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## Irish Legal System.Com; An Educational Game about the Irish Legal System

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**IRISH LEGAL SYSTEM.COM**

**AN EDUCATIONAL GAME ABOUT THE IRISH LEGAL SYSTEM**

A major project report submitted to the Dublin Institute of Technology  
in part fulfilment of the requirements for award of  
MA in Digital Media Technologies

by

Peter Dee

May 2006

Supervisor: Mr. Qamir Hussain

## DECLARATION

I hereby certify that the material, which I now submit for assessment on the programme of study leading to the award of

MA in Digital Media Technologies

is entirely my own work and has not been submitted for assessment for any academic purpose other than in partial fulfilment for that stated above.

*Signature:* \_\_\_\_\_ (*Candidate*)

*Date:* \_\_\_\_\_

## **DEDICATION**

To my truly wonderful wife Elaine

- Peter

## **ACKNOWLEDGEMENTS**

I would like to take this opportunity to thank my supervisor, Quamir Hussain, for his invaluable advice and support throughout the project. I would also like to thank the MA in Digital Media Technologies teaching staff for their exceptional help over the last two years.

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**PETER DEE**

**IRISH LEGAL SYSTEM.COM**

**AN EDUCATIONAL GAME ABOUT THE IRISH LEGAL SYSTEM**

The major project is about the design, development and implementation of an educational game which focuses on the Irish legal system. The written report describes how the idea for the game came about, how the project was managed and implemented, and how it works to provide the user with information about principal areas of law in Ireland. The project involved four phases across a fifteen week calendar schedule. Each phase was broken down into separate steps to enable easier management. Milestones were used to indicate progress and best practices were followed throughout each stage of the project. Research material and content was gathered and analysed. The information was used to determine the application's visual metaphor and user gameplay experience. The two games within the application relate to conveyancing and tort. Land Law is an action maze game and Law of Torts is a game show based on legal knowledge.

Once the application's graphical user interface was designed it was used to build the 'look and feel' prototype which was redesigned and retested based on feedback from user testing. ActionScript, the authoring language built into Macromedia Flash, was used to programme the prototype. Each line of code was tested to its limits as it was authored to ensure clean execution. Sound was integrated into the application to enhance interactivity and user gameplay experience. The application was rigorously playtested to ensure that everything worked as intended. The files relating to the application were then uploaded to the web server for online distribution. The major project report describes the four phases of the project's lifecycle in detail and evaluates the application and the reasoning behind all design and management decisions made during development.

## ABBREVIATION

<i>.AI</i>	Adobe Illustrator
<i>.FLA</i>	Macromedia Flash
<i>.JPEG</i>	Joint Photographers Expert Group
<i>.SWF</i>	Shockwave Flash
<i>.TXT</i>	Text file format
<i>.WAV</i>	Microsoft and IBM WAV
<i>AI</i>	Artificial Intelligence
<i>AS</i>	ActionScript 2.0
<i>DIT</i>	Dublin Institute of Technology
<i>EGA</i>	Educational Gaming Application
<i>EIDAU</i>	Enterprise Ireland Design Advisory Unit
<i>FLAC</i>	Free Legal Advice Centres
<i>FPS</i>	Frames per Second
<i>FTP</i>	File Transfer Protocol
<i>GDD</i>	Game Design Document
<i>GUI</i>	Graphical User Interface
<i>HCI</i>	Human-Computer Interaction
<i>HTML</i>	Hypertext Markup Language
<i>kHz</i>	Kilohertz
<i>LAB</i>	Legal Aid Board
<i>LGSFP</i>	Logical Game State Flow Prototype
<i>MB</i>	Megabytes
<i>PDF</i>	Portable Document Format
<i>RGB</i>	Red, Green, and Blue
<i>PPI</i>	Pixels per Inch
<i>TCA</i>	The Competition Authority
<i>UCD</i>	University College Dublin
<i>UNA</i>	User Needs Analysis
<i>URL</i>	Uniform Resource Locators

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## CHAPTER 1

### CONCEPTION

#### **Defining the Brief**

The major project is comprised of a digital media artefact and an accompanying written report of 10,000 - 12,000 words. The major project relates the study of digital media technologies to a practical (though not necessarily commercial) situation where the knowledge and expertise gained is applied to define, analyse and develop a solution to a digital media production problem. The major project report provides the opportunity to describe, analyse and evaluate the digital media artefact through a written submission of the highest academic standard (DIT, 2006).

#### **Project Background**

On Wednesday, 11th January 2006, the Minister for Justice, Mr. Michael McDowell announced the establishment of a new body to regulate legal costs and the introduction of a range of measures to make legal fees more transparent. He made this announcement on foot of the recommendations contained in the report of the Legal Costs Working Group set up in 2004 under the chairmanship of Mr. Paul Haran (Coulter, 2006, 'Legal fees to be made more transparent under reforms', *The Irish Times*) (Department of Justice, 2005, pp. 35-36) (*Appendix A*).

In examining the existing system of legal costs, the Haran group commissioned independent research from economist Vincent Hogan of University College Dublin (UCD). The research showed that there were wide variations in the fees charged to consumers by individuals of the legal profession, with some solicitors and barristers earning almost twice what others earned for the same work (Brady, 2006, 'Fat cat fees to be cut in legal reform', *Irish Independent*). In an era of consumer rights and competition,

the new reforms aim to force solicitors and barristers to provide a breakdown of fees being charged in order to give clients the information they need to make informed choices. All fees must be itemised and it must be clear to the client what they are being charged, why, and the basis for the charges (O'Malley, 2006, 'Reform must target costs of the law', *Irish Independent*).

### **Project Brief**

The brief for the major project was inspired by Mr McDowell's comments and revolves around the creation of an educational game about the Irish Legal System. In the format of an Educational Gaming Application (EGA), digital media technology is used as a tool to solve a real world problem; making information about some of the principal areas of law in Ireland more accessible to those who need it most. Every Irish citizen has the right of access to justice and any denial of this right, regardless of means, is the denial of a core and fundamental human right. In 1979 the Legal Aid Board (LAB) was established by the State to deliver a range of civil legal aid services at low cost to the growing number of people unable to fund such services from their own resources ([www.legalaidboard.ie](http://www.legalaidboard.ie) (2006) [Online]. [Monday 20th February]. Available from World Wide Web: <<http://www.legalaidboard.ie/lab/lab.nsf/leaflet1.pdf>>) (*Appendix B*). However, according to the Free Legal Advice Centres (FLAC) report published in July 1995, the LAB scheme had failed to achieve its stated goal after twenty five years of state legal aid. The FLAC report showed that many people suffer, unaware that they are being wronged, because they lack the relevant information or advice ([www.flac.ie](http://www.flac.ie) (2006) [Online]. [Monday 20th February]. Available from World Wide Web: <[http://www.flac.ie/Access to Justice\\_A right not a privilege.pdf](http://www.flac.ie/Access%20to%20Justice_A%20right%20not%20a%20privilege.pdf)>) (Free Legal Advice Centres (FLAC), 2005, pp. 3-7) (*Appendix C*).

### **Project Goal**

The goal of the application is to provide the user with information about principal areas of law in Ireland. In order to gain a clear understanding of the application's content and to identify potential users, a User Needs Analysis (UNA) was carried out (Murray, 2005) (*User Needs Analysis Framework* (2006) [Online]. [Monday 6th March]. Available from World Wide Web: [www.uclan.ac.uk/facs/destech/compute/research/conference/april2002/macfarlane.doc](http://www.uclan.ac.uk/facs/destech/compute/research/conference/april2002/macfarlane.doc)) (*Appendix D*). Based on the results of the UNA, two user scenarios were created.

### **User Scenario: Land Law**

A first time buyer is looking to make a house purchase but knows very little about the area of law that deals with the transfer and acquisition of the ownership of property. By playing Land Law, they attain outline knowledge of conveyancing (*Tyrrell Solicitors* (2006) [Online]. [Wednesday 8th February]. Available from World Wide Web: [www.lawyer.ie/10steps/house10s.htm](http://www.lawyer.ie/10steps/house10s.htm)).

### **User Scenario: Law of Torts**

A person with no legal background wants to get a basic understanding of the principal areas of law in Ireland. They play Law of Torts and are provided with outline knowledge of the area of law concerned with civil liability (Doolan, 2003, p. 157).

The UNA ensured that all tasks throughout the project's development were carried out with the sole objective of meeting the needs and expectations of the prospective user.

There are a number of purposes behind the application. The first is to provide the user with outline knowledge of some of the principal areas of

law in Ireland to work towards enabling them to make informed choices. The second is to entertain the user by ensuring that the application has good replay value. The third is to create awareness of the existence of low cost civil legal aid services in Ireland. In its initial capacity, the application will address the two most demanded areas of law, Land Law and the Law of Torts and will eventually expand to cover other areas including, Family Law, Contract Law, Criminal Law, Business Law and Employment Law (The Competition Authority (TCA), 2005, p. 27) (*Figure 1.1*). The application works as a learning tool which could be placed in the context of a citizen's advice web application.

Many socially excluded individuals and groups will, at some point, come into contact with the legal process, whether because of the condition of their housing, an inability to access essential services, or problems paying bills or for similar reasons. They may perceive law, and the legal process only as a threat. They are also those who are least likely to have access to justice. To date, the LAB has disseminated information about its services by producing a series of legal aid leaflets. This current level of publicity leaves a gap in information provided to the public about the service's existence (Free Legal Advice Centres (FLAC), 2005, pp. 24, 59-60). The application not only works to provide the user with outline knowledge of some of the principal areas of law in Ireland, but also works to create awareness of the existence of low cost civil legal aid services.

### **Project Management**

Of the several approaches which were available for managing the design and development of an EGA, the classic waterfall lifecycle model was used. This model followed four well-defined phases of preproduction, production, postproduction, and playtesting. Adherence to these phases imposed a logical sequence of elaboration and a reasoned and progressive management

structure (DIT, 2006). To ensure neat housekeeping, directories were created along the way to house content for each phase as the project developed (*Figure 1.2*). Only when each phase of the project was complete, did it progress to the next phase (Bates, 2004, p. 225).

Preproduction began with scheduling; involving an estimation of the scope of the project and the amount of weeks it would take to build the application. The estimate was spread out over a five day week calendar schedule, allowing for overhead activities such as meetings and holidays. The schedule allowed three weeks for preproduction, three for production, five for postproduction and four for playtesting. Milestones to mark the completion of a certain amount of work were used to give an indication of progress as the project developed over time. The schedule was created using Microsoft Office Excel 3003 by modifying an existing template available from Microsoft Office Online (*Microsoft Office Online* (2006) [Online]. [Monday 13th February]. Available from World Wide Web: <<http://office.microsoft.com/en-gb/templates>>) (*Figure 1.3*). The issues concerning budget and personnel were not major factors in the planning stages of this particular project because the application was developed by a single candidate for academic assessment leading to an educational award. A wide variety of different types of hardware and software resources were used to develop the application (*Table 1.1*).

### **Design Strategy**

The application was developed from a functional top-down approach, starting out with a high-level concept and breaking it down into separate steps which were easier to manage (Bhargal, 2004, pp. 30-33) (Schultz, Bryant, and Langdell, 2005, p. 79). The initial design included a formal Hypertext Markup Language (HTML) website through which the user would access the Flash-based application. This allowed for the addition of

new EGA's, based on principal areas of Irish law, at some future point in time. Research and brainstorming during preproduction was approached with a questioning attitude. Bits and pieces of information relating to the project were collected from numerous books, magazines and online sources and analysed. Objectives, content, target audience, user profile and technology issues were determined and a suitable genre and visual metaphor was chosen. The user gameplay experience for Land Law is an action maze and the Law of Torts is a game show based on legal knowledge. The application's mission is to provide the user with information about principal areas of law in Ireland. Every design, artwork, and programming decision during development stemmed from this mission statement.

A Game Design Document (GDD) was developed to describe in detail what the application was about and was updated regularly as the project took shape over its lifecycle. The GDD included complete information about the application's story, gameplay, content, characters, settings, controls, user interface, and required media assets. The features in the GDD became the requirements from which the art production plan and the technical plan were made (Bates, 2004, pp. 208-210, 276) (*Appendix E*).

A preliminary storyboard, determined by the content, was developed to bring the application to life through a series of simple sketches, incorporating details about user interaction, content, audio and instructions (Patmore, 2003, p. 24) (*Figures 1.4-1.7*). A Logical Game State Flow Prototype (LGSFP), developed from the storyboard, was used to categorise information and test user navigation (Gassaway, 1997, p. 16) (*Figure 1.8*). The application, at its core, consists of user input, followed by some form of output. Other types occur because the game state reaches a specific point (Fox and Verhovsek, 2002, pp. 15-16). A list for all media assets, which



varied from visual graphics and audio to hidden game state variables, was included in the GDD (*Table 1.2*).

