

3D DSLR LEARNING PLATFORM

By

Cheah Win Khai (09ACB03742)

A REPORT

SUBMITTED TO

University Tunku Abdul Rahman

In partial fulfillment of the requirements

For the degree of

BACHELOR OF INFORMATION SYSTEM (HONS)

BUSINESS INFORMATION SYSTEMS

Faculty of Information and Communication Technology

(Perak Campus)

April 2013

REPORT STATUS DECLARATION FORM

Title: _____

Academic Session: _____

I _____

(CAPITAL LETTER)

declare that I allow this Final Year Project Report to be kept in

Universiti Tunku Abdul Rahman Library subject to the regulations as follows:

1. The dissertation is a property of the Library.
2. The Library is allowed to make copies of this dissertation for academic purposes.

Verified by,

(Author's signature)

(Supervisor's signature)

Address:

Supervisor's name

Date: _____

Date: _____

3D DSLR LEARNING PLATFORM

By

Cheah Win Khai (09ACB03742)

A REPORT

SUBMITTED TO

University Tunku Abdul Rahman

In partial fulfillment of the requirements

For the degree of

BACHELOR OF INFORMATION SYSTEM (HONS)

BUSINESS INFORMATION SYSTEMS

Faculty of Information and Communication Technology

(Perak Campus)

April 2013

DECLARATION OF ORIGINALITY

I declare that this report entitled “**3D DSLR LEARNING PLATFORM**” is my own work except as cited in the references. The report has not been accepted for any degree and is not being submitted concurrently in candidature for any degree or other award.

Signature : _____

Name : _____

Date : _____

ACKNOWLEDGEMENTS

I would like to express my sincere thanks and appreciation to my supervisors, Ms Saw Seow Hui who has given me this bright opportunity to engage in the 3D DSLR learning platform project. It is my first step to establish career in the DSLR learning platform. A million thanks to Ms.Saw Seow Hui.

To a very special person in my life, Pai Shi Jian is my friend in the IB course. He is helpful person and helps me many times at the 3D DSLR Learning platform in project. Another person in my project, Seow Ching Siang, for his patience and support and for standing by my side during problems is coming. She teaches me how to use new language and fix errors in program. At last, I want to thanks to my parents and my family for their love, support and continuous encouragement throughout the 3D DSLR learning platform.

Thank you, Ms Saw Seow Hui

Abstract

Nowadays, DSLR (Digital Single Lens Reflex) trend is getting popular in the society. Since the price of DSLR is relatively high, fresh camera man is facing a hard time learning or testing DSLR before they decide to buy it. They are lack of practical experience. In consequence of the society requirement, an idea to develop a DSLR learning system to interact with the DSLR model and the user encountered. The objective of developing and designing 3D DSLR learning platform is to ensure that users have an intuitive understanding on a DSLR camera before purchasing. This system allows realistic interaction between user and 3D models on web based system. Furthermore, photographers can share their knowledge with each other to enhance their technical knowledge of camera. Meanwhile, beginners can go through this web-based system to learn the basic knowledge of camera. In order to develop the 3D DSLR learning platform, firstly 3D DSLR model is developed by the professional modelling software that is 3Ds MAX, then the 3D model will exported to VRML (.wrl) file format which supported by WireFusion. WireFusion is a powerful software and it provides an interactive 3D technology tools to enable both web and non-web applications to incorporate real-time 3D data, presentations and controls into non-3D content. Finally, the entire virtual system will publish onto web, in order to allow the users to browse the 3D model at any time. Users are able to move the mouse and rotate the camera, to observe the camera from different angles. Besides that, users can control and operate the settings of the camera and capture photos like real. This platform ensures the interaction between the 3D camera model and users on web-based system. In this project, it helps fresh camera man to be more familiar to the digital camera not only on the concept but also on the practical experience. In addition, it helped improving teaching effect and increasing the study interest.

Table of Contents

DECLARATION OF ORIGINALITY	v
ACKNOWLEDGEMENTS.....	vi
Abstract	vii
Table of Contents.....	viii
LIST OF FIGURES	xi
LIST OF TABLE.....	xiii
Chapter 1: Introduction.....	1
1.1 Problem Statement.....	1
1.2 Project Scope	1
1.3 Project Objectives	5
1.4 Impact, significance and contribution	6
1.5 Background Information	8
Chapter 2: Literature Review.....	9
2.1 Multimedia.....	9
2.2 Types of Multimedia	11
2.2.1 Linear Multimedia.....	11
2.2.2 Non-Linear Multimedia/Interactive Multimedia	12
2.2.3 Delivery Options for Multimedia	12
2.2.4 Online / Web-Based Delivery.....	13
2.2.5 Offline / CD-Based Delivery	14

2.3 Current Practice	15
2.3.1 A learning community for Photographers: Cambridge in Color	17
2.3.2 DSLR photographer demystified: Camera Simulator	19
2.3.3 DSLR TIPS.....	21
2.3.4 Design and Development of 3D Virtual DSLR Camera Based on VRML and JavaScript	22
2.3.5 Photocation: Tangible Learning System for DSLR Photography	24
2.4 Why 3D DSLR learning platform been introduced.....	25
2.5 Fact Findings	27
2.6 Data Collection.....	28
Chapter 3: Methodologies.....	32
3.1 Project Methodology	32
3.1.3 Implementation	41
3.1.4 Verification.....	42
3.1.5 Maintenance	42
3.2 Development Software	43
3.2.1 3DS MAX 3D	43
3.2.2 WireFusion 5.0	45
3.2.3 NETBEAN IDE 7.0.1.....	47
3.2.3 Adobe Photoshop CS5 and Adobe Illustrator CS5	48
3.3 Timeline.....	49
3.4 Requirement Specification.....	49
3.4.1 User Requirement.....	49
3.4.2 System Requirement.....	50
3.4.2.1 Justification of Requirements Specification.....	51
3.5 Flow Chart.....	53
3.5.1 System Flow Diagram.....	53

3.6 Use Case Diagram	55
3.7 Print Screen.....	59
Chapter 4: Implementation and Verification.....	63
4.1 Implementation	63
4.1.1 Modeling 3D DSLR model.....	63
4.1.2 Create Interaction 3D model	66
4.1.3 Create Webpages.....	70
4.2 System Testing	72
4.3 Testing Result.....	73
4.3.1 Test data	73
4.3.2 Test Case Design	74
Chapter 5 Conclusion	84
5.1 Conclusion.....	84
5.2 Problem Faced	85
5.3 Knowledge Gained	86
5.4 Project Limitation.....	87
5.5 Future Enhancement	88
BIBLIOGRAPHY	89
Appendix	92
3.3.1 Final Report 1Timeline	95
3.3.2 Final Year Project II Timeline.....	96

LIST OF FIGURES

Figure Number	Title	Page
Figure 1-2 F1	Recommendation of final photo	3
Figure 1-2-F2	Basic accessories	4
Figure 1-4-F1	Preferable learning lesson	7
Figure 2-3-1 F1	Cambridge in Colour Homepage	18
Figure 2-3-2 F1	CameraSim Webpage	19
Figure 2-3-3 F1	DSLR tips webpage	21
Figure 2-6-F1	Raw data from the survey	30
Figure 2-6-F2	Pie chart people will utilise this platform	31
Figure 3-1-F1	Waterfall Development	33
Figure 3-1-2 F1	Hierarchy Structures of this platform	35
Figure 3-1-2 F2	Blueprint of the 3D DSLR model	36
Figure 3-1-2 F3	Blueprint of the label the hotspot of the model	36
Figure 3-1-2 F4	Blueprint of the result image with the recommendation	37
Figure 3-1-2 F5	Blueprint of the homepage	38

Figure Number	Title	Page
Figure 3-1-2 F6	Blueprint of the tutorial page	39
Figure 3-1-2 F7	Draft of model camera	40
Figure 3-1-3 F1	Step of implementation	41
Figure 3-2-2 F1	View of WireFusion	47
Figure 3-2-3 F2	View of Adobe Photoshop CS5	48
Figure 3-5-1 F1	System Flow Diagram	54
Figures 3.6 F1	Use Case Diagram	56
Figure 4-1-1 F1	Step of modeling 3D DSLR and lens	64
Figure 4-1-1 F2	Model texturing	66
Figure 4.1.2 F1	Wirefusion Script and Stage view	67
Figure 4.1.2 F2	Connection among object in Wirefusion	68
Figure 4.1.2 F3	Java object in Wirefusion	69
Figure 4-3-2 F1	ISO module test	77
Figure 4-3-2 F2	Aperture and Shutter Speed module test	80

LIST OF TABLE

Table Number	Title	Page
Table 2-4-T1	Comparison between my proposed system and others	27
Table 3-2-1 T1	Comparison between 3Ds MAX and others 3D software	44
Table 3-4-2-1 T1	Justification of Requirements Specification	52
Table 3-6 T1	Use Case Diagram elaboration	58
Table 3-7 T1	Print Screen 1	59
Table 3-7 T2	Print Screen 2	60
Table 3-7 T3	Print Screen 3	61
Table 3-7 T4	Print Screen 4	62
Table 4.1.3 T1	Language used to create webpages	70
Table 4-3-2 T1	Login Module Unit Test	75
Table 4-3-2 T2	ISO Module Test	77
Table 4-3-2 T3	Input-output model of program testing	78
Table 4-3-2 T4	Aperture and Shutter Speed Module	79
Table 4-3-2 T5	Input-output model of program testing ii	81

Table Number	Title	Page
Table 4-3-4 T1	Usability Testing Result	83

Chapter 1: Introduction

1.1 Problem Statement

DSLR become common since digital photography has penetrated into daily life. However, features of DSLR are difficult to learn and it requires some skill to capture some better photos. Furthermore, the price of DSLR is relatively high and limited practical are allowed. Although there are a lot of DSLR e-learning systems around but unfortunately, some of them lack of capabilities for interaction that brings out the usefulness learning platform. Based on those problems, we can found that users are facing hard time to learning and understanding the DSLR. In order to solve this problem, I'm here to introduce a 3D DSLR Learning platform. From this system, fresh camera man can learn faster by interact with the 3D model DSLR camera rather than investigated based on the book.

1.2 Project Scope

The core of this project is provides a 3D DSLR learning platform that able for fresh camera men learn and understanding the DSLR.

The modules to be developed are:

- 3D DSLR model
- Photographic element
- 3D DSLR's accessories tools

- Different Lighting conditions
- Forum
- User Login

3D DSLR model – A consistency model of 3D DSLR was created, which allows users to interact with this half fledged DSLR.

Photographic elements – Those basic photographic elements: ISO, aperture and shutter speed. Users can experiment with wildly this different camera settings and see how each affects the final photo. User will received the feedback and suggestion based on their final photo.



Figure 1-2 F1: Recommendation of final photo

3D DSLR's accessories – The basic accessories for DSLR camera are provided for users to build onto the 3D DSLR model. The accessories include camera lens, tripod and the flashlight for user able to drag and drop those accessories onto the 3D camera model.



Figure 1-2-F2: Basic accessories

Different light conditions – In this platform, a controlled environment is provided for photographers to explore different light condition which from low light indoor to bright light condition.

Forum - A forum that able for either professional or fresh camera to discuss about the DSLR and also share their opinion to each other's.

User Login - It is free for sign up. After users register as a member, they can enjoy the benefits to use the different 3D model accessories and update news tutorial for users.

1.3 Project Objectives

Multimedia has been reformed to the education system from its advantages and capabilities. This development of 3D DSLR learning platform uses Nikon DSLR as a base to achieve the three main objectives, which are to provide interactive platform for fresh camera men to learn DSLR, to provide instant feedback or recommendation for fresh camera and to help in decision making for DSLR buyer.

This platform is about the multimedia implementation in 3D DSLR camera that to introduce basic concepts behind photographing for fresh camera men. Since it provides a tutorial on the way users directly interact with 3D DSLR model on the web-based system. By doing this, users are enable to operate and control the 3D DSLR model's button, set the different function of camera and capture real photos in a virtual testing room. On the other point of view, the functions of 3D DSLR enable users to shorten their time in learning DSLR camera rather than they investigated based on the theory. For example, 3D DLSR model label some hotspot on those functions, in turn, it enhance the operational skills of fresh camera men toward DSLR.

Moreover, 3D DSLR Learning platform provide a guideline for fresh camera men to learn from their mistake or inaccurate adjustment. This platform conveys instant feedback or recommendation to users on what mistake they made, or how they could do improvement on those settings. It becomes an easy way, even for fresh camera men, to understand and learn through 3D DSLR.

In today's high technology environment, this web-based system helps users to make a good decision whether to purchase extra DSLR tools. Through invisible web- based environment, 3D DSLR learning platform provide a virtual physical testing area for users to choose and purchase their preferable tools of DSLR. For instance, change

different lens, attach tripod and so on. As for whole, 3D DSLR learning platform play a vital role in recent multimedia industry.

1.4 Impact, significance and contribution

- With this website, fresh camera men can interact with 3D DSLR model on the web-based system and can learn in effective and efficient way. They practical more rather than investigated based on the theory. This reduces the percentage of users face hard time to learning and understanding the DSLR. Besides that, DSLR manufacturer can promote their DSLR camera though this platform.

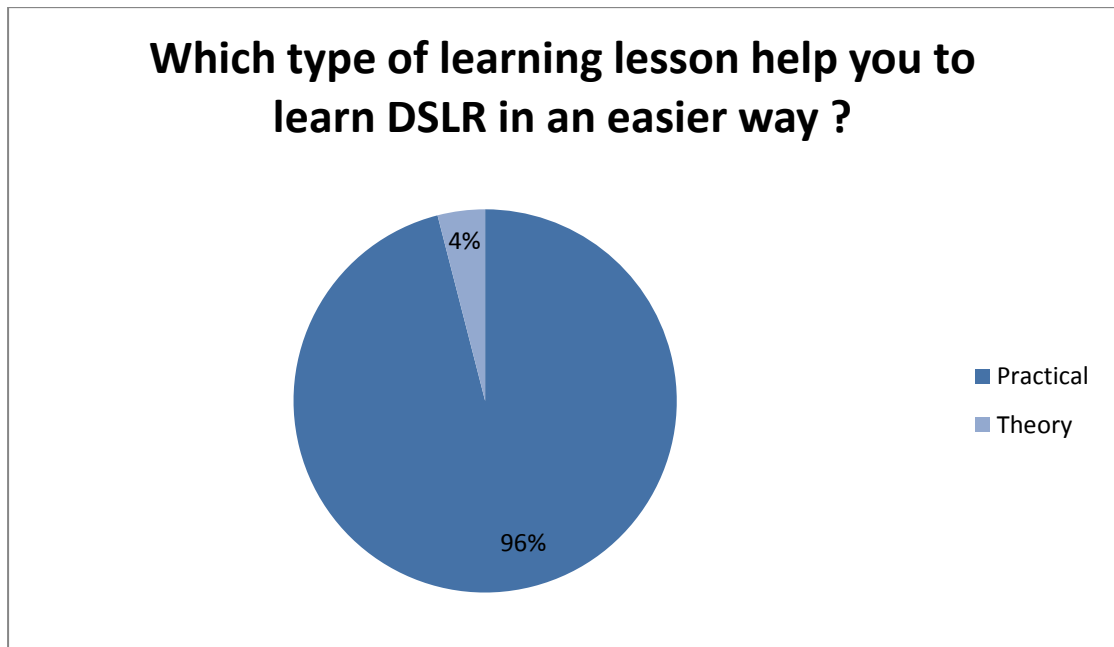


Figure 1-4-F1: Preferable learning lesson

1.5 Background Information

Interactive learning is emerging rapidly in the market because that it will increasingly influence how one learn in work force, in school and at home. Interactive Learning has evolved out of the hyper-growth in the use of digital technology and virtual communication, particularly by students. In order to make the best use of the new technologies, the concept of interactive with the 3D model is evolved. We can know that interactive with the model is the best way rather than investigated based on the book. A research done on the market reveals that there is a growing number of people request interactive learning. So, 3D DSLR learning platform would be a great alternative for people who face hard time to learn the DSLR. It provides for fresh camera man learn in effective and efficient.

