

STUDY OF FSKKP PORTAL BASED ON SHNEIDERMAN'S
EIGHT GOLDEN RULES

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ABSTRACT

Shneiderman's Eight Golden Rules is the choice of design principle for the design in this project. This project at the end will produce one prototype web portal for FSKKP to replace the current portal. The aim of this project is to develop a new web portal based on the rules by Shneiderman which the web portal produce will met all the design rules proposed by Shneiderman. Shneiderman's Eight Golden Rules is one of the design principles falls under the scope of Human Computer Interaction. In Human Computer Interaction, there are different set of design principles proposed by various researchers worldwide and the Shneiderman's rules is aim for the interface design of a system such as the consistency of the interface, error handling functionality and so on. In this project, the rules will be studied before any implementation is executed. Then the current web portal of FSKKP will be taken as the base design of the new portal. The system function of the web portal and the data will remain the similar, the only differences is the interface and the responses in term of usability, flexibility, robustness, etc. After the prototype had been build, survey and testing session will carry out to obtain the response of the prototype from the users. The expected result from the survey done will be a positive result where users are happy and welcome the new designed portal as the main portal for FSKKP. At the end, this research have proven that Shneiderman's Eight Golden Rules is a very suitable set of design rules for design interface for any systems worldwide and the similar type of research on this rules should be execute in future to ensure the system build is usable, user-friendly to human and the environment.

ABSTRAK

Shneiderman's Eight Golden Rules merupakan salah satu kaedah di dalam prinsip merekabentuk antaramuka sistem. Prototaip untuk portal FSKKP ialah hasil akhir dalam projek ini dan akan menggantikan web portal yang lama. Tujuan projek ini adalah untuk menghasilkan prototaip web portal menggunakan peraturan daripada Shneiderman iaitu prototaip itu akan memenuhi semua peraturan yang disediakan. Shneiderman's Eight Golden Rules juga salah satu prinsip design yang ada dalam *Human Computer Interaction*. Dalam *Human Computer Interaction*, terdapat banyak lagi prinsip reka sistem yang dikemukakan oleh semua penyelidik dalam dunia dengan tujuan utama prinsip Shneiderman adalah untuk mereka sistem yang mesra pengguna. Dalam projek ini, prinsip itu akan dikaji secara teliti sebelum pelaksanaan prinsip akan berlaku. Selepas itu, web portal yang lama akan dijadikan asas reka bentuk untuk web portal FSKKP yang baru. Fungsi untuk sistem juga tidak akan berubah dalam web portal yang baru, hanya rekabentuk antarmuka, kebolegunaan, fleksibiliti, dan lain-lain akan berubah menjadi lebih mesra pengguna. Selepas prototaip siap dibina, kaji selidik dan ujian untuk prototaip akan dijalankan untuk mendapatkan respons dari pengguna. Maklumbalas kaji selidik untuk prototaip ini adalah baik dan pengguna merasa senang untuk menggunakan web portal prototaip itu dan akan sangat dialu-alukan untuk menjadikan prototaip sebagai web portal utama FSKKP. Di peringkat akhir dalam projek ini, Shneiderman Eight Golden Rules akan terbukti kebolehpengguna prinsip ini dan sangat sesuai untuk digunakan dalam mana mana reka bentuk antaramuka sistem.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Since words have been introduced in the older age, it carries the role to capture or keeps information for some time periods. For the older time, information was carved on the wall, bone of animal, woods and so on. As time passes, papers are invented for the writing and keeping information purposes. From that on, all the information were kept in safe for future use in organization or company, to keep track of their businesses process and progress. But, the information kept using paper is not safe anymore because paper is disposable and easily catches fire. Furthermore, when there a lot of information is created, it needs a huge space to store the paper use for the information. Moreover, to access the information kept on paper is difficult because there is only one single copy for the information, people have to books for time just for purpose of accessing the information.

Then computerize paper are invented when computer are invented. These computerize paper are kept in a database where it safe a lot spaces compare to older technique to kept information and these database don't decay or dispose unless the hardware is broken. More and more advance technology been created as time passes that single server database able to stores ten years of information in a company. Then, when a company get bigger, more branches of company were establishes. So, all the information from the main company has to share with all the branches in all the places thus, Local Area Network (LAN), Metropolitan Area Network (MAN) and Wide Area Network (WAN) is introduced to share the data on different location from one serve database.