### **Media Assets**

The graphical assets which make up the application's Graphical User Interface (GUI) include characters, backgrounds, logos, objects, and titles. These are vector-based 2D illustrations which were created using Adobe Illustrator CS and imported into Macromedia Flash MX Professional 2004. Sound effects and background music that are integrated into the application were sourced from the web, processed and converted to Microsoft WAV file format (.WAV) using Digidesign Pro Tools and Sound Forge. The artificial Intelligence (AI) and global variables contained within each game were programmed with ActionScript 2.0 (AS), the authoring language built into Flash. AS follows the European Computers Manufacturers Association Script standard (ECMAScript) (Moronta, 2004, p. 5). The application was developed using Flash and incorporates image, text and sound. Requiring low-bandwidth, the application is designed for cross-platform delivery through common browser types with the latest Macromedia Flash Player installed (*Appendix F*).

## **CHAPTER 2**

### **DEVELOPMENT**

#### **Design Considerations**

The GDD and the LGSFP provided the framework upon which the application's 'look and feel' was developed. During the early stages of the production phase, a visual reference library of images, reflecting the application's intended artistic style, was assembled from research gathered during the preproduction phase. The reference material was used for guidance purposes.

#### **Design Development**

Adobe Illustrator CS was used to produce the application's 2D vector-based graphical elements and a single directory was used to store all of the concept art as it developed to ensure a consistent style throughout. Art production began with character development, namely Joe Punter, whose uncomplicated, symmetrical design employed the style of Bob the Builder. A limited animation technique was used to develop the Joe Punter character. Simple, separate shapes were combined with bold, flat colour and smooth unobtrusive line work so that all character drawing and manipulation could be carried out with ease. The fundamental design of the character's plump body shape worked to convey sanguinity and was carried through the rest of the cast (Patmore, 2003, pp. 16, 82) (*Figure 2.1*). A size comparison was generated to ensure that the characters measured up against each other (Peaty and Kirkpatrick, 2002, pp. 54-60). The aerial view of the characters used in the Land Law game were inspired by a series of pencil sketches sourced from the web (*Spring-Alpha* (2006) [Online]. [Thursday 16th February]. Available from World Wide Web: <[www.spring-alpha.org](http://www.spring-alpha.org)>) (*Figure 2.2*).

Once the characters were developed, a suitable and complimentary visual style was generated for the backgrounds using the references and visual metaphors gathered during research as a guide (*Figures 2.3-2.8*). The symmetrical backgrounds were created using a combination of simple, separate shapes and bold, flat colour for consistency. They were simple and uncluttered in their design to avoid distracting the user from important information onscreen. A standard screen layout size of 800 x 600 pixels was used for the application's GUI to ensure clarity and legibility. A limited colour palette was used throughout to ensure that all legal information, learning material and instructions were always the focus of attention.

Background colours were developed in empathy with the characters' colours to ensure that they formed part of the same universe whilst at the same time could be differentiated from each other (Peaty and Kirkpatrick, 2002, p. 63). The basic design and colours used for each character and background were consistently represented to aid communication. All colours used throughout the application's development adhered to the Red, Green and Blue (RGB) hexadecimal web safe colour palette (Holzschlag, 1999, pp. 528-529). Rockwell and Verdana, the fonts used in the application, are available on most computer systems. Rockwell is a slab-serif font and Verdana is sans-serif (*Figure 2.9*). These fonts were used because of their wide, clean characters which added to the application's light and modern feel.

### **Design Rationale**

The UNA ensured that all aspects of the application's GUI were designed with the sole objective of meeting the needs and expectations of the user (Bhangal, 2004, p. 24). Graphical elements which supported the LGSFP were devised and tested to ensure that the Human-Computer Interaction

(HCI) model was user-friendly and receptive to the user's needs. Working within a screen real estate constraint of 800 x 600 pixels, the application's integrated GUI was optimised to educate as well as to amuse (*Wikipedia* (2006) [Online]. [Wednesday 22nd February]. Available from World Wide Web: <[http://en.wikipedia.org/wiki/human-computer\\_interaction](http://en.wikipedia.org/wiki/human-computer_interaction)>) (*Appendix G*).

Layers were used in Adobe Illustrator CS to manage the artwork of the individual vector-based graphical elements. Templates for educational content and graphical elements, made up in turn of separate graphic elements were created and gradually combined to develop the GUI (*Figure 2.10*). The application's perceived quality and replay value was increased through the use of unique brand identities which were developed for each modular game (*Figure 2.11*). Navigational graphics, section titles and actual copy were added to the artwork which gradually became much more complex and the use of layers with descriptive names was essential (Chun and Garraffo, 2004, p. 91). Art production culminated with the integration of all graphical elements and the result being that all educational content was conveyed effectively to the user.

### **Prototype Development**

Good design is about communicating the right message to the user in a way that is both appealing to them and exceeds their expectations (Enterprise Ireland Design Advisory Unit (EIDAU), 2005, p. 22). The reason for all design decisions throughout the project's development revolved around the application's mission statement; to provide the user with information about principal areas of law in Ireland.

Research and brainstorming, carried out during the preproduction phase, was necessary to add credibility to the initial concept and to decide on major

gameplay elements. The application's vector-based graphical elements were created during the production phase. These elements (mathematical calculations expressed visually) were designed with file size and performance limitations in mind (Patmore, 2003, p. 98). Raster images, animated gradients, alpha transparencies and an excessive number of vector points were avoided throughout the development of the application's artwork to help keep file sizes relatively small. Simple, symmetrical shapes were optimised to increase performance and to reduce Central Processing Unit (CPU) calculations (Besley, Bhangal, Peters, and Young, 2004, pp. 34-39). The 216 colour web safe palette was used to ensure cross-browser, cross-platform stability. The overall design was about making a visually cohesive statement, one that was in line with the mission statement, and tied all of the various elements together.

Using the LGSFP developed from the preliminary storyboard, sample static computer screen visuals were created for key sections of the application's GUI. An initial playtest was run using the visuals to identify strengths and weaknesses in the GUI's design. Redesign and retesting continued until it was felt that the prototype was at a suitable stage to move to the postproduction phase of the project's development lifecycle. The tangible result of the production phase was a well-polished 'look and feel' prototype which captured the onscreen essence of the application (Bates, 2004, p. 211).

A vision of all of the different pieces, how they would eventually come together and what the user experience would be was required from the beginning (Bates, 2004, pp. 151-152). The GDD was used to describe the application in detail and included complete up-to-date information throughout each phase of development about required media assets including content information, art, sound, music and voice. Maintaining the

GDD throughout the project's development lifecycle ensured a firm understanding of the core elements required to make the outcome a success.

### **Management Considerations**

Throughout the four phases of its development, the application needed to be managed, designed and programmed, it required art, sound, and music and it needed playtesting (Bates, 2004, p. 151). The task of developing the application involved many subtasks. These were carried out by a single candidate for assessment leading to the award of Masters in Digital Media Technologies. A list of the various hardware and software resources used in the development of the application was included in the GDD.

The project's scope and the amount of time involved was estimated and spread out over a fifteen week calendar schedule (*Figure 1.3*). A narrow scope design from the start ensured that as the project progressed through the different phases there was enough time, across all disciplines, to concentrate on quality, not quantity. The waterfall lifecycle model was used to manage the application's development to ensure that everything was completed on time. To help accomplish this, the schedule included dates for particular milestones, marking the completion of a certain amount of work, called a deliverable. The milestones provided an indication of progress at any point in time along the schedule.

Throughout the project's development, a thorough understanding of many disciplines was required to manage, design and programme each separate deliverable that went towards forming part of the complete application. To ensure that the application reached its goal, to teach as well as to amuse, a UNA was carried out during the preproduction phase to gain a clear understanding of content and potential users. A LGSFP was designed based on the application's educational content and was used to

categorise the information and to test user navigation (Gassaway, 1997, p. 16) (*Figure 1.8*). Sample static computer screen visuals of key sections of the application's GUI were designed, based on the structure of the LGSFP. The GDD's up-to-date information and the 'look and feel' visuals were used to enable fresh users to run initial playtests of the static GUI. Their evaluations were used to highlight any difficulties and to ensure that the GUI was user-friendly, that its content was of educational value and that it was fun to play (Bates, 2004, p. 179).

### **GUI Modifications**

Tweaking continued, with relevant changes being implemented based on user feedback. This enabled the application's GUI to run as intended and to achieve what was required from the beginning. A barrister and also a lecturer in legal studies, was invited to playtest the prototype and to offer expert legal opinion regarding its enjoyment, usability and educational value. After an initial playtest, it was agreed that because of increased competition in the legal industry, consumers need information about Irish law to be made much more accessible. To have the educational and legal content checked for accuracy by an expert and to have the application patented was advised. The application was presented to the Learning and Technology Centre, Dublin, where all feedback was used to determine a well designed GUI.

To ensure good communication throughout the application's development, the GDD document and the schedule planner were updated and made accessible at all times. Across the fifteen week development lifecycle a functional top-down approach was taken to each of the four phases to divide large tasks into small, manageable subtasks. All tasks along the production path were rigorously tracked to give an indication of progress and to ensure that the application would be completed on time.

Advances were attached to milestones, which were clearly defined responsibilities throughout the project's development marked by the completion of a certain amount of work, or a deliverable (Bates, 2004, p. 251). The GDD exhaustively detailed everything about the application and was the most current representation of the project's scope throughout its development lifecycle (Schultz, Bryant, and Langdell, 2005, p. 91). The GDD included complete information about the user experience and ensured a firm understanding of how all of the different pieces would eventually come together.

Weekly meetings with the project supervisor during the development lifecycle ensured that the application's design and implementation process was meeting the high standards required for academic submission. The project supervisor was very professional and offered great support and guidance during each phase of the project. Throughout the course of the project's development, all relevant meetings and correspondence were formally documented to ensure a high standard of project administration.

### **Assets Tracking**

Based on user feedback, the redesign and retesting of the 'look and feel' prototype continued with relevant changes being implemented in an efficient manner to ensure that milestones or deliverables along the way were not affected. As the project progressed through the four phases of its development, the amount of data and media assets associated with the application began to grow (Bates, 2004, p. 158). A system of directories with descriptive names was used to house content and to keep track of files for each phase of development. Up-to-date information about media assets were recorded to the GDD throughout the project's development lifecycle to ensure that minutiae were accessible and that project continued to run smoothly at all times.



## **CHAPTER 3**

### **EXECUTION**

#### **Design Implementation**

All of the ideas, activities, and assets developed in the first two phases were carried out during the project's postproduction phase. The postproduction phase began on week seven of the calendar schedule and all tasks along the production path up to that point were achieved. The 'look and feel' prototype, which captured the onscreen essence of the formal HTML website and the Flash-based application, was thoroughly redesigned and retested in preparation for postproduction. In line with the application's mission statement, interactivity, animation, sounds and approved text were integrated into the prototype, to ensure that it achieved what was required from the beginning.

#### **Project Management Implementation**

Adherence to the four phases of the waterfall lifecycle model over the fifteen week calendar schedule imposed a reasoned and progressive management structure and ensured that the project ran smoothly at all times (DIT, 2006). Milestones marked the completion of deliverables to indicate progress and only when each phase was complete, did the project progress to the next phase. Data and media assets were housed in individual directories for tracking purposes and an up-to-date GDD was maintained throughout the project. This ensured a firm understanding of how all of the different pieces would eventually come together.

The vector-based graphical assets, including the application's GUI, were created using layers in Adobe Illustrator CS (.AI) and saved as '\*.AI' file format. Raster images were optimised using Adobe Photoshop CS and saved as Joint Photographers Expert Group (.JPEG) file format in RGB

colour mode at web standard 72 Pixels per Inch (PPI) resolution. Sound effects and background music were sourced from the web, processed using Digidesign Pro Tools and Sound Forge and were compressed to .WAV file format at a resolution of 16-bit, mono and a sample rate of eleven Kilohertz (kHz). Text content was saved as (.TXT) file format using Microsoft Notepad.

Macromedia Dreamweaver MX 2004 was used to build the formal HTML website through which the user would access the Flash-based application. Flash, the standard environment for making interactive vector-based graphics for web distribution, was used to build and programme the application and tie all of the multilayered elements together (Legno, 2004, p. 420). Comprised of three separate Flash format files (.FLA) of 800 x 600 pixels; an introduction section and two modular games, the application was designed for a standard 4:3 aspect ratio screen size of 1024 x 768 pixels. Its frame rate was set at 18 frames per second (FPS). Sound was integrated into the application to enhance interactivity and animation.