In addition, it also brings great opportunity for DSLR manufacturer. DSLR manufacturer promote their DSLR camera though website. DSLR manufacturer can advertise their new product and guide them by using the 3D model DSLR in an easier

Chapter 2: Literature Review

2.1 Multimedia

What is Multimedia? According to Kleen & Shell; Najjar; & Tannenbaum (as cited in Kahn, n.d.), Multimedia refers to computer-mediated information that is presented concurrently in more than one medium. It is the combination of text, animated graphics, video, and sound- presents information in a way that is more interesting and easier to grasp than text alone (Flynn & Tetzlaff ,1998).

Multimedia is an utterly misunderstood term used to describe the variety of applications that integrate media types, from CD-ROM to live performance to the Internet (Packer, 1999). Multimedia systems can thus be described as being computer based systems which enable the integrated and interactive processing, storage, retrieval, creation and manipulation of information represented by time dependent and time independent media (Joubert, n.d.). It represents a new type or classification of computer applications and a new style of computer usage and interaction in different sensory formats that enable end users to efficiently and effectively comprehend large volumes of complex information (Coughlan, 1994).

Grimes & Potel (1991) said that Multimedia isn't a product or service because it isn't a complete enough solution. Rather, multimedia is part of a service to develop presentations. Nonetheless, the goal isn't multimedia, but effective communications. Multimedia might help achieve this goal, like a magician's bag of tricks. Using multiple media can create message impact (assuming it isn't overused). People buy things that solve problems, but Multimedia isn't a "thing," it's a way to communicate.

According to Coughlan (1994), Multimedia is rapidly becoming the mechanism that is breaking new ground in redefining the use and application of information technology, and as such will be a key value add element in the creation of employment and wealth in the future. Packer (1999) also claims that more and more, the artistic, entertainment, and educational content we experience daily takes the form of multimedia. It will become even more pervasive with the convergence of film, television, and the Internet in the next century.

Shank (2005) said, Multimedia certainly has the potential to extend the amount and type of information available to learners. Multimedia can offer layers of beneficial resources, provide gratuitous information leading to frustration and overload, or anything in between. Information overload currently overwhelms employees in many industries. It is basically a question of how much information human beings can absorb, use effectively and act upon without losing sight of priorities. Developed and used correctly multimedia has the potential to become the single most efficient communication mechanism that will significantly enhance the user's ability to understand, learn, evaluate, interact, respond and act on high volumes of complex information. Multimedia does this by communicating with the user in the "human sensory bandwidth" (Coughlan, 1994).

According to Coughlan (1994), Multimedia is the natural way to learn, as it involves the user or student on an individual basis to interact through sight, sound, and touch. This direct individual involvement with an interactive multimedia knowledge base, and its associated scoring, testing, and progress reports is believed to enhanced knowledge absorption and retention rate, which is the main objective of all training programs.

2.2 Types of Multimedia

2.2.1 Linear Multimedia

A linear multimedia product describes when learners do not take part in the process but rather sit back and watch, it can be stated that an example of this is watching a DVD ("What is Multimedia", 2010). It is one where the end-user simply receives

information, advice, instruction or entertainment without any control over the presentation's content (Coughlan, 1994). According to Marc Spaniol et al (as cited in Nurnadiah et al, 2009), linear means that each part of the content is meant to be seen or heard in the same order every time it is experienced. Therefore, the only point of interaction on the recipient side is to stop or forward the story process without being able to influence the story's narrative path or the plot.

2.2.2 Non-Linear Multimedia/Interactive Multimedia

Non-linear content offers user interactivity to control progress as used with a computer game or used in self paced computer based training. Hypermedia is an example of nonlinear content (Nurnadiah et al, 2009). Coughlan (1994) also said, interactive multimedia systems achieve a higher level of information transfer because they provide customization that allows end-users to receive data, information or knowledge and to actively interact and participate in the process. It also permits evaluation of end user preferences, performance, and rapid scoring and statistical assessments of responses.

2.2.3 Delivery Options for Multimedia

Nigel and Chapman (as cited in Honarmand, 2008) said applications of multimedia require a means of delivery to distribute this material from the producer to the user. Multimedia lessons can be delivered in multiple ways, including through stand-alone CD-ROM. With the fast development of Internet and its bandwidth, it is also possible to place multimedia lessons on the World Wide Web as a part of an e-Learning programme. Thus we have two basic approaches to deliver multimedia lessons –

independent approach and Blended approach. Independent approach has two different modes – web delivery and CD-delivery. The blended approach has two strategies – Supplementary and Complementary. (“Delivery of Multimedia”, n.d.).

2.2.4 Online / Web-Based Delivery

Delivery on the World Wide Web usually sidesteps many issues of the delivery platform because web browsers all take the HTML (and more) that makes up a web page and display it on the user's computer. The Web is the multimedia delivery system that works on most computers because the browser takes care of the underlying operating system and hardware (England & Finney, 2002). Network is employed to send information from computer to computer often employing a server to provide centralized storage. Network may be a LAN in a single organization or more often the public Internet (Honarmand, 2008).

The new Web-based delivery formats focus more on the online presentation of courses, which is practically impossible to achieve with large segments of video clips and even small sound files (Laaser, 2004).

However, according to (“Delivery of Multimedia”, n.d.), since multimedia files are normally very big in size, they are not recommended for web-based delivery because of the poor bandwidth at the user's end. However, with the emergence of Shockwave, the delivery of multimedia on the web has become easier. Shockwave is a standard format for displaying media element. It is also an extension or plug-in for the browser. Essentially, it is a compression technique that allows you to play Director, Flash or Authorware files over the net.

2.2.5 Offline / CD-Based Delivery

Offline multimedia is works published in isolation. A network connection is not required. Its distribution medium, referred to as the 'carrier', can include CD-ROMs, DVDs, diskettes, zip disks, tapes, hard disks etc., or a single publication might be offered on a combination of media (“Offline multimedia”, n.d.). It is a removable secondary storage required with significant storage capacity and data transfer performance (Honarmand, 2008).

According to (“Delivery of Multimedia”, n.d.), the CD-ROM drive has become a standard component of computers these days, and therefore it is one of the best options available. Moreover, the sizes of multimedia lessons are normally big, and the high-density storage capacity of the CD suits the technical requirements.

Laaser and Gerke (as cited in Laaser, 2004) mentioned that a study showed that students found the CD very useful and they were very enthusiastic about the new learning possibilities. However, the constraint faced by the production teams is the time needed for such development. Frequently, it takes years to prepare such elaborated teaching materials.

2.3 Current Practice

There are a lot of multimedia ways to teach fresh camera man how to use DSLR camera. Currently, one of the famous ways to learn DSLR camera knowledge is through online/ web-based delivery.

“Learning in online is best way to teach the students, because the course materials is accessible 24 hours a day 7 days a week and teaches skills in using technologies that will be critical to workers in the 21st century business community that works with colleagues globally and across time zones.”(Worldwidelearn.com, 2005) There are three web learning DSLR applications which are Cambridge in Color, CameraSim and DSLR tips in my literature review. This three web learning DSLR applications applied different multimedia way to teach users learn the knowledge of DSLR in efficiency and effectiveness through tutorial, video, camera simulator and so on.

Another of current practice is 3D virtual DSLR camera based on VRML and JavaScript which is user can interact with the 3D model online. In this research paper, it also mentioned that has provided 3D virtual DSLR camera, but the limitation is without instant feedback for users that able to guide the user in correct way.

According to Asch (as cited in Machover, 1995), Virtual Reality is the ultimate Multimedia experience. Multimedia applications are achieving very high levels of realism and user immersion (Renault et al, 2004).

The ever increasing demand for applications where real and virtual worlds fully merge makes the traditional approach of implementing multi-media applications, based on predefined interaction scenarios, inappropriate and inefficient. The whole

concept of constructing multimedia applications must be redefined and brought closer to the way real worlds behave (Renault et al, 2004).

New visual technologies like Virtual Reality and Multimedia that expand the computer graphics “tool kit” have been often associated with “fringe” applications in art and entertainment (Machover, 1995).

The term virtual reality (VR) promises more than current technology can offer. The term has been used in many different ways for a specific type of user interfaces: on the one hand for artificial environments presented over head-mounted displays (HMD) and, on the other hand, for traditional animated computer graphics on conventional screens and even for text-based multi-user games (Steinmetz & Nahrstedt, 2004).

The key idea of projective virtual reality for the non robotic expert is not to show the robot at all, but to let the user just handle objects in the virtual world like he would do in the real world (Freund & Rossmann, 2001).

In the multimedia context, haptics could serve both to improve human–computer interaction (HCI) within authoring tools, and as a novel medium to express content. But this promising technology is still unexploited (Thalmann & Bonanni, 2006).

However, researchers have made impressive improvements in immersive multimedia applications in the last 15 years. Although interaction is a key element of immersive experiences, researchers have focused on visual perception, supported by advances in computer graphics (Thalmann & Bonanni, 2006).

Technologies for multimodal interaction and perception in virtual environments must reproduce the behavior of real objects through different channels of perception, including graphics, audio, and haptics into a single VR experience (Thalmann & Bonanni, 2006).

According to Valtolina (2005), books, museums, historical ruins, archeological sites are different mediums through which to know and to approach to this cultural knowledge. During the last few years the VR technologies added to those traditional communication channels. In fact, virtual reality offers the chance to visit the reconstruction of site normally inaccessible, either because of their location or because they no longer exist.

However, there is some problems occurred in current VR application. One of the major problems is that they require enormous computer power to calculate complex environments and their objects in realistic quality and speed. Another problem is that conventional display devices do not support the graphic resolution required to create a photo-realistic impression of virtual worlds (Steinmetz & Nahrstedt, 2004).

Photocation is another research paper that used tangible photography education system that invites people to explore and learn about the technical settings involved in a digital single lens reflex (DSLR) camera.

2.3.1 A learning community for Photographers: Cambridge in Color

Learning community is a community contains DSLR tutorials to teach the users how to use the DSLR. Through this community, photographer able to gain knowledge about DSLR based on the theory. In tutorial page, it provides lot tutorials for photographer which are include concept & terminology of camera, how to use camera equipment, edit & post-processing, photo technique and styles (Cambridgeincolour.com, 2012) and so on.



Figure 2-3-1 F1: Cambridge in Colour Homepage

Strength:

- They are providing very detailed information about the DSLR. Users can learn a lot of concept about photography from this learning community.
- Forums are provided for user to share their knowledge with each other, in order to improve their technical knowledge of camera.
- Accessible 24/7 days and anywhere since it was published online.

Weaknesses

- Without a 3D model for user to integrate with it. To enhance their technical knowledge of camera should have a model to integrate rather than based on the concept only.
- Users are facing hard time to understand the photographic elements since there have no DSLR model provided.

2.3.2 DSLR photographer demystified: Camera Simulator



Figure 2-3-2 F1: CameraSim Webpage

Camera Simulator is a platform for user to practice. This is different from other web application which is only provides theory. “This SLR camera simulator shows you visually how ISO speed, aperture, shutter speed, and distance affect the outcome of your digital photos.”(Camerasing.com, 2012)The latest function of CameraSim is the simulator can teach you how to use the exposure compensation control on a DSLR camera.

Strength:

- Provide a DSLR model for user to interact with it. This practice can make the users learn those skills such as ISO speed, aperture, shutter speed, and distance affect in fast and better ways.
- Users can operate the model as realistic camera. Users can adjust the level of photographic elements so that the user can review the outcomes with different level of photographic elements.

Weakness and Limitation:

- Only suitable for beginner because it provide very basic knowledge.
- Users cannot directly interact with 3D DSLR model on the web-based system, they only can adjust the features on the screen of webpage.

2.3.3 DSLR TIPS

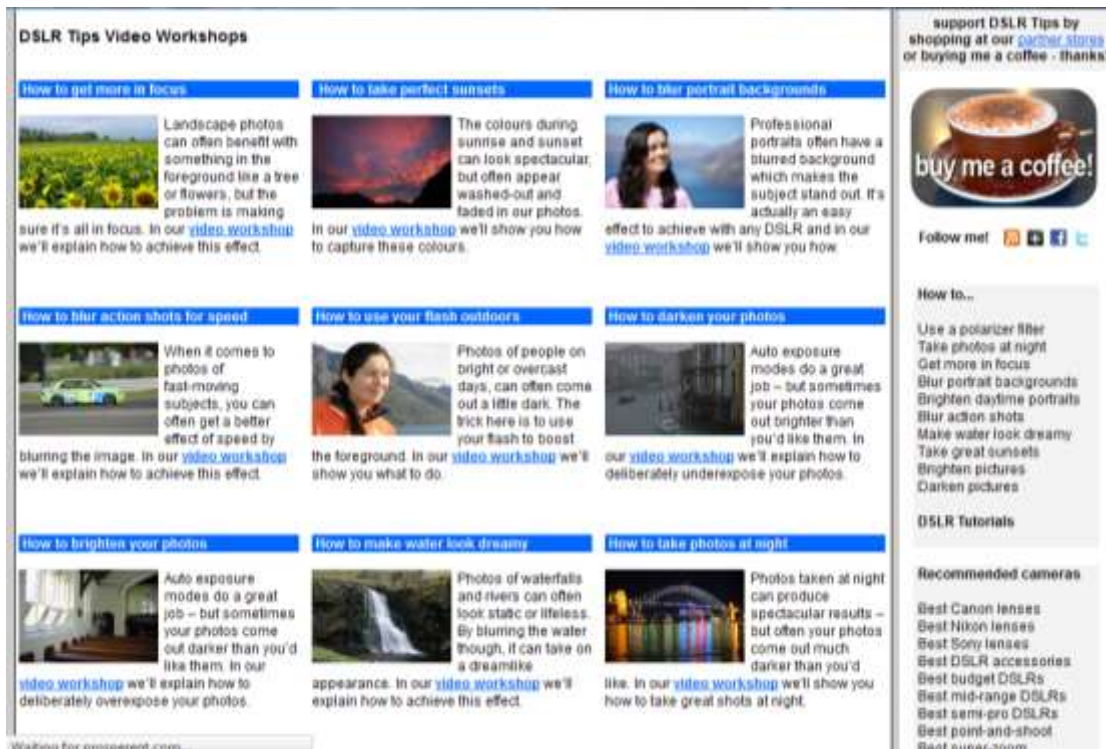


Figure 2-3-3 F1: DSLR tips webpage

Tips and tutorials for making the most of your DSLR. The purpose of this website is to ensure users can learn the tips of using DSLR in faster way. There provides a lot of DSLR tips videos workshop to help users learn effective and efficiency. (Laing, A., 2007)

Strength:

- Provides DSLR tips videos workshop with a specific DSLR tips such as How to get more in focus, How to blur portrait background and so on.
- Embedded attractive video in website.
- Forum was provided for users to discuss about DSLR so that they can gain more knowledge with each other's.
- Photography eBook was introduced to user, another great way to learn DSLR.

Weakness and Limitation:

- Unlike CambridgeInColor without provide very detailed information and concept about DSLR.
- Without a 3D model for user to integrate with it. To enhance their technical knowledge in effective and efficiency, 3D model must provide for users to integrate rather than based on the theory only.

2.3.4 Design and Development of 3D Virtual DSLR Camera Based on VRML and JavaScript

This paper offered a design and development of 3D virtual DSLR camera based on VRML and JavaScript, that user interact with the 3D model online and can browse the 3D scene at any time. “By moving mouse and rotating the camera, the users could observe the digital camera from different angles to acquaint various components particularly could interact with the 3D camera, operate the buttons and the components to simulate the real operation. It helps increasing the study interest and

improving teaching effect (Design and Development of 3D Virtual DSLR Camera Based on VRML and JavaScript, 2010).”