But, to setup all the network required great amount of money. So, to save the costs for the company, all the information were able to access from the webpage on the internet when internet is introduced. Until today, webpage is a very common tool for displaying data and processing data, there are various type of webpage built for different purposes such as educational, entertainment, political, touring, and so on. A common build webpage usually use for purpose of information management and displaying the information store in server database, where it allow certain level of user to access the data and modify the data without accessing the local server database. The purpose of having a webpage is to increase the performance and ease for the maintenance services to carry on, which the administrator staffs do not need to access to the main server to modify the data.

With time grows, the needed of webpage are increase greatly where users are demand for better view, functionality, responses, and so on. Hence a term is has came out to explain the needed which is the Human Computer Interaction. This term mean the webpage have to have interaction with the user both visible and invisible. When time passes, specific design rule are created for the interaction purposes where a webpage programmer have to follow the rule to design the webpage for their customer as part of the condition in the contract. These design rules are specifically design for the users. Some of the example of the design rules are increase the performance and responses of the webpage, some are to provided aided for the disabler, some are for the flexibility of the design webpage.

When more and more advance rules are being created, some set of rule are combine together and become standard for designing not only webpage even stand-alone system. Example of the standard are Shneiderman's Eight Golden Rules, Norman's Seven Principles, Jacob Nielsen Ten Heuristic of Usability, and many more. These are the standards which are well known by the society of computer science as a base for designing.

For my undergraduate project title, I propose the Study of FSKKP portal based on Shneiderman's Eight Golden Rules to repair, upgrade and enhance the current FSKKP portal into a better and more user friendly portal. This project will build based on the previously built source code of the portal. Set of questionnaire will be provided to the

staff and all other users of the webpage and result will be processes. With the complete result from the questionnaire, a new version of the webpage will be produce.

1.2 PROBLEM STATEMENTS

The websites nowadays are different from the past. From time to time, all the websites on the internet are upgrade into a better one. These upgrade or enhancement is taken because the owner of related website wants to create a better interaction with the customers they deal on the internet and reduce the mistake or error happen on the websites. The common problem that web page found is inconsistency of design, which will cause user to lost track. Second is a lot of information or data management website requires too much input at one time causing user to forget and make mistake.

There are more types of problem found on webpage today such as user lose control of the webpage where webpage do not function as what the user command to do. Then sometimes user are not feeling sure when one command is enter to the system which it do not provided feedback or message to inform command accepted or processing complete. There are also webpage did not cover with error prevention and error handling where user not able to undo or cancel the command the entered to the system when users have made some mistake. This is very important when the information entered is very critical and able to affected all other system or function, simple error handling will help to solve the problem for the system.

Thus, to prevent all this problem and mistake, a new version of FSKKP web portal will be build and all details of the web page will be build based on Shneiderman's Eight Golden Rules a standard which emphasize every detail on the web page from the interface until the performance.

1.3 SCOPES

The scopes for the project are listed below.

- Webpage development will be carry out based on Shneiderman's Eight Golden Rules

- A set of questionnaire will be create for the requirement and specification for the next version of the FSKKP portal
- Respondent only cover in Gambang campus and separate into 2 groups
 - Staffs – which will be the academic and non-academic staffs from FSKKP
 - Students – Mainly are FSKKP third year students

1.4 OBJECTIVES

The objectives for the project are stated below.

- To study all three design rule in detail, Shneiderman's Eight Golden Rules, Jacob Nielsen Ten Heuristic of Usability and Norman's Seven Principles
- To demonstrate the new version of FSKKP web portal based on Shneiderman's Eight Golden Rules
- To collect and analyze all the feedback result acquire from survey carry out among all the user which are the lecturer and student of FSKKP

1.5 THESIS ORGANIZATION

This thesis total up consists of five chapters, structure as below.

Chapter 1 is the introduction to the project. In this chapter contain introduction, problem statement, objective, scope, thesis organization and reference for this chapter.

In Chapter 2 which is literature review will consists of an introduction to this chapter, main body of the literature review and one conclusion for the literature review. The purpose of this literature review is to discuss on the title proposed in this thesis, the literature review will discuss on the different type of design rule which can be found in context of Human Computer Interaction. These discussion will supported by published

article, thesis, research paper, existing system report, journal or books that study on design rule and project that uses these design rules.

In chapter 3 consists of methodology uses for the proposed title. This chapter will describe how the data and result is process. This chapter will also discuss on the obtained result and conclusion for the result.

