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NATIONAL AUTISM SOCIETY OF MALAYSIA - NASOM PARENT'S SUPPORT SYSTEM: MONITORING MODULE

TAN WEI CHUEN

A thesis submitted in fulfillment of the requirements for the award of the Bachelor of Computer Science

Faculty of Computer Science and Information System Universiti Teknologi Malaysia

MAY 2010
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ACKNOWLEDGEMENT

“What we have to learn to do we learn by doing…” – Aristotle

First and foremost, I wish to express my personal appreciation to my supervisor, Prof. PM Wardah for her guidance and time. Her patience and trust has encouraged me to complete this project. Her efforts really mean a lot to me. Thanks for her comments and ideas that help me to improve the accuracy of this project. Besides, I would like to appreciate her professional opinions in the intelligent field that taught me lot of skill and knowledge in completing the system.

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NASOM Parent’s Support System – Monitoring Module is a tool that has similarity to Decision Support System (DSS). This system is introduced to a portal of our UTM’s master student, Puan Aida in order as a suggestion to perform medical monitoring by using this tool. This project is a combination of 3 system that consists “NASOM Parent’s Support System – Information System Module”, “NASOM Parent’s Support System – Diagnosis Module” and also “NASOM Parent’s Support System – Monitoring Module”. NASOM Parent’s Support System – Monitoring Module is a web based as a purpose to help the users mainly parents to monitor their children growth status. This system is developed using Evolution Prototype methodology. The software’s used in developing this system are consists of ASP.NET which is used as the main programming language and also MSSQL as to manage the system’s database. Besides, Microsoft Visual Studio 2008 is used in order to produce an interactive and user friendly web based system. By developing this project, hopefully the system can smooth the process of obtaining monitoring result for the autism children.
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CHAPTER 1

INTRODUCTION

1.1 Introduction

Until today itself, we are still experiencing lack of medical experts in various fields. Whenever a person goes to clinic or hospital to get treatment, he/she needs to queue up in a long line in order to get into they turn. To make matter even worse, some are needed to wait for months if they happen to make an appointment with government medical experts. In the field of Special Children Learning disabilities medical experts, the number of specialists is way much lesser than others.

Besides, there are not much of online diagnosis and monitoring system that is user friendly. Fonts, design, layout, medical terms are too focused on medical experts forgetting public users. What is the use of the highly advanced system that hardly to be understood by user? Our motive is to lighten burdens of parents, not adding more obstacles for them to verify what type of learning disabilities faced by their child.
Therefore, it is a need for this system to be effective yet easily understood as to achieve the goal of user-friendly.

Therefore, a newer version of online diagnosis and monitoring system is needed. A system that not just able help parents solve their problem but as well as making them easier to use. This newer version of online diagnosis and monitoring system is called **NASOM Parent’s Support System (NPSS)** which contains Diagnosis module, Monitoring module and also Information System module. In this thesis itself, only Monitoring module will be included. This module – Monitoring, is written by Mr. Tan Wei Chuen. As for Diagnosis module and Information System Module it will not be included in this thesis. If any information needed from Diagnosis module can refer to NASOM Parent’s Support System – Diagnosis Module that is written by Mr. Kong Chee Hong. Any information that needs reference Information System module can be refer to NASOM Parent’s Support System- Information System Module that is written by Mr. Tong Yong Wei.

NASOM is a non government organization that provides help and guidance to Autism child in Malaysia. Besides NASOM is also an organization that provides free service to the society which actually matches NPSS purpose as to provide free service to parents. The other reason NASOM is chosen to be the aim of developing this system as NASOM takes small amount charges when helping the society certainly this will leads to they have no enough funds for advance IT technology

Therefore, an Online diagnosis and monitoring system for learning disabilities that not only friendly user use by medical field related workers but also included parents should be developed. Figure 1.1 shown below is the main system and the relationship of the 3 sub system of the project.
Figure 1.1 Sub Systems of the NASOM Parent's Support System (NPSS)

1.2 Problem Background

When their child has health problem, surely they will seek for medical help. Sadly in Malaysia today, we are still facing the low number of specialists in the field of learning disabilities for special children. Even if a person manages to meet medical experts for the first appointment, but this field of study- learning disabilities, is not a
case that should be handling lightly as even a simple cough or fever nowadays is taken into serious medical treatment.

Of course one can seek for private hospitals’ help and treatment but we must realize their help is only for those who have the means. We should not forget there are families that unable to afford the fees for private hospital treatment.

There is also a lot of such system on the web, but not much of them are in Malay language. Elderly parents that did not receive early education during their schooldays of course will face difficulties not using the system itself but have problem also to go through the instruction to access a specific system. Some online diagnosis system does not have a clear message indicating the purpose of the page itself. This may leads to confusion among user.

1.3 Project Aim

The aim of the project, based on the problem discussed above, is to develop an online diagnosis and monitoring system that is capable of helping the public, not only specific for medical experts. Besides, the purpose of developing of this project is to help parents with special kids to ease their burden of verifying what case of learning disabilities faced by their child and prescribe a temporary treatment for their child until they meet up with a medical expert. NASOM will be the aim of this development. With this NPSS, it able help parents with special kids to ease their burden of verifying what case of learning disabilities faced by their child and prescribe a temporary treatment for their child until they meet up with a medical expert. This project also benefits on
financial factor of NASOM as they do not need to use tons of money to implement this system themselves. Besides, it will indirectly benefits parents so that they do not need to pay expensively for any medical fee regarding Autism as nowadays private medical sector are charging their customer with expensive fee. Lastly but not least, this project also focusing on user-friendly system. This system will aim on effective yet easy to understand to achieve the goal of friendly user system. Question will be Malay and English version. The overall design will consider on elderly parents for them easily to access the system.

This project also benefits on financial factor of parents. Nowadays, private medical sector are charging their customer with expensive fee but with this project, it will be free for user, saving a lot of parents’ money. Lastly but not least, this project also focusing on user-friendly system. This system will aim on effective yet easy to understand to achieve the goal of friendly user system. Wording will be Malay and English version and fonts will be big and clear. The overall design will consider on elderly parents for them easily to access the system.

1.4 Project Objective

To achieve the aim of the project, some objectives have been identified as below:

i. To monitor the growth status of the learning disability of special children (Autism)

ii. To educate parents for giving them a understanding of Autism Learning Disability
iii. Provides guidance and advices to parents immediately and helps them to avoid cumbersome red tape.

iv. To interact with parents by using the normal language instead of specialist language.

v. To provide service for the parents without wasting time queuing for seeking advice or while waiting for the doctor/specialist.

1.5 Project Scope

To ensure the objectives of project can be achieved and implement well, some scopes of the project have been identified as below:

i. The system that is to be developed is a web based system which can use by parents and specialists.

ii. The system is developed based on the study of National Autism Society of Malaysia (NASOM)

iii. The system included 3 parts, such as diagnosis system, monitoring system, and online journal system.

iv. The system is developed to help users (parents) to diagnose and monitoring their children.

v. Specialists can provide their suggestions and advices through the online journal system.
1.6 Importance of Project

The importances of developing the System have been identified and are stated as below:

i. It provides helps to parents immediately and helps them to avoid cumbersome red tape.

ii. It helps parents diagnose and monitoring their children.

iii. It helps parents to make decision on giving treatment on their children.

iv. It uses normal language instead of specialists’ language for better communication between specialists and parents.

1.7 Summary

This chapter describes the project introduction and the existing problem with the lack of web based diagnosis system. Besides that, this chapter also describes the objectives of the project, scopes and the importance of the projects as reference for the overall system development process. This project is to develop an online diagnosis and monitoring system. This chapter is important as a guideline and provides understanding of the general picture to develop the complete system.
CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature review consists of the research aspects of theory and method that will be used in the system development process. The objective of doing literature review is to gather information that is needed in developing a system. Literature review is important for the study and research of the critical aspects that are needed in developing a new system.

This chapter will discuss more on review and research of earlier studies of current available online similar system today. Besides that, this chapter also goes in-depth of gadgets that will be place on the online system. Ultimately, the purpose of this chapter is to discuss current online medical diagnosis system that available on the internet today, Decision Support System (DSS), and Autism learning disability as well as what effects/symptoms it will bring and all necessary data regarding it.
2.2 Study of the Existing Similar System

Figure 2.1 Interface of IAutistic Website (iautistic.com)

Free autism tests

Quick Test - A 1995 study in England screened 16,000 children of 18 months using the questions below. 12 children failed all 3 items. 10 were later diagnosed as autistic 2 years later.

1. Does the child use his/her index finger to point to share interest in (but not to obtain?) something?
2. Does the child turn to look in the same direction as an adult is looking?
3. Does the child pretend to make a cup

Figure 2.2 Interface of NeurologyChannel Website (www.neurologychannel.com)

Figure above are some examples of similar system that we will be building on. **Figure 2.1** shows the IAutistic website and **Figure 2.2** shows the website of NeurologyChannel. However, some color for their website, their design, their fonts, everything is not suitable for parents or those who fresh to computer. Although the websites offers a lot of tests and information, it is not well arranged leads to user been confused.
Regarding the font, it is too small for user. Elderly adults normally will have problem with their eyesight and small fonts will make their life more difficult as they cannot read it. Next, regarding to the color, as one can see, the figure above website is in black n white which is pretty dull. With only black and white, even there is important message over there, user will just slip it through as they are unnoticed about it. Besides that, is the term been use at the website. The system is not only been use by specialist but also parents. Parents do not understand what all these medical terms are. Furthermore, in this example, there is no user category too. However, in the figure above, that website is just simply a diagnosis system where no extra details given.

2.3 Team Spirit

Teamwork is a team formed by two or more people. Everyone in that specific group has their own ability and with extra abilities, that specific team will merge up them together and work with the guidelines of their own objectives to achieve a shared goal that everyone in that team has the same.

With several individual working together, an excellent and effective teamwork can be achievable and when this happens, the performance can goes beyond individual accomplishments. Therefore, what here trying to stress that is, if all the individuals in a specific group harmonize their contributions and work towards a common goal, an effective and efficient team will be appear.
2.3.1 Benefits of Teamwork

As discussed earlier what the meaning of teamwork is, one might realize the importance of teamwork, and however we will also look into the benefit of teamwork. According to the research of the benefits of teamwork, there are 6 most important benefits. Those 6 of them are as listed as:

- Creativity
- Motivation
- Skills
- Speed
- Sounding Board
- Support

2.3.1.1 Creativity

We all are human with different personality and abilities. By utilizing all these different aspects in a team, a team will be able to generate more variation of ideas and with more variation of ideas, the percentage of creative solution will raised too.
2.3.1.2 Motivation

Nowadays, employees are getting less and less satisfied with their job. Therefore, individuals prefer to choose to work together as a team to achieve a certain goal. As they interacts with each other, this raise up enthusiasm of everyone in that specific team. High enthusiasm leads to a team will put more effort and interest to the project that they were developing. This factor will results in positive impacts on motivation and have higher chance of to success a project.

2.3.1.3 Skills

A person is unable to possess all skills. Every person in this world has their pros and cons. A person maybe is good in coming up creative ideas or another will be good in technical area. Assuming a person weakness in a team is a gap and a person’s extra ability is a filling to fill up gaps. With gaps been filled up, certainly of course this will create a perfect team, a team that able to overcome all obstacles in the process of reaching their objectives.

2.3.1.4 Speed

In a project development life cycle, it consists of Planning, Analysis, Design, Implementation and Support. If one person were to finish all up by all alone, it will
obviously take for months. By splitting up tasks among teammates, all work can move toward in parallel direction therefore the time taken to complete the overall task become shorten.

2.3.1.5 Sounding Board

Each individual have their own opinion. If the teammate can come up with a good opinion, they can walk further. In a team situation, other team members can act as a sounding board, allowing us to cut through the options and get on with those most likely to achieve the desired goal.

2.3.1.6 Support

This is also somehow related with creativity. What is going to mention here is, a person idea will have boundaries but however when a person is in a team, he will be able to think more further than a preset boundaries as he know he can rely on his team. Never underestimate the significance of this because it may leads to great ideas.
Special children is a part of Disabled People, that is they cannot be fully independent with their own self and they are unable to live in the community together base on their physicality or mentality from when they born or acquired. Below are the six categories of disabled people that also involve children.

i. Hearing disability
ii. Vision disability
iii. Physical disability
iv. Cerebral Palsy
v. Learning disability
vi. The other symptoms will base on the medical diagnosis that covers up the entire disabled problem.