Strengths:

- User can moves, click and drags the 3D DSLR camera. They allow interacting with the various components of the camera.
- User can interact with 3D model online and can browse the 3D scene at any time.
- Users are able to rotate the 3D model in different angle.
- The body of DSLR is included such as viewfinder, LCD player, exposure mode dial, control dial and various operation buttons (Design and Development of 3D Virtual DSLR Camera Based on VRML and JavaScript, 2010).

Weaknesses:

- Without instant feedback for users that able to guide the user in correct way. When they encountered unpredicted outcomes, they need to try out themselves with different settings to achieve the good photo expression.
- Without provide basic function of DSLR and cannot capture photo like real, just a model for user to rotate it.
- Without a forum provided for users to share their knowledge with each other to enhance their technical knowledge of camera.

2.3.5 Photocation: Tangible Learning System for DSLR Photography

Currently, researchers done to resolve the problem, that present Photocation, a tangible photography education system that invites people to explore and learn about the technical settings involved in a digital single lens reflex (DSLR) camera (Photocation, 2012). The beginners can learn the basic settings elements such as aperture, shutter speed and ISO by using this photocation, a tangible photography education system.

Strengths:

- Photocation is a playful and easy to understand system for both novices and experts. It uses three key elements to operate and immediate feedback through the “forecast” screen (Photocation, 2012).
- Users can control and operate the photocation in realistic and it designed look like simple version of DSLR.” The concrete and physical representations also invited the users to grab them casually and experiment with how different DSLR settings produce different photo expressions (Photocation, 2012).”

Weakness/Limitation:

- Limited tangible provided, people experimented with the system components of photocation in limited. They cannot use in anywhere and anyplace, only use in when phocation are provided.

- Without suggestion or recommendation for users. When they encountered unpredicted outcomes, they need to try out themselves with different settings to achieve the good photo expression.
- In photocation there are limited photographic element are allowed. In this system it only focus on three basic photographic elements there are aperture, ISO and shutter speed.
- Users cannot enjoy to add-on extra DSLR accessories into the physical representation. In photocation build in the accessories are not allowed, they can only interaction with the three basic photographic elements.
- It was trouble when designed to serve as a controlled environment for people. If user want to explore different lighting condition, capture's object need to put into diorama box that a box away from external light.

2.4 Why 3D DSLR learning platform been introduced

In order to solve the weakness and limitations, an easy understands and interactive with 3D DSLR system has been proposed. 3D DSLR learning platform offers to all photographers who want to use their DSLR camera to take even better photos. This platform also provides an introduction to the basic concepts behind photography for beginners. In this platform, users able to integrate with 3D DSLR model and received an instant feedback to guide the user to take better photo.

	A leaning community for Photographers: Cambridge in Color	3D Virtual DSLR Camera Based on VRML and JavaScript	Photocation: Tangible Learning System for DSLR photography	Proposed System: 3D DSLR Learning platform
3D DSLR model availability	-	YES	Physical prototype	YES
Accessories (Lens, Tripod, Flashlight)	-	Lens only	-	YES
Different lighting conditions	-	-	YES	YES
Interaction with model (rotate, control and operate)	-	YES	YES	YES
Basic photographic elements (ISO, aperture, shutter speed)	-	YES	YES	YES
Label some hotspot on DSLR's	-	-	-	YES

components				
Instant feedback	-	-	-	YES
Available 24/7 day	YES	YES	-	YES
Forum provide	YES	-	-	YES
User Login	YES	-	-	YES

Table 2-4-T1: Comparison between my proposed system and others

2.5 Fact Findings

In this project, I was using questionnaire fact finding technique to collect system requirements and preferences. Gaining demographic data is fairly standard in social science research. It facilitates identification of individual traits which may have a bearing upon variables thereby identifying trends based on people preferences. Screen shot of survey form refer to Appendix.

2.6 Data Collection

The following are the data collect responses 50 participants from various backgrounds.

1	1. Do you own DSLR (Digital Single Lens Reflex) camera ?	2. What brand of DSLR camera do you have?	3. Do you know to use DSLR (Digital Single Lens Reflex) camera ?	4. (Where are you learn the basic photography lessons on the DSLR ?) can select more than one)	5. Are you internet user ?	6. Have you encourage 3D environment web based system?	7. What skill level are you right now?	8. Do you feel DSLR camera difficult to use?	9. Which DSLR photographic elements is the most difficult to learn?	10. Which type of learning lesson help you to learn DSLR in an easier way ?	11. What is your favourite scene ?	12. If offer 3D DSLR platform, will you utilise it before you buy a DSLR camera?
2	Yes (If Yes, please answer question 2)	Nikon	Yes (If Yes, please answer question 4)	Photographers, Friend and Family	Yes	Yes		2 Yes	Aperture, Shutter Speed, Exposure	Practical	Portrait	Yes
3	No (If No, please skip question 2)		Yes (If Yes, please answer question 4)	Web	Yes	Yes		1 Yes	Aperture, ISO, Shutter Speed	Practical	Night Scene	Yes
4	No (If No, please skip question 2)		No (If No, please skip question 4)		Yes	Yes		1 Yes	No idea	Practical	Fast moving object	Yes
5	No (If No, please skip question 2)		Yes (If Yes, please answer question 4)	Friend and Family	Yes	Yes		1 No	All Above	Practical	Anythings	Yes
6	No (If No, please skip question 2)		No (If No, please skip question 4)		Yes	Yes		1 Yes	No idea	Practical	Anythings	Yes
7	No (If No, please skip question 2)		No (If No, please skip question 4)		Yes	Yes		1 No	No idea	Practical	Fast moving object	Yes
8	No (If No, please skip question 2)		No (If No, please skip question 4)		Yes	Yes		1 Yes	No idea	Practical	Anythings	Yes
9	No (If No, please skip question 2)		Yes (If Yes, please answer question 4)	Web, Instructions Book, Friend and Family	Yes	Yes		1 No	All Above	Practical	Landscape	Yes
10	No (If No, please skip question 2)		No (If No, please skip question 4)		Yes	No		2 No	All Above	Practical	Landscape	Yes
11	No (If No, please skip question 2)		No (If No, please skip question 4)		Yes	Yes		1 Yes	No idea	Practical	Anythings	Yes
12	No (If No, please skip question 2)		No (If No, please skip question 4)		Yes	Yes		1 Yes	No idea	Practical	Anythings	Yes
13	Yes (If Yes, please answer question 2)	Canon	Yes (If Yes, please answer question 4)	Web, Photographers	Yes	Yes		3 Yes	Aperture, ISO, Shutter Speed, White balance, Exposure	Practical	Macro	Yes
14	Yes (If Yes, please answer question 2)	Canon	Yes (If Yes, please answer question 4)	Instructions Book, Photographers, Friend and Family	Yes	No		3 No	Aperture, Shutter Speed, White balance	Practical	Anythings	Yes

Chapter 2: Literature Review

16	No (if No, please skip question 2)	Yes (if Yes, please answer question 4)	Photographers, Friend and Family	Yes	Yes	2	No	ISO	Practical	Landscape	Yes
16	No (if No, please skip question 2)	No (if No, please skip question 4)		Yes	Yes	1	No	No idea	Practical	Macro	Yes
17	Yes (if Yes, please answer question 2)	Yes (if Yes, please answer question 4)	Web, Instructions Book, Friend and Family	Yes	Yes	2	Yes	Aperture, ISO, Shutter Speed	Practical	Landscape	Yes
18	Yes (if Yes, please answer question 2)	Yes (if Yes, please answer question 4)	Web, Instructions Book, Photographers, Friend and Family	Yes	Yes	4	Yes	Aperture, ISO, Shutter Speed	Practical	Anythings	No
19	No (if No, please skip question 2)	No (if No, please skip question 4)		Yes	No	3	No	No idea	Practical	Portrait	Yes
20	No (if No, please skip question 2)	No (if No, please skip question 4)		Yes	No	1	Yes	No idea	Practical	Anythings	No
21	No (if No, please skip question 2)	Yes (if Yes, please answer question 4)	Web, Instructions Book, Photographers	Yes	Yes	1	No	Shutter Speed	Practical	Landscape	Yes
22	No (if No, please skip question 2)	Yes (if Yes, please answer question 4)	Photographers, Friend and Family	Yes	No	1	Yes	Shutter Speed	Practical	Macro	Yes
23	Yes (if Yes, please answer question 2)	Yes (if Yes, please answer question 4)	Photographers, Friend and Family	Yes	No	2	Yes	Shutter Speed	Practical	Anythings	Yes
24	Yes (if Yes, please answer question 2)	Yes (if Yes, please answer question 4)	Web	No	Yes	3	No	Shutter Speed, No idea	Theory	Anythings	Yes
25	Yes (if Yes, please answer question 2)	Yes (if Yes, please answer question 4)	Web, Photographers	Yes	No	3	No	Shutter Speed, White balance	Theory	Night Scene	Yes
26	Yes (if Yes, please answer question 2)	Yes (if Yes, please answer question 4)	Instructions Book	No	No	1	Yes	White balance, All Above	Practical	Portrait	Yes
27	Yes (if Yes, please answer question 2)	Yes (if Yes, please answer question 4)	Instructions Book	No	No	2	Yes	Shutter Speed, White balance	Practical	Night Scene	Yes
28	Yes (if Yes, please answer question 2)	Yes (if Yes, please answer question 4)	All Above	Yes	Yes	4	Yes	Exposure	Practical	Anythings	Yes

Chapter 2: Literature Review

25	Yes (if Yes, please answer question 2)	Sony	Yes (if Yes, please answer question 4)	Talk	Yes	No	1 Yes	No idea	Practical	Partial	Yes
26	Yes (if Yes, please answer question 2)	Canon	Yes (if Yes, please answer question 4)	Photographers	Yes	Yes	2 Yes	Aperture, ISO	Practical	Anything	Yes
27	Yes (if Yes, please answer question 2)	Nikon	Yes (if Yes, please answer question 4)	Photographers	Yes	No	2 Yes	All Above	Practical	Anything	Yes
28	Yes (if Yes, please answer question 2)	Nikon	Yes (if Yes, please answer question 4)	Photographers	Yes	Yes	1 Yes	All Above	Practical	Anything	Yes
29	Yes (if Yes, please answer question 2)	Nikon	Yes (if Yes, please answer question 4)	Web, Instructions Book, Photographers	Yes	Yes	3 Yes	White balance, Exposure	Practical	Night Scene	Yes
30	Yes (if Yes, please answer question 2)	Sony	Yes (if Yes, please answer question 4)	Web, Photographers	Yes	Yes	2 Yes	Shutter Speed, White balance, Exposure	Practical	Landscape	Yes
31	No (if No, please skip question 2)		Yes (if Yes, please answer question 4)	Photographers, Friend and Family	Yes	Yes	1 Yes	Aperture, ISO, Shutter Speed, White balance, Exposure	Practical	Anything	Yes
32	No (if No, please skip question 2)		Yes (if Yes, please answer question 4)	Friend and Family	Yes	Yes	2 Yes	ISO, Shutter Speed	Practical	Night Scene	Yes
33	No (if No, please skip question 2)		Yes (if Yes, please answer question 4)	Friend and Family	Yes	Yes	2 Yes	ISO, Shutter Speed	Practical	Anything	No
34	Yes (if Yes, please answer question 2)	Canon	Yes (if Yes, please answer question 4)	Web, Instructions Book, Friend and Family	Yes	No	3 Yes	White balance, Exposure	Practical	Anything	Yes
35	Yes (if Yes, please answer question 2)	Nikon	Yes (if Yes, please answer question 4)	Photographers, Friend and Family	Yes	No	4 Yes	White balance, Exposure	Practical	Anything	Yes
36	Yes (if Yes, please answer question 2)	Sony	Yes (if Yes, please answer question 4)	Photographers, Friend and Family	Yes	No	2 Yes	All Above	Practical	Anything	Yes
37	No (if No, please skip question 2)		No (if No, please skip question 4)		Yes	Yes	1 Yes	No idea	Practical	Anything	Yes
38	No (if No, please skip question 2)		Yes (if Yes, please answer question 4)	Web, Photographers, Friend and Family	Yes	Yes	1 Yes	All Above	Practical	Anything	Yes
39	Yes (if Yes, please answer question 2)	Nikon	Yes (if Yes, please answer question 4)	Web, Photographers, Friend and Family, Talk	Yes	No	2 Yes	All Above	Practical	Anything	Yes
40	No (if No, please skip question 2)		Yes (if Yes, please answer question 4)	Web, Photographers, Friend and Family	Yes	Yes	1 Yes	All Above	Practical	Anything	Yes
41	Yes (if Yes, please answer question 2)	Lumix	Yes (if Yes, please answer question 4)	All Above	Yes	Yes	3 Yes	Exposure	Practical	Anything	Yes
42	Yes (if Yes, please answer question 2)	Canon	Yes (if Yes, please answer question 4)	Friend and Family	Yes	Yes	2 Yes	Exposure	Practical	Fast moving object	Yes
43	No (if No, please skip question 2)		No (if No, please skip question 4)		Yes	Yes	1 Yes	All Above	Practical	Anything	Yes
44	Yes (if Yes, please answer question 2)	Canon	Yes (if Yes, please answer question 4)	Friend and Family	No	No	2 Yes	Exposure	Practical	Night Scene	No
45	Yes (if Yes, please answer question 2)	Canon	Yes (if Yes, please answer question 4)	Friend and Family	Yes	Yes	4 Yes	White balance	Practical	Anything	Yes
46	No (if No, please skip question 2)		No (if No, please skip question 4)		Yes	Yes	1 Yes	All Above	Practical	Anything	Yes

Figure 2-6-F1: Raw data from the survey

Based on this research, statistics show that 78% of people feel that DSLR camera difficult to use, they are facing hard time to learn DSLR camera. By analyzing the data of this survey, we can say that people needed a platform for them practice before purchase a DSLR camera. They prefer practical rather than theory. This is because they feel can learn faster and be skilled. Besides, if offer 3D DSLR platform, 92% will utilise it before purchase a DSLR camera.

From the survey result, we can conclude that this **3D DSLR learning platform** system is able to help majority people solve their facing hard time of DSLR problem. The system will be designed with user friendly interface to encourage more users to use it.

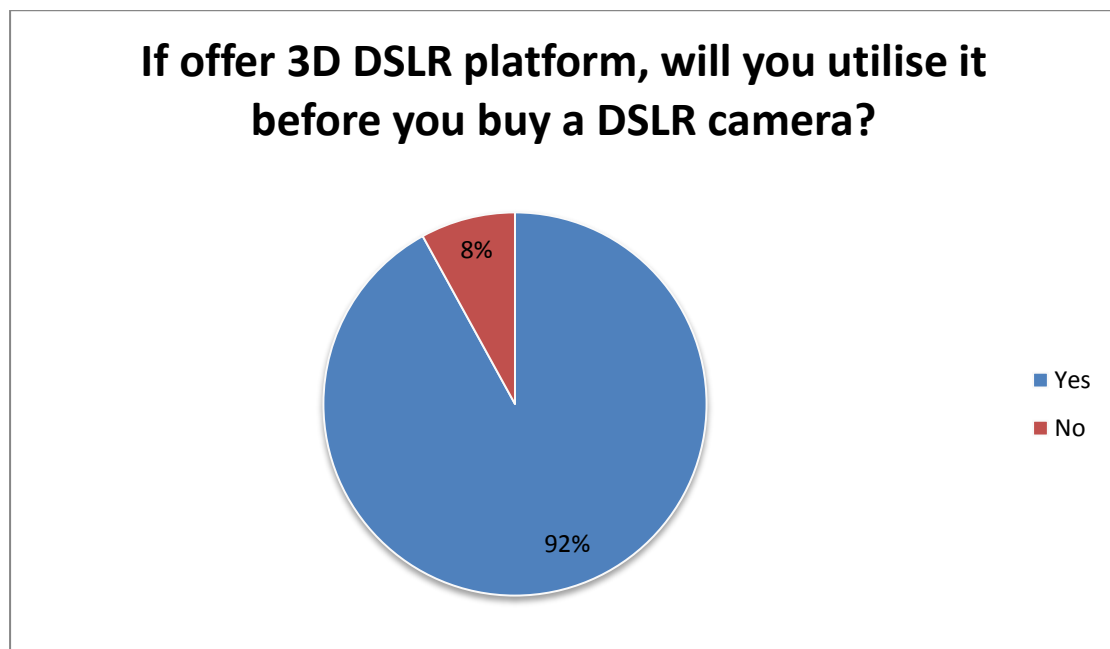


Figure 2-6-F2: Amount people will utilise 3D DSLR learning platfo

Chapter 3: Methodologies

3.1 Project Methodology

Software-development life-cycle methodologies provide what processes and deliverables, how techniques, and who roles for every typical role in a software development project, such as architects, business consultants and developers.

