researchers of this study then concludes that Pseudocon has been a success.

Keywords: *C Programming, Pseudocode, Converter, Experimental research method, Iterative software process model*

ALGORITHMS, COMPUTATION THEORY, AND APPLIED COMPUTING TECHNOLOGIES

AN ANDROID-BASED CITY ORDINANCE LIBRARY WITH SOCIAL NETWORK-BASED ADMINISTRATION

Win Win P. Alvar, Earl L. Corias,
Jose Paulo Miguel A. Santos, Exander T. Barrios

Information dissemination about solid waste management has always been a challenge to the government of Davao City. Since one of the primary sources of information nowadays is the updates from social networking sites, an Android based City Ordinance Library with Social-Networking-Based administration was developed to help disseminate the information of Solid Waste Management from a source, and can be viewed using an Android based phone. The purpose of designing and creating the application is to enhance the dissemination of information with social networking sites on Android phones. This study is intended to help the government disseminate information in real time and in a way that is more convenient. The general objective of this study is to develop a mobile application that can provide information to people about city

ordinances in Davao City using Android phones. The researchers used the constructive research method. With the aid of different technologies such as Eclipse Android development tool (ADT) bundle as the IDE, and an Android Software Development Kit (SDK) for developing Android-based applications. After the evaluation of the application, several recommendations from the respondents were gathered.

Keywords: *Social Network, City Ordinance, Android-based applications, Constructive research method, Information dissemination*

IMPLEMENTING A FACEBOOK APPLICATION FOR INTEGRATING MOODLE UPDATES

Don Lester Paul C. Cavan, Rea Mae U. Donato,
Jose Karlo L. Omambing, Oliver B. Sespeñe, John Larry Limbo

As part of innovation, University of the Immaculate Conception extends their learning environments online through Moodle. Moodle is a course management system that allows educators to create activities, announcements, quizzes and assignments online. It also allows them to upload course materials that would be used as a reference for learning. Since the majority of the students go online, specifically used Facebook than of Moodle, the researchers were then motivated to implement a Facebook application for integrating Moodle updates. Facebook has been classified as the widely used social networking site. The application would be responsible for retrieving latest updates (new announcement, new assignment, new course materials) and notify the student on Facebook. It also notifies the student whenever the student has committed the maximum number of absences for the semester.

Keywords: *E-Learning Management Systems, Moodle, Facebook*

PHPWIZARD: PHP IDE SYNTAX HIGHLIGHTER DESKTOP APPLICATION

Sheila Mae R. Caballero, Nikka Jane T. Maglines, Mariel L. Parreño, Ceasar Ian P. Benablo

During the past decades, software systems have grown significantly in size and complexity. One of the most used programming languages today is PHP and to be able to manipulate the source code, an IDE is required. The PHPWizard: PHP IDE Syntax Highlighter Desktop Application aims to provide helpful information of PHP functions for PHP programmers in the convenience of their desktop even without internet connection. The research aims to know how effective the system can help PHP programmers in making their coding experience more convenient in a PHP IDE. The researchers used constructive research method and rapid application development model in the development of the research. The results of the study were that the application effectively helped the PHP programmers experience coding in an IDE more comprehensively through the significant results the application showed and in other word processing applications and even in a web site. The researchers concludes that the proposed system is useful will greatly help PHP programmers especially newbies.

Keywords: *Integrated Development Environment, PHP, Syntax Highlighter, Constructive research method, Rapid application development model*