These children need medical treatment, guidance, assist and more attention from the people around them. A special government force is formed to take care of the welfare of the unfortunate children - the Ministry of Women, Family and Community Development. Under this ministry, another department is formed – the Department of Social Welfare Malaysia. They are very sensitive and ready to hear and assist those who needed. They provide shelter and rehabilitation for Department’s target groups, develop the community through the process of changing attitude and increasing capability for self-reliance, create a society with a caring culture and improve the well-being of society through professional social welfare and social development services and strategic sharing of responsibilities.
2.5 Autism Learning Disability

Autism is actually a type of LD as known as learning disabilities. Kids that have this LD will live their life much more different from a normal kid. It is because autism kids normally will find difficulties when communicating with others. Besides, they find themselves hard to express their feeling through words. All this symptoms or effects makes them into introvert and become less sociable. A normal sound level might be nothing for us, but for those kids with autism, it will be an annoyance till the level that one might use their hands to cover up his or her ears. Not only sound though, even a gentle touch will cause them uncomfortable.

Kids that have autism also cannot interpret expression or words correctly like other kids do. Let’s take an example of one person smiling, a normal kid will automatically know that that smiling person is happy because he or she links smile with happy feeling. However, for autism kid, they are unable to make connections between these two links. Not only just for expression, they might not able to link up with words as well. They do not understand what message people are trying to speak up with them. When they are unable to link up correct message with the correct words, certainly they will misuse words to express themselves.

Autism also causes child to act in weird behavior in the sense of repetition. They prefer to stay on a schedule that is always the same. It is because they do not like changes in their life. For example, they might flap their hands continuously, saying certain words over and over again. Another example will be maybe they like to arrange their toys in some sort of arrangement and if the arrangement is been disturbed or not they same, they will get upset.
Besides, someone who has autism also can’t able to prioritize their important tasks. They are unable to determine what they trying to do or neither how much importance for something they are doing. If they unable to prioritize their tasks, they would not be able to determine whether going to school or replying back to someone is important. However, this varies between kids. Some kids may mildly affected causing them to have little trouble in life, but however if one is severely affected, they are certainly going to need a lot of attention.

2.6 Decision Support System (DSS)

Decision Support System (DSS) is an interactive computer-based system or subsystem intended to help decision makers use communications technologies, data, documents, knowledge and/or models to identify and solve problems, complete decision process tasks, and make decisions. Decision Support System is a general term for any computer application that enhances a person or group’s ability to make decisions. Also, Decision Support Systems refers to an academic field of research that involves designing and studying Decision Support Systems in their context of use. In general, Decision Support Systems are a class of computerized information system that supports decision-making activities.
2.6.1 Characteristics and Capabilities of DSS

DSS is closely associated with the terms Online Analytical Processing (OLAP) and Data Warehousing (DW). OLAP refers to querying and accessing on-line database and DW refers to specific technical architectures for storing and accessing large amounts of data. The following are the key characteristics and capabilities of DSS.

- Provide support in semi-structured and unstructured situations.
- Support for various managerial levels.
- Support all phases of the decision-making process.
- Goal is to improve the effectiveness of decision making.

Thus decision makers can make better, more consistent decisions in a timely manner.

2.6.2 DSS Components

These technologies are assembled from four basic components (each with several variations and are typically deployed over the Web).

- Data Management Subsystem
- Models Management Subsystem
- Knowledge Management Subsystem
- User interface

A diagram of the DSS Architecture is shown as in the Figure 2.3 below.
2.6.2.1 The Data Management Subsystem

A data management system (DMS) is a computer program designed to manage a database (a large set of structured data), and run operations on the data requested by numerous clients. The DMS can be interconnected with the corporate data warehouse. Typical examples of DMS use include accounting, human resources and customer support systems.

Some of the capabilities of DMS in a DSS are:

- Captures/extracts data for inclusion in a DSS database.
- Interrelates data from different sources.
- Performs complex data manipulation tasks based on user queries.
2.6.2.2 The Model Management Subsystem

The model base management system (MBMS) is a computer program that includes financial, statistical, management science or other quantitative models that provide the system’s analytical capabilities and appropriate software management. Usually, the models are customized using modeling languages (programming tools). Some of the capabilities of MBMS in a DSS are:

- Allows user to manipulate the models so they can conduct experiments and sensitivity analyses ranging from ‘what-if’ to goal seeking.
- Catalogs and displays the directory of models for use by several individuals in the organization.

2.6.2.3 The Knowledge Management Subsystem

Many unstructured and even semi-structured problems are so complex that their solutions require expertise. This can be provided by an expert system or other intelligent system. Advanced DSS are equipped with a component called a knowledge-based management subsystem that can supply the required expertise for solving some aspects of the problem and provide knowledge that can enhance the operation of the DSS components. Some of the capabilities of KMS in a DSS are:

- Provides expertise in solving complex unstructured and semi-structured problems
- What models to use, how, and interpreting results
- Reasoning, handling uncertainty and learning from data
- Expertise provided by an expert system or other intelligent system (AI techniques)
2.6.2.4 The User Interface (Dialog) Subsystem

User interface is component of a computer system that allows bidirectional communication between the system and its user. User interface of a computer program refers to the graphical, textual and auditory information the program presents to the user, and the control sequences (such as keystrokes with the computer keyboard, movements of the computer mouse, and selections with the touch screen) the user employs to control the program.

2.6.2.5 The User

The person faced with a decision that a Management Support System (MSS) is designed to support is called the user, the manager or the decision maker. MSS has two broad classes of users that are managers and staff specialists. Staff specialists use the system much more frequently than manager and tend to be more detail-oriented. Besides that, a person who called intermediary uses a computer to fulfill requests made by other people such as Staff assistant, Business (system) analyst, and Group DSS Facilitator.
2.7 System Development Life Cycle (SDLC)

Once upon a time, system development consisted of a programmer writing code to solve a problem or automate a procedure. Nowadays, systems are so big and complex that teams of architects, analysts, programmers, testers and users must work together to create the millions of lines of custom-written code that drive our enterprises. To manage this, system development life cycle (SDLC) models have been created.

The Systems Development Life Cycle (SDLC) is a conceptual model to describe the stage of information system development from an initial feasibility study through maintenance of the completed application. Furthermore, SDLC usually been described as process of creating or altering systems, and the models and methodologies that people use to develop these systems in the field of systems engineering and software engineering.

Several SDLC methodologies have been developed and introduced to guide the processes involved including the waterfall model (the original SDLC method), rapid application development (RAD), joint application development (JAD), the fountain model and the spiral model. Those SDLC does not mean to be used alone they can be a mix of several SDLC resulting in a hybrid methodology.

Systems Development Life Cycle (SDLC) adheres to important phases that are essential for developers, such as planning, analysis, design, implementation and maintenance. The oldest model, waterfall model was originally regarded as "the Systems Development Life Cycle" is a sequence of stages in which the output of each stage becomes the input for the next. Normally these stages follow the same basic steps but many different waterfall methodologies give the steps different names and the number of
steps seems to vary between 4 and 7. There is no definitively correct or a prefix Systems Development Life Cycle model, but the steps can be characterized and divided in several steps. **Figure 2.4** Shows the model of SDLC and the 5 phases within the model.

![Figure 2.4 Model of the Systems Development Life Cycle](www.wikipedia.com)

Project planning – initiate, ensure feasibility, plan schedule, obtain approval for project
Analysis – understand business needs and processing requirements
Design – define solution system based on requirements and analysis decisions
Implementation – construct, test, train users, and install new system
Maintenance – keep system running and improve

### 2.8 Development Tools and Technology

Different tools and technology are needed in developing a system based on the requirements of the system. It is important to choose the right tools and technology to develop the system. Therefore, this section is to find out the usage and of the development tools and technology.
2.8.1 Microsoft Visual Studio 2008

Microsoft Visual Studio 2008 is used to develop console and graphical user interface applications along with Windows Forms applications, websites, web applications and web services for all platforms supported by Microsoft Windows, Windows Mobile, Windows CE, .NET Framework, .NET Compact Framework Microsoft Silverlight. The programming languages that are supported by Microsoft Visual Studio 2008 are C or C++ (via Visual C++), VB.NET (via Visual Basic .NET), C# (via Visual C#), XML or XSLT, HTML or XHTML, Javascript and CSS.

Microsoft Visual Studio 2008 was released in year 2007 alongside .NET Framework 3.5. It is focused on development of Windows Vista, 2007 Office system, and Web applications. It supports multi-targeting which lets developers to choose which version of the .NET Framework (out of 2.0, 3.0, 3.5, Silverlight CoreCLR or .NET Compact Framework) the assembly runs on. It also features a XAML based designer, workflow designer, LINQ to SQL designer, XSLT debugger, JavaScript Intellisense support, JavaScript Debugging support, support for UAC manifests, a concurrent build system, among others.

2.8.2 Microsoft SQL Server 2005

Microsoft SQL Server 2005 the successor to Microsoft SQL Server 2000. It is a relational database server where its primary query languages are T-SQL and ANSI SQL. Native support for managing XML data is included in Microsoft SQL Server 2005. An xml data type is defined either to be used as a data type in database columns or as literals.
in queries. Microsoft SQL Server 2005 has added some extensions to the T-SQL language to allow the embedding of XQuery queries in T-SQL.

Microsoft SQL Server 2005 is enhanced with new indexing algorithms and better error recovery systems. Furthermore, optimistic concurrency support is added for better performance and partitions on tables and indexes are supported natively. SQL CLR is to allow the integration of Microsoft SQL Server 2005 with the .NET Framework. Microsoft SQL Server 2005 introduced "MARS" (Multiple Active Results Sets), a method of allowing usage of database connections for multiple purposes.

2.8.3 ASP.NET

ASP.NET is a web application framework that allows programmers to build dynamic websites, web applications and web services. It is the successor to Microsoft’s Active Server Pages (ASP) technology. ASP.NET is built on the Common Language Runtime (CLR), allowing programmers to write ASP.NET code using any supported .NET language.

ASP.NET allows user to create reusable components through the creation of User controls. The applications of ASP.NET are hosted in a web server and are accessed over the stateless HTTP protocol. Programmers are allowed to develop system using an event-driven GUI model instead of the conventional web-scripting environments. ASP.NET has similar metaphors to Microsoft Windows applications such as controls and events. In addition, programmers can develop web pages in VB.NET, C#, J#, Delphi.NET or Chrome.
2.9 Monitoring System

Monitoring is always been refer to the effect and result of the growth status for the learning disability children. Monitoring for the learning disability children included the child’s learning period, problem and also difficulty that will faced by them. Furthermore, there are a lot different type of monitoring system in the internet. The monitoring system that will be produce in the project is to manage and calculate the actual age of the autism children in few important aspects.

2.10 Children Development Stage

Child development refers to the biological and psychological changes that occur in human beings between birth and the end of adolescence, as the individual progresses from dependency to increasing autonomy. Because these developmental changes may be strongly influenced by genetic factors and events during prenatal life, genetics and prenatal development are usually included as part of the study of child development. Related terms include developmental psychology, referring to development throughout the lifespan, and pediatrics, the branch of medicine relating to the care of children. Developmental change may occur as a result of genetically-controlled processes known as maturation, or as a result of environmental factors and learning, but most commonly involves an interaction between the two.

There are various definitions of periods in child development, since each period is a continuum with individual differences regarding start and ending.
Some age-related development periods and examples of defined intervals are:
newborn (ages 0–1 month); infant (ages 1 month – 1 year); toddler (ages 1–3 years);
preschooler (ages 4–6 years); school-aged child (ages 6–13 years); adolescent (ages 13–20). However, organizations like Zero to Three and the World Association for Infant Mental Health use the term infant as a broad category, including children from birth to age 3, a logical decision considering that the Latin derivation of the word infant refers to those who have no speech.

The optimal development of children is considered vital to society and so it is important to understand the social, cognitive, emotional, and educational development of children. Increased research and interest in this field has resulted in new theories and strategies, with specific regard to practice that promotes development within the school system. In addition there are also some theories that seek to describe a sequence of states that comprise child development.

2.11 Summary

This chapter describes the literature review that has been done in order to collect information to develop the Integrated Student Activity Management System. The websites of IAutistic and NeurologyChannel has been studied along with the technology needed to be used. This literature review is important to gain knowledge in scripting language. Literature review helps to give a better picture on the ways to develop a system that is better than the current system. It helps to identify the resources that are needed in developing the new system.
CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter discusses the methodologies involved in developing the Online Learning Disability-Autism Diagnosis and Monitoring System. It also discusses the justification of the chosen methodology. A good system will be developed if a suitable methodology is used. The justification of hardware and software are explained in this chapter. In addition, methodology helps to estimate the time and cost needed in developing a system. The Gantt Chart is used to illustrate the project schedule.

Several processes need to go through for a development of a system. The very first step of all is finding out what is the problem domain thus investigating and analyzing it. After successfully identifying a certain problem, a title will be chosen as to represent the problem that been identified. Planning process, scheduling, literature study, choosing method of solving the problem, development phase and writing report all come in next after successfully overcome first step.
3.2  Project Methodology

According to Wikipedia, Methodology can be explained as:

- "the analysis of the principles of methods, rules, and postulates employed by a discipline"
- "the systematic study of methods that are, can be, or have been applied within a discipline"
- "a particular procedure or set of procedures."