Since my system develop phase by phase and there are separate identified phases, so the methodology I choose to be used in this project is the waterfall model. These include Requirement, Design, Implementation, Verification and Maintenance.

It is chosen because each phase of my project is separate and distinct phase of specification and development. This methodology provides an orderly sequence of development steps and helps ensure the adequacy of documentation and design reviews to ensure the quality, reliability, and maintainability of the developed software. Furthermore, it is chosen because in my project's requirement are well-understood and changes will be fairly limited during the design process.

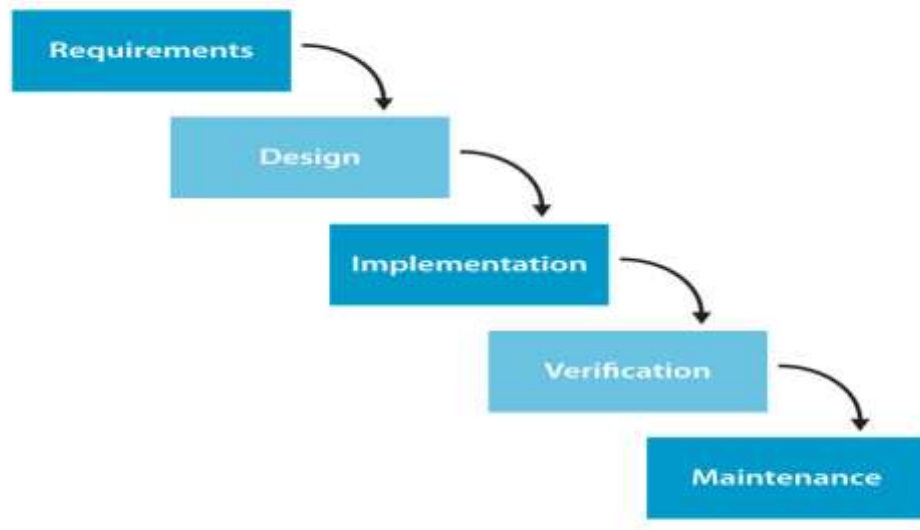


Figure 3-1-F1: Waterfall Development

3.1.1 Requirement

Naturally, the first phase is requirement analysis and definition. Requirements are collected and set in stone. The technique I use to gather the user requirements is through survey questionnaire. The objective of using this technique was gathered the requirement from different market newbie camera users. From survey questionnaire, features of DSLR that interviewee suggested and the way of learning DSLR was recorded. I would expect that a well-designed survey would provide qualitative guidance for characterizing the market.

To identify the basic features of a camera simulator, online survey is conducted as a method that used for this project. By visited different camera simulator website to

guide me what is the requirements for a camera simulator. Online survey has determined features, learning method and modules of a DSLR learning platform.

Besides that, I did observation to gather the user requirements. The study of users in their photographic expressions is what observation is about. By observing users, I can identify a process flow, awkward steps, pain points and opportunities for improvement.

3.1.2 Analysis/Design

Initial design of this project started with basic hierarchy structure. Hierarchy structure enables to outline entire module structure, and module should include into this project. The hierarchy structure is shown in the figure below.

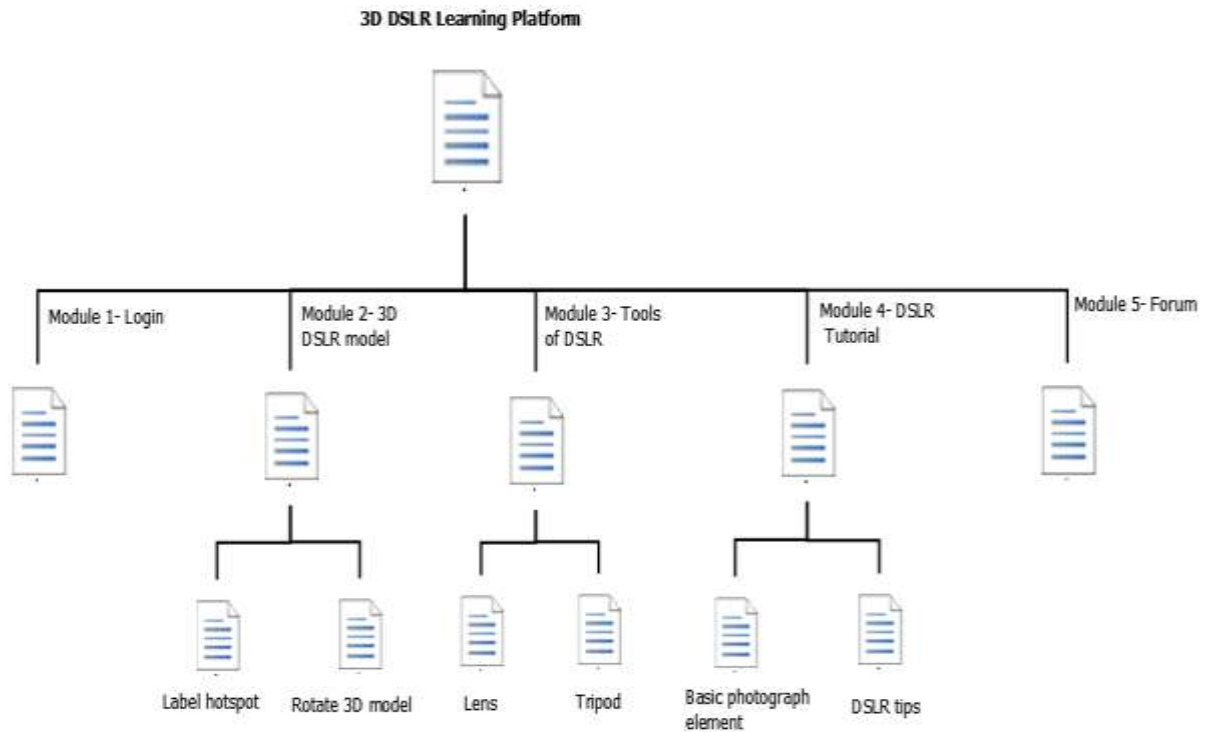


Figure 3-1-2 F1: Hierarchy Structures of the 3D DSLR learning platform

After completion hierarchy structure of this project, a “blueprint” of the system or the website layout plan is drawn out. The software I used to design out my system “blueprint” is Adobe Photoshop and develops my system based on this “blueprint”.

3D Modeling for E-Learning



Figure 3-1-2 F2: Blueprint of the 3D DSLR model

3D Modeling for E-Learning



SHUTTER SPEED

A camera's shutter determines when the camera sensor will be open or closed to incoming light from the camera lens. The shutter speed specifically refers to how long this light is permitted to enter the camera. "Shutter speed" and "exposure time" refer to the same concept, where a faster shutter speed means a shorter exposure time.

Figure 3-1-2 F3: Blueprint of the label the hotspot of the model

Users enable to interact with the 3D model by changing the different light conditions and photographic elements. Besides, adding hotspots label on the 3D model camera in order to users had an introduction of the 3D model camera before used it. To point out the touch sensors into 3D model camera and will briefly describe what they do by showing a label next to them. The purpose showing the label is to enhance the operational skills of fresh camera men toward DSLR.



Figure 3-1-2 F4: Blueprint of the result image with the recommendation

By clicking the capture button, a result image will display on the screen and follow by the recommendation or instant feedback to guide users on what they did right, or how the settings can be improved. It provides a guideline for fresh camera men to learn from their mistake or inaccurate adjustment.



Figure 3-1-2 F5: Blueprint of the homepage



Figure 3-1-2 F6: Blueprint of the tutorial page

To grabbing the users to visit my webpages, an attractive and proper website layout was designed. With user preferences as requirement, overall look and feel of the website can be further enhanced in order to optimize users' satisfaction.

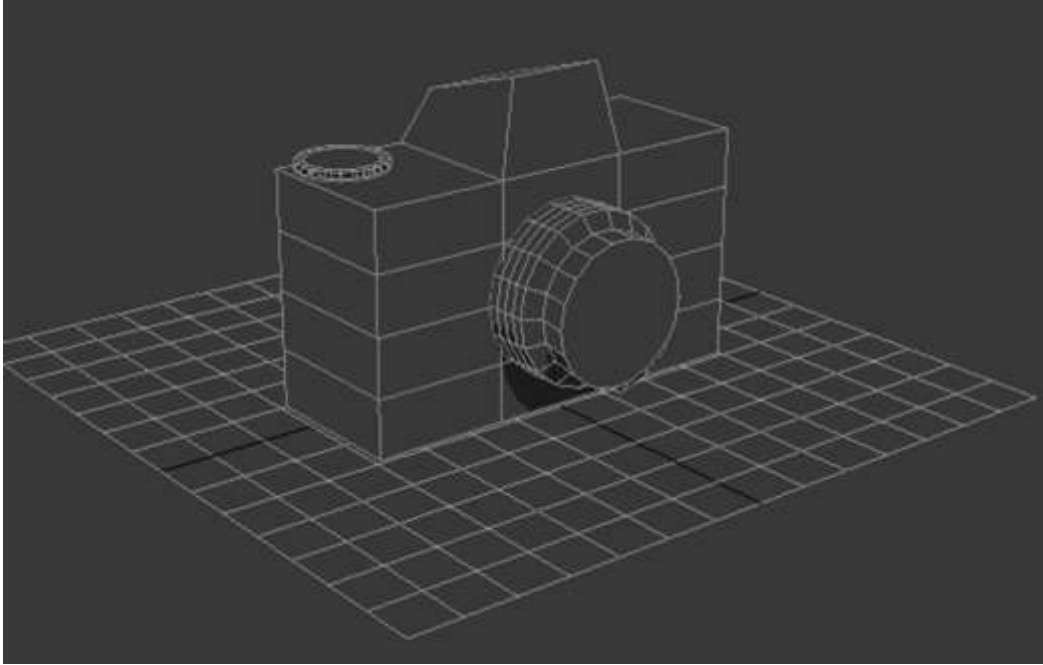


Figure 3-1-2 F7: Draft of model camera

Before modeling 3D camera, I used adobe Photoshop to sketch up the draft of model camera in order to have an idea or concept before going to the step of modeling 3D camera.

3.1.3 Implementation

In implementation phase, the 3D interactive demonstration of experimental objects was created. For modeling 3D model, I am using the professional design software, 3Ds MAX to model the 3D DSLR camera. After, exporting 3D model into VRML (.wrl) is needed so that users can operate the features and function of the model. Import the VRML model into Wirefusion for creates 3D interaction model purpose and used Wirefusion to design the virtual 3D interaction step was developed. Finally, the entire virtual system will publish onto web, in order to allow the users to browse the 3D model at any time.

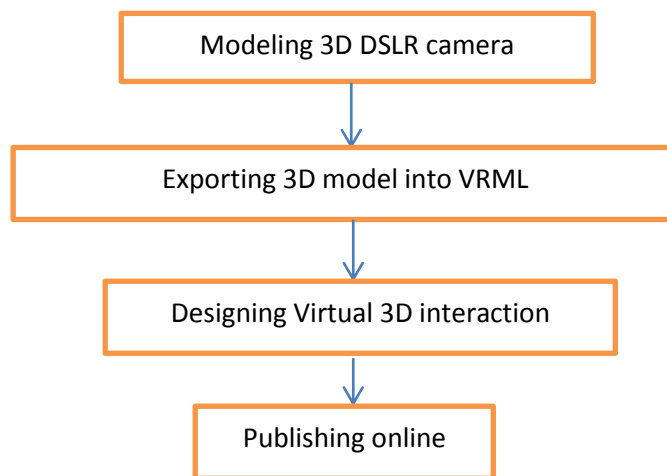


Figure 3-1-3 F1 Step of implementation

3.1.4 Verification

After the 3D model was build, the 3D model testing begins. Testing process include test the control setting, basic photographic element, rotating of camera and etc. Besides 3D model testing, integration testing, scalability testing, load testing, resolution testing and cross-browser compatibility testing should be done. After doing all the testing, a live testing is necessary for web sites. After uploading the site and 3D model, the complete testing will be conduct.

3.1.5 Maintenance

Since the 3D model publish onto online, it will need quite frequent updating to keep them very fresh. Furthermore, website will definitely go through change once when it is delivered to the customer. There are large numbers of reasons for the change. Change could happen due to some unpredicted input values into the system. In addition to this, the changes in the system directly have an effect on the website operations. The website will be implemented to accommodate changes that could be happen during the post development period.

3.2 Development Software

3.2.1 3DS MAX 3D

Modeling object was the most important step in the process of develops this system and I choose to use this professional software 3Ds MAX to modeling the 3D DSLR model and accessories.

	Blender	Google-Sketchup	3DS Max
Cost	free	Free / \$495	\$3,495/ Free for students
Availability			
Company	None, open source software	Google	Autodesk
Platform	Available for all major operating systems	Mac OS X , Microsoft Windows	Windows , OSX
Supported Video	Software Rendering , OpenGL	OpenGL	Direct X , OpenGL , Software Rendering , Heidi
Features	much of the features of something like 3DS MAX including polygon, NURBS and spline modeling, bone rigging,	Basic function, only for modeling, and has no renderer	most full-featured and complete package

	animation, texturing, shading, and so on.		
Mainly used for	Animation, Lighting, Modeling, Rendering, Video Game Creation, Visual 3D Effects, Sculpting, Basic Post-Production Video Editing	Computer Aided Design	Modeling, Animation, Lighting, Rendering, Video Game Creation, Visual 3D Effects, Post-Production Video Editing
Export function	Can export blender files to any others major format	Limited, only can export JPG, PNG , TIF, BMP	Can export to any others format
Extension language(s)	C , Python	-	MAXScript , C++ (SDK)
User Interface	non standard	Simple and customizable	customizable
Rendering	fast rendering	surface rendering	fast rendering
Plugin provided	Moderate	Very seldom	Many
Youtube Tutorial provided	Seldom	Very Seldom	Many

Table 3-2-1 T1: Comparison between 3Ds MAX and others 3D software

After analyse among 3D software, can show that 3Ds MAX have more benefits among this three software. I decided choose 3Ds MAX to been used for develop this project since it's free for students for educational purpose http://students.autodesk.com/?nd=download_center to download. Besides, it is chosen because it's been under development by Autodesk organisation for many years and has now become an impressive product, providing much of the features including polygon, spline modelling, bone rigging, animation, texturing, shading, and so on. Since 3Ds MAX provides much of features, I can use the modelling feature to develop the 3D DSLR camera, DSLR accessories and so on. Plus, 3Ds MAX is popular modelling 3D software, it can easier to learn from the web. These include:

- <http://www.youtube.com/user/3dsMaxHowTos>
- <http://cg.tutsplus.com/tutorials/autodesk-3d-studio-max/model-a-detailed-high-poly-camera-in-3ds-max/>
- http://students.autodesk.com/?nd=learning_center

3.2.2 WireFusion 5.0

Wirefusion 5.0 enterprise published by Demicron is a powerful interactive model created software. It provides an interactive 3D technology for product visualization and internet marketing. With WireFusion 5.0 it can develop a platform that users can interactive with the model, and different features can be develop by Java object include in the WireFusion. Besides, WireFusion 5.0 provides different objects that used to develop your platform which include Multimedia object s, 3D objects, Logic objects, environment objects and etc. Besides, the most attractive part in WireFusion is able users to make connection between those objects and link together. The

parameters sent out through objects out-port when the object's mouse events occurred and come into an object through in-port.