"WORK IT OUT": A 5-DAY RESET PERIOD MOBILE APPLICATION FOR DIET BEGINNERS

Bryan Blaire D. Ormido, Rod Tyrone C. Molinos,
Shenna Rhea A. Maranguit

Nowadays, there are lots of people who are prone to diseases. Bacteria and viruses are fast spreading in different parts of the globe. There were many reasons in why there were so many unhealthy people in the community, one was they don't care about their eating habits, they just eat and eat that's why they suffer from obesity and overweight that had led them to acquire some diseases and illnesses, second is that they do not prefer to do simple workouts like walking but instead ride a vehicle, a simple and easy way to burn fat in the body, and the third is that most people do not have a dietary plan of what are the proper and healthy foods to eat every single day. It is important that people must practice healthy lifestyle to keep them away from diseases and illnesses. Though the benefits of healthy lifestyle choices are well-established among the general population, less is known about how developing and adhering to healthy lifestyle habits benefits obese versus normal weight or overweight individuals. The purpose of this study is to determine the association between healthy lifestyle habits, eating fruits and vegetables daily, exercising regularly, consuming alcohol in moderation, and not smoking and mortality in a large population-based sample stratified by body mass index (BMI). An experimental research approach was employed in the study and guided with the 4D Methodology the application was successfully developed.

Keywords: *Mobile Application, Diet Meal Plan, Body Mass Index, Experimental research approach, 4D Methodology*

AN ADVISORY APPLICATION SYSTEM INTEGRATED THROUGH BARCODE SCANNER FOR SCHOOL INFORMATION

John Carlo M. Bustria, Ephraim H. Franco, Floracris D. Montorio, Diana N. Sumalinog, Nikko Isadore R. Tinio

Nowadays, technology is viral and certain codes programmed in a technical device will likely perform specific tasks that are allocated by the maker, and this aspect, which carried all throughout since the debut of computer programming in businesses, have grown to several varying fields and means. Nevertheless, although technology may have some drawbacks to consider towards directing our society, like an increasing dependency on one's role or performance from machines for example, but it too had never failed its basic forms of accomplishment, and that is to reduce workload and increase productivity. Consequently, the researchers had come up with an idea of making an application, which applies the same principles, yet intangible to begin with, because it is a software application that can be collaborated to some particular machines apt for this program to function. To specify, an application for a barcode to find their class schedules, as well as providing certain information in the future. For example, a student who wants to map out class location and its schedule can definitely use this system by exposing the barcode found on the identification card to the scanner, and eventually details regarding the class and outlined location images will be presented on the screen, thus one could immediately know these crucial information, and ensure precision to some extent of activities. Moreover, unlike barcode scanners that are found in supermarkets, it will have the ability to detect authentic students, as well as teachers, besides from relaying messages to users. However, this application is interdependent on some equipment to benefit its operation as a whole, namely a computer, I.D. card and the Barcode scanner itself. and, in addition, the Internet with a network connection is strongly required for the reason that it will harmoniously perform tasks from other needed services. In general, this application will more likely revolutionize the mere use of one identification card into a key for several functions such as checking legitimate clients, know informational details,

and aid uncertainties. Therefore, using this application in businesses and other establishments, like schools and offices is not far from becoming a reality, and with regards to technical advancement, it's never to decrease human creativity and work performance, but to provide more manageable time of doing other activities with much higher necessities.

Keywords: *Student Identification Card, Barcode Scanners*

WEB BASED PORTAL FOR PROFILING THE SOCIAL BEHAVIOR OF MODERN PARENTS AND TEENS

Kenneth Jan A. Asoque, Charmaigne Jane R. Segura, Ceasar Ian P. Benablo

It is during teenage years that people starts to encounter issues about their self worth and their relationship with others. As a result, several problems in the society brought by these issues are experienced. It is therefore important that teenagers have an avenue for open communication among themselves and with adults where they can openly express their thoughts and sentiments to keep them from succumbing to dreadful activities. The purpose of this study is to improve the communication between teens and their parents through a web-based portal. Using Applied Research Method, the researchers gathered pertinent information and then formulated questions to form part of the portal. Through answering these questions, teenagers' sentiments and problems being encountered could be determined. The development of the portal was made easier with the use of Scrum Process Model which allowed and somehow required the researchers to work more often with better result for every sprint. At the end of the study, the researchers were able to draw significant findings on the identification of existing problems between parents and teens. With these results, the researchers are positive that this will somehow, if not totally, help bridge the communication gap between parents and teens.