In chapter 4 which is the design for the system proposed in the title. This chapter consists of the design pattern for the system, prototype, interface and description for each subsystem and function for the system.

Lastly in chapter 5 is the summarize conclusion for the whole project. In this chapter will consist of discussion and conclusion for the project. This chapter will also contain future works for this project.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The word Human Computer Interaction is very common when a software or computer program was developed. According to John M.Carroll “Human-computer interaction (HCI) is an area of research and practice that emerged in the early 1980s, which initially as a specialty area in computer science embracing cognitive science and human factors engineering”. (John M.Carroll, 2009) This shows that the term Human Computer Interaction or commonly known as HCI is already a knowledge use in early 1980s. The term HCI means to study the interaction happen between human and computer or hardware when commencing a program in area of computer science.

According to Fakhreddine, “sometimes called as Man-Machine Interaction or Interfacing, concept of Human-Computer Interaction/Interfacing (HCI) was automatically represented with the emerging of computer, or more generally machine, itself. The reason, in fact, is clear: most sophisticated machines are worthless unless they can be used properly by men. This basic argument simply presents the main terms that should be considered in the design of HCI: functionality and usability.” (Fakhreddine, 2008)

Thus, in designing an interface for program, web program, or etc, a set of guideline or standard will be followed or implemented. Some of the well known guideline or standard are listed as shown: Shneiderman’s 8 Golden Rules, Jacob Nielsen 10 Heuristic of Usability, Norman’s 7 Principles and etc. The content below will describe each of these guideline or standard and one of these guideline will choose and implement as the development of next version of FSKKP web portal.

2.2 SHNEIDERMAN'S EIGHT GOLDEN RULES

The guideline Shneiderman's Eight Golden Rules of interface design is obtained from the text designing the User Interface by Ben Shneiderman. These collections of design principles are derived based on experience by many developers and can be applied into programs after being refined. Below are the discussions on each single rule found in Shneiderman's Eight Golden Rules.

The first rule is Strive for consistency. The meaning of this rule based on rough explanation is to achieve or to aim for the consistency of an object. But in terminology of computer science, this means to achieve or to aim for the consistency of the program interface, how the interface looks and detail of the layout of the program. For example, the banner for all pages should be the same in terms of size, location, color, and etc to avoid confusion. According to Romli,

“Consistency interfaces let users to be familiar with the system thus helps them to use the system well.” (Cha A.P., Romli A., 2010).

Similar content or layout will assist the user because they will not feel trouble when wants to use the system and understand the function of each button or link thus help to reduce mistakes.

According to Nielsen, “Consistent systems will make the user dare to explore the system and learn more, the same info should always be in the same position and look similar. If the user knows that the same command always has the same effect he will be more confident when using the system.” (Nielsen, 1993)

The second rule is Enable Frequent Users to Use Shortcut. The reason for using shortcut is to save time or to improve performance for an expert user. Expert users usually know to use special key, hot key or hidden commands to speed up performance of an action thus, this feature is necessary in the system but not mandatory to use because for a beginner user they might not be familiar with the function available in the system yet. According to Cha and Romli, “This definitely reduces time and prevents major error in the system and for user.” (Cha A.P., Romli A., 2010). For a new user, they are new to the system, thus they will feel lost and worried when using the system. So simple methods should be shown on the interface so that they could easily find it and

notice the function they look for. When a user getting use to the system, they will feel less worried because they already knew what will happen when they click on the function available on screen. Thus the system should provide with shortcut that enable to perform the similar function for the experience user.

The similar explanation was quote by Nielsen, “When choosing how many alternatives there should be for a user interaction, you should make the easiest alternative visible so new users can use that and do not have to choose between alternatives. When users become more experienced they can be offered more alternatives. This way they can choose the most effective way when they are more confident with the system.” (Nielsen, 1993)

The third rule is Offer Informative Feedback. Feedback is very important as they will be message from the system need to inform the user. For all action done by the user, system should prompt with feedback to inform user which state they are in. Thus, visibility of the feedback and its format are very important so user able to notice the feedback easily.

“Informative feedback such as when the user did not input the right format, they will be message box guiding them what to do. This also happens when user click on the menu, informative feedback is display as they are informed of the current state and user will know what to do on that state of interface.” (Cha A.P., Romli A., 2010)

One more characteristic of feedback is its response time. An important feedback need to appear on the screen in very short time and need to be very visible to user, while for the less important or standard feedback, the time or visibility can be modest.