Methodology acts as a road map to bring developers to their destination that is producing a product on time yet the quality is at its best. In other meaning, methodology means a sequence of processes that includes procedures, actions, tasks, milestone and activities to create or develop project. It provides a guideline for developer to complete their project in a well arranged and systematic way.

3.2.1  Evolutionary Prototyping

Nowadays, there are several types of methodologies of system development. For example, there are system development life cycle, analysis, prototype and even structured design. Each and every methodology is different and varies from each other. They have their own states or stages to be followed in sequence before achieving their goal.
In Evolutionary Prototyping, there is four phases – Project planning phase, analyzing phase, design phase, and lastly implementation phase. Analyze phase, design phase, and implementation phase are all been execute together. This three phase will keep on been repeat until the whole system is completely been developed as this is to fulfill parents’ requirements on this upcoming system.

A readily system will be let out to user that is parents and specialists to try out. This step is to let user get used to it, try the system firsthand themselves, and to verify every requirements they need is in that system. After all these procedures had been done, users are required to give comments or opinion for enhancing this system so that this is the system that users really requested for. This step too, will be keep on repeating as to make sure prototype that been developed enable to satisfy what user needs and accordingly to their requirements.

### 3.2.2 Methodology Justification

After much researching for types of methodology, the prototyping approach is more suitable to develop the Online Learning Disability-Autism Diagnosis and Monitoring System.

Evolutionary prototyping methodology is able to reduce development costs and time. Missing functionality can be identified easily and early detection of error will certainly save a lot of costs and time during the whole project development.

Next, it also enables the flexibility of design. Evolutionary prototyping methodology will keep on repeating in analyze phase, design phase, and implementation
phase. This is to make sure users’ requirements for the system are been made. Users are also able to add or change requirements without affecting much of the system development.

Therefore, the prototyping approach will be used to develop Online Learning Disability-Autism Diagnosis and Monitoring System since it has so many advantages and is suitable in developing this system.

3.3 Methodology Of The System Development

There are 5 phases in evolutionary prototyping methodology and the tasks that carried out in each phase will be discussed further.

3.3.1 Project Planning Phase

Project planning phase is the first phase in this system development. The primary objective of the planning phase are to identify the scope of the new system, ensure that the project is feasible, and develop a schedule, resource plan, and budget for the remainder of the project. There are 5 activities that will be identified in the project planning phase:

i. Define the problem.
ii. Produce the project schedule.
iii. Confirm project feasibility.

iv. Staff the project.

v. Launch the project.

The activity for this phase includes the distribution time for completing every specific task and also project’s activity scheduling. For the activities scheduling part will be using Microsoft Project 2003 software to generate a Gantt chart where it will list all the activities and the estimated time span. Gantt chart is to act as a reminder to remind people involved in this project to finish the task at a given time span so that the process of this project will run smoothly. Besides, in this particular project, there should be a judgment on each other talent individually and distribute task accordingly and lastly combination of all modules should be done within the whole team.

3.3.2 Analysis Phase

The primary objective of the analysis phase is to understand and document the business needs and the processing requirements of the new system. Analysis is essentially a discovery process. The key words that drive the activities during analysis are discovery and understanding. Six primary activities are considered part of this phase

i. Gather information.

ii. Define system requirement.

iii. Build prototypes for discovery of requirements.

iv. Prioritize requirements.

v. Generate and evaluate alternatives.

vi. Review recommendations with management.
In this phase, that is analysis phase, research on the problem domain as like the result shown in chapter 2- Literature Review had been done. Several resources for future usage like diagnosis and monitoring booklets from Ministry of Health were gathered. Several related sectors had been called to enquire and confirm the finding too.

### 3.3.3 Design Phase

The objective of the design phase is to design the solution system based on the requirements defines and decisions made during analysis. High-level design consists of developing an architectural structure for the software components, database, user interface, and operating environment. Low-level design entails developing the detailed algorithms and data structures that are required for software development. Seven major activities must be completed during the design phase:

1. Design and integrate the network.
2. Design the application architecture.
3. Design the user interfaces.
4. Design the system interfaces.
5. Design and integrate the database.
6. Prototype for design details.
7. Design and integrate the system controls.

In Design Phase, wireframe that is a layout of design that will be use in implementation phase was prepared. Besides, it also acts as a first step to design and improve the user interface. Besides that, Data Flow Diagram (DFD) and Entity-Relationship Diagram (ERD) were produced in this phase too. With all these design, a clearer picture of how this system runs and operates will be viewed.
3.3.4 Implementation Phase

During the implementation phase, the final system is built, tested, and installed. The objective of the activities of this phase is not only to produce a reliable, fully functional information system, but also to ensure that the users are all trained and that the organization is ready to benefit as expected from the use of the system. All the prior activities must come together during this phase to culminate in an operational system. Five major activities make up the implementation phase:

i. Construct software components.
ii. Verify and test.
iii. Convert data.
iv. Train users and document the system.
v. Install the system.

3.3.5 Support Phase

The objective of the support phase is to keep the system running productively during the years following its initial installation. The support phase begins only after the new system has been installed and put into production, and it lasts throughout the productive life of the system. During the support phase, upgrades or enhancements may be carried out to expand the system’s capabilities, and they will require their own development projects. Three major activities occur during the support phase:

i. Maintain the system.
ii. Enhance the system
iii. Support the users
3.4 Hardware And Software Requirements

Hardware and software are very important for developing a stable system and that are very crucial as they play an important roles in this project. The correct choice of software and hardware will leads developer able to achieve their goals in their timeline or even faster. Moreover, good selection of software will enable developer to take shorter time to masteries it. Below are the characteristic of the right software to be chosen:

i. The software that will be chosen must be easy to understand.
ii. The software that been used must be friendly user and able to work well along with database.

Hardware that been chosen also should be able to last long and should be able to load a large amount of data in fast and effective performance. One shall remember that faulty hardware will cause loss of time and data. Therefore it is very important in term of choosing software and hardware.

3.4.1 The Specification Of Needed Hardware

The specification of the hardware have to be explain clearly to avoid any problem occur during the system development. The list of hardware that will be applied in the system development will be shown below:

<table>
<thead>
<tr>
<th>NO.</th>
<th>HARDWARE</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>CPU</td>
<td>Intel Core 2 1.0GHz</td>
</tr>
</tbody>
</table>
### 3.4.2 HARDWARE JUSTIFICATION

Below will be a more detailed explanation of why these hardware been selected for the usage of the system development

#### i. Processor
A suitable processor such as Intel Core 2 with the speed of 1.0GHz is needed for the system development so that it can be carried out compatibly with the development of the technology now a day.

#### ii. RAM
The capacity of 2GB is needed to avoid any problem or error that will happen during the usage system when there requires a huge transaction of data been stored and retrieved.

#### iii. Monitor
LCD monitor is needed as it able to display output in high resolution and much more clearly compared to CRT monitor. Besides long usage of CRT monitor will definitely bring bad effects to developers in term of health.
iv. Mouse
Mouse is used to symbolize developer hand in term of executing and pointer to choose selection

v. Keyboard
Keyboard is the tool used for input of data and also for the development of the system such as typing in codes to communicate with the computer.

### 3.4.3 The Specification Of The Needed Software

The software that will be use during the system development is listed as below.

<table>
<thead>
<tr>
<th>NO.</th>
<th>SPECIFICATION</th>
<th>SOFTWARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>System Software</td>
<td>Windows Vista</td>
</tr>
<tr>
<td>2.</td>
<td>Database</td>
<td>MS SQL Server 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ASP.Net Visual Basic (Language)</td>
</tr>
<tr>
<td>4.</td>
<td>Project Management</td>
<td>Microsoft Project 2003</td>
</tr>
</tbody>
</table>
3.4.4 Software Justification

Below is the explanation for the software specification that needs to be used to develop the system.

i. System Software
System software is used as the operating platform for the implementation of this system.

ii. Database
Database is a collection of data or records that been grouped together into a common pool that able to provides information for one or more users.

iii. Programming Language
Programming language is known as computer language designed to communicate with computer. It is also known as mode of human communication with the machine.

iv. Project Management
Project management includes planning, organizing and managing resource in a disciplined manner to achieve successful completion of project objectives.

3.5 Work Planning/Gantt Chart

Gantt chart is a type of bar chart that illustrates a project schedule that follows the fixed time period. It will illustrate the start and finish dates of the terminal elements and summary element of a project. Terminal elements and summary elements comprise
the work breakdown structure of the project. The Gantt chart for this project will be shown in APPENDIX A1.

3.6 Summary

Overall, this chapter tells about the planning work should be done to obtain an effective system with selection of appropriate methodology. Development system should have the specifications of hardware and software needs to be used to meet the preferences of the user system. In choosing the appropriate methodology, the development process and system will run smoothly through each phases and activities.
CHAPTER 4

ANALYSIS AND DESIGN

4.1 Introduction

In this chapter, the system processes, databases, modules and interface that have to be developed will be discuss. However, user’s requirement must be obtained by studying the current organization website. It is a crucial move because the user’s requirement is the main key to produce the skeleton of the system. Thus, after knowing what user needs from current website, planning for process design, module design, database design, input design, and output design will be carried out to produce a new system. All the activities and works will be discussed further in this chapter.
4.2 Organization Background

Offering Life-Long Services to People with Autism, that is what National Autism Society of Malaysia (NASOM) motto. NASOM, as a non-profit organization, was registered on 3rd March 1987 as Malaysia charitable organization. It aims to provide information, helps and offers care plus protection for people with autism and their family members. In NASOM, it is formed by a group of parents and professionals which is more than 100 members all together. Until today itself, NASOM is all over Malaysia, covering mostly every state.

NASOM’s Vision
To become an efficient and effective organization that provides services, strength and sanctuary for people with autism.

NASOM’s Mission
To advocate for the rights of people with autism and in doing so provide opportunities for them to learn and lead a productive and fulfilling life.

NASOM’s Objectives
- To identify and promote the treatment, education, welfare and acceptance of people with autism
- To watch over and protect the people with autism
- To provide assistance and advice to families of people with autism
- To be a useful resource in the study, research and development of methodologies, therapies and treatment of autism and related disorders
NASOM’s Service

NASOM offers services through several of services and programs. Their programs are results based oriented and focus on acquisition of skills and changes in behavior. Their services are divided into 3 categories as listed at below:

- Assessment and diagnosis
- Early intervention
- Vocational training

4.2.1 Organization Chart

The organization chart shown in the Figure 4.1 is all the committee that runs the NASOM.
Figure 4.1  Organization Chart of NASOM (www.nasom.com.my)
4.2.2 Weaknesses of the Organization System

Since the project vision is doing Online Autism Diagnosis and Monitoring for National Autism Society of Malaysia known as NASOM, the chosen website that is www.nasom.com.my as current website available for this section. The Figure 2.2 shown the main page of the NASOM.

![NASOM main page](http://www.nasom.com.my)

**Figure 4.2** NASOM main page (http://www.nasom.com.my)

This is the homepage of NASOM. As mentioned earlier in Chapter 2, a successful web contains a navigator bar however in NASOM website it is clear than they do not have any navigator bar either on top of the page or either at the side of their page. This will leads their user hard to find what actually they are actually looking for. Besides, it will also be hard for user to search for information they wanted. In other words, navigator bar acts as and map. Without that, user may not be able to use the system comfortably and ends up been confused and annoyed.
Secondly, their website too, there is too little information regarding treatment and autism. A website regarding autism should have ample information so that user may able to find and know much more regarding autism. Lack of information leads bad impression to user as for user knows they will not get any useful information in they were to visit this website again.

Moreover, some links and functions in their website are also not working. For example, their language links. When Malay language is selected, their website still displays information in English. They should remember that not everyone in Malaysia knows English language well. Function that unable to be use will leads user unable to browse through that website smoothly as they do not know how to read well.

4.2.3 Suggested Strength for the Organization System

All the information that mentioned above earlier, a system or website that is well arranged will be implemented. For example, like Figure 4.3, everything is well arranged. When things are well arranged, certainly of course this makes user life easier when surfing through our website.
Next will be regarding the font used. The users for the system are specialists and parents. Therefore, 2 different type interfaces will be created that are mainly for parents and specialists. For parents and specialists, an interface will be design will be not too complex, rich of information and helps, and of course, big and clear fonts. For specialists, it will be some sort same like parents, however will extra functions added in.

We are living in a country called Malaysia that filled with all types of races. It is true that the international language is English however we cannot assume everyone in Malaysia knows English. Until today itself, most of the online diagnosis and monitoring system are in English language. A parent that does not know well in English will face difficulties in using this particular system. Therefore, it is very important for this system to be implements in both languages that is English and Malay. With this implementation, we will able to provide such system throughout the whole world without neglecting our very own country Malaysia.
4.3 System Design

System design includes all design aspect that is Process Design, Database Design, Module Design and Interface Design. The purpose to have a system design is to define how actually this system will be implemented. System Design able to gives developers a clearer picture of what they are doing before starting their project. Therefore, with system design readied, the development of new system will certainly easy.