Keywords: *Web-based Portal, Applied research method, Scrum Process Model*

VOICE TO TEXT APPLICATION FOR WINDOWS USING GOOGLE SPEECH API

Nick B. Gulayan, Peter Clinton L. Layno, John Dave Mordeno, Natasha Bianca E. Roa, Harold P. Garcia

When productivity is concerned, it is important that people deliver as much output as possible. In a typical office setting for clerical people, it is expected that a number of paper works has to be dealt with. In cases where an individual is not that proficient or has difficulties in typing, the job becomes more difficult to accomplish. Hence, this study which aimed to develop a voice-to-text application for Windows using Google Speech API was conducted. The goal is to provide to people as an alternative to typing a tool to input the desired text through the use of voice. Guided with Constructive Research Method, the researchers went through series of readings particularly on the technology being used. In the development of the application, the researchers used Iterative Process Model. The study had 10 respondents that tested the functionality and acceptability of the application. All the respondents had positive feedbacks as the application was able to convert spoken words into texts. As such, the researchers conclude that the application is a good alternative to dealing with paper works. It is recommended however that for better results, the pronunciation of words be made clear as it affects the resulting texts.

Keywords: *Voice-to-Text application, API, Google Speech API, Constructive Research Method, Iterative Process Model*

PARENTAL CONTROL: AN APPLICATION TO MONITOR CHILD ACTIVITIES ONLINE THROUGH SMS

Mark Anthony Y. Hernandez, Darwin Clovis E. Razo,
Pievan John M. Tocao, Exander T. Barrios

With the increasing utilization of the Internet services, it is difficult to monitor online activities of people especially children. Since the Internet provides a vast collection of information, in any form and from various sources, it is important for parents to ensure that what their children gets are only those that will be beneficial for them. The purpose of this study is to present opportunities for many parent/s or guardian/s in monitoring online activities of children. The researchers used Constructive Research Method as guide. As an offshoot to this study, the researchers have developed an application that monitors what children are accessing in the Internet. The application works by providing parents ability to receive a notification in the form of short messaging system texts that is sent whenever access to websites with malicious and inappropriate content are made. This in turn lets the parent allow or prohibit the access. The application was tested and the results show that it was able to provide parents the capability to monitor and control their children's access to various websites. The researchers were able to conclude that with the help of the application, inappropriate activities of children were minimized.

Keywords: *Internet, Short Messaging System, notification, Constructive Research Method*

CAESPERI: A FACEBOOK-BASED PROJECT MANAGEMENT APPLICATION FOR MULTIPLE PROJECT CONNECTIVITY

Jayson Y. Cano, Rhady L. Estrada, Rose Angelique C. Perong, Kevin John A. Rivera, Francis Rey F. Padao

This is a study about a Facebook-based project management application that tends to help project developer's problem in monitoring and controlling multiple task and multiple projects especially in the part of the project manager who are experienced difficulties in prioritizing the task to be done. Another difficult situation comes upon is the visualization of the task presentation which is more important because it allows the development team to see the workflow of the project. The researchers came up with the idea of making a Facebook-based project management application. This idea was taken from different research and reflective analysis. The main feature of this application is to display a graphical presentation of the multiple projects. The objective of the researchers is to fill the needs of the project developers especially in helping them to complete their project on time. The method that the researchers used in completing the research was descriptive method. The researchers came up with the result of this study. It will help the project developers in checking the workflow of their project using the visualization and the graphical presentation in the application. Therefore, the researchers conclude that this study will help the project developers to be successful in making projects.

Keywords: *Project Management, Facebook, Visualization*

NETWORKING TECHNOLOGIES

A MULTI-INSTALLATIONS OF ANDROID MOBILE APPLICATION IN A DISTRIBUTED SYSTEM ENVIRONMENT

Alvince Japhet M. Alconera, Jo Mark P. Gonzaga, Allan Winston G. Ladores, Jade C. Tan, John Marco M. Pitlo