According to Nielsen, “Response times should always be as fast as possible. The limit to what is perceived as immediate is 0.1 seconds. The limit for perceiving something as flowing is one second and after about ten second the user will lose attention on the current interaction. When something takes more than ten second there should be a visual feedback showing how much time is remaining and how much work has been done. For actions that take two to nine seconds there could be some feedback that is not drawing the attention very much, for example a small number increasing in a corner of the screen.” (Nielsen, 1993)

The fourth rule is Design Dialogs to Yield Closure. Series of task need to be grouped in columns, thus user can continue complete all task require for an action. For every stage of phases, a feedback is show to user for notify or indicate what the process is complete and new process is ahead. As refer from Edward, “Create a feeling of progress and achievement. Immediate feedback allows users to assess whether the results were what they expected. Previews of coming results should be available where possible.” (Edward, 2004)

The fifth rule is Offer Error Prevention and Simple Error Handling. The purpose of this rule is to prevent the error from happening and provide with simple error handling or recover when an error is happens. System or programs have to be develop so that it minimize or reduce as many as possible errors by users and when error happens system offer simple instruction for recovery and the progress of action are undone to previous state. “Error prevention and error handling is one way that can prevent user from making mistakes and if they do, they are offered clear and informative instructions to enable them to recover.” (Cha A.P., Romli A, 2010)

Where according to Backlund, “design the system so that the user cannot make a serious error. If a user commits an error, the system should detect the error and offer simple, constructive and specific instructions for recovery. The user should not have to redo the entire action, only the erroneous part.” (Backlund J., 2001)

The sixth rule is Permit Easy Reversal of Action. In this rule, user are provided with undo feature which they able to undone all action they made so user can recover quickly from error. “This feature relieves anxiety, since the user knows that errors can be undone thus encourages exploration of unfamiliar options.” (Cha A.P., Romli A., 2010)

The seventh rule is Support Internal Locus of Control. This rule is to make sure that the user are the one who in charge to the system but not the system who controlling. This is important because user can do anything as they want while not being control by the system. Unpredictable system functionality, difficulty in data processing, large amount of time delay for complete action, and etc lead to dissatisfaction of user.

“Place the user in control and provide proactive assistance. Enable users to accomplish tasks using any sequence of steps they would naturally use. Current state

and possible actions should be obvious. You can leave the system and return later and the system is in the same state.” (Edward, 2004)

The eighth rule is Reduce Short-Term Memory Load. In terminology of memory, a normal human are only able to remember around 7 things for a short periods. System required information for data processing should be kept in simple and straight forward. Thus, all system developed have to be consider for all type of user. According to Cha and Romli, “the display of an interface should be simple to reduce short-term memory load. Interfaces are design as simple as possible, but still promote positive responses from user...” (Cha A.P., Romli A., 2010)

2.3 NORMAN’S SEVEN PRINCIPLES

The first rule of Norman’s Seven Principles is Use Both Knowledge in the World and Knowledge in the Head. The rule means to aid the user of the system by including the factor of knowledge both easily available in daily life and came from experience. This way user able to adepts into the system more quickly because the knowledge needed to operate the system is available in daily life and from experience from the pass.

According to Fischer, “Norman argues that a task is more easily learned when the needed information is available in the world. This information is only useful when it is presented in a ‘natural easily’ interpreted way. When a user becomes experienced less knowledge has to be extracted from external sources and more will be in the head. The offered information in the world may never interfere with the use of experienced users.” (Fischer, 1999)

The second rule is Simplify the Structure of the Task. Structure of task that available in the system should be as simplify as possible and easily understand by all range of user. Problematic, critical thinking process should be kept away from the structure to increase the performance speed.

According to Neerincx, “This is where the designer should pay attention to psychological aspects of the user. The offered stimuli should not result in an overload situation of the workload of the user. It is however also important that a minimum level

of challenge is guaranteed because the user might easily make errors based on inattention and boredom.” (Neerincx, 1995).

The third rule is Make Things Visible: Bridge the Gulfs of Execution and Evaluation. The rule means all actions, feedback, process and etc available in the system have to be clearly shown its information, expected result and provided visible step to user so that user can see what is the result and how to operate the action. Confirmation message, system message, task completion message and other have to be shown clear to the user to make sure user is notified with the action they made.