Best practices were followed in setting up the project's Flash workspace from the outset. Folders were created in the Library panel to store all imported Flash content, button, graphic and movie clip symbols (*Figure 3.1*). A 'cut and paste' technique was used to bring the application's vector-based graphical elements from the Adobe Illustrator CS artwork into individual layers in Flash (*Figure 3.2*). Each of the application's GUI elements were positioned manually onto individual layers using the Properties panel because of the high level of placement accuracy required by Flash (Bhargal, 2004, p. 78).

## **Programming**

Programming for the application, which stemmed from the LGSFP and the 'look and feel' prototype, involved translating the concepts, elements, and story into code. AS, the authoring language built into Flash (a hybrid between scripting and traditional programming languages), was used to programme the application, incorporating image, text and sound (Sanders, 2001, p. 232). The AS code was converted by Flash's publishing process into Shockwave Flash (.SWF) file format which would get stored and executed on the end user's computer with the Flash Player plug-in (Schultz, Bryant, and Langdell, 2005, p. 64). AS is an interpreted language because it requires the Flash Player to run (Moronta, 2004, p.5). A client-side scripting detection process was integrated into the HTML to initiate an installation or upgrade of Flash Player, with minimum distraction, on the end user's computer if the version of Flash Player required was not present. A link to the Macromedia Flash Player download page was also created (*Macromedia* (2006) [Online]. [Wednesday 26th April]. Available from World Wide Web: <[www.macromedia.com/go/getflashplayer/](http://www.macromedia.com/go/getflashplayer/)>). META tags were inserted into the head section of the HTML pages to identify and keyword the site and to enable search engines to index the pages (Holzschlag, 1999, p. 918).

A reference library of AS code for the application's intended running environment was assembled from research gathered during the preproduction phase and used for guidance purposes. Following best practice, the application was streamlined by optimising the Flash authoring environment to ensure that its file sizes remained small, user input responses and animations were smooth and revisions were uncomplicated (Chun and Garraffo, 2004, pp. 607-610). All trade-offs between quality and quantity of Flash content and size and performance of the application revolved around

the prospective user's bandwidth and their computer's CPU. Layers were assigned meaningful names to organise content and labels were used to mark different areas of the timeline instead of using scenes. All of the actions, the basic building blocks of AS, were consolidated to one layer on the root Timeline as much as possible and comments were added to explain the logic of the code throughout. Layers for AS code and Labels were added to the top of the root Timeline to ensure that the graphics from the bottommost layers would load first. These layers remained locked during development to prevent onstage editing during postproduction (Bhangal, 2004, p. 7).

An intuitive and consistent camelCase naming practice with standard suffixes was used for variables, objects, instances and other elements which needed to be identified (Bhangal, 2004, p. 11) (Chun and Garraffo, 2004, p. 91). To save working memory, the application's interactivity was built in a modular fashion, using smaller, separate components with functions used to define frequently accessed tasks (Chun and Garraffo, 2004, p. 610). The Actions panel in Flash was used to write the Actions (also known as commands in programming terms) for the application's introduction section and its two modular games. The introduction was saved as 'irish\_legal\_system fla' and the modular games were saved as 'land\_law fla' and 'tort\_law fla' respectively.

Each section of the application opens with a preloader, to inform the user of how much has downloaded and how long they have to wait (*Figure 3.3*). At any point within the application, the user is provided the option to return to the start. All button instances on stage are assigned event handlers on the timeline for accessibility (*Figure 3.4*). Event handlers performed certain actions as a response to events. AS is used to generate empty movie clips on the root Timeline and streaming sounds are loaded into them

dynamically. The introductory 'irish\_legal\_system.fla' file is made up of eleven frames. External text files containing relevant learning information are loaded into dynamic text fields on the stage at run-time. Relative Uniform Resource Locators (URL) link event handlers are assigned to button instances on stage to open the different sections of the application within the current browser window.

### **Land Law Game**

The Land Law game 'land\_law.fla' file is made up of fifteen frames. It is a top-view maze game in which the character is positioned in the centre of the play area and is user-controlled to run around searching for Infopacs containing information about conveyancing. Points are awarded on the score panel for each Infopac collected. Each Infopac contains information about one of the ten steps involved in conveyancing. The user is able to stop and start the game at any time and has the choice to play again when all of the ten Infopacs are collected. Once the game loads the user is given the option to enter a user name. A variable is used store the string value entered into the input text field. The character selection button sends the playhead forward to the point where the game begins whilst at the same time hides the other character on stage from the user. Variables are used to provide the way in which the character moves, the way the town moves and are also used to hold information about the number of Infopacs collected (*Figure 3.5*).

Distance-based collision detection and user control creation programming techniques were used to build the Land Law game. (Peters, 2006, pp. 197-199) (Besley, Bhangal, Peters, and Young, 2004, p. 226). The character's position on the x-axis and y-axis does not change during the game. The impression of the character moving is achieved by changing the x- and y-axis position of the town movie clip. The town movie clip is made

up of different instances of the road clip and is moved on its x- and y-axis, relative to the direction as defined by the user. The direction variable is assigned to button event handlers to enable user control. The houses and Infopacs move on the x- and y-axis relative to the town movie clip whilst the grass area remains stationary (*Figure 3.6*). Variables are declared for the boundary of the road movie clip and a fixed point coordinate on stage. The character is positioned directly over this coordinate. The Pythagorean Theorem, contained within an `if` statement is used to calculate the distance between the registration point of each road movie clip instance and the fixed point coordinate onstage (*Figure 3.7*).

A collision is detected when the fixed point coordinate on the stage falls within the bounds of a road movie clip instance. The `eval` function is used to read the expression generated by each movie clip instance as the collisions are detected and to return the value as a single string to an `if` statement contained within three loops (Chun and Garraffo, 2004, p. 418). The loops are used to enable the town movie clip to move around the fixed point coordinate on the stage but within the bounds of different instances of the road movie clip (*Figure 3.8*). Distance-based collision detection is also applied to the Infopac movie clip. An increment operator is applied to a score variable to record the collisions. The Land Law game ends when all of the ten Infopacs have been collected by the user.

### **Law of Torts Game**

The Law of Torts game ‘`tort_law.fla`’ file is made up of thirty frames. Law of Torts is a game show based on legal knowledge and is divided up into two multiple choice rounds with five questions in each plus a sixty second true or false bonus round made up of ten questions. The sequence of each question is stored to an array and, during the game, points, which are stored to a variable, are awarded on the score panel for each correct answer.

The user is presented with questions and multiple choice answers relating to tort law in clear, straightforward language. Button event handlers allow the user to answer the questions and progress through the three rounds of the quiz.

Flash's built-in Hot Spot and True or False learning interactions are used to build the Law of Torts game. The interactions are part of the game where the user interacts to provide a response (*Macromedia Learning Interactions* (2006) [Online]. [Monday 3rd April]. Available from World Wide Web: <[www.macromedia.com/support/flash/applications/learning\\_interactions/](http://www.macromedia.com/support/flash/applications/learning_interactions/)>). The interactions are Flash components and are customised to suit the quiz game's GUI. Components are a special kind of symbol called a compiled clip which encapsulates complex functionality (Chun and Garraffo, 2004, p. 577). A Hot Spot learning interaction is used to set up the interaction for the first two rounds where the user responds to the question by selecting one of the four answers onscreen. The Hot Spot was added to the timeline from the Common Libraries panel where its parameters were changed using the Component inspector (*Figure 3.9*).

During the second round, the user is given twenty seconds to answer each question. A countdown timer uses the `getTimer` function to retrieve the time elapsed since the question is introduced and the result is then output to a dynamic text field on the stage (Chun and Garraffo, 2004, p. 577) (*Figure 3.10*). A True or False learning interaction is used to set up the third round where the user responds with either a true or false response. The Component Inspector was used to change the parameters of the True or False interaction. The graphics of each component were changed to match the game's 'look and feel' prototype. The process of changing the appearance of a component by modifying its source graphics is called

skinning (*Macromedia Flash Article* (2006) [Online]. [Monday 17th April]. Available from World Wide Web: <[www.macromedia.com/devnet/mx/flash/articles/skinning\\_2004\\_print.html](http://www.macromedia.com/devnet/mx/flash/articles/skinning_2004_print.html)>). The global style declaration that sets style properties was used to customise the colour and text properties of all the component instances for consistency. The Law of Torts game ends after the third round of the quiz where the user must return to the application's introduction section.

Following best programming practices, each line of code was tested to its limits as it was authored using the Test Movie command to ensure that run-time errors could be traced within larger blocks of code. Run-time errors are commonly called bugs and the process of finding and fixing the errors is called debugging (Moronta, 2004, p. 42). Throughout the entire programming process, the application's AS code was constantly tested to ensure clean execution.

### **Audio Integration**

Event-based sound effects and sampled music files, some of which were sourced from the web and others which were captured using an iRver H320 pocket jukebox, were integrated into the application to enhance the user experience. Sound effects are used to serve as feedback to the user, telling them how to react to the graphical elements onscreen. Sound is added to the games in a way that ensures that the right sound is played at the right time and does not distract the user from important information. Sound effects and music loops were edited in Sound Forge and compressed to .WAV file format. These files were then imported into the Flash library where they were integrated into both games. Sound files were either placed on the timeline of the Flash file or introduced dynamically using AS for added interactivity (*Figure 3.11*). Music loops which provide the games' continuous soundtracks are long enough to ensure that the user does not



notice them repeating. A script was prepared and voice for the application was recorded to a Pro Tools session in the recording studio using a Neumann microphone. Pro Tools was used to edit the voice which was saved as .WAV file format. The integration of sound and voice adds a high degree of interactivity and usability and ensures that the application is both aesthetically pleasing and audibly stimulating.

### **Playtesting**

Adherence to the calendar schedule ensured that there were no bottlenecks and that pressure was kept to a minimum at all times during the project's development lifecycle. Targets during each phase were met and only when each deliverable was complete, did work on the next deliverable begin. An up-to-date GDD was maintained to ensure that the objectives of the brief were being met and that the project continued to run smoothly.

Although testing began to play a vital role in the application's development as soon as the first piece of AS was written, the playtesting phase officially began on week eleven of the calendar schedule. At this stage the application was uploaded to the server using Dreamweaver, where it was available online and was more or less playable from start to finish. Four weeks of the schedule were allocated to playtesting, which meant that almost a third of the application's total development lifecycle was spent on playtesting and redesign.

The goal of playtesting was to iron out any defects in the application's code or GUI and to make sure that it not only worked, but was also fun to play. Every playtesting and redesign decision was made to ensure that the application worked to provide the user with outline knowledge of some of the principal areas of law in Ireland. The GDD, which described how the application would eventually come together and what the user experience

would be, was used as a starting point for the playtesting plan. Moment to moment checks were carried out to ensure that the application was behaving as intended and that all media assets and content information were present and correct. The application was tested on as many different system platforms and browsers as possible and all copy was proofread and checked for error.

The design of the GUI originated from the UNA and was developed with the sole objective of meeting the needs and expectations of the user. The GUI was tested to ensure that all elements worked to educate as well as to amuse and that the application's HCI model was user-friendly and receptive to the user's needs. Throughout the playtesting phase a system was developed where all bugs in the application were recorded to a list and only when these were ironed out, were they removed from the list. Fresh users were cycled in to playtest the final prototype. Their new eyes spotted unseen bugs and their evaluations offered a fresh perspective on different aspects of the GUI. Based on their feedback all necessary modifications were made to ensure that the application's GUI was user-friendly, that its content was of educational value and that its basic gameplay mechanisms were enjoyable.

As the project progressed through the playtesting stage, the development work stopped and the focus shifted from building to finishing, from creating to polishing. All minor bugs were fixed and loose ends were tidied up in preparation for File Transfer Protocol (FTP) upload to the web server for online distribution. The application was published to '\*.SWF' file format for browser enabled playback using the Publish Settings dialog box in Flash (*Figure 3.12*). The final file size of the entire uploaded application was 1.5 Megabytes (MB). Once the files were uploaded to the remote server and became live, they were checked again to ensure that the application was

working as intended. A final validation check of the formal HTML site was carried out by W3C HTML Validation Services (*W3C Markup Validation Service* (2006) [Online]. [Tuesday 9th May]. Available from World Wide Web: <<http://validator.w3.org/>>).