The use of Android smartphones has increased in recent years. As a result, there has also been an increase in the number of application installation. Many repair shops offer application installation services for customers. However, the installation process is too lengthy that it involves a lot of processes. The purpose of this study is to create a PC application that makes the installation of Android application convenient through wireless installation to multiple Android devices. The proponents used experimental research method. In the process, a survey was conducted to determine how simultaneous installation of Android application to multiple Android phones in a wireless local area network can be helpful in different individual and in different situations. In the development of the application, Incremental Process Model was used. In the end, the researchers selected students in the University of the Immaculate Conception for the evaluation of the application. The evaluation, which was in the form of a survey, revealed that in order for the desktop application to be able to

be able to install applications to multiple devices, several technical factors have to be considered and be done. In conclusion, the application was able to conveniently install Android applications to multiple devices.

Keywords: *Android smartphones, Android application Wireless Area Network, Experimental research method, Incremental Process Model*

A LOCAL AREA NETWORK BASED APPLICATION MONITORING PLUGGED/ UNPLUGGED UNIVERSAL SERIAL BUS STANDARD DEVICES

Rodney Rock M. Bautista, Kinneth A. Gorre,
Jeremiah Peter P. Taclob, Exander T. Barrios

Computers nowadays are common devices. Along with it are its Universal Serial Bus standard devices - mouse, keyboard, USB hub, mass storage devices, and mobile phones. For security and safety purposes, there are internet cafes and computer laboratories that does not allow plugging or unplugging of USB standard devices, flash drives to be specific, since it can contain viruses that may harm the computer's software. The purpose of this study is to develop a Local Area Network-based application that can monitor the plugging or unplugging of USB standard devices. The researchers used the constructive research method. To monitor the different plugged or unplugged USB standard devices, the researchers used socket programming and sending message through LAN that enables the client and the server to communicate with each other. Through formulated test cases, a user acceptance testing was conducted on selected students of the University of the Immaculate Conception and Retroport customers. The researchers were able to conclude that the application is capable of detecting different USB standard devices plugged into the computer unit but with specific conditions.

Keywords: *Universal Serial Bus, Local Area Network, Constructive research method, User Acceptance Testing*

WEB-BASED CALLER ID BLOCKER APPLICATION FOR ASTERISK SERVER USING GSM GATEWAY

Peter John P. Belandres, Marc Angelo S. Gumapac, Analisa L. Sarte, Shenna Rhea A. Maranguit

Voice over Internet Protocol is the real-time transmission of voice signals using the Internet Protocol over the public Internet or a private data network. VoIP converts voice signal from the telephone into digital signal that can travel over the internet. Nowadays, even small and medium businesses are interested in implementing VoIP. However, VoIP is prone to the external threats such as vishing, spoofing, phreaking, VoIP spam or unwanted calls. The researchers proposed to implement a Web-based caller ID blocker application for asterisk server using Global System for Mobile gateway. This web based application aims to extend the capabilities of asterisk server for blocking any suspicious calls within and outside the LAN. The administrators have a full authority access to the web based caller ID blocker application. The administrator has an authority to block any incoming calls. This will help the administrator to reduce possible attacks that can harm the company who are using VoIP technology. This research web-based caller ID blocker application for asterisk server using GSM gateway aims to reduce the VoIP attacks that can harm entirely the network and the company. Furthermore, it will also identify the caller IDs that will be blocked by the administrator who has the full authority in blocking and unblocking inbound and outbound calls.

Keywords: *Voice over Internet Protocol, VoIP technology, private data network, ID blocker application, Global System for Mobile*

DAVAO CYBER SECURITY AWARENESS SURVEY PORTAL

Nonie Van F. Nadera, Romeo A. Petiza,
Donna Mae Q. Tabuno, John Larry A. Limbo

Threats on computer network and security are present but only few people are aware of this. With this, people may have exposed themselves into these threats without even knowing it. As a result, several incidents relating to fraud have been experienced. Davao Cyber Security Survey Portal is a study that aims to develop a tool for raising awareness on these threats. The objective of creating this portal is to provide information to the users about the different attacks on computer network and security. One key component of the study is to determine the awareness of students. Out of 622 students, 244 were chosen to be part of the survey. Through answering the survey questionnaires, respondents' level of awareness have been determined. With the portal's graphical representation, user may view the result of the survey and may distinguish what attacks are well-known and what attacks are not. The portal also provides pertinent information about the different attacks. For security purposes, the portal does not allow users in editing the displayed information. The researchers were guided by the Waterfall process model in the development of the application.