4.3.1 Process Design

Processes involved in this system are defined in Process Design. This step need to be identified and understand as it acts as a guidance to developer what they are going to build. Data flow Diagram (DFD) is used to show the process design of this system.

The Diagram 0/Context Diagram shown in the Appendix B1 is the Data Flow Diagram of NASOM Parent’s Support System. Appendix B2 is the Diagram 1. There are 5 functions in this system that is Login, Diagnosis, Monitoring, Publishing Result and lastly Online Journal. As for data, there will be 7 tables:

<table>
<thead>
<tr>
<th>User’s information</th>
<th>: Information regarding parents and their children.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist’s Information</td>
<td>: Information regarding doctors and their related personal details.</td>
</tr>
<tr>
<td>Children medical report</td>
<td>: Information and a full report of children that been diagnosis and monitored by Online Autism Diagnosis and Monitoring System.</td>
</tr>
</tbody>
</table>
Growth Observation: A full observation combining with medical report, written by parents of their child growth rate. Specialists will drop down their expert suggestion on how their children progress.

Diagnosis tools: A collection of questions that able to detect child learning disabilities and how serious it was.

Monitoring tools: A collection of questions and suggestion that able to give the correct treatment to an autism child.

Item Gallery: A collection of item details been shared to the system by user to share it to others.

The lower level of the DFD which is the Diagram 1 will be shown in Appendix B3 - Appendix B8.

4.3.2 Module Design

There are 2 main modules in NASOM Parent’s Support System (NPSS). The modules are:

- Parents Module

In Parents Module, there are 6 sub modules that is registration module, diagnosis module, monitoring module, viewing result module, item gallery module and lastly journal module. To use the system, parents are required to register themselves in registration module. After successfully registered, they are able to move on to other module. Diagnosis module is where parents are required to input information regarding their child to check is there child has autism and if there is autism, also able to detect how serious it was. Next is regarding monitoring module. In this module, suggestion and treatment according to child
age will be shown to parents however parents, similar to diagnosis module, they also are required to input certain information just like child age and their child’s behavior. Besides, there is also viewing result module; parents are able to view their child profile that will be including the output of diagnosis and monitoring module. Next, it will be Item Gallery module where user can upload item that they want to share or else they can search for item within the system that they desire. Lastly will be Journal Module where parents are able to write their child condition daily. They are able to write they child’s growth progress according to date. It works similar to blogs.

- Specialists Module

In Specialist Module, there are 2 sub modules that are registration module and Journal module involved. In registration module, before a specialist is able to give their opinions or suggestion, they are required too to register through the system by sending a form with necessary information to system administrator for verification purposes. After been verified, specialists themselves are able to view child profile which contains written daily journal, diagnosis and monitoring report and give their expert suggestion.

4.3.3 Database Design

Database design is all about designing and producing a data model of a database. All the data in database will be linked thus accessing data will be easier. Database itself is a guide for developer to manage and maintain existing entities in this system. Entities itself, will communicate with each other through various process. All the database design of the system will be shown in Appendix E1.

4.3.4 Interface Design
Interface is for the interaction between users with the system. The interface design has to be user friendly where user can access the information easily. A good interface design helps to capture the interest of users while using the system. Appendix D1 Appendix D2 is the proposed interface design and will be improved in the future.

4.3.5 Input Design

This interface is about input design. This interface is one of the input interfaces that are parents are required to insert their child particular details into here for processing purposes. Appendix D3- Appendix D7 shows one of the examples of input interface design.
4.3.6 Output Design

This output interface is more to result of the system. It acts as a medium between system and parents to display their outcomes. The data been displayed on this page mostly is retrieved from database. Appendix D8-Appendix D10 shows one of the examples of output design.

4.4 Summary

This chapter describes the initial design of the system that is going to be developed. Diagrams such as DFD and ERD are used to model the system. Problems will not arise during the system development phase since the processes has been identified in this chapter.
CHAPTER 5

SYSTEM IMPLEMENTATION

5.1 Introduction

This chapter will discuss the implementation of the **NASOM Parent’s Support System (NPSS) – Monitoring Module**. Hardware and software installation will be discussed in this chapter. Activities involved in system development will be discussed in this chapter. Interface development, database system development and programming code development are the activities that will be explained for the implementation.

5.2 Installation of Required Software

Software used to implement **University Commercialization System** includes Windows XP Service pack 2 as the minimum operating system, Visual Studio 2008 and
Microsoft Project 2003. Microsoft Visuals Studio 2008 comes with Microsoft SQL 2005. This is the main software that is used to develop the whole system. Microsoft SQL 2005 is used for managing system database. Finally, Microsoft Project 2003 is used to do the planning and generate Gantt chart for this project.

### 5.3 System Development

Activities involved in the development of **NASOM Parent’s Support System (NPSS)** – Monitoring Module including database development, interface development and programming code development.

#### 5.3.1 Database Development

Environment Microsoft Visual Studio 2008 (VS2008) supports almost all types of DBMS (Database Management System). There is a DBMS, Microsoft SQL Server 2005 comes with VS2008. Once successfully installed VS2008, users can generate a database of Microsoft SQL Server 2005 with the following steps.

1. On the Solution Server, right-click the App_Data SQL Server database and add new ones.
2. Enter the name of the database, and then click OK.
3. Produced a new database will be displayed in the Data Connection in the Server Solution. Entities can be produced in the Table.

5.3.2 Interface Development

The interfaces of **NASOM Parent’s Support System (NPSS)-Monitoring Module** are developed by using Microsoft Visual Studio 2008 and Adobe Photoshop CS4. By using Adobe Photoshop CS4, attractive interfaces can be built.

5.3.3 Programming Code Development

In this section, coding extracted from the main functions will be discussed. The coding of **NASOM Parent’s Support System (NPSS)-Monitoring Module** is developed using ASP.NET Visual Basic and Microsoft Visual Studio 2008 is the software for writing programming code. Following are the snapshots of the coding of few main functions of the system.
5.3.3.1 Monitoring Tool

This is one of the main functions of the system. There will be 5 page for 5 aspect of the child’s development process. Each page is to monitor the aspect of the child’s development process. In this section, programming code about connecting to database (retrieve data) and generate dynamic ASP controls are included. The snapshot below shows each part of the aspect coding of the monitoring tool.

```vbnet
Protected Sub Page_Load(ByVal sender As Object, ByVal e As System.EventArgs) Handles Me.Load
Using myConnection As New SqlConnection(ConfigurationManager.ConnectionStrings("ConnectionString").ConnectionString)
Const SQL As String = "SELECT [question] FROM [Monitor] WHERE [area]='physical' AND [age]=@age"
Dim myCommand As New SqlCommand(SQL, myConnection)
myConnection.Open()
Dim age As Double = Session("age")
myCommand.Parameters.AddWithValue("@age", age)
Dim myReader As SqlDataReader = myCommand.ExecuteReader
Dim table As New Table()
table.ID = "Table1"
Placeholder1.Controls.Add(table)
Dim i As Integer = 0
Dim j As Integer = 0

While myReader.Read
    i = i + 1
    Dim rowA As New TableRow
    Dim rowB As New TableRow
    Dim rowSpace As New TableRow
    Dim cellA As New TableCell
    Dim cellB As New TableCell
    Dim cellSpace As New TableCell
    Dim lblA As New Label
    Dim lblB As New Label
    Dim rdbA As New RadioButton
    Dim rdbB As New RadioButton
    Dim rdbC As New RadioButton
```
lblA.ID = "lblA" + i.ToString
lblA.Text = i.ToString + ". "
lblB.ID = "lblB" + i.ToString
lblB.Text = myReader("question").ToString

cellSpace.Height = 20

cellA.Controls.Add(lblA)
rowA.Cells.Add(cellA)
table.Rows.Add(rowA)
cellA.Controls.Add(lblB)
rowA.Cells.Add(cellA)
table.Rows.Add(rowA)

rdA.ID = "rdA" + i.ToString
rdA.Text = "Yes"
rdA.GroupName = "group" + i.ToString
cellB.Controls.Add(rdbA)
rowB.Cells.Add(cellB)
table.Rows.Add(rowB)

rdbC.ID = "rdbC" + i.ToString
rdbC.Text = "Sometime"
rdbC.GroupName = "group" + i.ToString
cellB.Controls.Add(rdbC)
rowB.Cells.Add(cellB)
table.Rows.Add(rowB)

rdbB.ID = "rdbB" + i.ToString
rdbB.Text = "No"
rdbB.GroupName = "group" + i.ToString
cellB.Controls.Add(rdbB)
rowB.Cells.Add(cellB)
table.Rows.Add(rowB)

rowSpace.Cells.Add(cellSpace)
table.Rows.Add(rowSpace)

j = i * 2

End While

lblLoop.Text = i
lblMPhy.Text = j

myReader.Close()
myConnection.Close()

End Using

End Sub

**Figure 5.1:** Coding of Generating Monitoring Tool (one aspect)
Protected Sub btnNext_Click(ByVal sender As Object, ByVal e As System.EventArgs) Handles btnNext.Click

    Dim total As Integer
    Dim lop As Integer = lblLoop.Text
    Dim rdb1 As String
    Dim rdb2 As String
    Dim rdb3 As String
    Dim ajax As AjaxControlToolkit.TabContainer = CType(Page.FindControl("TabContainer1"), AjaxControlToolkit.TabContainer)
    Dim panel As AjaxControlToolkit.TabPanel = CType(ajax.FindControl("TabPanel1"), AjaxControlToolkit.TabPanel)

    For counter = 1 To lop

        rdb1 = "rdbA" + counter.ToString
        rdb2 = "rdbB" + counter.ToString
        rdb3 = "rdbC" + counter.ToString

        If CType(panel.FindControl(rdb1), RadioButton).Checked Then
            total = total + 2
        End If

        If CType(panel.FindControl(rdb3), RadioButton).Checked Then
            total = total + 1
        End If

        If CType(panel.FindControl(rdb2), RadioButton).Checked Then
            total = total + 0
        End If

    Next

    lblTolPhy.Text = total

    Dim check As Integer
    For i = 1 To lop

        rdb1 = "rdbA" + i.ToString
        rdb2 = "rdbB" + i.ToString
        rdb3 = "rdbC" + i.ToString

        If CType(panel.FindControl(rdb1), RadioButton).Checked = False And CType(panel.FindControl(rdb2), RadioButton).Checked = False And CType(panel.FindControl(rdb3), RadioButton).Checked = False Then
        Else

    End If
check = check + 1

End If

Next

If check = lop Then

& "&MPhy=" & 
& lblMPhy.Text)

End If

End Sub

Figure 5.2: Coding of Question Validation

5.3.3.2 Display Result of Monitoring

In this section, the coding of calculating and displaying the result of the
monitoring process will be revealed. The snapshot below shows a part of coding of the
result calculating and displaying.
' Area Calculation
Dim phy As Double
Dim int As Double
Dim lan As Double
Dim emo As Double
Dim soc As Double
Dim overall As Double

phy = (TolPhy / MPhy) * 100
int = (TolInt / MInt) * 100
lan = (TolLan / MLan) * 100
emo = (TolEmo / MEmo) * 100
soc = (TolSoc / MSoc) * 100
overall = ((TolPhy + TolInt + TolLan + TolEmo + TolSoc) / (MPhy + MInt + MLan + MEmo + MSoc)) * 100

lblOverall.Text = overall

' choosing the physical result
If phy <= 70 Then

Using myConnection As New
SqlConnection(ConfigurationManager.ConnectionStrings("ConnectionString").ConnectionString)
Const SQL As String = "SELECT [solution] FROM [solution] WHERE [area]='physical' AND [age]=@age"
Dim myCommand As New SqlCommand(SQL, myConnection)
myConnection.Open()

Dim age As Double = Session("age")
myCommand.Parameters.AddWithValue("@age", age)

Dim myReader As SqlDataReader = myCommand.ExecuteReader

Dim tablePhy As New Table
tablePhy.ID = "TablePhy"
phPhy.Controls.Add(tablePhy)
Dim iPhy As Integer = 0

While myReader.Read
    iPhy = iPhy + 1
    Session("iPhy") = iPhy

    Dim rowAPhy As New TableRow
    Dim cellAPhy As New TableCell
    Dim lblAPhy As New Label
    Dim cellNumPhy As New TableCell
    Dim lblNumPhy As New Label

    lblNumPhy.ID = "lblNumPhy" + iPhy.ToString

    rowAPhy.Cells.Add(cellAPhy)
    cellAPhy.Controls.Add(lblAPhy)
    cellNumPhy.Controls.Add(lblNumPhy)