In Demicron websites, it also provides support for their users who purchase their product. In the documentation tutorial support, users can free for download the manual book of Wirefusion to learn the basics of Wirefusion through a series of hands-on examples. The tutorial consist three parts In Part 1, we will first load and preview an already made WireFusion project. Then we will go through the rather lengthy, but inspiring process of re-creating the exact same presentation. In Part 2, you will learn how to use the WireFusion Debugger, which will not only help you to track problems in your visualcode, but it will also help you understand how and when events are executed in WireFusion. Finally, in Part 3, you will learn how to extend WireFusion with external functions and how the example in Part 1 could be done quicker using an already made function.

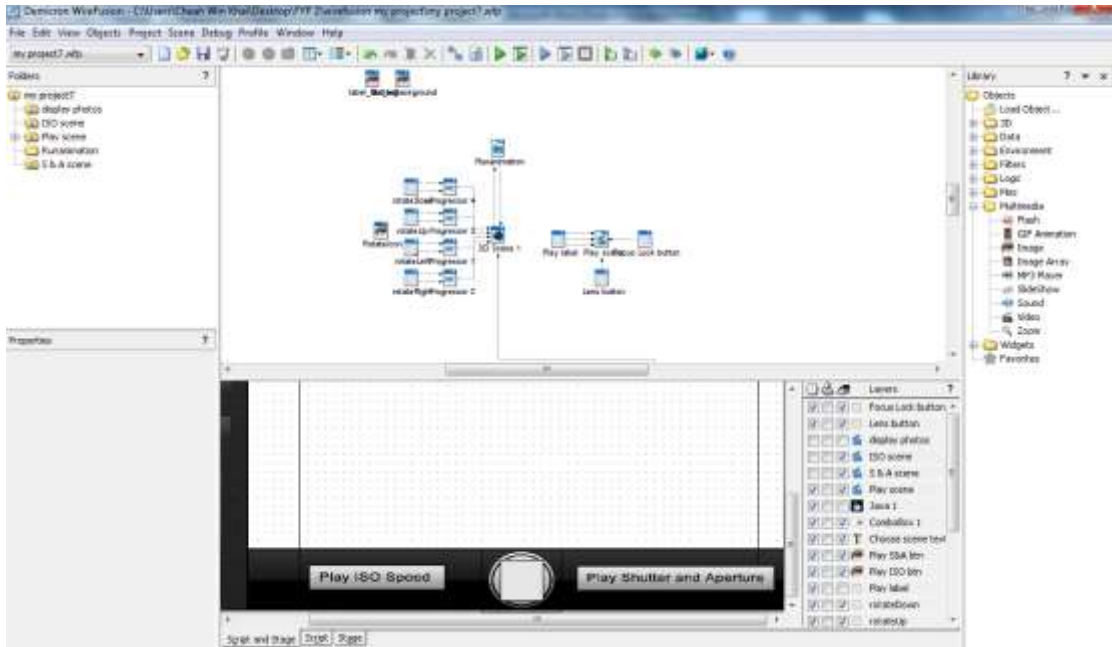


Figure 3-2-2 F1 View of WireFusion

3.2.3 NETBEAN IDE 7.0.1

The NetBean PHP editor offers code templates and code generation (Getters and Setters), refactoring (Instant Rename), parameter tooltips, hints and quick fixes (Implement All Abstract Methods), and smart code completion (including bracket completion) (Netbeans.org, 2012). From the benefits, I choose the NETBEAN to start the PHP development.

3.2.3 Adobe Photoshop CS5 and Adobe Illustrator CS5

For graphic and icons creation, Adobe Photoshop CS5 and Adobe Illustrator CS5 are used. The reason will be the need to edit existing graphic elements with Adobe Photoshop and creation of vector graphic for buttons, labels and other user interface with Adobe Illustrator. By using Adobe Photoshop, edit images elements in different condition for users differentiate result with different input. Besides, both of this software is used to design the web page layouts and the 3D DSLR model module in analysis and design phase, which is the “blueprint” of this project. These two image editing software have high popularity among image editing professionals. So, it had been choose as my project development tools.

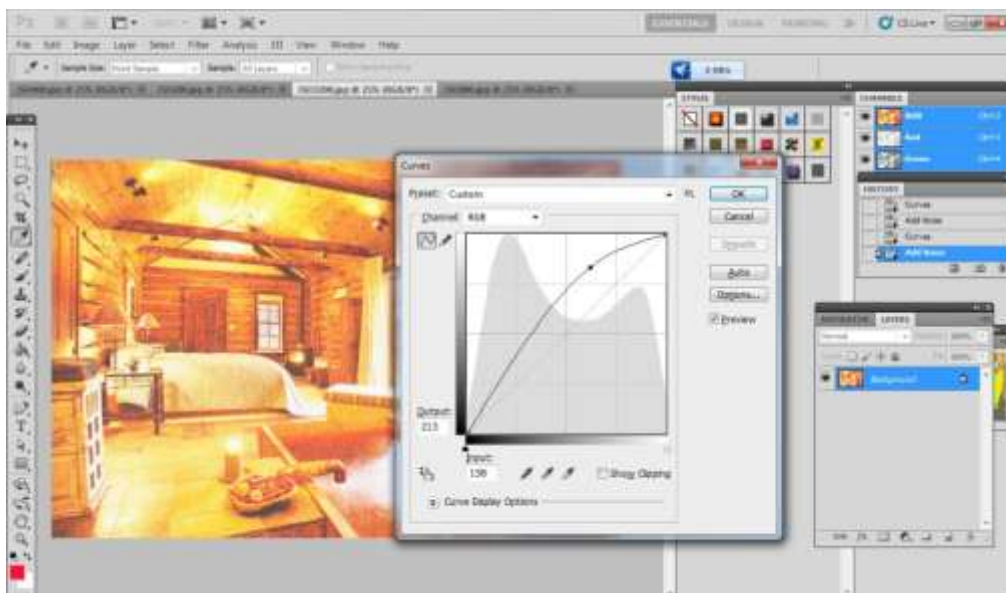


Figure 3-2-3 F2 View of Adobe Photoshop CS5

3.3 Timeline

In order to carry out the entire project in scheduling, the timeline for deliverables and milestones consisting FYP1 and FYP2 are created. Figure below shows the Gantt chart with specific tasks to be done in certain period.

3.4 Requirement Specification

3.4.1 User Requirement

Functional requirements capture the intended behavior of the system-or what the system can do. This behavior may be expressed as services, tasks or functions the system is required to perform.

- The system can let user to operate with 3D model as realistic.
- The system can display the result of image after capturing.
- The system provides guideline or recommendation for users to improve their skills.

Non-functional requirements capture required properties of the system, such as timing constraint, constraints on the development process, security, etc. In other words, often apply to the system as a whole rather than individual features or services.

- The system should be available 24/7 day.
- User interacts with the 3D DSLR model should be smoothly.
- The speed of display image result response time should be faster.

3.4.2 System Requirement

System requirement are broken into three sections in order to differentiate into several aspect. These three sections include technical requirement, system functional requirement and screen layout.

Technical requirement related to multimedia components and media elements are determined. Technical requirements are listed below:

- Image (.jpeg) file should be used as all image result.
- Vector graphic should be used as icons and buttons.
- VRML format (.wrl) file should be used as 3D DSLR model.
- Wave (.wav) file should be used as sound effect.

System functional requirement related to the function of system and what system can do are listed below:

- Showing hotspot label on the 3D DSLR model.
- User able to capture photo which on the screen.
- Different basic features of DSLR functions should be include.
- Instant feedback or recommendation for users.

For screen layout, requirement related to appearance of the platform are listed below:

- Consistent layout should be used for every scene.
- Text colour will be darker than background colour or contrast with background colour.
- Scene will changed according to the module.

- Close buttons will be always aligned at top right of the screen.
- DSLR features controller will be always placed at bottom of the scene.

3.4.2.1 Justification of Requirements Specification

Requirements	Justification
Technical requirements	
Image (.jpeg) file should be used as all image result.	All photos file saves as JPEG format and ensure image quality is high.
Vector graphic should be used as icons and buttons.	Maintain the quality icons and buttons as the resolution of scene is changed.
VRML format (.wrl) file should be used as 3D DSLR model.	VRML (.wrl) format export from 3Dmax to ensure smooth animation 3D model.
Wave (.wav) file should be used as sound effect.	High quality of audio is used as sound effect in this platform. Wave audio is uncompressed and lossless audio so suitable to be process in loop.
System functional requirement	
User able to capture photo which on the screen.	The platform provide different scene for users to capture.
Different basic features of DSLR functions should be include.	The basis features such as ISO, Shutter speed, Aperture and etc was included in the platform and ensures functionality is same with DSLR.
Instant feedback or recommendation for	Provides instant feedback for user on

users.	what they did right, or how their settings can be improved.
Screen layout	
Consistent layout should be used for every scene.	Develop tidy and neat layout for users. It helps to minimize ambiguous of users toward the user interface.
Text colour will be darker than background colour or contrast with background colour.	Ensure users to read content easily.
Scene will changed according to the module.	Ensure users to differentiate what module is perform.
Close buttons will be always aligned at top right of the screen.	Consistency user control throughout every screen of the platform.
DSLR features controller will be always placed at bottom of the scene.	Consistency user control throughout every screen of the platform.

Table 3-4-2-1 T1 Justification of Requirements Specification

3.5 Flow Chart

In order to show the flow of the 3D DSLR learning platform from start until the end, flow chart is probably the most suitable graphical format to accomplish the task. From the clear illustration of abstract representation into graphical form, one can easily grasp the idea of the flow and structure of the program. Instead of showing the flow, flow chart can be used as a verification plan to verify the structure to ensure correctness of the output to closely matched with the requirement specification.

3.5.1 System Flow Diagram

Since the project containing several modules branched out throughout the flow, system flow diagram is used to show the entire flow of the platform including its modules. The system flow diagram of the 3D DSLR learning platform is as below:

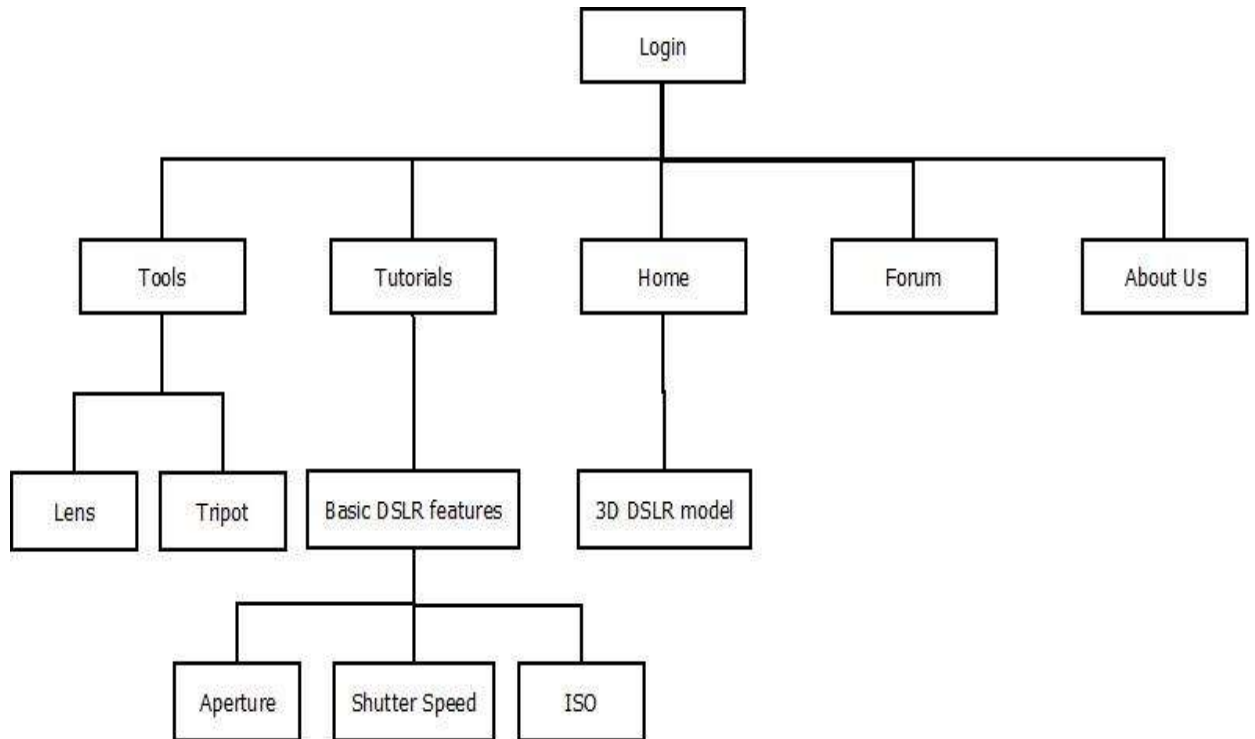
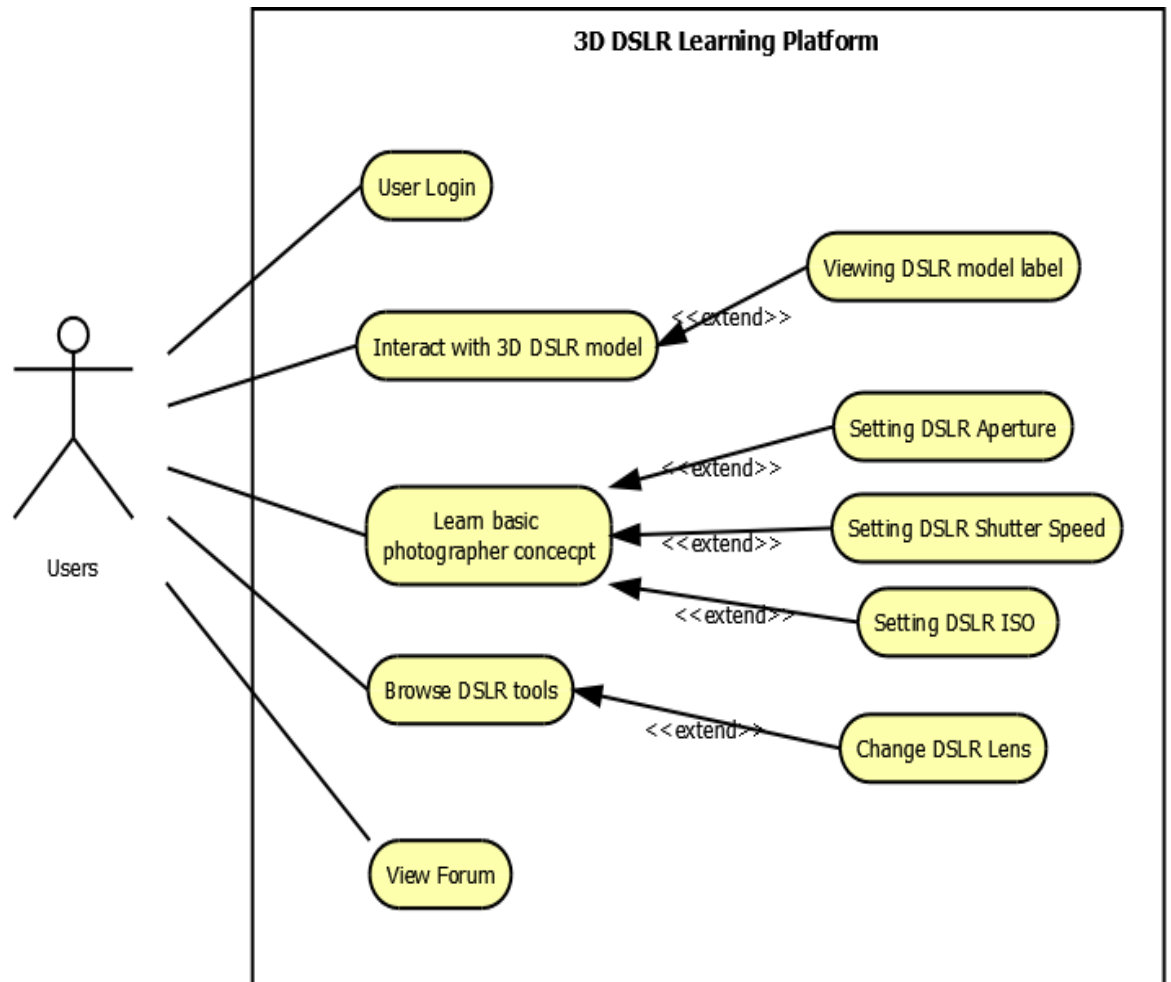


Figure 3-5-1 F1: System Flow Diagram

Based on the flow diagram above, there are four levels of modules in this platform. After users login, they can browse different five pages which are home page, tutorial page, tools page, forum and about us page. In home page, a 3D DSLR model was embedded and user can interact with the model. Tutorial page consist basic DSLR features for photographer to learn the basic photographer concept and some tips about DSLR. Another page is tools page, the purpose of this page is allow users to attach or change the accessories of DSLR. Forum page is for user to discuss all the knowledge or information about DSLR. Lastly, about us page is about the introduction of this 3D DSLR platform.