## **CHAPTER 4**

### **FINAL ANALYSIS – THE CRITICAL REVIEW**

#### **The Brief**

The objectives of the brief, as set out at the beginning of the project's lifecycle, were met in full. The knowledge and expertise gained through the study of digital media technologies was applied to define, analyse and develop a solution to a real world problem; making information about some of the principal areas of law in Ireland more accessible to those who need it (DIT, 2006). The digital media artefact, in the shape of an educational game about the Irish Legal System, is designed to meet the needs and expectations of the prospective user and is optimised to educate as well as to amuse. The brief was developed in full from the outset to ensure a firm understanding of the objectives of the application and how those objectives would be achieved. Twenty people were interviewed as part of the UNA's development process to gain a clear understanding of the application's content and to identify potential users. A greater number of interviewees would have generated more information about user profile and could have improved the development process.

#### **The Design**

The project's design rationale and strategies were appropriate to the brief because they revolved around the application's mission statement; to provide the user with information about principal areas of law in Ireland. Research and brainstorming were carried out to add credibility to the initial concept and the UNA was developed to ensure that all aspects of the application's GUI were designed with the sole objective of meeting the needs and expectations of the user. The GDD and the LGSFP provided a firm understanding of how all of the core gameplay elements would

eventually come together to ensure a successful outcome. The design process worked extremely well to ensure that the application communicates the right message to the user in a way that is both appealing to them and exceeds their expectations.

### **The Management**

Throughout its development the application needed to be managed, designed and programmed, it required art, sound, and music and it needed playtesting. The administrative plan augmented the project. It ensured that each phase of development ran smoothly and that all tasks were completed on time during the project's lifecycle. The lifecycle followed four well-defined phases of preproduction, production, postproduction, and playtesting. Adherence to these phases imposed a logical sequence of elaboration and a reasoned and progressive management structure (DIT, 2006). A system of directories was used to house content and all media assets were recorded to the GDD. The management system was paper-based. An online system could have improved the management of the project's documentation.

### **The Application**

The assessment criteria for the application stemmed from the project brief. The application was examined in terms of its success and failure at being able to provide the user with information about principal areas of law in Ireland. The application's HCI model was assessed for its user-friendliness to ensure that its elements were receptive to the user's needs and that the sum of its parts came together to form a whole that worked to educate as well as to amuse. The application could be developed further with the addition of new EGA's, based on principal areas of Irish law including, Family Law, Contract Law, Criminal Law, Business Law and Employment Law.

### **The Report**

The major project report describes the four phases of the project's lifecycle in detail and evaluates the application and the reasoning behind the design and management decisions made during development. The major project was a real challenge and proved to be a great source of learning. It provided the opportunity to attain skills in researching, defining, analysing, designing, developing and managing solutions to solve a wide variety of digital media production problems.

## APPENDIX A

Late last year, the Minister for Justice, Equality and Law Reform, Mr Michael McDowell, TD, established the Legal Costs Working Group. The Group was asked to look at the way in which legal costs are determined and assessed and to make recommendations which would lead to a reduction in the costs associated with civil litigation.

The issue of legal costs is never far from the headlines. Recent controversy about alleged double charging in respect of Redress Board cases has once again brought the issue to the fore. The determination and assessment of legal costs is, however, a complex issue and it is one which, for some time, has evaded root and branch reform. The Group, in approaching the issue, came to the task with open minds, ready to explore all options and come to conclusions designed to serve the public interest.

There are three broad strands to the recommendations contained in the Report. Firstly, the Group recommends the replacement of the existing taxation of costs system with a new system of assessment predicated on the formulation of recoverable cost guidelines - based on work actually and appropriately done - by a regulatory body. Secondly, the Group recommends significant changes in the information that a solicitor is required to provide clients and the manner in which it is to be provided. And finally, the Group recommends a number of legislative and procedural changes to reduce delays in the courts process. It is the Group's view that these proposals will, if acted upon, lead to a new costs assessment process which will be transparent, predictable and accessible.

At the heart of the recommendations contained in this Report is the principle that the individual litigant should have a central role to play in controlling legal costs. How the litigant can be so empowered is dealt with in detail in the report. Suffice to say at this point that the timely provision of information to clients is central to this empowerment.

*Source: Report of the Legal Costs Working Group, 2005.*

## APPENDIX B

The Legal Aid Board provides legal advice and legal aid in civil cases to persons who satisfy the requirements of the Civil Legal Aid Act, 1995, principally, a person's means must be below a certain limit and there must be merit to the case. Legal advice is any oral or written advice given by a solicitor or barrister, including writing letters and negotiations. The services available include advice on: separation / divorce, domestic violence, custody of children, contract matters, and other civil law matters.

Legal aid is representation by a solicitor or barrister in court proceedings. A person must first accept an offer of a legal aid certificate, specifying the legal services being granted, and pay the legal aid contribution specified on the certificate. The Board will then provide the services of a solicitor and, where necessary, a barrister for court proceedings. A person seeking legal services can apply at any of the law centres listed in this leaflet by calling into, telephoning, or writing to the nearest centre.

A person may apply for legal services in respect of two or more matters at the same time. A person applying for legal advice and / or legal aid must complete a Statement of Income / Capital form giving details of their income and of any capital resources, such as, property, a car, and money in the bank, to enable the Board determine that the person's means are below the prescribed limit.

All persons who are granted legal advice and / or legal aid must pay a contribution to the Board. The legal advice contribution will be assessed on their disposable income, i.e. income after certain deductions in respect of, for example, dependants, accommodation costs, income tax, etc. have been made. The legal aid contribution will be assessed on the person's disposable income and disposable capital i.e. the value of capital resources after certain deductions have been made in respect of, for example, any mortgage, loan or debt. The minimum contribution is €6 for legal advice and €35 for legal aid. The law centre staff will advise a person of the actual contribution in each individual case.

*Source: Legal Aid Board Public Information Leaflet, 2006.*



## APPENDIX C

Many clients attending FLAC centres need legal representation in relation to social welfare, housing, employment, immigration, and debt and consumer law. These needs are not met in the current system. Contrary to its stated goal of providing a legal aid service to those who deserve it, it is designed and managed centrally to suit its creators and managers. Many who need and deserve a service do not get it, in clear breach of their civil and human rights.

This current overburdened, under-resourced and limited service is a direct and foreseeable consequence of the lack of state priority in promoting, or even protecting, the fundamental human right of access to justice. Most immediately, this shows in the total failure of the State to meet either of its explicit goals for its own legal aid scheme. Contrary to Minister Collins' intention, the necessary legal services are not available to every deserving person. In stark conflict with the purpose of the Civil Legal Aid Act 1995, civil legal aid and advice is not available to every person of insufficient means, given that many on very modest incomes fail to qualify. People have suffered and will continue to suffer harm. Wrongs are not rectified, or are rectified much later than they should be. Many are unaware that they are being wronged because they lack relevant information or advice.

There is an urgent need for change and reform. Civil legal aid must have proper, stable statutory funding. The Legal Aid Board must employ sufficient staff to provide civil legal aid and advice to those who need legal services to use the law, but who cannot afford it without aid. The income and contribution limits used in the current assessment of means are hopelessly outdated. The means test must be set at a level which allows people to get over the lack of money barrier which impedes them from accessing justice. Where contributions are payable, they should be realistic and a person's family home should not be used as the basis for calculating a contribution to legal aid. Instead of selecting certain areas of law that it chooses to cover, the State should immediately recognise its duty to provide legal aid based on the client's need. These changes are needed urgently as minimum measures to repair a system which has fallen into serious disrepair through neglect. However, the State's responsibility to protect and to promote the right of access to justice is not met by remedial action alone. Its duty is to ensure access to justice for its entire people.

Communities which are marginalised or living in poverty are particularly likely to suffer serious injustices. The same groups are also likely to be excluded from the various routes by which other members and groups in society in general may seek remedies. State responsibility extends to ensuring that these groups are empowered to remedy these wrongs. The current structure of civil legal aid is not inclusive. It does not place the needs of the client at the heart of its decision and policy-making. It does not engage with communities in relation to their priority needs, nor does it undertake public or community legal education.

The denial of the right of access to justice is the denial of a core and fundamental human right. It is the duty of the State, and agencies such as the Legal Aid Board which carry a statutory mandate, to ensure that the right is respected, protected and promoted. The existence of a civil legal aid scheme demonstrates that the State recognises it has a key role to play. However the restrictions, inadequacies and delays in the current scheme, together with the lack of any proper facility for addressing client or community need, show that only grudging steps have been taken to ensure to every person the right to equality before the law; a right guaranteed by Irish constitutional law and international human rights law. FLAC calls on the State and on the Legal Aid Board to make equal access to justice for all a reality.

*Source: Free Legal Advice Centres, 2005.*

## APPENDIX D

### **User Needs Analysis:** *Irish Legal System.com*

The objective of the UNA is to define the EGA's requirements and expectations from the customer / audience's perspective. The main purpose of the UNA is to inform the educational and technical developments of the project. Twenty people, between the ages eighteen to sixty five, were interviewed individually or in pairs with a focus on the type of information which they might require about Irish law. Over half of the group were interested in conveyancing and the rest were divided up between tort law, wills and probate, family law and contract law. This information is used to build a profile of user characteristics, goals, and environment. Aspects of user age, disabilities, educational level, linguistic, cultural and social background, experience and familiarity with technology are considered for in the GUI's design.

The minimum age of the user is sixteen years and the maximum is eighty years. The user accesses the application from the local library and internet cafe on a standard personal computer (PC) running Microsoft Windows XP. Their goal is to find out information about principle areas of Irish law, particularly conveyancing and tort law. The application is advertised on the OASIS government information website and the Bank of Ireland website.

## APPENDIX E

### **Game Design Document**

#### **Irish Legal System.com**

Copyright Information: Copyright (c) 2006 Peter Dee.  
All Rights Reserved.

#### *Project Overview:*

Game designer and developer: Peter Dee  
Supervisor: Qamir Hussain

#### **Executive Summary:**

##### *High Concept:*

The EGA is about the Irish legal System and works to entertain and inform the user about the law of torts and Irish land law.

##### *The Hook:*

Edutainment: Original idea and a topical issue: will work to entertain and inform the user.

##### *Story Synopsis:*

A mature website that informs the user about what is going on. It will set the scene. Refer to following websites for tone of voice: [www.oerb.com](http://www.oerb.com), [www.mccannfitzgerald.ie](http://www.mccannfitzgerald.ie), [www.algoodbody.ie](http://www.algoodbody.ie) and [www.efc.ie](http://www.efc.ie)

##### *Setting:*

There are two games, both of which relate to law.

First Game: Quiz Show: Different Rounds: Five Multiple choice questions with 1,000 point score for every correct answer!

Second Game: (A couple buying a house.)

Visual style: 2D vector graphics developed in Flash with audio to enhance. (Some video, Portable Document Format (\*.PDF) files, (\*.HTML) links etc.). Develop with Macromedia Flash, Illustrator and Photoshop

##### *Core Gameplay:*

Single player / user game and the user must work through. Each game is a series of obstacles or a step by step process on the way to achieve something. Questions will be answered as EGA develops. How does the user enter the game? How do they journey through the game and what is their reward?

*Game Features:*

Artistic techniques: simple illustration (Bob the builder style). A contemporary style of music and a humorous slant on a serious topic targeting an adult audience will give this application an edge above its competitors. Audio will be sourced from the web.

*Project Scope:*

Main website: Access to EGA and Flash Player Detection Kit.

EGA Introduction.

Quiz game with three levels: Five questions in each of two rounds and five true or false questions (three levels will relate directly to law of torts and process). Legal Questions: Sourced from web / legal books.

Land Game: Buying a house: three levels until success and own your new home (Three levels will relate directly to house purchase process).

*Target audience:*

The main website: In the main, the game will target an adult audience wanting to know more about the Irish Legal system, particularly land law and the law of torts.

*Delivery platform:*

Web browser platform (HTML and Flash Plug-in) on both Apple and PC.

## **Story, Setting and Characters**

*Back Story:*

Reform of legal system to bring down exorbitant level of legal fees to be introduced by Minister McDowell. Changes will make it easier for clients to shop around. The game will give the user information needed about the Irish legal system to make informed choices.

*In game story:*

What happens during the game?

Introduction plus background followed by a quiz game or a house purchase game where both will close at the end of the game showing scores. User can return to main serious introduction at any time.

*Environments / General Description:*

Serious tone and then the games will have a humorous tone and illustration style (bold and flat colour vector shapes).

*Environments:*

Serious side and humorous side.