End While
lblNumPhy.Text = iPhy.ToString + ". "

lblAPhy.ID = "lblAPhy" + iPhy.ToString
lblAPhy.Text = myReader("solution").ToString
Session("phy" + iPhy.ToString) = lblAPhy.Text

End While

myReader.Close()
myConnection.Close()
End Using

Else
Dim lblPhy As New Label
lblPhy.Text = "Your child’s PHYSICAL DEVELOPMENT is at normal stage. Keep it up the good way."
phPhy.Controls.Add(lblPhy)
Session("phy") = lblAPhy.Text
End If

'choosing the intellectual result
If int <= 70 Then

Using myConnection As New SqlConnection(ConfigurationManager.ConnectionStrings("ConnectionString").ConnectionString)
Const SQL As String = "SELECT [solution] FROM [solution] WHERE [area]=’intellectual’"
Dim myCommand As New SqlCommand(SQL, myConnection)
myConnection.Open()
Dim myReader As SqlDataReader = myCommand.ExecuteReader

Dim tableInt As New Table()
tableInt.ID = "TableInt"
phInt.Controls.Add(tableInt)
Dim iInt As Integer = 0

While myReader.Read

iInt = iInt + 1
Session("iInt") = iInt

Dim rowAInt As New TableRow
Dim cellAInt As New TableCell
Dim lblAInt As New Label
lblAInt.ID = "lblAInt" + iInt.ToString
lblAInt.Text = myReader("solution").ToString
Session("int" + iInt.ToString) = lblAInt.Text

End While

myReader.Close()
myConnection.Close()
End Using
cellAInt.Controls.Add(lblAInt)
rowAInt.Cells.Add(cellAInt)
tableInt.Rows.Add(rowAInt)

End While

myReader.Close()
myConnection.Close()

Else
    Dim lblInt As New Label
    lblInt.Text = "Your child’s INTELLECTUAL DEVELOPMENT is at normal stage. Keep it up the good way."
    phInt.Controls.Add(lblInt)
    Session("int") = lblInt.Text
End If

'choosing the language result
If lan <= 70 Then

Using myConnection As New SqlConnection(ConfigurationManager.ConnectionStrings("ConnectionString").ConnectionString)
    Const SQL As String = "SELECT [solution] FROM [solution] WHERE [area] = 'language' AND [age] = @age"
    Dim myCommand As New SqlCommand(SQL, myConnection)
    myConnection.Open()
    Dim age As Double = Session("age")
    myCommand.Parameters.AddWithValue("@age", age)

    Dim myReader As SqlDataReader = myCommand.ExecuteReader

    Dim tableLan As New Table()
    tableLan.ID = "TableLan"
    phLan.Controls.Add(tableLan)
    Dim iLan As Integer = 0

    While myReader.Read

        iLan = iLan + 1
        Session("iLan") = iLan

        Dim rowALan As New TableRow
        Dim cellALan As New TableCell
        Dim lblALan As New Label
        Dim cellNumLan As New TableCell
        Dim lblNumLan As New Label

        lblNumLan.ID = "lblNumLan" + iLan.ToString
        lblNumLan.Text = iLan.ToString + ". "

        lblALan.ID = "lblALan" + iLan.ToString
lblALan.Text = myReader("solution").ToString
Session("lan" + iLan.ToString) = lblALan.Text

cellNumLan.Controls.Add(lblNumLan)
rowALan.Cells.Add(cellNumLan)

cellALan.Controls.Add(lblALan)
rowALan.Cells.Add(cellALan)
tableLan.Rows.Add(rowALan)

End While
myReader.Close()
myConnection.Close()
End Using

Else
Dim lblLan As New Label
lblLan.Text = "Your child’s LANGUAGE DEVELOPMENT is at normal stage. Keep it up the good way."
phLan.Controls.Add(lblLan)
Session("lan") = lblLan.Text
End If

'choosing the emotional result
If emo <= 70 Then

Using myConnection As New
SqlConnection(ConfigurationManager.ConnectionStrings("ConnectionString").ConnectionString)
Const SQL As String = "SELECT [solution] FROM [solution] WHERE [area]='emotional'

Dim myCommand As New SqlCommand(SQL, myConnection)
myConnection.Open()
Dim myReader As SqlDataReader = myCommand.ExecuteReader

Dim tableEmo As New Table
tableEmo.ID = "TableEmo"
phEmo.Controls.Add(tableEmo)

Dim iEmo As Integer = 0

Dim lblHeader As New Label
Dim rowHeader As New TableRow
Dim cellHeader As New TableCell
lblHeader.Text = "The steps involve:"
cellHeader.Controls.Add(lblHeader)
rowHeader.Cells.Add(cellHeader)
tableEmo.Rows.Add(rowHeader)

While myReader.Read

Dim head As Integer = 1

iEmo = iEmo + 1
Session("iEmo") = iEmo
Dim rowAEmo As New TableRow
Dim cellAEmo As New TableCell
Dim lblAEmo As New Label

lblAEmo.ID = "lblAEmo" + iEmo.ToString
lblAEmo.Text = myReader("solution").ToString
Session("emo" + iEmo.ToString) = lblAEmo.Text

cellAEmo.Controls.Add(lblAEmo)
rowAEmo.Cells.Add(cellAEmo)
tableEmo.Rows.Add(rowAEmo)

End While

myReader.Close()
myConnection.Close()

Else

Dim lblEmo As New Label
lblEmo.Text = "Your child’s EMOTIONAL DEVELOPMENT is at normal stage. Keep it up the good way."
phEmo.Controls.Add(lblEmo)
Session("emo") = lblEmo.Text

End If

'choosing the social result
If soc <= 70 Then

Using myConnection As New SqlConnection(ConfigurationManager.ConnectionStrings("ConnectionString").ConnectionString)
Const SQL As String = "SELECT [solution] FROM [solution] WHERE [area]='social'
AND [age]=@age"

Dim myCommand As New SqlCommand(SQL, myConnection)
myConnection.Open()

Dim age As Double = Session("age")
myCommand.Parameters.AddWithValue("@age", age)

Dim myReader As SqlDataReader = myCommand.ExecuteReader

Dim tableSoc As New Table()
tableSoc.ID = "TableSoc"
phSoc.Controls.Add(tableSoc)
Dim iSoc As Integer = 0

While myReader.Read

iSoc = iSoc + 1
Session("iSoc") = iSoc

Dim rowASoc As New TableRow
Dim cell1ASoc As New TableCell

End While

myReader.Close()
myConnection.Close()
Dim lblASoc As New Label

Dim cellNumSoc As New TableCell
Dim lblNumSoc As New Label

lblNumSoc.ID = "lblNumSoc" + iSoc.ToString
lblNumSoc.Text = iSoc.ToString + ". "

lblASoc.ID = "lblASoc" + iSoc.ToString
lblASoc.Text = myReader("solution").ToString
Session("soc" + iSoc.ToString) = lblASoc.Text

cellNumSoc.Controls.Add(lblNumSoc)
rowASoc.Cells.Add(cellNumSoc)

cellASoc.Controls.Add(lblASoc)
rowASoc.Cells.Add(cellASoc)
tableSoc.Rows.Add(rowASoc)

End While

myReader.Close()
myConnection.Close()
more on his/her weak aspeck. Keep up the good work.”
    phOve.Controls.Add(lb10ve)
Else
    lb10ve.Text = “Your child is beyond his/her development stage’s age. He/She might be a brilliant child. Keep up the good work.”
    phOve.Controls.Add(lb10ve)
End If

Session("ove") = lb10ve.Text
Session("overall") = lb10veScoll.Text

End Sub

Figure 5.3: Coding of Calculating and Displaying Result

5.3.3.3 Generating result in PDF and E-mail Form

In this section, the function of generating result in PDF and E-mail form will be discussed. The coding of these functions is shown by the snapshots below.

Protected Sub Page_Load(ByVal sender As Object, ByVal e As System.EventArgs) Handles Me.Load

    Dim age As String
    age = Session("age")

    Dim iPhy As Double = Session("iPhy")
    Dim phy As String
    Dim iInt As Double = Session("iInt")
    Dim int As String
    Dim iLan As Double = Session("iLan")
    Dim lan As String
    Dim iEmo As Double = Session("iEmo")
    Dim emo As String
    Dim iSoc As Double = Session("iSoc")
    Dim soc As String
    Dim ove As String = Session("ove")
    Dim overall As String = Session("overall")

    Dim doc As Document = New Document
Dim header As HeaderFooter = New HeaderFooter("SUGGESTED SOLUTION & SUMMARY OF YOUR CHILD"), False)
doc.Header = header

Dim footer As HeaderFooter = New HeaderFooter("This is page: ", True)
doc.Footer = footer

doc.Open()
emo = Session("emo" + counter.ToString)
doc.Add(New Paragraph(emo))

Next
emo = Session("emo")
doc.Add(New Paragraph(emo))

doc.Add(New Paragraph(" "))

'social
doc.Add(New Paragraph(New Chunk("SOCIAL ASPECT",
FontFactory.GetFont(FontFactory.TIMES_ROMAN, 15, Font.BOLD Or Font.UNDERLINE))))
For counter = 1 To iSoc
  soc = Session("soc" + counter.ToString)
  doc.Add(New Paragraph(counter.ToString + ". " + soc))
Next
soc = Session("soc")
doc.Add(New Paragraph(soc))

doc.Add(New Paragraph(" "))

'overall
doc.Add(New Paragraph(New Chunk("OVERALL OVERVIEW",
FontFactory.GetFont(FontFactory.TIMES_ROMAN, 15, Font.BOLD Or Font.UNDERLINE))))
doc.Add(New Paragraph(overall))
doc.Add(New Paragraph(ove))
doc.Close()

Response.Redirect("~/Monitoring Report Summary.pdf")

End Sub

Figure 5.4: Coding of Generating PDF File

Protected Sub Page_Load(ByVal sender As Object, ByVal e As System.EventArgs) Handles Me.Load
  Dim age As String
  age = Session("age")

  Dim iPhy As Double = Session("iPhy")
  Dim phy As String
  Dim iInt As Double = Session("iInt")
  Dim int As String
  Dim iLan As Double = Session("iLan")
  Dim lan As String
  Dim iEmo As Double = Session("iEmo")
  Dim emo As String
  Dim iSoc As Double = Session("iSoc")
  Dim soc As String
  Dim ove As String = Session("ove")
  Dim overall As String = Session("overall")

End Sub
Dim doc As Document = New Document

Dim header As HeaderFooter = New HeaderFooter(New Phrase("SUGGESTED SOLUTION & SUMMARY OF YOUR CHILD"), False)
doc.Header = header

Dim footer As HeaderFooter = New HeaderFooter(New Phrase("This is page: "), True)
' footer. = Rectangle.NO_BORDER or re
doc.Footer = footer
doc.Open()

Dim jpeg As Image = Image.GetInstance("C:\Users\antt\Documents\Visual Studio 2008\WebSites\PSM\pic\nasom.jpg")
doc.Add(jpeg)

' physical
doc.Add(New Paragraph(New Chunk("PHYSICAL ASPECT",
FontFactory.GetFont(FontFactory.TIMES_ROMAN, 15, Font.BOLD Or Font.UNDERLINE))))
For counter = 1 To iPhy
    phy = Session("phy" + counter.ToString)
doc.Add(New Paragraph(counter.ToString + ". " + phy))
Next
phy = Session("phy")
doc.Add(New Paragraph(phy))

doc.Add(New Paragraph(" "))

' intellectual

doc.Add(New Paragraph(New Chunk("INTELLECTUAL ASPECT",
FontFactory.GetFont(FontFactory.TIMES_ROMAN, 15, Font.BOLD Or Font.UNDERLINE))))
For counter = 1 To iInt
    int = Session("int" + counter.ToString)
doc.Add(New Paragraph(int))
Next
int = Session("int")
doc.Add(New Paragraph(int))

doc.Add(New Paragraph(" "))

' language

doc.Add(New Paragraph(New Chunk("LANGUAGE ASPECT",
FontFactory.GetFont(FontFactory.TIMES_ROMAN, 15, Font.BOLD Or Font.UNDERLINE))))
For counter = 1 To iLan
    lan = Session("lan" + counter.ToString)
doc.Add(New Paragraph(counter.ToString + ". " + lan))
Next
lan = Session("lan")
doc.Add(New Paragraph(lan))

doc.Add(New Paragraph(" "))
' emotional
  doc.Add(New Paragraph(New Chunk("EMOTIONAL ASPECT", FontFactory.GetFont(FontFactory.TIMES_ROMAN, 15, Font.BOLD Or Font.UNDERLINE))))
  For counter = 1 To iEmo
    emo = Session(" emo" + counter.ToString)
    doc.Add(New Paragraph(emo))
  Next
  emo = Session(" emo")
  doc.Add(New Paragraph(emo))
  doc.Add(New Paragraph(" "))