3.6 Use Case Diagram

Before implement the function of 3D DSLR learning platform, Use cases are used to describe the basic function of this platform. Use case diagram can illustrate the activities that are performed by users of this platform. Since use case diagram only illustrate the activities of the platform so it without specifying how the activities are implemented. The use case diagram of the 3D DSLR learning platform is as below:



Figures 3.6 F1: Use Case Diagram

Users	User Login	Users have to login before browse the web page. User name and password was retrieved from the platform. After verified the username and password, Users only can visit the learning platform
	Interact with 3D DSLR model	After login, uses can interact with 3D DSLR model, and understand the each component by viewing the label on DSLR model.
	Learn basic photographer concept	Users able to learn the basic photographer concept that include setting DSLR aperture, setting DSLR shutter speed and setting DSLR ISO was provided in this platform.
	Browse DSLR tools	3D DSLR learning platform also provide the

		activity for users to browse the DSLR's accessories and able for users to change those accessories from DSLR model.
	View Forum	An activity provided for user to discuss DSLR tips and information.

Table 3-6 T1 Use Case Diagram elaboration

3.7 Print Screen

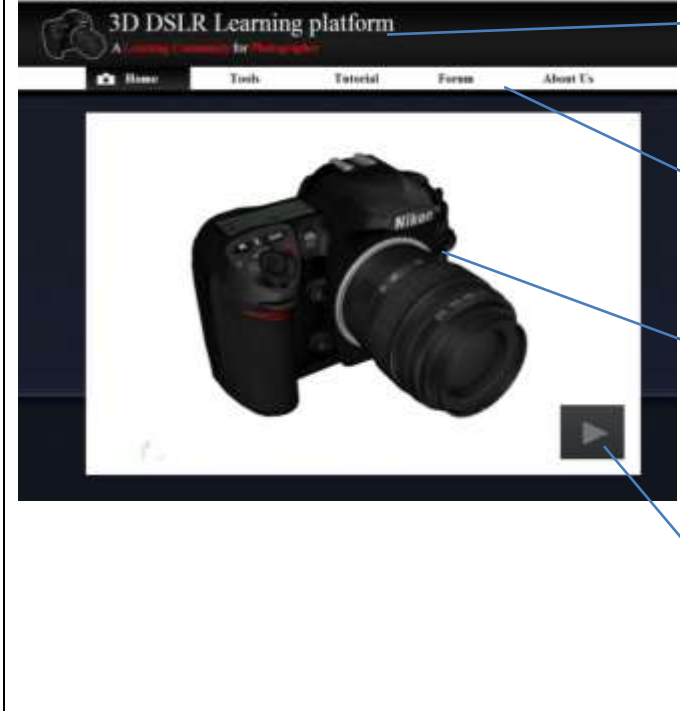
	<ul style="list-style-type: none">- 3D DSLR Learning. Platform Logo. A symbol or logo used to represent in this website.- Navigational bar. It used to navigate different page in this website.- 3D DSLR model. Users can interact with this model and rotate the model with different camera view.- Play Button. After clicking “play button”, it will label the hotspot of the camera model.
--	---

Table 3-7 T1 Print Screen 1


	<p>- Tools page. The page provide for users to browse the DSLR's accessories and able for users to change those accessories from DSLR model.</p>
	<p>- Macro Lens Button. After user clicking "Macro Lens Button", it macro lens will attach into the model.</p>
	<p>- Capture Button. This button was used in the entire platform for capture photo function. After user clicking on the "capture button", the image was capture by the camera model.</p>

Table 3-7 T2 Print Screen 2


	<p>- Tutorial Page. This page provide for fresh camera men different DSLR tutorial to improve their DSLR skills. Not only theory tutorials but also provide different DSLR simulators for users to easier to learn.</p>
	<p>- Shutter Speed Scene. A motion scene provided for users to explore how the shutter speed work.</p>
	<p>- Shutter speed controller. After dragging the “shutter speed controller”, it will change the shutter speed of the DSLR model.</p>
	<p>- Aperture Controller. After dragging the “aperture controller”, it will change the aperture of the DSLR model.</p>
	<p>- Tour guideline button. After user clicking the “tour guideline button”, a tour will guide the user to start how to control aperture and shutter speed.</p>

Table 3-7 T3 Print Screen 3


	<p>- Result Image. After clicking the capture button, the result image will display for user on the screen.</p> <p>- Recommendation/ Instant Feedback. A guideline will display on the bottom of image result for improvement purpose.</p>
--	--

Table 3-7 T4 Print Screen 4

Chapter 4: Implementation and Verification

4.1 Implementation

4.1.1 Modeling 3D DSLR model

In implementation phase, the 3D interactive demonstration of experimental objects was created. For modeling 3D model, I am using the professional design software, 3Ds Max 2012 64-bit English version published by Autodesk to model the 3D DSLR camera. Autodesk 3Ds Max is top animation software used by developers, graphic designer in film, television, visual effect artists and the game industry. For this platform, 3Ds Max was used to modeling the 3D DSLR model, Lens models and so on. Steps of modeling 3D DSLR camera is listed as below:

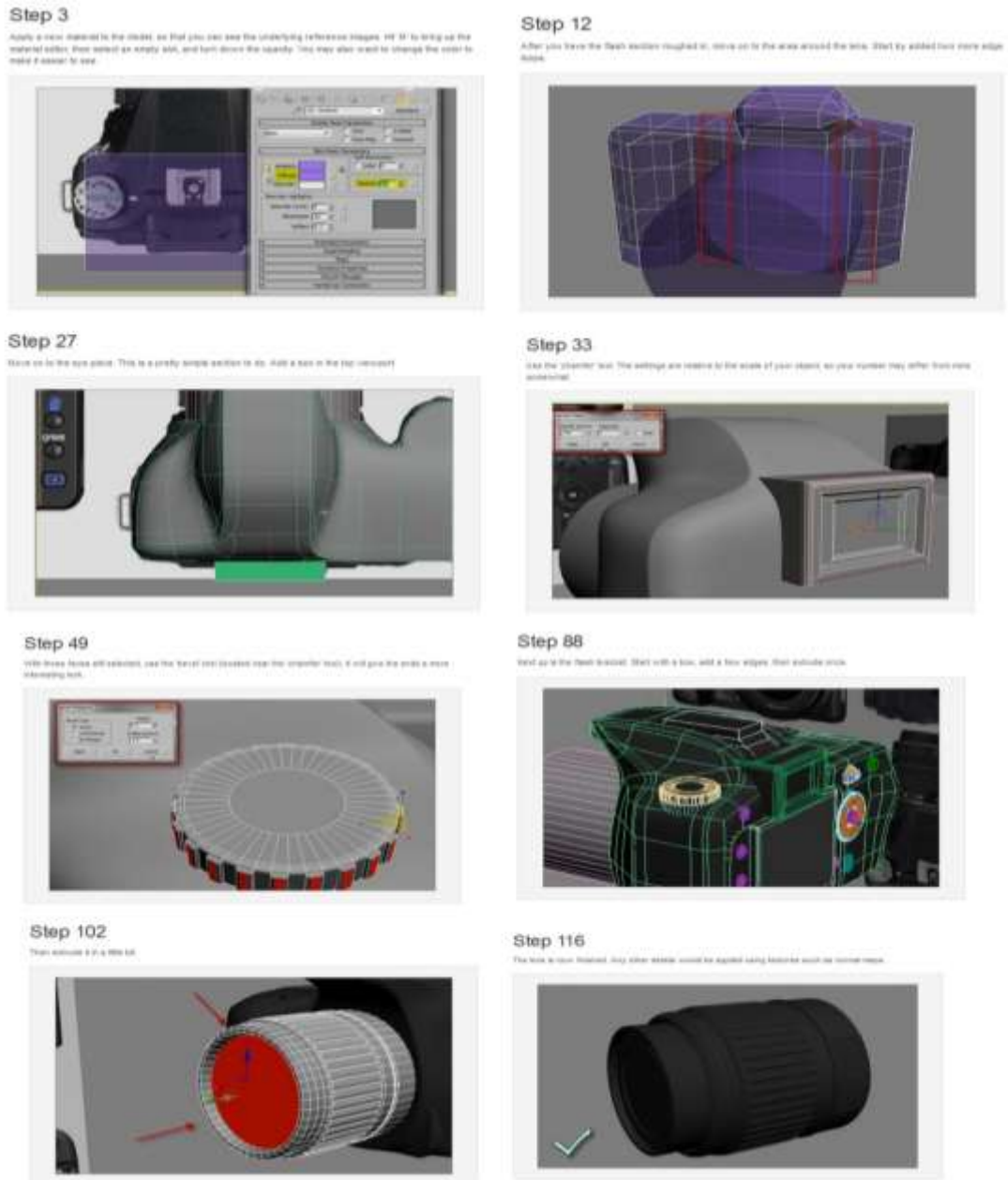


Figure 4-1-1 F1 Step of modeling 3D DSLR and lens

Regarding the pictures above, those steps are used to modeling a detailed 3D DSLR camera. From the step 3 picture, we can know that the dimension of the camera based on the references scene provided on the web. Started by add two more edge loops on the area around the lens by follow the steps 12. The pictures shown the step 33 is used the 'Chamfer' tools to create the camera model's viewer and by follow step 49 to create the mode selector dial which users can adjust different modes on the camera. To make the mode selector dial look more exactly like real life, extrude every other face on the side. According to the picture which shown step 88 enable to create each of small components of 3D model camera. Follow the step 102 until step 116, the DSLR lens model was completely done.

To make the model to more realistic, texturing DSLR model action was taken. The skin of DSLR was created with use of Adobe Photoshop and the skin of DSLR must arrange accordingly position so it only can fixed in the right position. After, open material editor in 3Ds Max and choose diffuse bitmap to diffuse the skin on the certain component. The picture below show that diffuse lens skin on the surface of lens model.



Figure 4-1-1 F2 Model texturing

4.1.2 Create Interaction 3D model

After that, exporting 3D model into VRML97(*.WRL) file format that can supported by Wire fusion 5 for purpose to create a model that users to operate and interact with the 3D DSLR model, within set different functions of camera and able user to capture photos like real.

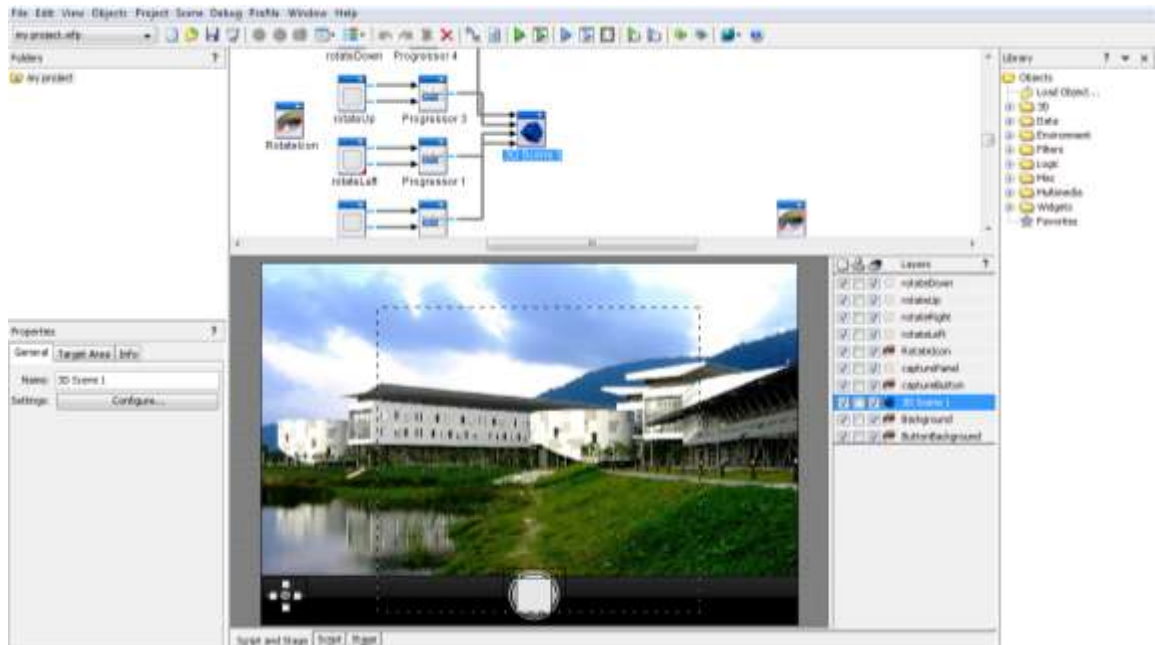


Figure 4.1.2 F1 Wirefusion Script and Stage view

In Wirefusion 5 any object can be insert and also 3D scene object. In 3D scene object it contain two type of 3D mode which are 3D object examine mode use to rotate and zoom and 3D world walk use to walk around to the scene. Import 3D DSLR model and choose the examine mode enable users to rotate, operate, zoom and also control with the model.

Connect among the objects together was an essentials procedure in these project, where the connections are used to for exchanging information and parameters between the objects. The parameters sent out through an out-port when the object's mouse events occurred and come into an object through in-port.