Characters: *Serious side:* see [www.oerb.com](http://www.oerb.com)

*Humorous side:* Bob the builder / Earl Rigwell style of animation

### **Controls:**

*PC Keyboard / Mouse controls:*

(Default Keys for movement control: Move forward (Up Arrow), Move back (Down Arrow), Move left (Left Arrow), Move right (Right Arrow),  
Collect / Pause: Spacebar

*Detailed level descriptions:*

Quiz: Questions to be developed. Complete level walkthrough:

Scoring / Storyboard:

House purchase: Map / Area / Maze to be developed. Complete level  
walkthrough: Scoring / Storyboard:

*Source: Game Design Project Document Templates*

*(Bates, 2004: pp. 276-291)*

## APPENDIX F

### **Flash Player Plug-in**

Flash content - whether interactive games, advertising, flexible messaging, video programming, or commerce-based applications - runs on Flash Player. The version of Flash Player required to view your content needs to be installed on the end user's computer. Even with the wide variety of computing platforms and browsers your audience uses to access the web and your Flash content, you can detect the presence of Flash Player and its version in most instances and initiate an installation or upgrade of Flash Player on the end user's computer.

It would be quite a task, however, to tests all possible operating system and browser combinations when deploying new Flash content. Macromedia has put together best practices and templates to help target a wide variety of deployment environments. In addition to the Flash Player detection techniques, or as an alternative, provide an introduction page that displays version information and contains a link to the Flash Player download page: <http://www.macromedia.com/go/getflashplayer/>.

*Source: (Macromedia (2006) [Online]. [Monday 10th April]. Available from World Wide Web: <<http://www.macromedia.com/go/getflashplayer/>>)*

## APPENDIX G

### **Human-Computer Interaction**

Human-computer interaction (HCI) or, alternatively, computer-human interaction is the study of interaction between people (users) and computers. It is an interdisciplinary subject, relating computer science with many other fields of study and research. Interaction between users and computers occurs at the user interface (or simply interface), which includes both software and hardware, for example, general purpose computer peripherals and large-scale mechanical systems such as aircraft and power plants.

A basic goal of HCI is to improve the interaction between users and computers by making computers more user-friendly and receptive to the user's needs. Specifically, HCI is concerned with methodologies and processes for designing interfaces (i.e., given a task and a class of users, design the best possible interface within given constraints, optimizing for a desired property such as learnability or efficiency of use) methods for implementing interfaces (e.g. software toolkits and libraries; efficient algorithms) techniques for evaluating and comparing interfaces developing new interfaces and interaction techniques developing descriptive and predictive models and theories of interaction

A long term goal of HCI is to design systems that minimize the barrier between the human's cognitive model of what they want to accomplish and the computer's understanding of the user's task.

*Source: (Wikipedia (2006) [Online]. [Wednesday 22nd February]. Available from World Wide Web: <[http://en.wikipedia.org/wiki/human-computer\\_interaction](http://en.wikipedia.org/wiki/human-computer_interaction)>)*



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## TABLES

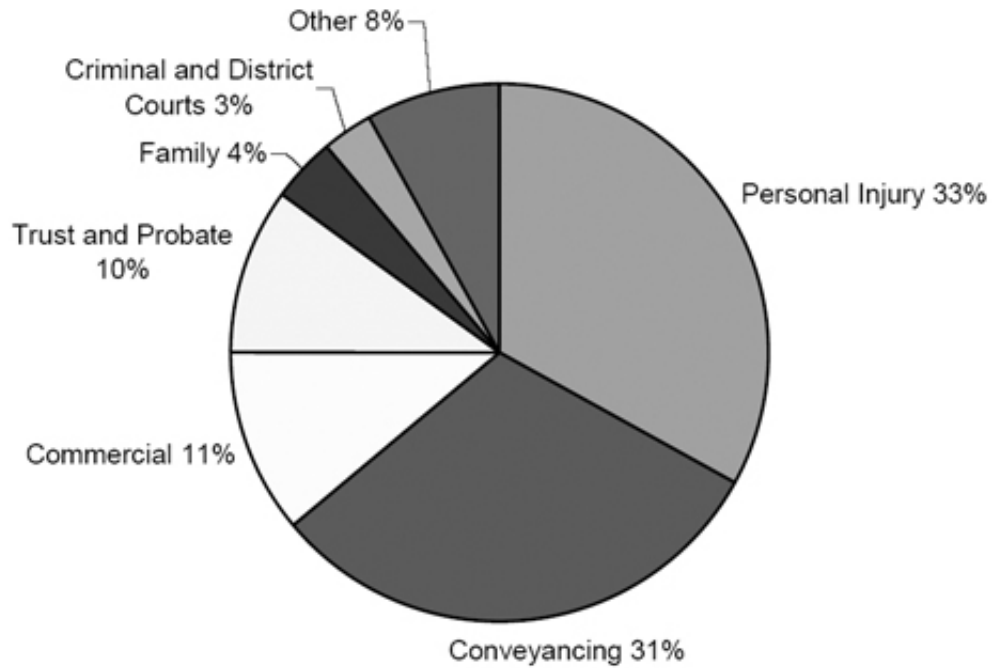
<b>Hardware</b>
<i>Packard Bell Laptop Personal Computer (P C) running Microsoft Windows XP Professional with Intel Pentium 4 Processor with 256 Megabytes (MB) Random Access Memory (RAM)</i>
<i>Apple eMac desktop computer running Mac OS X Version 10.3.9 with 1.25 GigaHertz (GHz) PowerPC G4 Processor with 1 Gigabyte (GB) RAM</i>
<i>iRiver H320 pocket jukebox with 20 GB capacity with line-in stereo minijack to connect to external audio sources and Universal Serial Bus (USB) for data transfer</i>
<i>Maxtor OneTouch external hard drive with 200GB capacity</i>
<i>Disgo USB data storage device with 128MB capacity</i>
<i>Epson Perfection 2400 Photo flatbed desktop scanner</i>
<i>Hewlett-Packard (HP) LaserJet printer</i>
<b>Software</b>
<i>Adobe Illustrator CS Version 11.0.0</i>
<i>Adobe Photoshop CS Version 8.0</i>
<i>Adobe ImageReady Version 8.0</i>
<i>Adobe Acrobat Version 7.0</i>
<i>Macromedia Flash MX Professional 2004 Version 7.2</i>
<i>Macromedia Dreamweaver MX 2004 Version 7.0.0</i>
<i>Microsoft Office Word 2003</i>
<i>Microsoft Office Excel 2003</i>
<i>Microsoft Office Powerpoint 2003</i>
<i>Windows XP Notepad</i>
<i>Digidesign Pro Tools LE Version 7.0</i>
<i>Sonic Foundry Sound Forge Version 6.0</i>
<i>Microsoft Internet Explorer 6.0 Browser</i>
<i>Safari 1.3.2 Browser</i>
<i>Netscape Navigator 8.0 Browser</i>
<i>Mozilla Firefox 1.7.12 Browser</i>
<i>SourceTec Sothink SWF Decompiler</i>
<i>Eltima Software Flash Decompiler</i>

***Table 1.1. Hardware and Software Resources***

<b>Graphical Elements</b>
<b>Characters:</b> Barrister Bill, Solicitor Sue, Joe Punter, Pam Punter and Little Punter. Land game aerial view of Joe and Pam Punter.
<b>Background Art:</b> EGA Opening, Land Law and Law of Torts
<b>Logos:</b> irishlegalsystem.com, Land Law, Law of Torts and Family Law
<b>Objects:</b> EGA Opening Info Screen, Land Game Infopacs, Conveyancing Process Info. Panel and Infopac Information Notifier. Law of Torts Question and Answer Panel and Clock Timer
<b>Environments:</b> HTML Website EGA Opening, Land Law and Law of Torts
<b>Buttons:</b> Start, Go, Back, Next, Land Law Controler, Law of Torts True or False
<b>Animations:</b> Set style and timing of animation throughout. To be confirmed as EGA develops. Characters' eyes will blink.
<b>Titles / Game Level Headings:</b> Similar style throughout: Rockwell and Verdana. Ten Steps to Conveyancing. Torts: Trespass, Nuisance, Negligence, Defamation
<b>Images:</b> Legal Images to be sourced for Irish Legal System.com HTML Website
<b>Sound Effects</b>
Sourced from web and found sounds
<b>Background Music</b>
Sourced from web
<b>Levels</b>
Land Law and Law of Torts games accessed through introduction
<b>Interface</b>
Simple, uncluttered and easy to read
<b>Artificial Intelligence</b>
Use of variables to store information
<b>Global variables (Change as the game is played: score, round number etc.)</b>
To be developed

**Table 1.2. Media Asset List**

## FIGURES AND GRAPHS



**Figure 1.1. Share of Fee Income by Area of Law, 1999**  
(The Competition Authority (TCA), 2005, p. 27)

Source: A survey conducted by the Law Society. Because the survey was limited in scope, figures should be used as a rough guide rather than exact numbers.