' social
  doc.Add(New Paragraph(New Chunk("SOCIAL ASPECT", FontFactory.GetFont(FontFactory.TIMES_ROMAN, 15, Font.BOLD Or Font.UNDERLINE))))
  For counter = 1 To iSoc
    soc = Session(" soc" + counter.ToString)
    doc.Add(New Paragraph(counter.ToString + ". " + soc))
  Next
  soc = Session(" soc")
  doc.Add(New Paragraph(soc))
  doc.Add(New Paragraph(" "))

' overall
  doc.Add(New Paragraph(New Chunk("OVERALL OVERVIEW", FontFactory.GetFont(FontFactory.TIMES_ROMAN, 15, Font.BOLD Or Font.UNDERLINE))))
  doc.Add(New Paragraph(overall))
  doc.Add(New Paragraph(ove))
  doc.Close()

  Dim mail As MailMessage = New MailMessage()
  Dim smtp As SmtpClient = New SmtpClient()

  mail.To.Add("vinpsm@gmail.com")
  mail.Subject = "<COPY> Suggested Solution And Overview Of Your Child ~ FROM NASOM"
  mail.Body = "TO DEAR PARENTS: <br><br> This is a copy of your child monitoring report. Keep it for your own reference. <br><br> From<br>Nasom Manager<TAN WEI CHUEN">
  mail.Attachments.Add(New Attachment(Request.PhysicalApplicationPath + "\Monitoring Report Summary.pdf"))
  mail.IsBodyHtml = True
  smtp.Host = "smtp.gmail.com"
  smtp.Credentials = New System.Net.NetworkCredential("vinpsm@gmail.com", "vinpsm-psm")
  smtp.EnableSsl = True
  smtp.Send(mail)

' To respond back to the previous page
If Not IsPostBack Then
  ViewState("RefUrl") = Request.UrlReferrer.ToString()
End If
Dim refUrl As Object = ViewState("RefUrl")
If Not refUrl Is Nothing Then
    Response.Redirect(CStr(refUrl))
End If

End Sub

**Figure 5.5:** Coding of Generating E-mail attachment

### 5.3.3.4 Insert Data Into Database

In this section will show the coding how to insert data into the database. The coding of the function is shown as the snapshot below.

Using myConnection As New SqlConnection(ConfigurationManager.ConnectionStrings("ConnectionString").ConnectionString)

Dim currentdate As String
Dim currentmonth As String
Dim currentyear As String

currentmonth = MonthName(Month(Now))
currentyear = Year(Now)
currentdate = DateValue(Now)

myConnection.Open()
Dim SQL As String = "Insert into [result] values (@name, @id, @age, @percentage, @date, @month, @year)"

Dim myCommand As New SqlCommand(SQL, myConnection)

myCommand.Parameters.AddWithValue("@Username", username)
myCommand.Parameters.AddWithValue("@id", Session("childID"))
myCommand.Parameters.AddWithValue("@age", Session("age"))
myCommand.Parameters.AddWithValue("@percentage", Session("overall"))
myCommand.Parameters.AddWithValue("@date", currentdate)
myCommand.Parameters.AddWithValue("@month", currentmonth)
myCommand.Parameters.AddWithValue("@year", currentyear)
5.4 Summary

This chapter describes the implementation of **NASOM Parent’s Support System (NPSS)-Monitoring Module** during the development phase. Implementation can be described as the realization system from the design and analysis phases. The development of database, interface and program are also discussed in this chapter. The developed database is not only for storing data but also retrieving and manipulating the data to produce output that are useful to the users.
CHAPTER 6

SYSTEM TESTING AND EVALUATION

6.1 Introduction

This chapter discusses about the system testing phase and strategy. System testing plays an important role in ensuring the system meets the user specifications and requirements and free of any errors. The error rate in the system is minimized with the help of this testing phase. Various kinds of testing will be carried out to evaluate the system to make sure that it is working properly and ready to be used. The testing is done with black box testing, interface testing and requirement testing.
6.2 Program Debugging

Program debugging is performed by using Microsoft Visual Studio 2008 debugger. The program debugging is applied for each function and available on each user interface through the web browser. The purposes of program debugging are to make sure that system logic is correct and the program can run correctly by producing preferred result. Furthermore, it is also used to ensure that the syntax in the program is correct and the program does not give any harmful affect on other files or data.

6.3 Black Box Testing

Black box testing is also known as functional testing or behavioral testing. Black box testing is focuses on determining whether or not the system has fulfilled the system specifications. In order to implement black box testing strategy, tester needs to know exactly the system specifications and as the user, should know how the system should behave in response to particular action. Black box testing can helps to detect some errors as below:

i. Incorrect or missing function
ii. Error in interface
iii. Error at the beginning and ending of the system
iv. Error when connect to database

In other word, black box testing can be considered as the input testing and output testing for the system. Input testing is done to ensure the data saved in database is
correct to avoid error during data output. Output testing is done to display the information input into the system during input testing.

![Figure 6.1: Black Box Testing](image)

**6.3.1 Benefit Using BBT**

i. **Ease of use.** Because testers do not have to concern themselves with the inner workings of an application, it is easier to create test cases by simply working through the application, as would an end user.

ii. **Quicker test case development.** Because testers only concern themselves with the GUI, they do not need to spend time identifying all of the internal paths that may be involved in a specific process, they need only concern themselves with the various paths through the GUI that a user may take.

iii. **Simplicity.** Where large, highly complex applications or systems exist black-box testing offers a means of simplifying the testing process by focusing on valid and invalid inputs and ensuring the correct outputs are received.
6.4  Testing by Developer

Before the system is delivered to end-user, system testing is implemented in order to deliver a system that meets the user requirement. Testing process involves in the system are database testing, input testing, output testing, program testing and interface testing.

6.4.1  Database Testing

Database testing is a process to ensure the data key into the database is correct. At the same time, the outputs from the database also have to be accurate. Database testing is very important to ensure the data being input is correct and the output is accurate in order to avoid the system generates inaccurate data for user.

6.4.2  User Interface Testing

User interface testing is implemented to ensure the user can understand and use the system smoothly. In addition, the arrangement of the interface of the developed system has to be systematic, clear and the color applied in the system has to attract people attention.
6.4.3 Input Testing

Input testing is very important and required when related program code require user to insert correct data into database. The data inserted by the user has to be verified whether correct or not in order to avoid error in the output. If user has no into the system, the alert message box will pop up to inform user there are no data being selected. Hence, user will know what happen and could solve the problem without any technical knowledge. Figure below shows the alert message that will pop up when no data is selected.

![Alert Message Box](image)

**Figure 6.2:** Example of Alert Message Box

6.5 Interface Testing

Objectives of interface testing are to detect faults due to interface errors or invalid assumptions about interfaces. Interface testing is particularly important for object-oriented development as objects are defined by their interfaces. Interface errors can be categorized as below:

i. Interface misuse
   - A calling component calls another component and makes an error in its use of its interface such as parameters in the wrong order.
ii. Interface misunderstanding
   - A calling component embeds assumptions about the behaviour of the called component which are incorrect.

iii. Timing errors
   - The called and the calling component operate at different speeds and out-of-date information is accessed.

6.6 Summary

This chapter describes the implementation of **NASOM Parent’s Support System (NPSS)-Monitoring Module** during the development phase. Implementation can be described as the realization system from the design and analysis phases. The development of database, interface and program are also discussed in this chapter. The developed database is not only for storing data but also retrieving and manipulating the data to produce output that are useful to the users.
CHAPTER 7

DISSCUSSION AND CONCLUSION

7.1 Introduction

In this chapter, the conclusion will state overall information of the system. The main purpose of development of the Online Learning Disability-Autism Diagnosis and Monitoring System is to assist the parents having online knowledge and advice about autism instantly. The new system will helps the users (mostly parents) to gain information and advice about autism without wasting time for long queuing to seek for doctor advice. The parents are able to diagnose and monitor their children’s problem and growth’s status. Furthermore, new ideas and improvement will be proposed to increase the quality of the system in the future.
7.2 Achievement

A well design system should have an excellent performance in every aspect, such as professional interface, comfort outlook, and also provide excellent services to the user. While analyze and design the system, it teaches and guides how to have a proper way to develop a system. During analyze and design phase, information was collected through interviews, observation, and research for this project. Information collection activities were carried out by visiting some of the clinic and hospital that nearby UTM. The objective and scope of the project where successfully identified during the information collection activities.

The knowledge and technology that is needed in developing the new system was identified during literature review. The methodology that is going to be used to develop the system is successfully identified too. A good and effective system will be developed with all these information. In addition, I have learnt that time management is the most important and crucial part that will lead the system to be successful or to be a bad evaluated system.

During the development and implementation stage of the NASOM Parent’s Support System, new and advanced method of ASP.NET and VB.NET coding where discovered. Varies type of coding structure where implemented to solve the logic and structure of the system. Function logics were perfectly coded as the beautifulness of Visual Studio 2008.
Research on medical information and children development process is the most precious knowledge to know about. Since the developers are not specialist in medical substances and knowledge, interview session is a good way to gather more useful medical information. Interviewing specialist such as doctor, nurse, special education teacher and also autism specialist, given more information to develop the system. After the interview session, improvement of knowledge regarding to autism and also children development process improve the progress and quality of the system development.

7.3 Challenge

During analyze and design phase, there were some challenges while completing this project. The challenges where identified and show below:

i. **Less Reference/Material Of DSS**  
Lack of reference material that related with the Decision Support System (DSS) that will be applied to the actual system.

ii. **Hard To Obtain The System Requirement**  
Have difficulty to obtain the precise information, especially in identifying the needs and requirements of users in the implementation of the proposed system.

iii. **Hard To Understand Medical Terms**  
As it is a medical system, some of the medical term is so hard to understand and have to find out all the information about it.
iv. **Have To Work As A Team**

As this is a single system with 3 major modules, it need extremely perfect teamwork to cooperate and complete the project.

v. **Difficulty Obtaining The Actual Medical Monitoring Module**

There are difficulties in obtaining the actual medical monitoring module, which should be fully implemented for the system. As a result, the monitoring module for the actual system cannot be implemented comprehensively and this should be emphasized to enable the system can be used effectively.

vi. **Difficulty Of Designing System Flow Diagram**

While designing the DFD, ERD and database, there are difficulties because of the combination of the 3 modules. There must have a perfect combination with the 3 designs to produce an excellence system.

7.4 **Expectation**

To make the system even more valuable, the expectation for this project is to provide excellence services and correct information to the users as this is a medical support system. The system meets the user requirements and also achieves the objectives of this project that were set earlier. For the continuity in the future, some addition suggestion and evolution may be considered. For example, implementation of forum or portal for the system enables information or knowledge to be shared between the specialist and the parents.
7.5 Lesson Learned

During the development phases of NPSS, several lessons have been learned as per listed below:

i. Working as a team bringing the project towards success.
ii. Have research on how to develop an attractive user interface as well as learning and applying latest technologies in this project.
iii. Major improvement in programming skill.
iv. Teamwork has better efficiency compare to doing a task alone.
v. Sharing knowledge with others not only helping others but also self helping to strengthen the knowledge in memory.
vi. Time management is the most important and crucial part that will lead the system to be successful.

7.6 Summary

In conclusion, this chapter describes the results from the overall the project. The achievement of the project, challenges that faced by the developers, expectation of the project were all explained and presented in this chapter. With the teamwork that acquire by the developers, possibility of successfulness will be high. This will able to carry out the new system to the real world.
REFERENCES


2. Retrieved on 5 August 2009, from msdn.microsoft.com


8. Family Health Development Division Ministry of Health, Malaysia
   ii. Manual on Management of Children with Fine Motor Delay
   v. Manual on the Management of Children with Communication Problems


APPENDIX A1

Gantt Chart PSM 1 & PSM 2
APPENDIX B1

Context Diagram of NPSS Diagnosis and Monitoring System
APPENDIX B2

Diagram 0 of NPSS Diagnosis and Monitoring System
APPENDIX B3

DFD Fragment for Login process
APPENDIX B4

DFD Fragment for Diagnosis Process

Parents ➔ Information of children ➔ 2.1. Showing screen of diagnosis system ➔ Data input for diagnosis system ➔ 2.2. Diagnose the LD ➔ diagnosis rules ➔ Diagnosis test ➔ Result of diagnosis ➔ Children medical report
APPENDIX B5

DFD Fragment for Publishing Result Process

Edraw Trial Version
APPENDIX B6

DFD Fragment for Monitoring Process
APPENDIX B7

DFD Fragment for Online Journal Process
APPENDIX B8

DFD Fragment for Collect Item Information Process

Parents

6.1 Storing and uploading item information and picture

6.2 Searching item from item gallery

Specialist

picture and information of item

item information

item gallery

item information

arranged item information

item indesired item information
APPENDIX C1

ERD of NPSS Diagnosis and Monitoring System
APPENDIX D1

NPSS Home Page
APPENDIX D2

NPSS Monitoring Home Page

Welcome to NPSS Monitoring System

This monitoring system is to help the parents to monitor their child’s development process.