As refer from Fischer, “The user-interface should provide the user with information, feed-forward, to decide which actions he should undertake. The right side of the schema with the stages: perceiving the state of the world, interpreting the perception, and evaluation of the perception; is the evaluation side. The user-interface should give feedback that can be understood. Thus the user can see what can be done and what the results are.” (Fischer, 1999)

The fourth rule is Get the Mapping Right. This specific principle means the designer of the system need to assign all the control to the correct button or notation so it carries its purpose of the particular control. The control provides to the user are also need to be logical to the control we see in daily life and easily can understand the meaning of the control. For example in Microsoft word, save button display as a diskette icon, close button display as cross icon and etc. This logo represent its meaning as in the real world, thus even user without any experience to the system they will slightly understand the meaning for certain button or icon.

According to Fischer, “to get the mappings 'right' a ‘natural’ mapping should be used. A natural mapping is a mapping that leads to immediate understanding because the representation of the functionality in the controls is made considering physical analogies and cultural standards.” (Fischer, 1999)

The fifth rule is Use Exploit the Power of Constraints both Natural and Artificial. This rule means to use the constraints as the thing to direct user to perform the correct action in the correct manner. According to Fischer, “design the product in such a way that only one action is possible or logical in any given situation.” (Fischer, 1999)

The sixth rule is Design for Error. Sometimes user makes error, so this rule is to make sure designer always prepare an alternative for user whenever an error is found and able to recover from the error. Error prevention, recoverability is requires for all system in the world due to the human nature for making mistake. Human are easily commit mistake when they confront with unfamiliar object or problem, thus prevention method and recover method have to prepare.

According to Fischer, “assume that any error will be made. A user will make errors so the system should be designed to anticipate all possible errors and allow the user to correct them.” (Fischer, 1999)

The seventh rule is When All Else Fails, Standardize. A lot of information and type of design need to be implement, sometime there are certain information which are very difficult to explain, thus one type of standard need to be follow for all the encounter which similar.

As quoting from Fischer, “when something cannot be explained in any way completely logical or culturally determined, make sure a universal standard is followed. When standards are followed rigorously they may well become part of a cultural stereotype and change into a natural mapping. Things like that have happened with the analogue clock, type writer keyboards, and the side of the road people drives on.” (Fischer, 1999)

2.4 JACOB NIELSEN TEN HEURISTIC OF USABILITY

The first rule is Visibility of System Status. In this rule mention that the system needs to keep the users informed of what they are doing with a highly visible notification. System status and error message have to shown clearly to user so that they are notify with their position in the system progress.

According to Grobschmidt, “Making it clear where the user is benefits everyone, whether disabled or not. Proper use of titles, headings and sub-headings help those using assistive technology devices such as screen readers, which provide easy methods of calling out what those headers are. Clear-cut way finders in extensive processes are

particularly useful for those with cognitive disabilities, keeping them focused on what they are seeing.” (Grobschmidt, 2012)

The second rule is Match between system and the Real World. This rule specifically mention on the language, words, or concept that use to display on the screen to the user. Always consider to the range of users proposed in the system, the system also need to organize all the information in such way that suit the users view making information as natural as possible.

According to Cha A.P. and Romli A., “The phrases and instruction or test questions are easy to understand. Same goes to dialog boxes, which uses normal and familiar phrases, without using computer jargon that might be hard to understand by user.” (Cha A.P., Romli A., 2010)

The third rule is User Control and Freedom. The availability of control by user is very important because it will make user feel in control to the system but not controlling by the system. User able to make emergency action in all phase of the progress making them able to restore and recover before any error is happens.

According to Grobschmidt, “don’t set your users down paths they can’t easily get out of. If they get themselves stuck in some location or process they didn’t mean to, make it really easy to climb out and back on their way.” (Grobschmidt, 2012)

The fourth rule is Consistency and Standard. This rule carries meaning of creating all interfaces in one specific style, using similar font type, font size, and even location of information have to be allocated in an orderly manner so that user will not feel lost when using the system. Consistent layout of any interfaces will help user to recognize certain function or action available based on previous action done on the similar interface.

According to Grobschmidt, “call things by the same name everywhere on your web site or application. Switching around terminology will throw people off. This includes being consistent with links, buttons...all calls to action. You never know who is getting to your site or application on what page, so make sure it feels like a unified experience everywhere.” (Grobschmidt, 2012)

The fifth rule is Error Prevention. Error prevention is essential for all system because all people will makes mistake sometimes, thus error prevention is necessary to reduce the chances of getting an error. The term prevention is better than cure can be applied in all system because system able to prevent user for committing error and provided them with alternative solution, in certain circumstances when an error is happen all the information key into the system is lost due to one small error happen, thus increase user dissatisfaction.