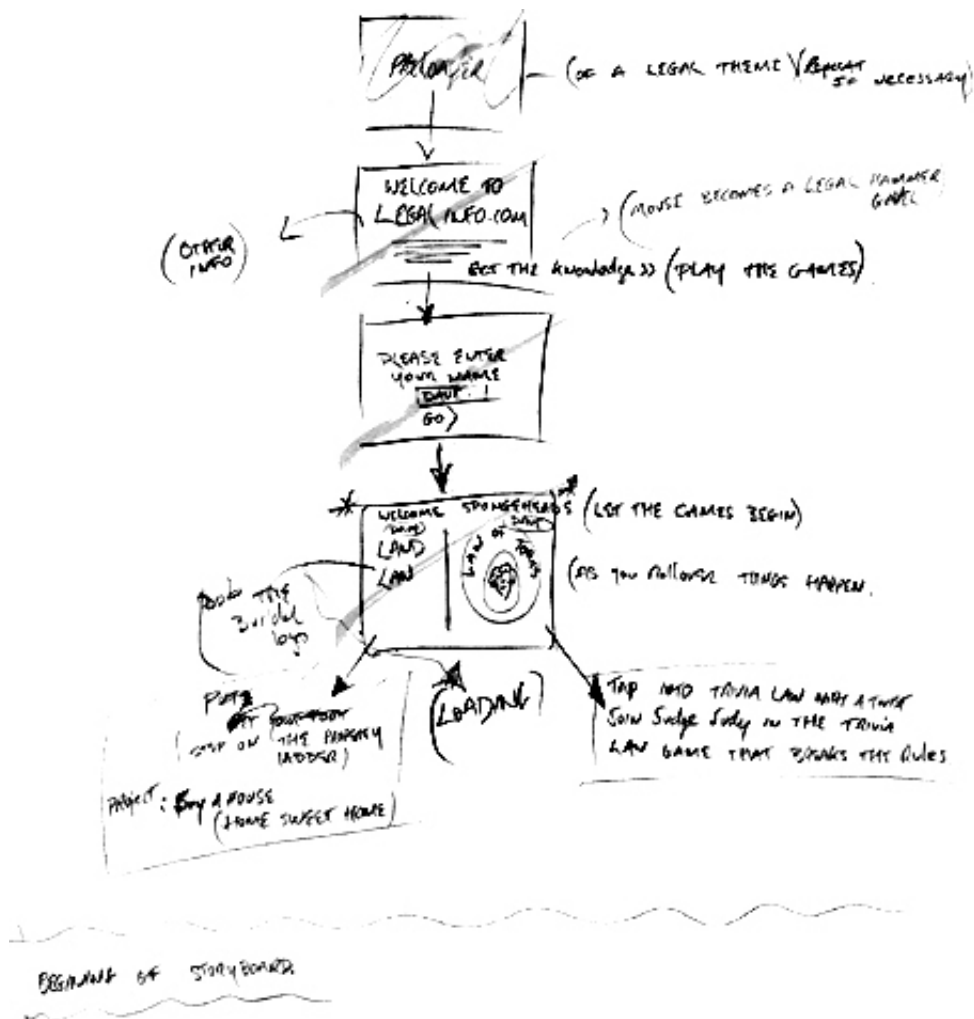


*Figure 1.2. Directories for each phase of development*

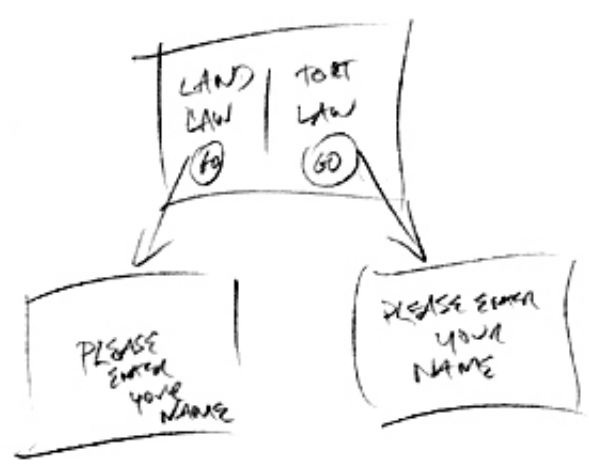
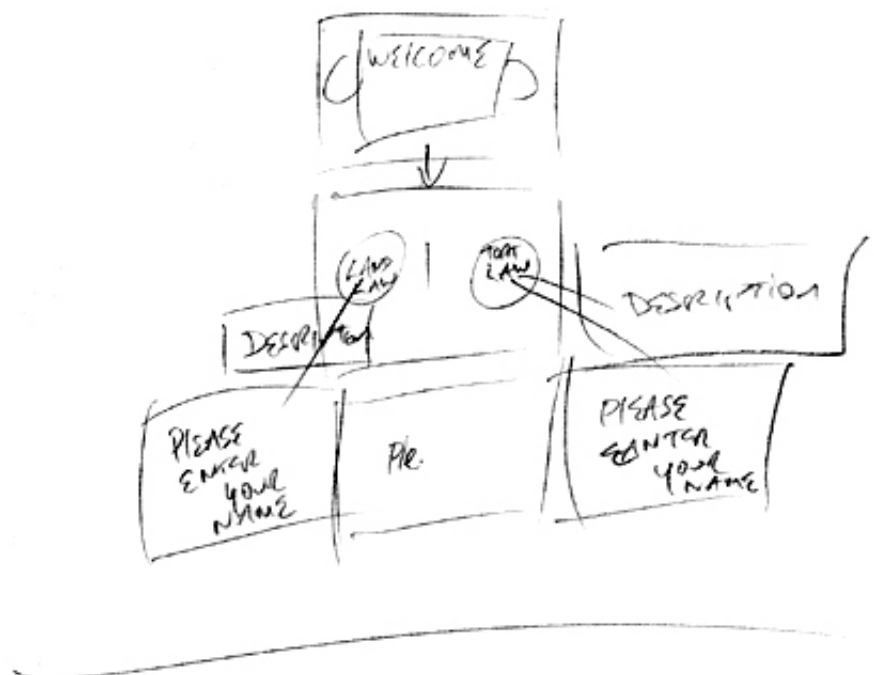
<i>EGA Work Schedule</i>	<i>February</i>			<i>March</i>				<i>April</i>				<i>May</i>			
	1	2	3	1	2	3	4	1	2	3	4	1	2	3	4
<b><i>Preproduction</i></b>															
<i>Create Schedule</i>	█														
<i>Research / Analysis</i>		█													
<i>Create GDD</i>			█												
<b><i>Production</i></b>															
<i>Graphical Elements</i>				█	█	█									
<b><i>Postproduction</i></b>															
<i>Programming</i>								█	█	█					
<i>Sound / Music</i>										█					
<b><i>Playtesting</i></b>															
<i>Testing Process</i>													█		
<i>Quality Assurance</i>														█	
<i>Launch</i>															█
															█

**Figure 1.3. Project Work Schedule**  
 Developed using Microsoft Office Excel 2003



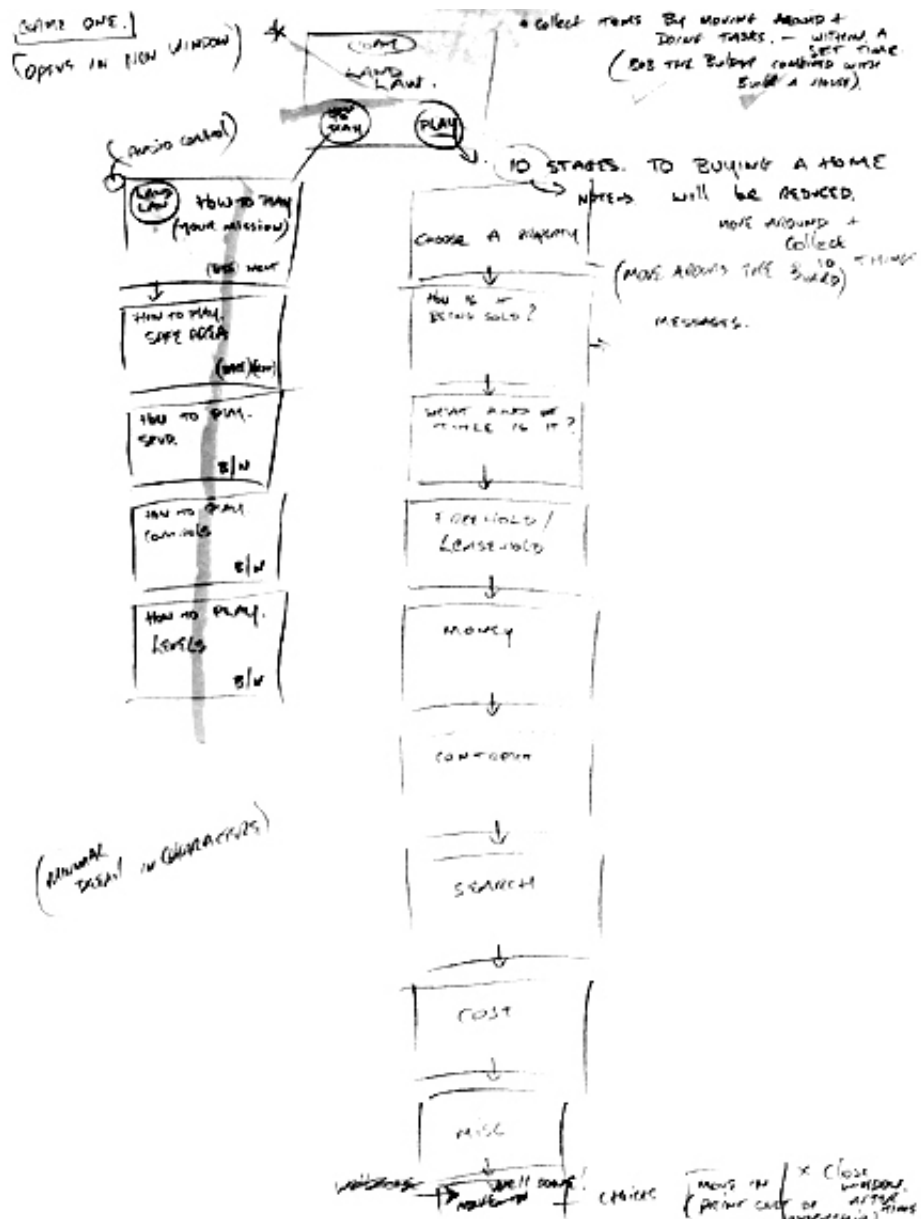


**Figure 1.4. Storyboard: Introduction**  
 Series of simple sketches showing user navigation.

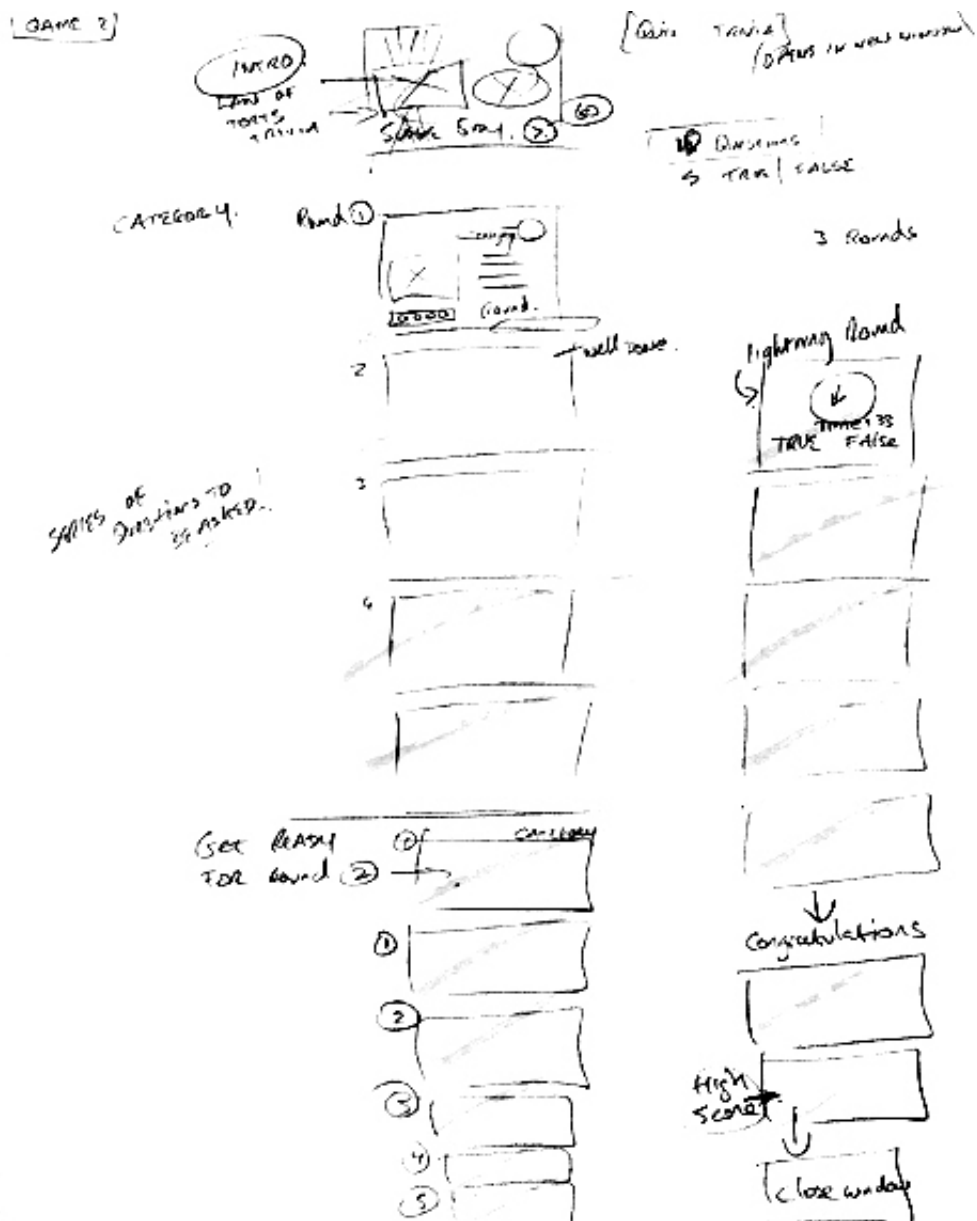


**Figure 1.5. Storyboard: Revised Plan**

Revised plan of point in the application where username is entered.