Child development stages describe theoretical milestones of child development. Many stage models of development have been proposed, used as working concepts and in some cases asserted as nativist theories.

This article puts forward a general model based on the most widely accepted developmental stages. However, it is important to understand that there is wide variation in terms of what is considered “normal,” driven by a wide variety of genetic, cognitive, physical, family, cultural, nutritional, educational, and environmental factors. Many children will reach some or most of these milestones at different times from the norm.


[Begin Your Test!]
APPENDIX D3

Physical Aspect Development Selection Page

**PHYSICAL ASPECT**

<table>
<thead>
<tr>
<th>ENGLISH</th>
<th>BAHASA MELAYU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Moves arms purposefully.</td>
<td></td>
</tr>
<tr>
<td>Yes ☐</td>
<td>Sometime ☐</td>
</tr>
<tr>
<td>2. Lifts head and chest up higher now, when lying on tummy. Rests weight on outstretched arms and flat palms.</td>
<td></td>
</tr>
<tr>
<td>Yes ☐</td>
<td>Sometime ☐</td>
</tr>
<tr>
<td>3. Will pull himself to sit when hands are held. Will lift head up when lying on back.</td>
<td></td>
</tr>
<tr>
<td>Yes ☐</td>
<td>Sometime ☐</td>
</tr>
<tr>
<td>4. Plays with feet when lying on back. Sits upright supported.</td>
<td></td>
</tr>
<tr>
<td>Yes ☐</td>
<td>Sometime ☐</td>
</tr>
<tr>
<td>Yes ☐</td>
<td>Sometime ☐</td>
</tr>
</tbody>
</table>
APPENDIX D4

Intellectual Aspect Development Selection Page

INTELLECTUAL ASPECT

<table>
<thead>
<tr>
<th>ENGLISH</th>
<th>BAHASA MELAYU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Forgets about toy if hidden.</td>
<td></td>
</tr>
<tr>
<td>Yes ☐ Sometime ☐ No</td>
<td></td>
</tr>
</tbody>
</table>

| 2. Stares at toys within reach, and grabs toy with both hands. Occasionally uses one. |
| Yes ☐ Sometime ☐ No |

| 3. More alert now and eagerly watches people in the room. |
| Yes ☐ Sometime ☐ No |

| Yes ☐ Sometime ☐ No |

| 5. Passes toy from hand to hand. Watches toy fall. |
| Yes ☐ Sometime ☐ No |
## APPENDIX D5

Language Aspect Development Selection Page

### LANGUAGE ASPECT

<table>
<thead>
<tr>
<th></th>
<th>ENGLISH</th>
<th>BAHASA MELAYU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Starts to make tuneful double or single syllable sounds, eg ‘muh-muh’.</td>
<td>☐ Yes ☐ Sometime ☐ No</td>
</tr>
<tr>
<td>2</td>
<td>Laughs to self while playing, also screams with delight and with irritation.</td>
<td>☐ Yes ☐ Sometime ☐ No</td>
</tr>
<tr>
<td>3</td>
<td>Turns to where familiar voice comes from. Listens to voice.</td>
<td>☐ Yes ☐ Sometime ☐ No</td>
</tr>
</tbody>
</table>

[PREVIOUS] [NEXT]
## Emotional Aspect Development Selection Page

<table>
<thead>
<tr>
<th>ENGLISH</th>
<th>BAHASA MELAYU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Manipulates toys very well. Watches them at the same time.</td>
<td></td>
</tr>
</tbody>
</table>
   - Yes □ Sometime □ No |
| 2. Loves rattles and will grab for one when offered. Then shakes it deliberately. | 
   - Yes □ Sometime □ No |
| 3. Holds hands up to be lifted. | 
   - Yes □ Sometime □ No |
| 4. Touches breast or bottle when being fed. | 
   - Yes □ Sometime □ No |
APPENDIX D7

Social Aspect Development Selection Page

SOCIAL ASPECT

1. Becomes unfriendly to strangers at about 7 months.
   - Yes [ ] Sometime [ ] No [ ]

2. Is still friendly with strangers unless startled or familiar adult isn't there.
   - Yes [ ] Sometime [ ] No [ ]

3. Loves 'Rough and Tumble' play.
   - Yes [ ] Sometime [ ] No [ ]

FINISH - Submit Test
APPENDIX D8

Solution and Result Display Page

SOLUTION AND RESULT

PHYSICAL SOLUTION
Your child’s PHYSICAL DEVELOPMENT is at normal stage. Keep it up the good way.

INTELLECTUAL SOLUTION
Your child’s INTELLECTUAL DEVELOPMENT is at normal stage. Keep it up the good way.

LANGUAGE SOLUTION
Your child’s LANGUAGE DEVELOPMENT is at normal stage. Keep it up the good way.

EMOTIONAL SOLUTION
Your child’s EMOTIONAL DEVELOPMENT is at normal stage. Keep it up the good way.

SOCIAL SOLUTION
Your child’s SOCIAL DEVELOPMENT is at normal stage. Keep it up the good way.

OVERALL DESCRIPTION
Your child overall scoll is NaN%
Your child is beyond his/her development stage’s age. He/She might be a brilliant child. Keep up the good work.
APPENDIX D9

PDF Format Output Page

SUGGESTED SOLUTION & SUMMARY OF YOUR CHILD

PHYSICAL ASPECT
1. Get good heat control.
2. Encourage baby to sit up, sit, and turn over.
3. Encourage baby to move to reach for objects.
4. Encourage baby to turn around.
5. Encourage weight bearing.

INTELLECTUAL ASPECT
1. Talk to your baby. Language and intelligence go hand in hand. Speak clearly to your child, even when you’re just alone at home, to enhance what your child knows and recognizes as belonging to things and forms around the home. Television does not do the same thing as live speech. It is much better to shut the TV off and begin talking with your child. Avoid baby talk as it will give the baby the wrong idea of how speech is done.
2. Read to your baby. Use simple books at first that just have pictures and words. Point to the picture and say the word so that baby understands the meaning of the picture. Show your baby what it want to imitate the words for you and, as a result, quickly understand a wide range of words.
3. Listen to music. There are a lot of good educational music tapes and CDs out there for baby to listen to. Through those babies improve hearing skills which encourage many more subtle aspects of intellectual development. As a general rule, music should be lively, inviting and easy to sing along to.
4. Use educational toys. There are many toys that boost intellect. Some of them include counting games and games of small motor or memory skills that build the capacity of your child to learn and grow. Playing educational games is another fun way of improving infant intellectual development, but it should be increased in complexity as your child grows up.

LANGUAGE ASPECT
1. Talk and play with your baby.
2. Use words and play actions when talking with your baby.
3. Play games with your baby, such as peek-a-boo and pat-a-cake, that teach your child about taking turns when communicating with another person.

SUGGESTED SOLUTION & SUMMARY OF YOUR CHILD

4. Place a rattle in your baby’s hand. Hold out a squeeze toy for your baby to grab.
5. Hand things to your baby and ask the baby to hand them back.

EMOTIONAL ASPECT
1. Observe the circumstances of the child’s unacceptable behaviour/emotional.
2. Try to understand why he behaves as he does. (Why hasn’t he/have such emotional act)
3. Set a reasonable goal for improvement based on his immediate needs and development level.
4. Plan to work towards the goal in small steps.
5. After the child’s behaviour improves, gradually move towards a more natural way of communicating with him/her.

SOCIAL ASPECT
1. Encourage child to respond to mother’s/care giver’s face, smile and voice.
2. Create child’s interest in noises, people and objects.
3. Create good eye contact.
4. Expose child to being touch, outside or comfort.
5. Encourage reaction to sound stimuli like voice or music.
6. Encourage child to turn head to person talking or singing.
7. Encourage interest/response when child is about to be picked up.
8. Teach child to respond to peek-a-boo.
9. Teach child to drink from cup (adult holding it).

OVERALL OVERVIEW
Your child overall is 0%.
Your child has serious development problem. Advice to consult with doctor as soon as possible.
APPENDIX D10

Email Format Output Page

CNN.com Recently Published/Updated - Google-China move hurts businesses, academics - 6 hours ago

<COPY> Suggested Solution And Overview Of Your Child - FROM NASOM  Inbox | X

vinpsm@gmail.com

TO DEAR PARENTS:

This is a copy of your child monitoring report. Keep it for your own reference.

From
Nasom Manager
TAN WEI CHUEN

Monitoring Report Summary.pdf
7K View Download

Reply  Forward
APPENDIX E1

Database Design

**UserProfile - Primary Key (ChildIcno)**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Size</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChildName</td>
<td>nchar</td>
<td>20</td>
<td>Children name</td>
</tr>
<tr>
<td>ChildIcno</td>
<td>nchar</td>
<td>20</td>
<td>Children identification number</td>
</tr>
<tr>
<td>ChildAge</td>
<td>nchar</td>
<td>10</td>
<td>Children age</td>
</tr>
<tr>
<td>ChildBirthday</td>
<td>nchar</td>
<td>150</td>
<td>Children Birth date</td>
</tr>
<tr>
<td>ChildGender</td>
<td>nchar</td>
<td>100</td>
<td>Gender of the Children</td>
</tr>
<tr>
<td>ChildRelation</td>
<td>nchar</td>
<td>300</td>
<td>Relation of Children with user</td>
</tr>
<tr>
<td>MotherName</td>
<td>nchar</td>
<td>100</td>
<td>Child’s mother name</td>
</tr>
<tr>
<td>MotherAddress</td>
<td>nchar</td>
<td>200</td>
<td>Child’s mother address</td>
</tr>
<tr>
<td>MotherEmail</td>
<td>nchar</td>
<td>100</td>
<td>Child’s mother email address</td>
</tr>
<tr>
<td>MotherHomePhone</td>
<td>nchar</td>
<td>200</td>
<td>Child’s mother home phone number</td>
</tr>
<tr>
<td>MotherCellPhone</td>
<td>nchar</td>
<td>200</td>
<td>Child’s mother cell phone number</td>
</tr>
<tr>
<td>MotherOccupation</td>
<td>nchar</td>
<td>200</td>
<td>Child’s mother occupation</td>
</tr>
<tr>
<td>FatherName</td>
<td>nchar</td>
<td>100</td>
<td>Child’s father name</td>
</tr>
<tr>
<td>FatherAddress</td>
<td>nchar</td>
<td>200</td>
<td>Child’s father address</td>
</tr>
<tr>
<td>FatherEmail</td>
<td>nchar</td>
<td>100</td>
<td>Child’s father email address</td>
</tr>
<tr>
<td>FatherHomePhone</td>
<td>nchar</td>
<td>200</td>
<td>Child’s father home phone number</td>
</tr>
<tr>
<td>FatherCellPhone</td>
<td>nchar</td>
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<td>Child’s father cell phone number</td>
</tr>
<tr>
<td>FatherOccupation</td>
<td>nchar</td>
<td>150</td>
<td>Child’s father occupation</td>
</tr>
<tr>
<td>MaritalStatus</td>
<td>nchar</td>
<td>100</td>
<td>Child’s parents marital status</td>
</tr>
<tr>
<td>Username</td>
<td>nchar</td>
<td>100</td>
<td>Person who registered this child</td>
</tr>
</tbody>
</table>
### item - Primary Key (itemnameuser)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Size</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>itemname</td>
<td>nchar</td>
<td>100</td>
<td>Item name</td>
</tr>
<tr>
<td>itemcategory</td>
<td>nchar</td>
<td>100</td>
<td>Category of item</td>
</tr>
<tr>
<td>itemdescription</td>
<td>nchar</td>
<td>100</td>
<td>Item description</td>
</tr>
<tr>
<td>itemprice</td>
<td>nchar</td>
<td>100</td>
<td>Price of item</td>
</tr>
<tr>
<td>itemwhere</td>
<td>nchar</td>
<td>100</td>
<td>Location of item can be obtained</td>
</tr>
<tr>
<td>itemowner</td>
<td>nchar</td>
<td>100</td>
<td>Owner of the item</td>
</tr>
<tr>
<td>itemcontactphone</td>
<td>nchar</td>
<td>100</td>
<td>Item owner contact phone number</td>
</tr>
<tr>
<td>itemcontactemail</td>
<td>nchar</td>
<td>100</td>
<td>Item owner email address</td>
</tr>
<tr>
<td>itemsell</td>
<td>nchar</td>
<td>100</td>
<td>Indicates if user are selling this item</td>
</tr>
<tr>
<td>username</td>
<td>nchar</td>
<td>100</td>
<td>Person who shared the item</td>
</tr>
<tr>
<td>itempicturelink</td>
<td>nchar</td>
<td>100</td>
<td>Address link to obtain the item picture</td>
</tr>
<tr>
<td>itemnameuser</td>
<td>nchar</td>
<td>100</td>
<td>Combination of item name and user to form a string for identification purposes</td>
</tr>
</tbody>
</table>