Keywords: *Computer network and security, Threats, Portal, Waterfall process model*

DEVELOPING A MONITORING SYSTEM WITH BUILT-IN STRING ANALYZER APPLICATION

Lawrence Gaudee B. Avellana, Kristine Joy D. Diabordo, John Roger N. Pitogo, Roxanne S. Tronco, Joseph Brylle N. Cambronero

At present, many people are already using the Internet to access various websites. These websites provide relevant and irrelevant information. The access to any website is not directly prohibited. As such, access to websites with adult contents are made available even to children. The purpose of the study is to develop a monitoring system with built-in string analyzer that can be an efficient tool in minimizing the access to websites with adult content. The study also aims to determine how can a string analyzer application be utilized and implemented to minimize the access to these websites with Internet Explorer being the web browser. The string analyzer application was specifically used to check inputted words and match them with words associated to obscenity. The researchers followed the Experimental research method. In the development of the application, the researchers used the 4D methodology as guide. At the end of the study, the researchers were able to conclude that the application would work best with Internet Explorer. With such limitations, the researchers highly recommend that the application be made applicable to all browsers for optimal use.

Keywords: *Internet, monitoring system, string analyzer, Internet Explorer, Experimental research method, 4D methodology*

DYNAMIC CLEANING UTILITY VIRUS: AM ENHANCEMENT OF CLEANING UTILITY VIRUS FOR COUNTER ATTACKING VIRUSES

Lhendylyn M. Bandayon, Ana Rohma Mae H. Fernin, Tito E. Soliva, Daniel P. Laurel

Maintaining a clean and virus-free personal computer is one difficult task. Since people today are becoming more engaging, exchange of data and information also becomes prolific. In the process, it is inevitable that as data are transferred from one unit to another, several kinds of computer virus often comes along with it. This oftentimes causes harm to computer systems. This study is conducted with the purpose of providing an enhancement on the previous research undertaking concerning the development of a mechanism to handle computer viruses. The researchers were guided by Experimental Research method in the conduct of the study. The result of the study is Dynamic Cleaning Utility Virus - a virus that counter-attacks viruses, neutralizes it and provides protection among your files and folders. DCUV is capable of counter-attacking more viruses dynamically. The application was tested by 20 students of the Information Technology Education program of the University of the Immaculate Conception. In conclusion, the researchers believe that apart from having a user-friendly interface, DCUV is capable of neutralizing viruses that enters both the computer's system and other storage devices.

Keywords: *Personal computer, Computer virus, Cleaning Utility Virus, Dynamic Cleaning Utility Virus, Neutralizing, Experimental Research method*

DYNAMIC / STATIC PASSWORD GENERATION FOR WIRELESS ROUTER USING ANDROID PHONE

Kris Gauin A. Cablayan, Floyd Mark B. Manon-og,
Rommel Nephi B. Miranda, Eric John G. Emberda

Internet, being a powerful tool, allows various processes to be done online and information to be acquired. As such, Internet are often being made available in establishments for people's utilization. One option in making Internet available is through inplacing WiFi or a wireless local area network. WiFi technology allows devices to get connected for better resource sharing. However, as the number of connected users increase, the slower the Internet becomes as the bandwidth is divided. Hence, passwords are used to limit the accessibility of the network. The problem occurs when there is an unauthorized sharing of password. The purpose of this study is to develop a dynamic/static password generator using Android phone. This will help owners of WiFi devices better manage the number of connected users. In the course of the study, the researchers followed Experimental Research method. For the development, the researchers used Incremental Process model. The researchers conducted a testing to 5 users. With the results, the researchers were able to conclude that the application has helped users in dynamically or statically changing of WiFi passwords. It is to be noted however that the application would become more useful if it can support more router brands.

