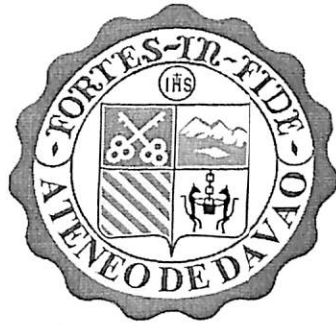


**INVERSE BOGGLE: A WORD SEARCH GAME USING ADOBE FLASH
BUILDER & PHP**



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**INVERSE BOGGLE: A WORD SEARCH GAME USING ADOBE FLASH
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Abstract

There had been numerous web applications everywhere in the web today. One of these is the game application which rapidly grows and innovates every day. Games come in different types such as puzzles, arcade, board and word games, and many more. These game applications do not always offer educational benefits but banishes boredom of people of different ages.

The purpose of this study is to create a game application that will offer educational benefits such as increase in vocabulary and improvement in spelling. This study aims to develop a recreational game application applicable to people no matter what age, skill level, and experience. Specifically, this research aims to implement an inverse boggle word search game using adjacency matrix as its data structure in plotting the words into the grid. Adjacency matrix is a means of identifying which vertices of a graph are adjacent to other vertices. The application makes use of WampServer that manages Apache and MySQL services. Apache is a freely available Web server distributed under an open source license. It allows the game application to be available and accessible through the web. While MySQL is a database system used on the web which allows the creation of relational database structure in order to store data or automate procedures.

The development of the web-based game application is implemented on Windows Operating System using Adobe Flash Builder 4. The graphic user interface of the application is created through Adobe Photoshop CS5 Extended.

Keywords:

Inverse Boggle, Game Application, Word Search, Adjacency Matrix, WampServer, Apache, MySQL, Windows, Adobe Flash Builder, Adobe Photoshop

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

English is the universal language and the medium used to communicate with people around the world, therefore it is important to be familiar with the language. It is used by teachers in teaching and by people in the business world who strictly implement the use of this language since they work with other people from different parts of the country. When it comes to gaming, it is significant to use English language since it is distributed not just in a country but also to other countries.

Two popular word games are considered in this project. The typical Word Search game which has an objective of finding and marking all the words placed either horizontally, vertically, or diagonally and hidden inside the box. The other game is Boggle, a game in which letters are randomly placed into a grid and players have to find the words that are present in that grid. One application that displays a large percent of Bookworm is a popular word search game that is known globally and was developed by PopCap Games. The game's objective is to find as many words on the grid of letters by forming a word through connecting adjacent letters as how it is in boggle. The player must have a vast vocabulary in order to score high on this game.

Like these games, this project is also a word game that aims to help in the familiarization and exposure of users to the English language, specifically synonyms and antonyms. This project brings forth a fun way of learning; a recreation merged with learning.

1.2 Technology Application Context

A word search application, more likely called as a word search puzzle, is a well-known type of game. This type of game is commonly used for spelling and vocabulary practices. Some examples of this game type recognized in and out of the Internet include games such as Boggle and Crossword puzzles. One conceptual basis for this project is the software application Bookworm which is famous online. However, since the goal is to create something new out of existing technologies, an additional focus on Synonym and Antonym is added.

In the implementation of the project, several technologies were applied. The need for the right plotting algorithm pushed through the investigation of numerous plotting algorithms. Algorithms for random selection of words and positioning were considered too. Selection of words from the database is in random to prevent the usual outcome of the list of words in every game. Upon plotting the words into the grid, the letters of a word needs to be adjacent to its previous and preceding letter.

Another body of knowledge applied is the ActionScript 3.0. It is a powerful, object-oriented programming language that signifies an important step in the evolution of the capabilities of the Flash Player runtime. ActionScript 3.0 supports hardware acceleration to improve its performance. Since the project to be developed is a game application, this programming language suits best because of its advances in providing superb performance and ease of development. It is a helpful tool in creating amazing browser-based games for this project.

The completion of the project has been made possible with the aid of various software applications. One of these is Adobe Flash Builder 4 for the main development of

the project. This software is a development tool for rapidly building standout mobile, web, and desktop applications using ActionScript and the open source Flex framework. It has the capability to build exceptional applications, debug and test easily, and code faster. Another is WampServer 2.0, a mini-server that runs on almost any Windows Operating System, for the database management. This application is an excellent web server that includes useful features such as Apache, Php, MySQL, and PhpMyadmin which allows users to easily manage their server. WampServer comes with a service manager as a tray icon.

The graphic user interface of the project was done through Adobe Photoshop CS5 Extended. Adobe Photoshop is a graphics editor that is one of the most popular programs for image creation and manipulation. This software allows the source file, .psd, to make many different customizations. Adobe Photoshop offers various filters, image adjustments, text elements and, basic shapes that can be customized.