### itemcomment - Primary Key (id)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Size</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>itemid</td>
<td>nchar</td>
<td>100</td>
<td>Item identification for item</td>
</tr>
<tr>
<td>comment</td>
<td>nchar</td>
<td>100</td>
<td>Item’s comment</td>
</tr>
<tr>
<td>username</td>
<td>nchar</td>
<td>100</td>
<td>Person who commented the item</td>
</tr>
<tr>
<td>date</td>
<td>nchar</td>
<td>100</td>
<td>Date of comment</td>
</tr>
<tr>
<td>id</td>
<td>int</td>
<td>100</td>
<td>Unique number for each comment</td>
</tr>
</tbody>
</table>

### usercomment - Primary Key (ChildIcno)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Size</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChildIcno</td>
<td>nchar</td>
<td>100</td>
<td>Children identification number</td>
</tr>
<tr>
<td>comment</td>
<td>nchar</td>
<td>100</td>
<td>Profile’s comment</td>
</tr>
<tr>
<td>username</td>
<td>nchar</td>
<td>100</td>
<td>Person who commented the profile</td>
</tr>
<tr>
<td>date</td>
<td>nchar</td>
<td>100</td>
<td>Date of comment</td>
</tr>
<tr>
<td>id</td>
<td>int</td>
<td>100</td>
<td>Unique number for each comment</td>
</tr>
</tbody>
</table>
### Register - Primary Key (NationalID)

<table>
<thead>
<tr>
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<th>Data Type</th>
<th>Size</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>username</td>
<td>nchar</td>
<td>100</td>
<td>Username of the person who register</td>
</tr>
<tr>
<td>name</td>
<td>nchar</td>
<td>100</td>
<td>Name of the person who register</td>
</tr>
<tr>
<td>country</td>
<td>nchar</td>
<td>100</td>
<td>Country of the person who register</td>
</tr>
<tr>
<td>NationalID</td>
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### CountReport - Primary Key (Question)

<table>
<thead>
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<th>Field Name</th>
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<th>Size</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td>varchar</td>
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<td>Diagnosis questions from 1 to 23</td>
</tr>
<tr>
<td>Yes</td>
<td>int</td>
<td>-</td>
<td>Count of the “yes” answer by users</td>
</tr>
<tr>
<td>No</td>
<td>int</td>
<td>-</td>
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<td>Total number of questions failed</td>
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<td>The sensitivity of the test</td>
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<tr>
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<td>The specificity of the test</td>
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### DiagnosisQuestions - Primary Key (QuestionID)

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<td>-</td>
<td>Identity number for each question</td>
</tr>
<tr>
<td>QuestionM</td>
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<td>Max</td>
<td>Diagnosis question in Malay language</td>
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<td>AnswerM</td>
<td>varchar</td>
<td>50</td>
<td>Diagnosis answer in Malay language</td>
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<td>QuestionE</td>
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<td>Diagnosis question in English language</td>
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Monitor - Primary Key (id)

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<tr>
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<tr>
<td>age</td>
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<td>-</td>
<td>Age of the child</td>
</tr>
<tr>
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Solution - Primary Key (id)

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</thead>
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<td>Solution for each aspect</td>
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<tr>
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</tr>
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</tr>
<tr>
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<td>Question of the diagnosis system</td>
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</tr>
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<td>Question22</td>
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</tr>
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<td>Question23</td>
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</tr>
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<td>Date</td>
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<td>Current date</td>
</tr>
</tbody>
</table>
APPENDIX F1

User Manual

NPSS Homepage

User will see this interface when enter to the NPSS homepage.

Figure G1 NPSS Homepage
NPSS Monitoring Process

1. Firstly, login as a user as shown at the figure below before using the monitoring system. If does not have any account, click on the “First Time User? Register Now” to register as a new user.

![NPSS Login Control](image)

**Figure G2** NPSS Login Control
2. After enter the correct combination of User ID and Password, the side navigator will change just like the figure below.

![Figure G3 Successful Login Control](image)

3. After user logged into the system, click the “Monitoring” button which located at the NPSS Tools navigator.

![Figure G4 NPSS tools Navigator](image)
4. This is the welcoming page of the monitoring system. Click on the “Begin Your Test!!” button to start the monitoring process.

![Welcome Page for NPSS Monitoring Tool](image)

This monitoring system is to help the parents to monitor their child’s development proses.

Child development stages describe theoretical milestones of child development. Many stage models of development have been proposed, used as working concepts and in some cases asserted as nativist theories.

This article puts forward a general model based on the most widely accepted developmental stages. However, it is important to understand that there is wide variation in terms of what is considered “normal,” driven by a wide variety of genetic, cognitive, physical, family, cultural, nutritional, educational, and environmental factors. Many children will reach some or most of these milestones at different times from the norm.


**Figure G5** Welcome Page for NPSS Monitoring Tool
5. There will be 5 aspect of the children’s development process’s question will be asked against the user. Different age category will prompt out different set of question.
Physical > Intellectual > Language > Emotional > Social

a. Physical Aspect Question Area
   i. Answer the entire questions that prompt out as shown in the below figure.
   ii. There will be 3 options for each question, which is “Yes”, “Sometime” and “No”. Each of the option has different weight value. “Yes” is having the highest weight value and “No” is having the lowest weight value.
   iii. After finishing answer all the question, press the “NEXT” button to proceed to the following aspect.

Figure G6 Physical Aspect Question
b. Intellectual Aspect Question Area
   i. Answer the entire questions that prompt out as shown in the below figure.
   ii. There will be 3 options for each question, which is “Yes”, “Sometime” and “No”. Each of the option has different weight value. “Yes” is having the highest weight value and “No” is having the lowest weight value.
   iii. After finishing answer all the question, press the “NEXT” button to proceed to the following aspect.

**Figure G7** Intellectual Aspect Question
c. Language Aspect Question Area
   i. Answer the entire questions that prompt out as shown in the below figure.
   ii. There will be 3 options for each question, which is “Yes”, “Sometime” and “No”. Each of the option has different weight value. “Yes” is having the highest weight value and “No” is having the lowest weight value.
   iii. After finishing answer all the question, press the “NEXT” button to proceed to the following aspect.

![Figure G8 Language Aspect Question](image-url)

**Figure G8** Language Aspect Question
d. Emotional Aspect Question Area
   i. Answer the entire questions that prompt out as shown in the below figure.
   ii. There will be 3 options for each question, which is “Yes”, “Sometime” and “No”. Each of the option has different weight value. “Yes” is having the highest weight value and “No” is having the lowest weight value.
   iii. After finishing answer all the question, press the “NEXT” button to proceed to the following aspect.

**Figure G9** Emotional Aspect Question
e. Social Aspect Question Area
   i. Answer the entire questions that prompt out as shown in the below figure.
   ii. There will be 3 options for each question, which is “Yes”, “Sometime” and “No”. Each of the option has different weight value. “Yes” is having the highest weight value and “No” is having the lowest weight value.
   iii. After finishing answer all the question, press the “NEXT” button to proceed to the following aspect.

**Social Aspect**

<table>
<thead>
<tr>
<th>ENGLISH</th>
<th>BAHASA MELAYU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Becomes unfriendly to strangers at about 7 months.</td>
<td></td>
</tr>
<tr>
<td>☐ Yes ☐ Sometime ☐ No</td>
<td></td>
</tr>
<tr>
<td>2. Is still friendly with strangers unless startled or familiar adult isn't there.</td>
<td></td>
</tr>
<tr>
<td>☐ Yes ☐ Sometime ☐ No</td>
<td></td>
</tr>
<tr>
<td>3. Loves 'Rough and Tumble' play.</td>
<td></td>
</tr>
<tr>
<td>☐ Yes ☐ Sometime ☐ No</td>
<td></td>
</tr>
</tbody>
</table>

FINISH - Submit Test

*Figure G10 Social Aspect Question*
6. After finishing the entire test question, solution will be provided if the child have development problem for every aspect. There will have 2 options option for the user to generate the solution and result for keeping purpose.
   a. If prefer PDF downloadable format
      i. Click on the “PDF version” button then it will prompt out a save option for the user to save the PDF file.
      ii. Select the location that you wanted to save.
   b. If prefer Email format
      i. Click on the “Email version” button then it will send a copy of the result in PDF format to your email.
      ii. A message box will be prompt out after the email was successfully sent. Click on the “OK” button to continue.

**SOLUTION AND RESULT**

**PHYSICAL SOLUTION**
Your child’s PHYSICAL DEVELOPMENT is at normal stage. Keep it up the good way.

**INTELLECTUAL SOLUTION**
Your child’s INTELLECTUAL DEVELOPMENT is at normal stage. Keep it up the good way.

**LANGUAGE SOLUTION**
Your child’s LANGUAGE DEVELOPMENT is at normal stage. Keep it up the good way.

**EMOTIONAL SOLUTION**
Your child’s EMOTIONAL DEVELOPMENT is at normal stage. Keep it up the good way.

**SOCIAL SOLUTION**
Your child’s SOCIAL DEVELOPMENT is at normal stage. Keep it up the good way.

**OVERALL DESCRIPTION**
Your child overall score is NaN%
Your child is beyond his/her development stage’s age. He/She might be a brilliant child. Keep up the good work.

**Figure G11** Solution and Result Page
SUGGESTED SOLUTION & SUMMARY OF YOUR CHILD

PHYSICAL ASPECT
1. Get good head control.
2. Encourage baby to turn the left, right and turn over.
3. Encourage baby to move to reach for objects.
4. Encourage baby to turn around.
5. Encourage weight bearing.

INTELLECTUAL ASPECT
1. Talk to your baby. Language and intellect go hand in hand. Speak clearly to your child, even when you’re just alone at home to enhance what your child knows and recognizes as belonging to things and items around the home. Television does not do the same thing as live speech. It is much better to shut the TV off and begin talking with your child. Avoid baby talk as it will give the baby the wrong idea of how speech is done.
2. Read to your baby. Use simple books at first that just have pictures and words. Point to the picture and say the word so that baby understands the meaning of the picture. Soon your baby will want to initiate the words for you and, as a result, quickly understand a wide range of words.
3. Listen to music. There are a lot of good educational music tapes and CDs out there for baby to listen to. Through these basics improve hearing skills which encourage many more subtle aspects of intellectual development. As a general rule, music should be lively, interesting and easy to sing along to.
4. Use educational toys. There are many toys that boost intellect. Some of them include counting games and games of small motor or memory skills that build the capacity of your child to learn and grow. Playing educational games is another fun way of improving overall intellectual development, but it should be increased in complexity as your child grows up.

LANGUAGE ASPECT
1. Talk and play with your baby.
2. Use words and play actions when talking with your baby.
3. Play games with your baby, such as peek-a-boo and pat-a-cake, that teach your child about taking turns when communicating with another person.

SUGGESTED SOLUTION & SUMMARY OF YOUR CHILD

EMOTIONAL ASPECT
1. Observe the circumstances of the child's unacceptable behaviour/emotional
2. Try to understand why he behaves as he does. (Why has he done such emotional act?)
3. Set a reasonable goal for improvement based on his immediate needs and development level.
4. Plan to work towards the goal in small steps.
5. After the child's behaviour improves, gradually move towards a more natural way of communicating with him/her.

SOCIAL ASPECT
1. Encourage child to respond to mother's / care giver's face, smile and voice.
2. Create child's interest in noises, people and objects.
3. Create good eye contact.
4. Expose child to being touch, outside or comfort.
5. Encourage mastication to sound stimuli like voice or music.
6. Encourage child to turn head to person talking or singing.
7. Encourage interest in response when child is about to be picked up.
8. Teach child to respond to peek-a-boo.
9. Teach child to drink from cup (adult holding it).

OVERALL OVERVIEW
Your child overall score is 0%
Your child has serious development problem. Advice to consult with doctor as soon as possible.

This is page 2

Figure G12 Example of result PDF that will be generate
Figure G13 Example of result Email that will be generate

Figure G14 Alert Message Box of Successfully sent Email
Previous Button Function

User can use the “PREVIOUS” button function to preview back the previous aspect if he thinks to correct or redo the question.

p/s: The following aspect questions will need to answer again as it will generate the question again automatically. The button is advice for user to use if there are any mistake make in the previous page.

Figure G15 “PREVIOUS” button

Question Validation Review

1. All questions should be answered. If not it won’t proceed to the next test process.
2. If the user did not answer any question in any aspect, an alert message box will prompt out and tell the user which question is not answered. The alert message box is shown below.

Figure G16 Alert Message Box