Keywords: *Internet, WiFi, wireless local area network, bandwidth, Experimental research method, Incremental Process model*

DEVELOPING A GOOGLE CHROME EXTENSION FOR MINIMIZING DNS SPOOFING BASED PHARMING ATTACKS

Ronald Grenan Ela, Kevin Mark Faunillan, Rick Stephen Gingo, Quirstan Jybee Magallon, Eric John G. Emberda

The resesarchers have made a Google Chrome extension that minimizes DNS-Spoofing based pharming blocking the suspected pharming site. This extension was developed in a way that prevents a user in accessing a pharming site that will steal another user's credentials or information such as username and password. The extension will retrieve the IP address of the current website being accessed and the IP address of the network and compare the accessed site with the network IP addresses in the network IP addresses, if the IP address of the accessed site is the same with one of the compared network IP address in the network IP addresses, that site is pharmed or the IP address of the corresponding website is being spoofed then the google chrome extension blocks this site by prompting the user a warning and redirecting the user to a blank page. Using this extension, the researchers have found out that the comparing technique they have use is effective for it is able to block a pharming site. Furthermore, this extension will not totally eliminate pharming through DNS-Spoofing hwever it will minimize the threat of this kind of attack. An experimental research methodology was employed in the study, guided with the incremental software process model the researchers were able to implement the study.

Keywords: *DNS-Spoofing, IP addressing, google chrome, experimental research method, incremental software process model*

ENTERTAINMENT AND MULTIMEDIA TECHNOL0GIES

WILD ADVENTURES OF BOGGART: WILDLIFE GAME SIMULATION

Edeson John M. Cabanes, Jeffrey J. Comilang, John Marco M. Pitlo

Games have somehow become a form of leisure or sometimes it has become an entertainment to people. Several studies have shown that teaching students through games can be an effective learning tool. The researchers then thought of creating an educational game for elementary students to know if this could enhance their knowledge and analytical thinking skills, and help them increase their knowledge about the Philippine Tarsier Wildlife as only few only knew about this. The general objective of this research is to create a story-based educational game that is based on the Philippine Tarsier Wildlife and to use video games for educational purposes. Specifically, this research would want to know if an educational game can be an effective tool for increasing a user's knowledge. The researchers had used Flash Action Scripts 2.0 language to develop the game, guided

by the Waterfall approach as the software development method. With the use of a researcher made survey questionnaire, researchers were able to conclude that most of the students had learned something more about the life of the Philippine Tarsier through an educational game.

Keywords: *Philippine Tarsier Wildlife, Educational games, Flash Action Scripts, Waterfall Approach*

JUMP WITHOUT HESITATION: A 2D ANDROID PHONE GAME APPLICATION BASED ON A TRADITIONAL "LUKSONG TINIK"

Earl James M. Barlis, Joanne Marie P. Manimtim, Eric John G. Emberda

Games are challenging, interesting, and engaging. It has been used to teach concepts, and skills. With the advancing technology landscape offered by mobile phones, games are more immersive than ever. The gaming preferences of children has always been a matter of choice. Less engagement in outdoor activities as much as the older generation used to has increased and children have largely embraced technological innovations wholeheartedly. Understanding the fundamental concept of a game is the most important aspect of game development in order to hold the interest of the gamer. In this way the researchers formally constructed the method of development by creating a virtual environment, applying features, and providing simple mechanics to engage users in an easy, fun, and interactive way. In general, this paper describe the concept and implementation of Android game applications based on the adaptation of traditional Filipino street game called Luksong Tinik: Jump Without Hesitation. This paper also describes a design for run-and-jump action that allows the player to perform a simple gesture of

tapping and swiping for the type of game experience. With the use of this application, the researchers were able to help the users develop an appreciation for Filipino culture and traditions and give them an idea of nationalistic identity.