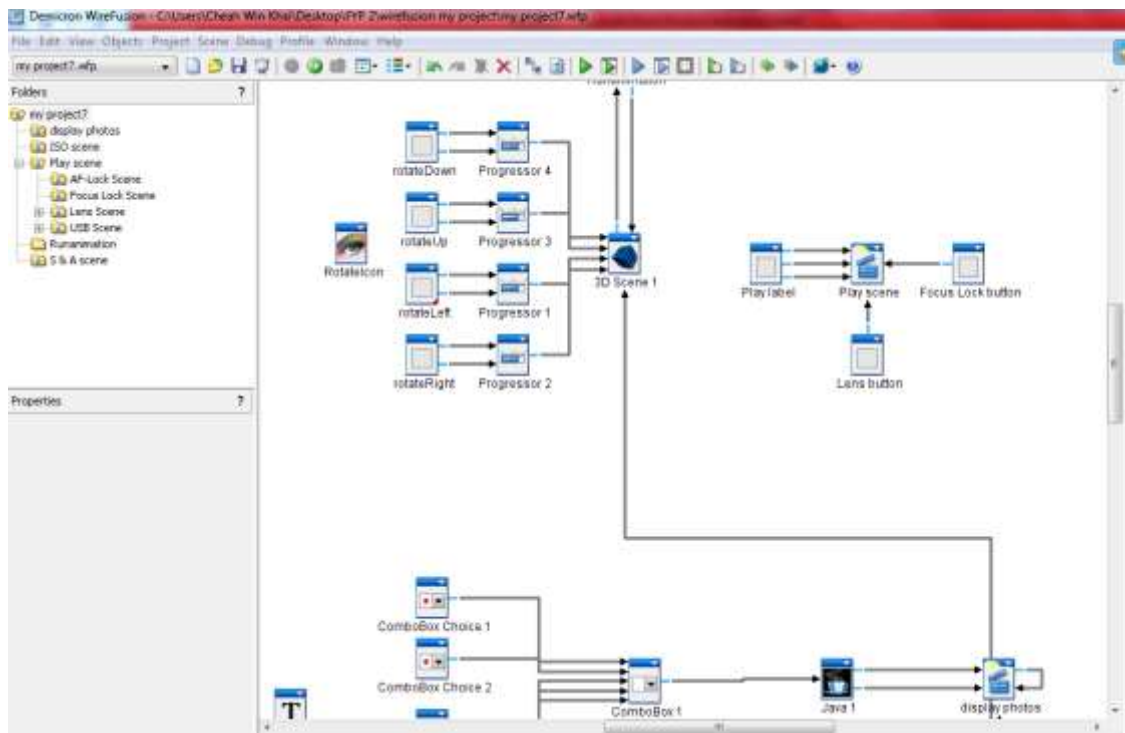


Figure 4.1.2 F2 Connection among object in Wirefusion

A powerful Java object is available in wirefusion. It can be used for building your own WireFusion objects, for controlling 3D Scene objects and to dynamically control objects and wires during presentation runtime.

In Java object, it allows to write and compile Java code directly from inside WireFusion. It is, for instance, very useful for writing widgets, mathematical expressions or advanced functions. Pulses, numbers, 2d numbers, text strings and Boolean parameters can be sent in to the object, which can be processed and then sent

out again. It can also be used to control parameters in 3D scenes using the 3D API. External Java libraries and resources, like images for example, can be imported.

Java object was used for controlling 3D DSLR object and to set different features of 3D camera. After add on external Java image libraries, image can be sent in to java and perform some action before sent out. Java image libraries was play an vital role t develop this learning platform, since most of the elements in these platform is image.

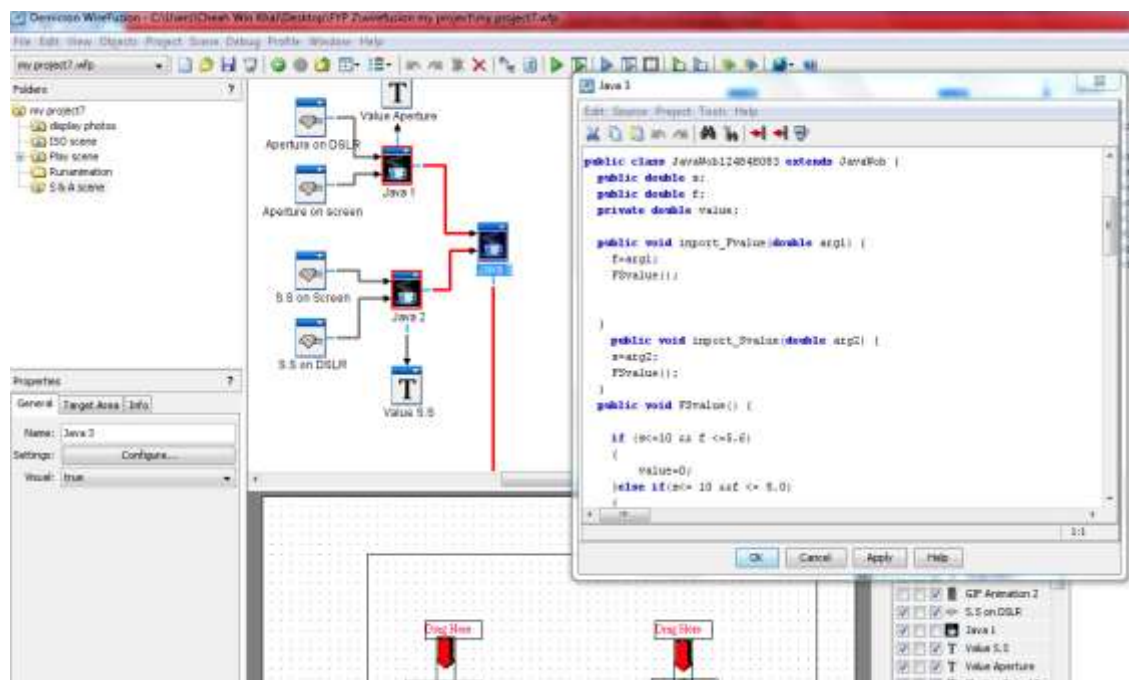


Figure 4.1.2 F3 Java object in Wirefusion

Entire interactive 3D DSLR platform is develop by wirefusion that provide an interactive 3D technology for product visualization and internet marketing. Finally, the platform will publish onto web, in order to allow the users to browse the 3D model at any time.

4.1.3 Create Webpages

The table below show that some tools and language was used to create a webpages.

Cascading Style Sheets	Cascading Style Sheets control how web pages are displayed in the browser, and allow the separation of presentation from structure and content. CSS help ensure that web pages are presented in an accessible way to all visitors, over a wide range of media.
JavaScript	JavaScript is a lightweight scripting technology which is used alongside XHTML documents to make websites more interactive.
HTML	HTML is a language for describing web pages. It is the predominant markup language for web pages. HTML is the basic building-blocks of webpage.

Table 4.1.3 T1: Language used to create webpages

For generation of code, Programming tools like Compilers, Interpreters, and Debuggers are used. In addition, I will generate necessary testing plans as well as technical documentation. This may help in programmers understand the program flow when doing maintenance in the future.

4.2 System Testing

System testing is the important part to be done after it reaches its development completion. A completed 3D DSLR learning platform was tested to ensure software requirements specification concerning the actual software has been met the error that detected before the system deliver to the end user.

Black-box testing and White-box testing approaches have been chosen to conduct the testing for 3D DSLR learning platform. These techniques are exercising a program with the specific intent of finding errors and validate and verify correctness before delivery to end users. Black-box testing is an approach which the program test cases are carried out based on the system specification. Besides, it is a technique which develops tests by examining the object under test with no knowledge of its internal structure/ design/ implementation. It focuses on the functionality of the system. In 3D DSLR learning platform, an input-output model of program testing was designed to determine the anomalies and defects of this system. It is effective technique for discovering the program error of this system. Positive testing and negative testing used to conduct invalid and valid action. Positive testing was designed to determine expected results that are consistent with the stated requirements. Negative testing was designed to determine what respond taken if key in invalid or unexpected data. The error guessing was used to notify the user to enter correctly value by prompting out a message box. White-box testing is a derivation of test cases according to program structure and usually examines the source code to develop test cases. This testing is a method of testing in which knowledge of the software's internal design is use to develop test cases. There consist the equivalence portioning and boundary analysis. The equivalence portioning will test the user to enter valid input in the range of value. The boundary analysis will exercise specific limitations of

the software such as minimum and maximum values in order to determine if the software behaves reasonably.

Besides, usability testing also included in testing process and it broken down into three sections. These include layout and user interface, quality content and complexity. In first section, layout and user interface was conducted to tested layout structure, button function, camera view of 3D model, multimedia elements used and link between modules. Second section more focus on quality content is all about content in each respective module. It will be tested based on reliability, correctness of DSLR tips, error free from grammar and scope. For third section, complexity of the 3D DSLR learning platform has been tested. It test about the platform ease of use which includes the time needed to get used of platform operation, user control of the 3D DSLR model and navigation between the pages.

4.3 Testing Result

4.3.1 Test data

Real data has been used to perform all the test script for 3D DSLR learning platform.

Login Module

Password valid	Password invalid
----------------	------------------

Password	Key	Output
{1234}	Nothing	False, ??
{1234}	{1234}	True, 1
{1234}	{0000}	False, ??
{1234},{0831},{dslr},{aperture}	{1234}	True, 1
{1234},{0831},{dslr},{aperture}	{aperture}	True, 4
{1234},{0831},{dslr},{aperture}	{8899}	False, ??

DSLR ISO Module

Setting ISO 200	Setting ISO 800	Setting ISO 1600
-----------------	-----------------	------------------

Input	Test Data	Output
Drag ISO to 200	Same image with ISO 200	True
Drag ISO to 800	Same image with ISO 800	True
Drag ISO to 1600	Same image with ISO 1600	True

4.3.2 Test Case Design

The unit testing refers Table 4-3-2 T1 to Table 4-3-2 T3

Project ID	PKS 4543 –PSM 2		
AUT Title	3D DSLR Learning platform	AUT version	1.0
Testing Phase	Unit Testing	Date of Test	20/3/2013

Test ID	UT01 – Password correctness module unit testing(s)
Purpose of test	To ensure that users can login successfully
Test environment	Windows 7 Ultimate WireFusion 5.0 enterprise
Test Steps	<p>Enter the password, and click on the “Login” button to login. Click on” Clear All” button to clear the password on the text box.</p> <p><u>Positive and Negative Testing</u></p> <p>Enter the valid password and invalid password to determine what respond taken.</p> <p><u>Error Guessing</u></p> <ul style="list-style-type: none"> • If invalid passwords enter, a message box “please key in correct password” will be displayed and notice users to login again.
Expected Result	After password enters correct, Home page with a 3D DSLR model will appear on the display screen.

Table 4-3-2 T1: Login Module Unit Test

Project ID	PKS 4543 –PSM 2		
AUT Title	3D DSLR Learning platform	AUT version	1.0
Testing Phase	Unit Testing	Date of Test	18/3/2013

Test ID	UT02 –DSLR ISO module unit testing(s)
Purpose of test	<p>To ensure that</p> <ul style="list-style-type: none"> • The effect of image result is exactly with realistic image result. • Different contrast and noise on the photo depend on different setting of ISO. • Different instant feedback based on different ISO setting.
Test environment	<p>Windows 7 Ultimate WireFusion 5.0 enterprise</p>
Test Steps	<ul style="list-style-type: none"> • Drag ISO controller to ISO equal to 200, then click on “capture” button. • The result image will be display. • Used the result image compare contrast, brightness and noise with realistic image which setting ISO 200. • Repeat steps above into different ISO settings which are 400, 800 and 6400. <p><u>Input-output model of program testing</u></p>

	If adjust to ISO 200, the contrast, brightness and noise on result image is exactly with result image which also adjust ISO 200 on the DSLR camera.
Expected Result	The result of different ISO setting on the platform will accordingly with the result of different ISO setting on realistic DSLR.

Table 4-3-2 T2: ISO Module Test



Figure 4-3-2 F1 ISO module test


<p>Result image (ISO6400) on the 3D DSLR learning platform</p>	<p>Realistic image (ISO image)</p>
	

Table 4-3-2 T3 Input-output model of program testing

Project ID	PKS 4543 –PSM 2		
AUT Title	3D DSLR Learning platform	AUT version	1.0
Testing Phase	Unit Testing	Date of Test	19/3/2013

Test ID	UT03 –Aperture and Shutter Speed module unit testing(s)
Purpose of test	<p>To ensure that</p> <ul style="list-style-type: none"> • The effect of image result is exactly with realistic image result. • Different effects of the photo depend on different setting of

	<p>shutter speed and aperture.</p> <ul style="list-style-type: none"> • Different instant feedback based on different shutter speed and aperture was set.
Test environment	<p>Windows 7 Ultimate WireFusion 5.0 enterprise</p>
Test Steps	<ul style="list-style-type: none"> • Drag aperture controller to F/8.0 and shutter speed into 1/30 sec, then click on “capture” button. • The result image will be display. • Used the result image compare the effect of the photo (blur motion, brightness and clearer) with realistic image which setting aperture F/8.0 and shutter speed 1/30sec. • Repeat steps above into different aperture and shutter speed settings which are (F/16.0, 1/125 sec), (F/22, 1/1000sec) and (F/5.6, 1/500sec) <p><u>Input-output model of program testing</u></p> <p>Each of the result image’s effect same with the realistic photos capture by DSLR with same setting.</p>
Expected Result	<p>The result of different aperture and shutter speed setting on the platform will accordingly with the result of different aperture and shutter speed setting on realistic DSLR.</p>

Table 4-3-2 T4: Aperture and Shutter Speed Module



Figure 4-3-2 F2 Aperture and Shutter Speed module test



<p>Result image on the 3D DSLR learning platform (<i>setting aperture F/8.0 and shutter speed 1/30sec</i>)</p>	<p>Realistic image (<i>setting aperture F/8.0 and shutter speed 1/30sec</i>)</p>
	

Table 4-3-2 T5 Input-output model of program testing ii

4.3.3 Table Summary Result

Test ID	Success	Failure	Software Problem Submitted	Remarks
UT01	Yes	None	None	None
UT02	Yes	None	None	None
UT03	Yes	None	None	None

Table 4-3-3 T1 le Summary Result

4.3.4 Usability Testing Result

The result of each usability testing is organized in table below:

Usability Testing	Layouts and User Interfaces <ul style="list-style-type: none">- Users are able to understand what the buttons represent in first sight.- Users are satisfied the layouts and structure of the platform.- Users comfortable the different view of camera on different modules.- Users are able to operate the platform as desired with available control functionalities.
	Contents <ul style="list-style-type: none">- Fresh camera men are able to understand the contents provided.- The contents are suitable for the fresh camera men.- The contents provided correctly DSLR tips.

	<p>Complexity</p> <ul style="list-style-type: none">- Users are able to operate the platform freely without user manual.- Users can navigate throughout the platform without difficulty.
--	--

Table 4-3-4 T1 Usability Testing Result

Chapter 5 Conclusion

5.1 Conclusion

In the nutshell, 3D DSLR learning platform is an effective and efficient learning platform. By introducing 3D DSLR learning platform, this platform can help fresh camera men to learn the operation of DSLR in a short time period eliminate faces hard time to learn DSLR. Since it provides a good understanding to users and users can directly interact with the 3D model DSLR camera, instead of they do their own study on books. With the intention to show its ability to provide a different experience of learning and study, this has become one of motivations of this project.

Besides, it can train photography hobbyist to take professional-quality photographs. Photographers can change different lens, build in tripod by using the 3D DSLR platform. Through this, it helps users to make a good decision whether to purchase extra DSLR tools. Through invisible web- based environment, 3D DSLR learning platform provide a virtual physical testing area for users to choose and purchase their preferable tools of DSLR. Based on the research, photographer wishes to have a camera testing on the web-based system before purchase a new DSLR camera. They also hope can practice without stepped out from their home.

Moreover, advertising is another selling point of 3D DSLR learning platform. DSLR manufacturer introduces a new product and it is unfamiliar by current market. They can advertise their new product and give a guideline to users them by using the 3D model DSLR in an easier way.

5.2 Problem Faced

Several difficulties are encountered in different stages of project development. The first problem faced is regarding cannot find the software for 3D interaction. Before I am planning use X3D or VRML to develop 3D model interaction, but the result not satisfied due to the running of model unsmooth. In order to produce interaction 3D DSLR model with smoothly, powerful interactive 3D technology tools such as Demicron WireFusion is used. But, Demicron only provided WireFusion Free version which is limited tools and cannot perform JAVA. I am trying to use WireFusion5.0 Free version to develop my project but failed because of a lot modules cannot be develop since most of the features (ISO, Shutter Speed, and Aperture) that need to use JAVA to develop. In the end, WireFusion 5.0 enterprise with trial version was used to develop my project. Although WireFusion provide powerful interactive 3D technology tools for development, zero experience in using the tools is going to prolong the time of development. In addition, Blender is the modeling model in earlier stage since it is free for download from Blender organization but Blender's tools and tutorials provided in the internet were limited. Swift from Blender to 3Ds MAX decision was made in order to provide a model that exactly similar to today's world. After I checked from the internet, 3Ds MAX provided an educational version for students and with a complete function. 3Ds MAX have been used to model DSLR camera, lens and tripod. Not to mention that time allocated for the entire project is compact, extra time is needed to get familiar for both development tools is barely enough.