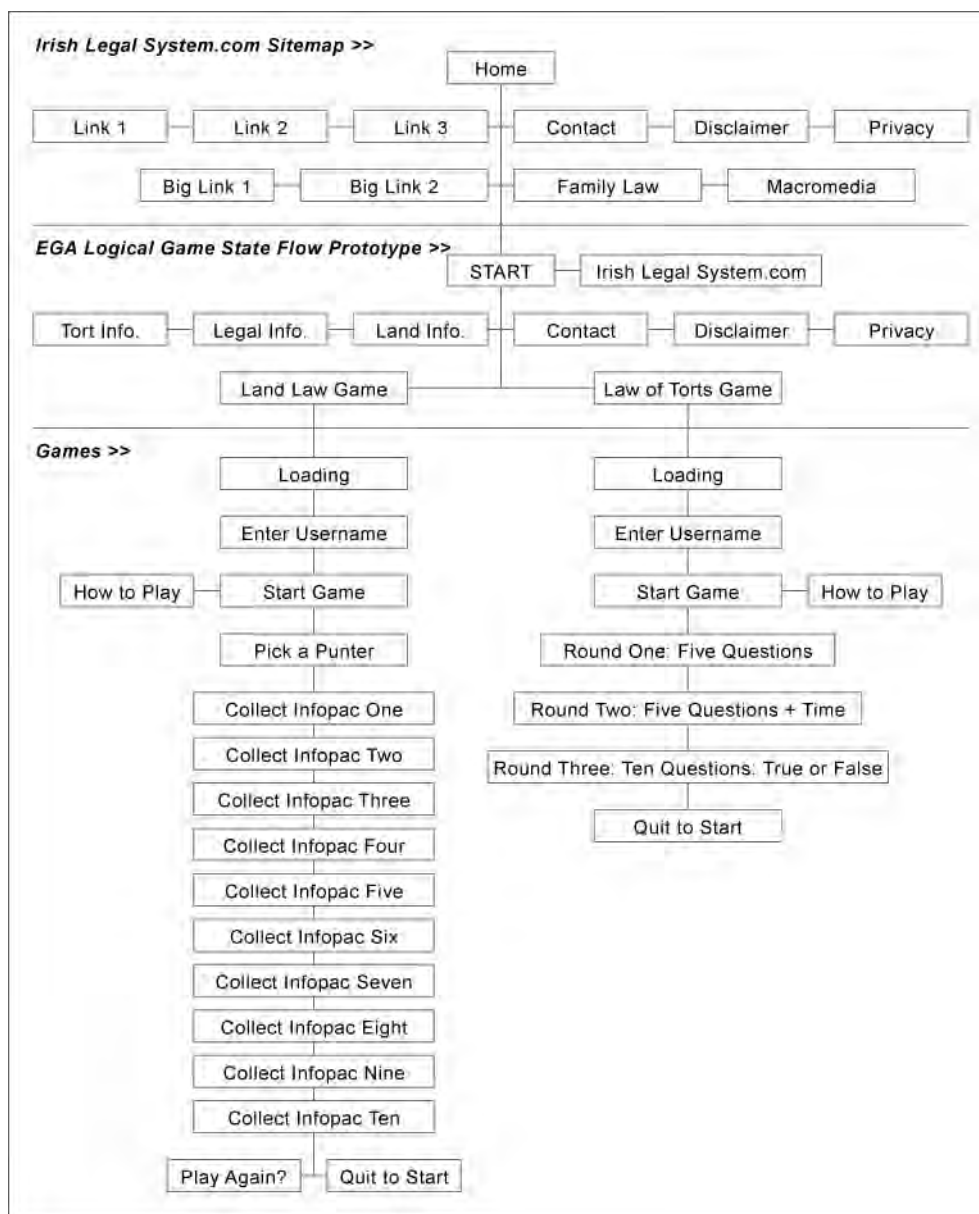


**Figure 1.6. Storyboard: Land Law**  
Illustration showing user progression through the Land Law game.



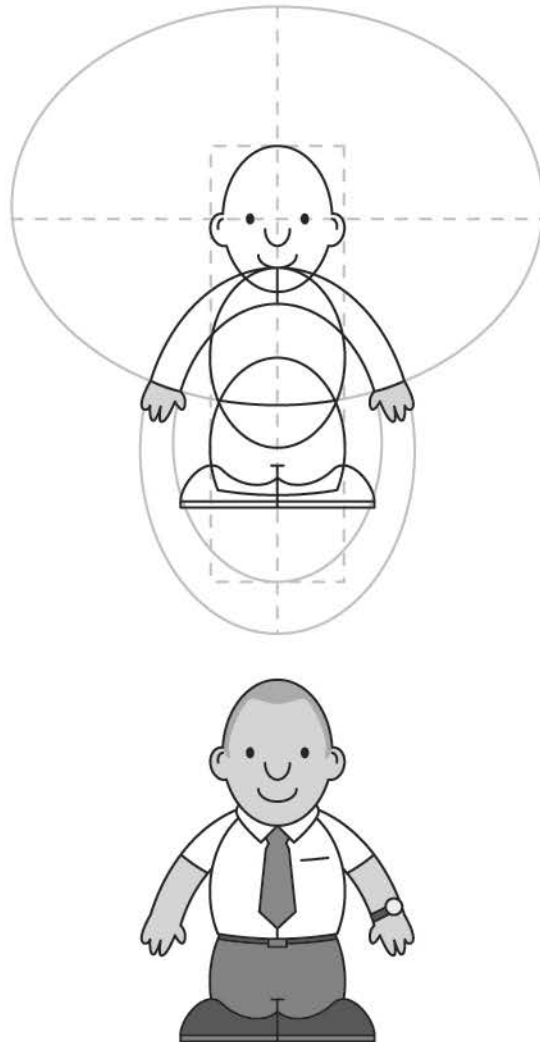
**Figure 1.7. Storyboard: Law of Torts**

Illustration showing user progression through the Law of Torts game.



**Figure 1.8. Sitemap and LGSFP**

Developed using Adobe Illustrator CS, the flowchart enables the testing of access to content and the effectiveness of navigational features.



*Figure 2.1. Joe Punter Development: Character Schematic*



*Figure 2.2. Cast Size Comparison*



**Figure 2.3. Visual Reference Library: Introduction**





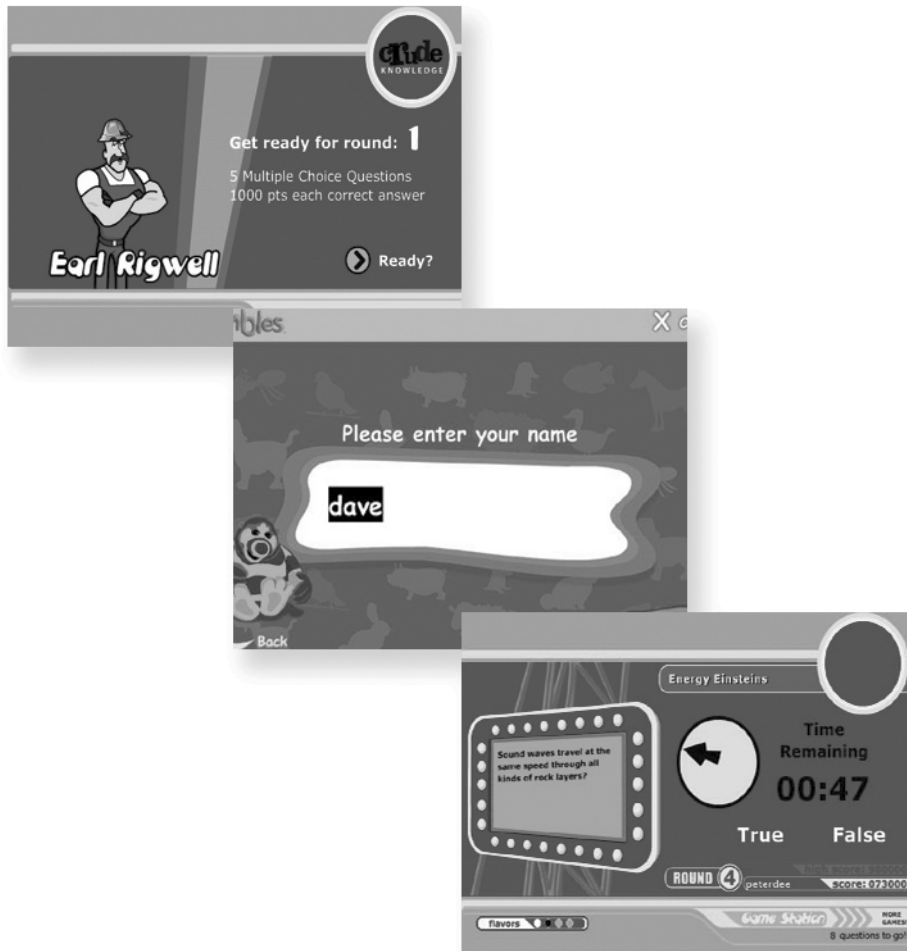
**Figure 2.4. GUI: Introduction**



*Figure 2.5. Visual Reference Library: Land Law*



**Figure 2.6. GUI: Land Law**



*Figure 2.7. Visual Reference Library: Law of Torts*



**Figure 2.8. GUI: Law of Torts**

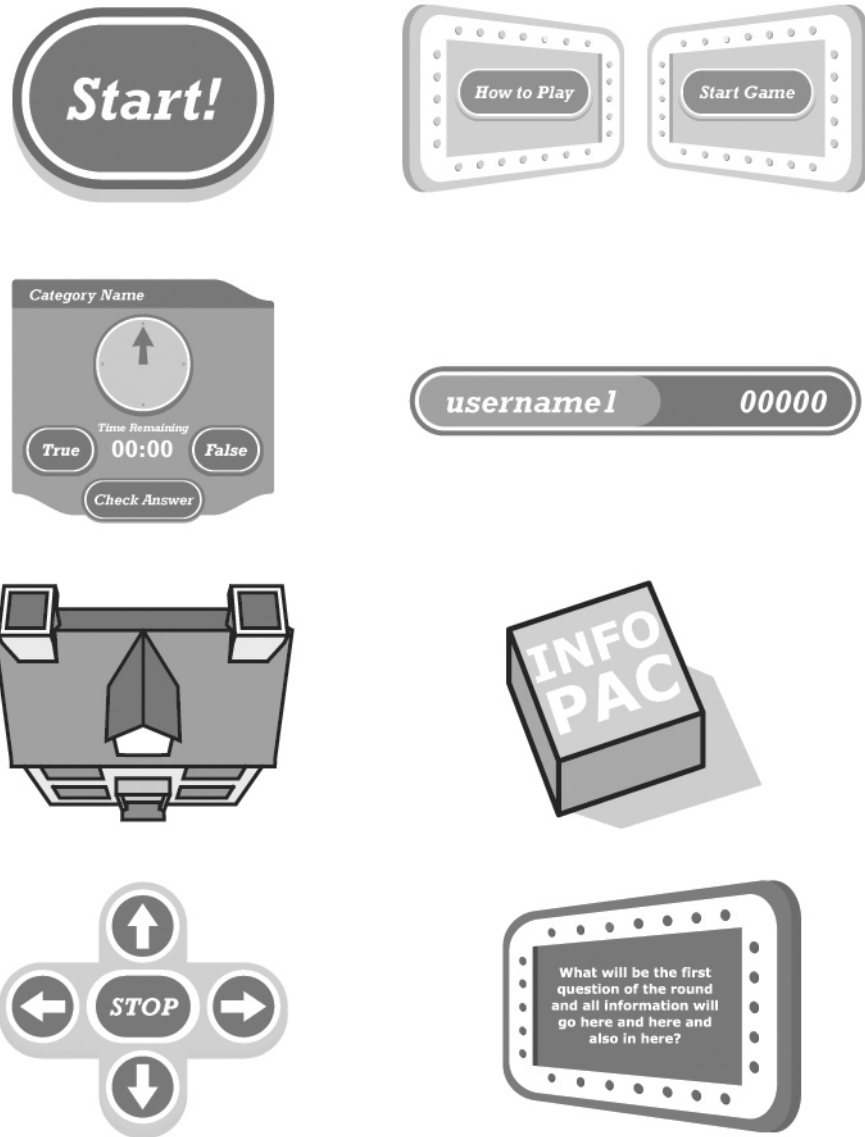
ABCDEFGHIJKLMNOPQRSTUVWXYZ  
abcdefghijklmnopqrstuvwxyz  
1234567890&

*ABCDEFGHIJKLMNOPQRSTUVWXYZ*  
*abcdefghijklmnopqrstuvwxyz*  
*1234567890&*

**ABCDEFGHIJKLMNOPQRSTUVWXYZ**  
**abcdefghijklmnopqrstuvwxyz**  
**1234567890&**

***ABCDEFGHIJKLMNOPQRSTUVWXYZ***  
***abcdefghijklmnopqrstuvwxyz***  
***1234567890&***

*Figure 2.9. Fonts: Verdana and Rockwell*



*Figure 2.10. Vector-based Graphical Elements*

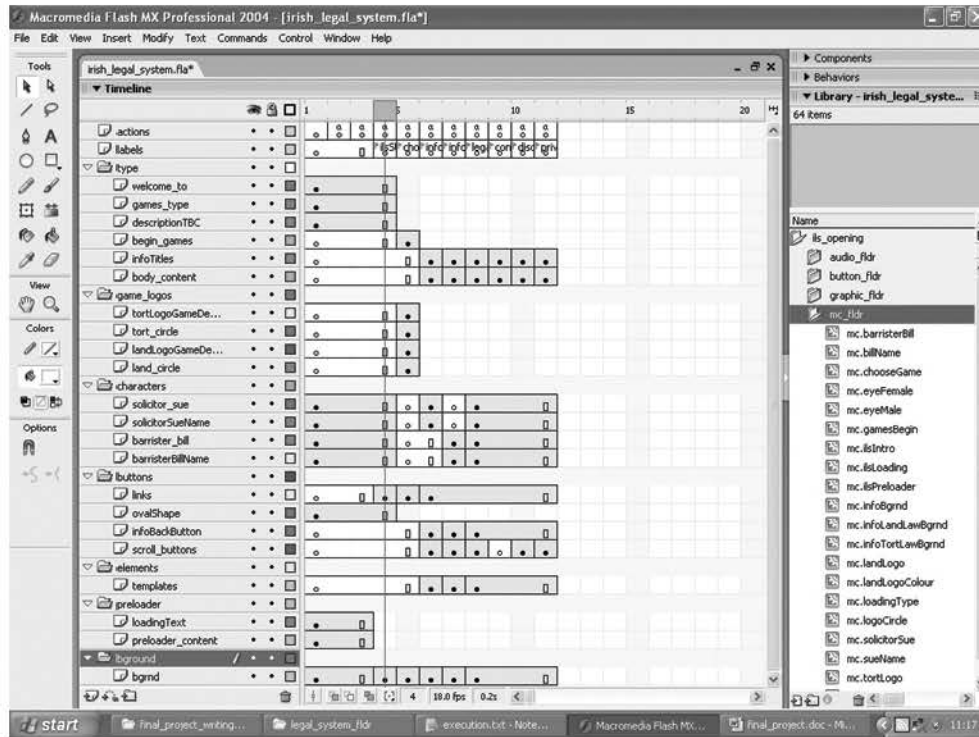


*Figure 2.11. Game Brand Identities*





**Figure 3.1. Macromedia Flash MX 2004 - Application's Workspace**



*Figure 3.2. Macromedia Flash MX 2004 - Application's Layers*

```
Frame 2  
// AS for preloader (Math.round: returns an integer)  
var frame = Math.round(getBytesLoaded() / getBytesTotal() *  
100);  
  
// Go to frame set by variable result.  
barLand_mc.gotoAndStop(frame);  
  
Frame 3  
// If statement based on variable result.  
if (frame < 100)  
{  
    gotoAndPlay(2);  
};  
// end if
```