Keywords: *Android game applications, Luksong Tinik, Developmental research method, Incremental Process model*

DIGOY THE EXPLORER: AN ADVENTURE GAME PROMOTING DAVAO CITY'S TOURISM

Janine D. Bataga, Maria Cristina M. Delfin,
Jon Lois D. Demetrio, Francelome John E. Noveno

In order to help in the advocacy of strengthening the tourism of Davao City, the researchers developed Digoy the Explorer: An Adventure Game Promoting Davao City's Tourism. Game applications are now widely used in promoting advertisements. The researchers were then motivated to do this research in order to help promote Davao City, the tourist destination found in the city, its history, heritage, and culture. The researchers used the Exploratory research method in conducting this research. Using Adobe Illustrator CS4, Adobe Photoshop CS5, and Flash Actionscript version 5.5 the game was developed. The researchers then recommends to enhance the level of difficulty of the game in order to help boost the critical thinking skills of the player. The researchers recommends to include more places, to improve the game design, concept, and aptitude.

Keywords: *Educational Game, Tourism, Adobe Illustrator CS4, Adobe Photoshop CS4 / CS5, Flash Action Script version 5.5, Exploratory research method*

ISKRAMBOL: A FILIPINO-INSPIRED SCRABBLE GAME

Melchisedec Jethro L. Colinares, Marvic Lean F. Tonatos, John Marco M. Pitlo

Nowadays, Computer games have transformed the human society into another league. It becomes a major factor in today's entertainment field. English has been the universal language of most of the game application played by the majority, this influences the children to use it in their daily living. Filipinos are aware that English is more used than the native language especially in schools. However, there are many alternative solutions for that, teaching and learning will be easier if the students are having fun on what they are doing. The researchers are then motivated to develop a computer game which can help to preserve and familiarized the native language. ISKRAMBOL is a Filipino inspired Scrabble game. It is a word game by forming words from individual lettered tiles on a gameboard marked with a 15-by-15 grid. An Exploratory research approach was employed by the researchers and was guided by the Iterative software process model for the actual development of the game. The result of the evaluation of the application shows that educational games are indeed effective in improving or enhancing the vocabulary skills of the individuals.

Keywords: *Game development, Scrabble Game, Exploratory research method, Iterative software process model*

FLOP EM' UP: A 3D GAME APPLICATION BASED FROM THE TRADITIONAL FILIPINO TUMBANG PRESO GAME

Marco Angelo V. Deligero, Kai Phylles B. Pelayre,
Albert Ryan J. Villamor, Eric John G. Emberda

The researchers of this study aim to develop a game application that adapts the concept of the traditional outdoor Filipino game Tumbang Preso. The game itself focuses on simulating Tumbang Preso's gameplay in order for its players to virtually adapt the game's fundamental principles and eventually contribute to its preservation into the players' consciousness. This study will involve a particular Physical Education 4 class taking part on a series of surveys, a pre-survey wherein the researchers are to determine their level of familiarity on Tumbang Preso and a post-survey that aims to find out whether or not the game itself is an effective tool in teaching and instilling into the minds of the students the concepts about Tumbang Preso. This study had utilized the use of Quasi-experimental research since the respondents are not randomized and is to be implemented through the Iterative software process model.

Keywords: *Educational Game Development, Tumbang Preso, Quasi-Experimental research, Iterative software process model*

AN ENHANCED INTERACTIVE FILIPINO-BASED ROLE PLAYING GAME FOR STORYTELLING

Melchisedec Jethro L. Colinares,
Marvic Lean F. Tonatos, John Marco M. Pitlo

In this study, the researchers developed an enhanced interactive Filipino-based role playing game for storytelling. Game applications are now widely used by people, most especially students. The researchers conducted this research in order to enhance the features of an existing interactive Filipino-based role playing game to further its comprehensive aspect and gain a wider audience range. The researchers used the exploratory research method in conducting this research. Using Adobe Photoshop for the character design, After Effects for the 3D models export, and Unity 3D for developing the game. The researchers recommend enhancing the level of difficulty of the game in order to help boost the critical thinking skills of the player. It would be better to include more places, to improve the game design, concept and aptitude.

Keywords: *Game Development, Multimedia tools, exploratory research method*