According to Grobschmidt, “even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.” (Grobschmidt, 2012)

The sixth rule is Recognition rather Than Recall. This rule is to make sure when some information is needed in any phase of a progress, user do not need to memorize from the beginning of the progress. All other require information should somewhat display or notify the user in the system.

According to Grobschmidt, “make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.” (Grobschmidt, 2012)

The seventh rule is Flexibility and Efficiency of Use. Any systems that develop need to cater for both experience and inexperience users. This is because the system is understandable by inexperience users and not too directive for an experience user. In all, one similar action is able to perform both easily by an inexperience user and quickly by an experience user.

Referring to Grobschmidt, “in creating a good experience, you shouldn’t cater only to the newbies. Find ways to provide shortcuts for experienced users, so that they don’t have to go through unnecessary steps every time they try to do something they routinely are coming back to do.” (Grobschmidt, 2012)

The eighth rule is Aesthetic and Minimalist Design. Unnecessary information, irrelevant points should not show to user. This is because the more information

available, the more confuse the user will be. Users tend to read and implement everything display to them whether they understand or not, thus the chance of an error to happen is very high. So, all message box, popup menu have to be as simple as possible.

According to Grobschmidt, “keep things simple and straightforward. Much like a good writer eliminates unnecessary words to build a concise, impactful piece of work, you should ask yourself with every element you put on a web site or in an application, “Is this really necessary?” Boil it down to the most critical information. Anything else is probably just noise.” (Grobschmidt, 2012)

The ninth rule is Help Users Recognize, Diagnose and Recover from Error. When an error happens, error message is prompt to users in order to aid user to recover from the error. Thus, the language use needs to be simple, easy to understand, and keep away from giving nonsense information. When an error is happen, system able to recognize the error and then provide the user with alternative solution to correct the error. Then system should recover from the error and able to proceed with previous state without removing any input data from user.

According to Cha A.P. and Romli A., “ESPBSM provides error messages that helps user to recover from error by expressing them in a simple, understandable to indicate the problem and constructively suggest a solution. Every error messages is vital to help user to understand the current status of ESPBSM.” (Cha A.P., Romli A., 2010)

The tenth rule is Help and Documentation. The last rule of Nielsen Ten Usability Heuristic is to provide with help or document that contain of way to operate, diagnose, recover from error, and all the system functionality. This is a very important aspect since the developer cannot aid the user from time to time, so the document is consider as a first level of solution to user when they encounter with problems.

According to Grobschmidt, “Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user’s task, list concrete steps to be carried out, and not be too large.” (Grobschmidt, 2012)

2.5 COMPARISON BETWEEN ALL THREE STANDARD

The guideline proposed by Shneiderman, Norman, and Jacob Nielsen all have its own strength and focus design principle. So, based on all the discussion between guideline as shown above, one of the guideline will be selected for the main guideline for designing the next version of FSKKP web portal that suit to the range of user of FSKKP web portal and standard. Comparison between all three guideline will be done and the most suitable guideline will be selected.

Table 2.1 show the attribute allocation of all three guideline for specific design principle which very crucial for any development of system.

Table 2.1 Attribute point allocation summarize for all three discussed guidelines

Sources	Shneiderman	Norman	Jacob Nielsen
Consistency	x	x	x
User Control	x		x
Appropriate Presentation	x	x	x
Error Handling and Recovery	x	x	x
Memory-Load Reduction	x	x	x
Task Match		x	x
Flexibility	x	x	x
Guidance, Help			x

According to Keinonen, “table 2.1 (above) presents the most frequently mentioned principles and the guidelines that address them (marked as x). Different references arrange the same aspects in different ways. Some dimensions that seem to be lacking in a guideline are included as sub dimensions or even as items in a checklist. For some principles it is difficult to decide whether a guideline mentions them or not. Some themes are made explicit, while some are only implied. Sometimes the same principles are illuminated from the point of view of system design and sometimes from that of user behavior. Thus, the table cannot be interpreted as absolutely exact. Neither does the comparison aim at suggesting some definitive set of principles as better or more comprehensive than another. The differences are due to the varying scopes of the different guidelines. The table is presented to illustrate the agreement between the