***Figure 3.3. Preloader AS Code***

```
// Button event handler.  
goNameTort_btn.onRelease = function () {  
    gotoAndStop ("tortIntro");  
    outputUserName_str = inputUserName_str;  
};  
  
// Button event handler.  
homeTort_btn.onRelease = function () {  
    getURL("ilsgame.html", "_parent");  
};
```

***Figure 3.4. Button Event Handler AS Code***

```

// Declare time variable.
var delay = 3000;

// Declaring variables to make Punter character move.
var punterDirection = 1;
var oldDirection = 0;
var newDirection = 1;
var turn =
"0110.0111.0011.0110.0111.1101.0011.1110.1001.1110.1101.0111.
1011.1110.1011.1100.1101.1011.1100.1001";
var speed = 12; // Twelve pixels per Frame.
var speedSqr = speed * speed;
var rotate = 0;

// Declaring town variables.
var numJunctions = 20;
var numHorizontals = 13;
var numVerticals = 13;

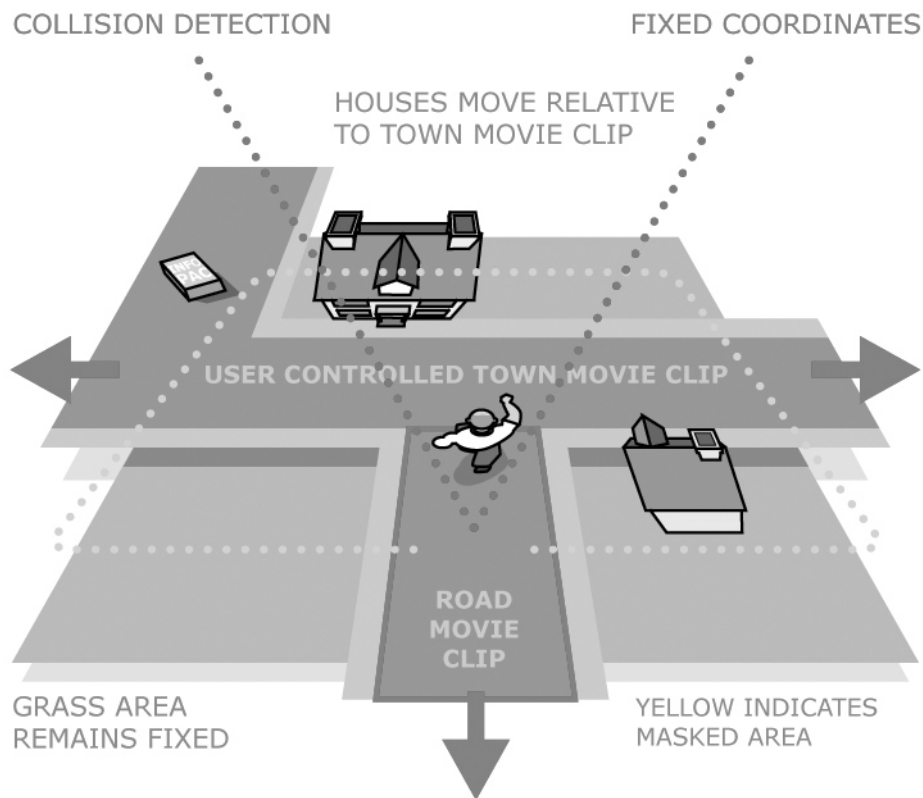
// Declare stage position of character MC.
var xOffset = 300;
var yOffset = 345;

// Declare INFOPAC variables.
var infopacs = 0;
var score = 0;
var lastScore = -1;

```

***Figure 3.5. Variables AS Code***

## LAND LAW GAME CONSTRUCTION DIAGRAM



**Figure 3.6. Land Law Distance-based Collision Detection**

The impression of the character moving is achieved by changing the x- and y-axis position of the town movie clip.

```

Road Movie Clip AS Frame 1
// Declare variables.
// MC registration point.
var cx = _x;
var cy = _y;

// MC boundary.
var left = _x - (_width / 2);
var right = _x + (_width / 2);
var top = _y - (_height / 2);
var bottom = _y + (_height / 2);

Road Movie Clip AS Frame 2
// Declare variables.
// Registration point in relation to town.
var x = _root.xOffset - getProperty("_root.town_mc", _x);
var y = _root.yOffset - getProperty("_root.town_mc", _y);

// Boolean to store collision detection.
var hit = false;
var centre = false;

//If collision happens.
if (left < x && x < right && top < y && y < bottom)
{
    var hit = true;
    // Pythagorean Theorem: Distance between objects.
    var distSquared = (_x - x) * (_x - x) + (_y - y) * (_y -
y);

    if (distSquared < _root.speedSqr)
    {
        var centre = true;
    }; // end if
};
// end if.

```

***Figure 3.7. Distance-based Collision Detection AS Code***

The Pythagorean Theorem is used to calculate the distance between the registration point of the road movie clip and the fixed point coordinates onstage.

```

While loop
//While loop until collision detection.
while (numJunctions >= i && !hit)
{
    var thisHit = eval("town_mc.junction" + i + ":hit");
    if (thisHit)
    {
        var thisCentre = eval("town_mc.junction" + i +
":centre");
        var x = eval("town_mc.junction" + i + ":cx");
        var y = eval("town_mc.junction" + i + ":cy");
    } // end if

    var hit = hit || thisHit;
    var offset = Math.round(5 * (i - 1));
    var moves = substring(turn, offset + 1, 4);
    ++i;
}; // end while

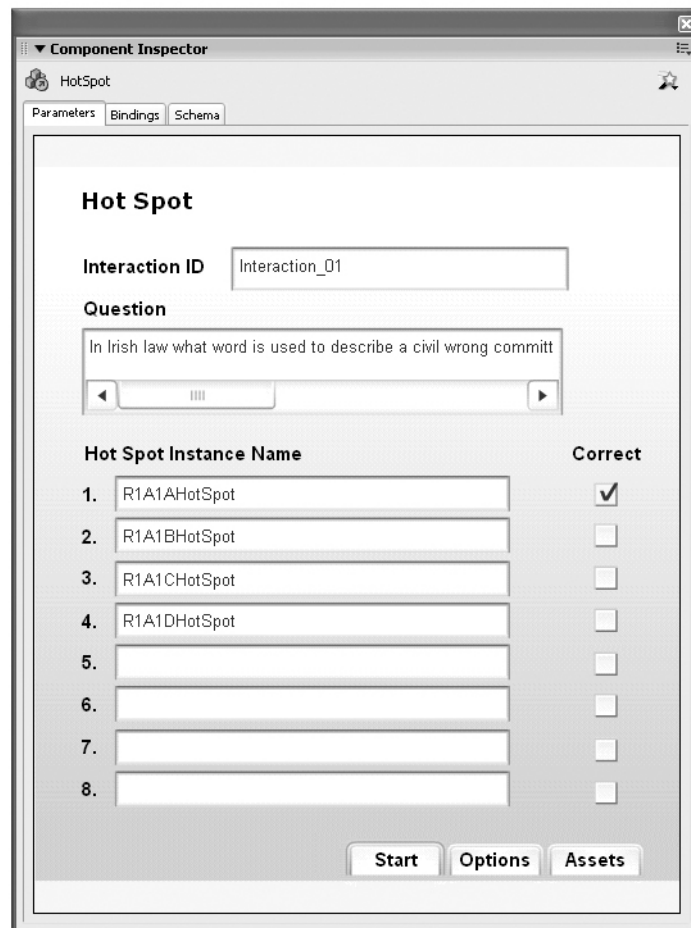
For loop
// If not hit, loop until collision detection.
*/
if (!hit)
{
    for (i = 1; numHorizontals >= i && !hit; i++)
    {
        var thisHit = eval("town_mc.horizontal" + i +
":hit");
        var hit = hit || thisHit;
        if (thisHit)
        {
            var moves = "0101";
            var x = eval("town_mc.horizontal" + i + ":cx");
            var y = eval("town_mc.horizontal" + i + ":cy");
        }; // end if
    }; // end of for
};
// end if

```

**Figure 3.8. Game Loops AS Code**

The town movie clip is able to move around the fixed point coordinate on the stage but within the bounds of different instances of the road movie clip.





*Figure 3.9. Law of Torts Hot Spot Learning Interaction*

```
// Timer.
startTime = getTimer();
_root.onEnterFrame = function() {
    currentTime = getTimer();
    elapsedTime = (currentTime-startTime)/1000;
    timeDisplay_txt.text = Math.round(elapsedTime)+":00";

    if(elapsedTime >= 20) {
        timeDisplay_txt.text = "20:00";
        soundQuizEnd_sound.start();
    }
};
```

***Figure 3.10. Countdown Timer AS Code***

The `getTimer` function is used to retrieve the time elapsed. The result is output to a dynamic text field.

```

// Attach two sound objects dynamically.
_root.createEmptyMovieClip("movieclip1_mc", 1);
streamMusic_sound = new Sound(movieclip1_mc);
streamMusic_sound.attachSound("streamDrumID");
streamMusic_sound.start(0, 999);

_root.createEmptyMovieClip("movieclip2_mc", 2);
soundQuizEnd_sound = new Sound(movieclip2_mc);
soundQuizEnd_sound.attachSound("soundQuizEnd2ID");

var keyListener:Object = new Object();
keyListener.onKeyDown = function() {
    if (Key.isDown(Key.ENTER)) {
        gotoAndStop ("tortIntro");
        outputUserName_str = inputUserName_str;
    };
};
Key.addListener(keyListener);

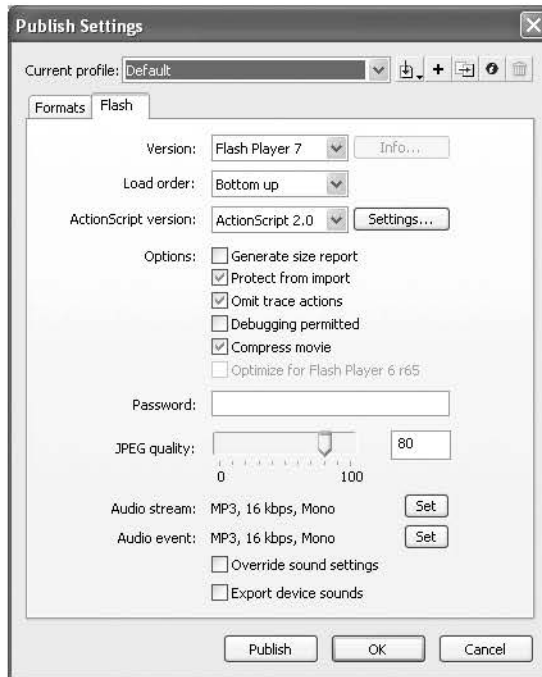
// Button event handler.
goNameTort_btn.onRelease = function () {
    gotoAndStop ("tortIntro");
    outputUserName_str = inputUserName_str;
};

// Button event handler.
homeTort_btn.onRelease = function () {
    getURL("ilsgame.html", "_parent");
};

```

***Figure 3.11. Sound Objects AS Code***

Empty movie clips act as targets for the new sound objects.



*Figure 3.12. Macromedia Flash Publish Settings Dialog Box*