Apart from software issues, survey from fresh camera men is another challenge that I have met. Since 3D DSLR platform is more focusing on those who are unfamiliar with the DSLR, task of filter out among camera users is necessary. In this platform,

collecting the information from fresh camera men is needed since the purpose of this platform is provide an introduction of basic concepts for fresh camera men.

5.3 Knowledge Gained

It can be said that a lot of new knowledge is acquired throughout the process of the project. The first knowledge I had gained is related to multimedia developing skills. By following the tutorials on the web, I have learnt how to model a 3D model on the 3Ds MAX. Extrude a model, diffuse bitmap on the surface model, distort model, create animation on the model and etc skills were gained when developing the 3D DSLR model. Besides, using WireFusion tools to create an interaction model that have been learnt. In WireFusion's support center allow me to learn to create a connection between objects, parameters send through in port and out port, setting different camera view on the 3D DSLR, touching sensors to activate animation on 3D, using Java to create the features of DSLR and etc. I learnt those skills from different tutorials that are available on the web, including learn from video, manuals book, user forum, WireFusion's project provided on web and etc.

Another skill I have gained is project planning skills. This is what I have acquired during the planning stage of the 3D DSLR learning platform. I have learned how to plan and schedule my project in timelines. With this planning it can minimize uncertainty which will pass up project in deadlines and achieve the objectives of this project.

Third and final I have gained is time management skill. Since the development of this multimedia platform is individual work, it is crucial to effectively use the available time to complete the whole project without exceeding the due date. Besides, I have

learnt to arrange my time into schedule to keep track of the project progress while handling assignment and test for other subject. Time to learn the modelling model and create interactive model are calculated as well to allow me to have sufficient time in learning the required skills to develop the project.

5.4 Project Limitation

Since there is a large scale of knowledge about DSLR, basic photograph concept has become the major limitation of this project. It cannot be fulfilled the satisfaction of photographers' need to explore more than that through this platform. Although this platform was providing almost full range of basic photographer concept for fresh camera men, but it still not enough for photographers who want to explore more. Besides, it also becomes a limitation for expert photographers who want to learn expert DSLR tips. In this platform, it just only provides the basic photographer concept that include expert photographer concept such as white balance, exposure and etc.

Currently, there are a lot of different types of DSLR in the current market, some of the components or button place on different location on the DSLR body and might be made confusing for the photographer. Although, the model is develop according to the consistent DSLR in the market.

5.5 Future Enhancement

Future enhancement of the 3D DSLR learning platform is referring the project limitation. In the future, this platform will be filled with more and more the tips of DSLR, and even the expert photographer concept will be included. It will be included different DSLR features besides of IOS, aperture and shutter speed which are white balance adjustment, exposure and etc. An enhancement in tools as well, it will provide many tools for users to attach into 3D DSLR. The tools include different type of Lens, flashlight and etc.

There are two leading companies in current market which are NIKON and CANON. So for second enhancement is about provide two different brands 3D DSLR model for fresh camera men instead of one NIKON brand 3D DSLR model in currently platform. CANON model will be created for users who prefer CANON brands.

BIBLIOGRAPHY

1. Design and Development of 3D Virtual DSLR Camera Based on VRML and JavaScript (2010) Design and Development of 3D Virtual DSLR Camera Based on VRML and JavaScript, 5 (August 24-17,2010), p.1380-1384.
2. Photocation (2012) Tangible Learning System for DSLR Photography, 5 (May 5-10,2012), p.1691-1696.
3. Cambridgeincolour.com (2012) Cambridge in Colour - Photography Tutorials & Learning Community. [online] Available at: <http://www.cambridgeincolour.com> [Accessed: 11 Jul 2012].
4. Netbeans.org (2012) NetBeans IDE - PHP Development. [online] Available at: <http://netbeans.org/features/php/> [Accessed: 18 Jul 2012].
5. Sixrevisions.com (2009) 40 Useful Photoshop Web Layout Tutorials. [online] Available at: http://sixrevisions.com/web_design/40-useful-photoshop-web-layout-tutorials/ [Accessed: 19 Jul 2012].
6. Web3d.org (1977) Web3D Consortium - X3D Specifications. [online] Available at: http://www.web3d.org/x3d/specifications/x3d_specification.html [Accessed: 20 Jul 2012].
7. Worldwilearn.com (2005) Benefits of Online Learning | Education Guidance |

Bibliography

WorldWideLearn.com. [online] Available at:
<http://www.worldwidelearn.com/education-articles/benefits-of-online-learning.htm>
[Accessed: 7 Aug 2012].

8. Camerasim.com (2012) CameraSim | SLR Photography Demystified. [online]
Available at: <http://camerasim.com/> [Accessed: 16 Aug 2012].

9. Laing, A. (2007) DSLR Tips - Support this site by shopping via our partner stores.
[online] Available at: http://www.dsrltips.com/support/Support_DSLR_Tips.shtml
[Accessed: 11 Aug 2012].

10. Packer, R. (1999). Just What Is Multimedia, Anyway?. Pappas, C. (n.d.). The
ADDIE Instructional Design Model. Retrieved from:
<http://www.slideshare.net/CPappasOnline/the-addie-instructional-design-model>

12. Joubert, G. R. (n.d.). MULTIMEDIA: AN INTRODUCTION. Kahn, D. (n.d.).
How Effective is Multimedia in Online Training?. Retrieved from: <http://www.e-learningguru.com/wpapers/multimedia.pdf>

13. Coughlan, C. (1994). MULTIMEDIA: THE MARKETPLACE POTENTIAL.
Czyzewski, A., Skarzynski, H., Kostek, B. & Geremek, A. (1998). MULTIMEDIA
TECHNOLOGY FOR HEARING IMPAIRED PEOPLE.

14. Honarmand, M. (2008). Using Multimedia in Computer Based Learning (CBL) A
Case Study: Teaching Science to Student. Retrieved from:
<http://www.waset.org/journals/waset/v42/v42-134.pdf>

15. Laaser, W. (2004). Multimedia Enrichment for Online Courses in Economics and
Business Administration. Retrieved from:

Bibliography

<http://pppjj.usm.my/mojit/articles/pdf/1204/Multimedia%20Enrichment%20for%20Online%20Courses.pdf>

16. Machover, C. (1995). USING MULTIMEDIA AND VIRTUAL REALITY IN ENGINEERING AND MANUFACTURING.

17. Renault, S., Meikohn, F., Kharaoui, D. & Blandin, P. (2004). Reactive and Adaptive Multimedia Objects Approach For Interactive and Immersive Applications.

18. Freund, E. & RoBmann, J. (2001). Multimedia and Virtual Reality Techniques for the Control of ERA, the First Free Flying - Robot in Space.

19. Thalmann, N. M. & Bonanni, U. (2006). Haptics in Virtual Reality and Multimedia The ADDIE Instructional Design Model. (n.d.). Retrieved from: <http://www.outsource2india.com/LearningSolutions/articles/ADDIE.asp>

Appendix

Survey Form

3D DSLR LEARNING PLATFORM

Research is initiated to obtain answers to certain questions of interest. The following questions are use to ascertain or obtain answers from responders to use as an example for a research project. Thank you for talking the time to fill in this questionnaire, you will remain anonymous.

*** Required**

1. Do you own DSLR (Digital Single Lens Reflex) camera ? *

Yes (If Yes, please answer question 2)

No (If No, please skip question 2)

2. What brand of DSLR camera do you have?

Nikon

Canon

Olympus

Sony

Pentax

Other:

3. Do you know to use DSLR (Digital Single Lens Reflex) camera ? *

Yes (If Yes, please answer question 4)

No (If No, please skip question 4)

4. Where are you learn the basic photography lessons on the DSLR ? (can select more than one)

Web

Instructions Book

Photographers

Friend and Family

Talk

All Above

Other:

5. Are you internet user ? *

Yes

No

6. Have you encourage 3D environment web based system? *

Yes

No

7. What skill level are you right now? *

1 2 3 4 5

Begginer Professional Photographer

8. Do you feel DSLR camera difficult to use? *

Yes

No

9. Which DSLR photographic elements is the most difficult to learn? *

Apperture

ISO

Shutter Speed

White balance

Exposure

All Above

No idea

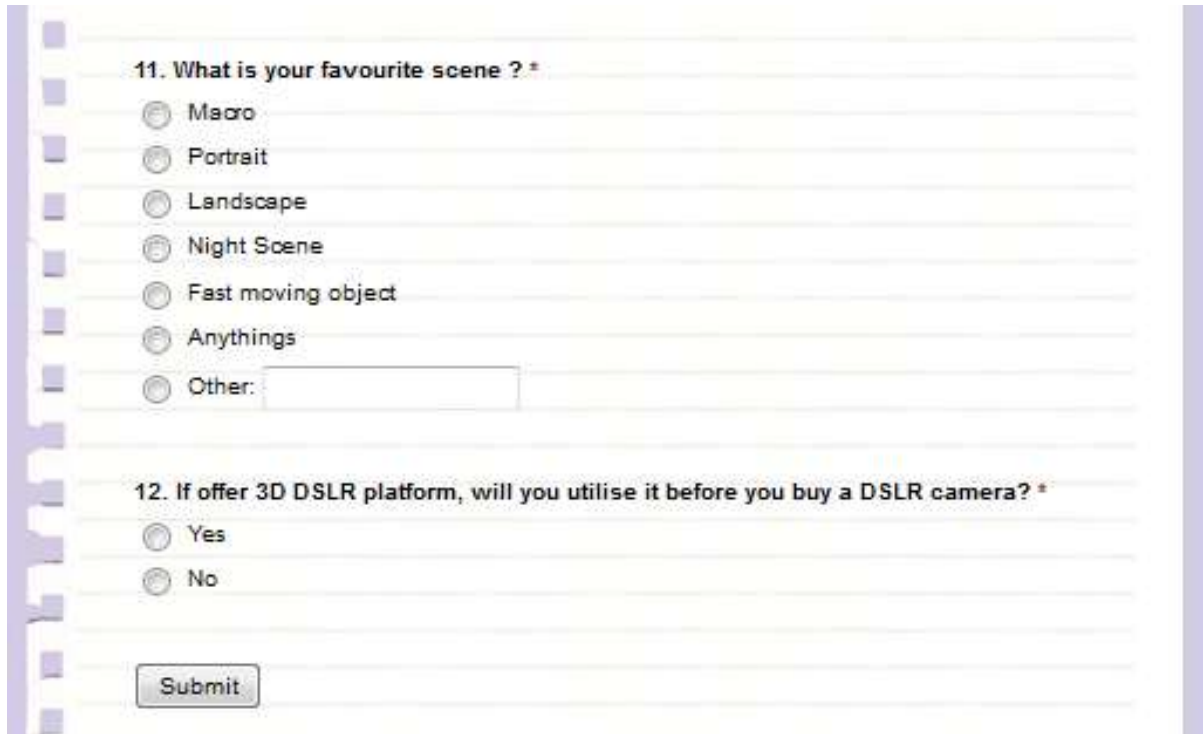
Other:

10. Which type of learning lesson help you to learn DSLR in an easier way ? *

Practical

Theory

Other:



11. What is your favourite scene ? *

- Macro
- Portrait
- Landscape
- Night Scene
- Fast moving object
- Anythings
- Other:

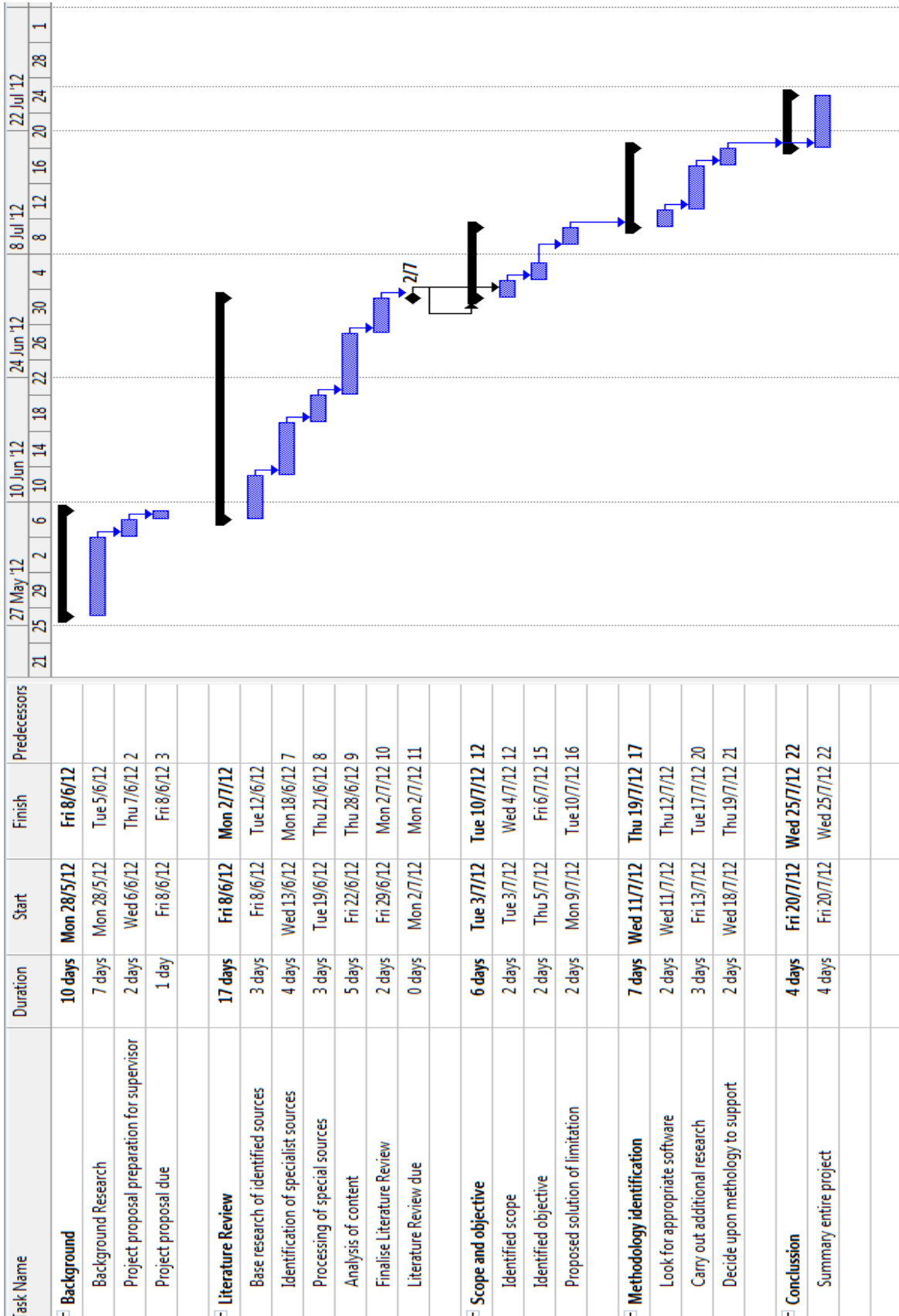
12. If offer 3D DSLR platform, will you utilise it before you buy a DSLR camera? *

- Yes
- No

Survey Form: URL

<https://docs.google.com/spreadsheet/viewform?formkey=dGdMWGFrdV9Eakkwb0dlWkpFZFdnaEE6MQ#gid=0>

Final Report 1 Timeline



Final Year Project II Timeline