1.3 Objectives of the Study

The general objective of this study is to develop an inverse boggle word search game. Specifically, this study aims to:

- Develop a functional synonyms and antonyms word search game using Adobe Flash Builder 4
- Design a visually appealing GUI using Adobe Photoshop CS5 Extended
- Learn how to connect MySQL in Adobe Flash Builder for the list of words to be used

1.4 Significance of the Study

This study is relevant and beneficial in studying the English language while being a recreational game in itself. It will help students build a good foundation on their English vocabulary proficiency especially for the paper works that awaits them.

This will also help those who are non-English speakers who yearn to learn the language. It will help them gain knowledge and exposure on the terms and vocabularies used in the English language.

1.5 Scope and Limitations of the Study

This study features a sequential click-and-drag basis for selecting the word string in a 10x10 matrix. The study also includes the creation of a database of synonyms and antonyms, with each word limited to only 15 letters long using MySQL. The group developed the application using Adobe Flash Builder 4 IDE (integrated development environment) using ActionScript 3.0 programming language. The project is web-based and is accessible through the local host.

This study is limited in terms of the language that will be used, which is in this case, English. However, unlike other word search applications the group looked into, such as BookWorm, the project has a more definite emphasis on synonyms and antonyms.

1.6 Definition of Terms

- **ActionScript** – an object-oriented programming language originally developed by Macromedia Inc. (now owned by Adobe Systems)

- **Algorithm** – a specific set of instructions for carrying out a procedure or solving a problem.
- **Antonym** - are words that have the opposite meaning as another word.
- **Boggle** – a game in which letters are randomly placed into a grid and players have to find the words that are present in that grid.
- **Database** – a collection of records or data that is stored in a computer system.
- **Data structure** - a particular way of storing and organizing data in a computer so that it can be used efficiently.
- **Grid** – a 10x10 grid of letters.
- **HyperText Markup Language (HTML)** – the main markup language for web pages. HTML elements are the basic building-blocks of webpages.
- **Integrated Development Environment (IDE)** - a software application that provides comprehensive facilities to computer programmers for software development.
- **Matrix** – a rectangular array of numbers, symbols, or expressions.
- **MySQL** – is a database system used on the web which allows user to create a relational database structure on a web-server somewhere in order to store data and automate procedures.
- **Synonym** - are different words with almost identical or similar meanings.
- **Word Search Application** – a game that has an aim of finding words plotted in a grid of letters.

CHAPTER 2

REVIEW OF RELATED LITERATURE AND WORKS

2.1 Bookworm



Figure 2.1.1 Bookworm Application

Bookworm is a word search game developed by PopCap Games. It consists of a grid of letters and its objective is to find as many valid words or words that could be found in a standard dictionary as you can. The method of forming the word is through clicking the tiles that are only adjacent or connected. The scoring method is based on the length and on the dot found on every tile. There are also burning tiles that may burn up the entire grid of letters and you could possibly lose the game. To prevent the tiles from burning you have to look for a valid word adjacent to the burning tile in order to put off the flame. This is quite similar to the project we are proposing but, it differs in our project in the sense that it has a definite goal regarding synonyms and antonyms. Instead of looking for valid words, our project aims to provide a list of words and look for it in

the grid. If all the listed words were found, it will proceed to the next level. (Popcap, 2008)

2.2 Online Crossword Puzzle

The proponents also checked Online Crossword Puzzle, an application found in facebook. This application is just like the typical crossword puzzles found on newspapers, magazine and the like. You have to fill the grid with letters that will form words given with a clue. The application works well but the problem is, the puzzle is the same every single day. It does not generate new sets of puzzle after it is completed. The advantage of this game is that it is well known that anyone knows how to play it. While the disadvantage is it has no new innovations. What the proponents can adapt from this application is on how to generate the grid, specifically the algorithm it uses. This application is readily available and anyone who has a facebook account may install and use this application. (Facebook, 2011)

2.3 Word Search

Another facebook application looked up is the Word Search. This application basically has a grid of letters that is 15 x 15 in size. With this application, the user has to find the list of words given. Selection of the string or words may run left to right, right to left, top to down, down to top, and diagonal. It has a timer to track how fast the user can find the words and the faster the time one finds them the greater the score one can gain. It has also a hint through a “Hint” button to help you find the location of the first letter of the word. The game can be regarded as an easy one. What is important is that one has

only to find the words without much difficulty. In other words, it is not that challenging. The algorithm it used can also be adapted to place the words on the grid and on how it generates the entire grid. (Grant Felming; Steven Bayhack; Robin Evason; Wilhelm Elimann, 2011)

2.4 Genetic Boggle

Genetic Boggle is a program that uses genetic algorithm to encode as many strings as possible from a given list into a grid of letters using Boggle encoding. It starts with a set (called a generation) of randomly generated grids and applies fitness rules to them. The fittest grids mate and spawn a new generation of grids. This simple procedure is repeated over and over. As if by magic, a result is obtained that would be very difficult to program using a more conventional analytical approach. (Guy T. Schafer, 2011)