Audience Feedback as an Influence on Graphic Design Problem Solving

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Abstract

User-generated feedback is arguably the most efficient tool to evaluate a specific product or service. Even though it is widely used to evaluate and subsequently improve video game design, it is not commonly used for graphic design applications. The aim of this thesis is to demonstrate how user-generated feedback can be utilized to improve existing graphic design applications. Specifically, three types of feedback collection vehicles were selected for use in graphic design: personal observation, evaluation polls, and existing video game design feedback. In order to demonstrate the advantage of using user-generated feedback, information collected through the feedback collection vehicles was interpreted and applied to improve the way-finding signage system at Strong Memorial Hospital in Rochester, New York.

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Problem Statement

Audience feedback related to a design solution is essential to the further development and improvement of not only that one solution, but also the improvement of graphic design problem solving in general. In today's world of high-speed internet and online discussion, the public is able to express opinions rapidly, particularly in the realm of interactive design. A specific area of this discipline which has been successfully attaining user-generated feedback is video game design. Video games are not only a highly escalating market but also one with a large fan-base which uses carefully established vehicles for evaluation such as forums, personal 'blogs,' and numerous online surveys. These critiques focus on all aspects of video game design, including graphics, storyboards, character development, usability and playability, longevity, etc.

Even though video games have evolved and improved through incorporating user-generated feedback into the design process, this has not been the case for other graphic design applications, such as wayfinding signage systems. Using methods of feedback collection intended for video game design, as well as translating the feedback itself for use in graphic design would be an effective strategy for understanding the advantage and impact such information can have in the graphic design problem-solving process.

This thesis will include research and analysis of factors which contributed to the evolution of video game design, the growing acceptance of video games by the general public, and the simultaneous surge of online user-generated feedback. In addition, various feedback vehicles will be reviewed and discussed in order to establish which are more relevant for use in graphic design. This background research will identify the specific areas of video game design that are evaluated most frequently by users as well as the contribution of their feedback to the problem-solving process. The aim of this study will be to use the findings of this research to understand how user-generated feedback can be applied to the graphic design problem-solving process. Specifically, this will be demonstrated through following the process of improving the wayfinding signage system at Strong Memorial Hospital in Rochester, New York by incorporating personal observations, user-generated feedback on the existing signage system, and aspects of improved massively multiplayer online role playing games.

Key Questions

1. What are the differences and similarities between video game and graphic design problem-solving?
2. How has user-generated feedback influenced the evolution of problem-solving in video game design development?
3. Which feedback vehicles are most appropriate to attain audience feedback related to a specific graphic design application? On what basis are particular methods chosen?
4. Which factors contribute to the audience's decision-making processes?
5. How can audience feedback be evaluated in order to be the most useful within the problem-solving process?

Associate Areas of Study

Graphic Design	Statistics
Video Game Design	Psychology
Interactive Design	Sociology
Information Design	

Project Relevance and Importance

This study will demonstrate how the solicitation, analysis and integration of user-generated feedback from a relatively new and growing discipline can be useful influences on graphic design problem-solving. The careful assessment of audience feedback received from feedback vehicles could make important contributions toward solving graphic design problems. This study aims to create methods for graphic designers to evaluate audience experience and suggestions in order to improve the problem-solving process and final graphic design application results.

Precedent A: Prototype Testing of New York City Parking Signage Design Firm: Addison, New York City, NY

Description

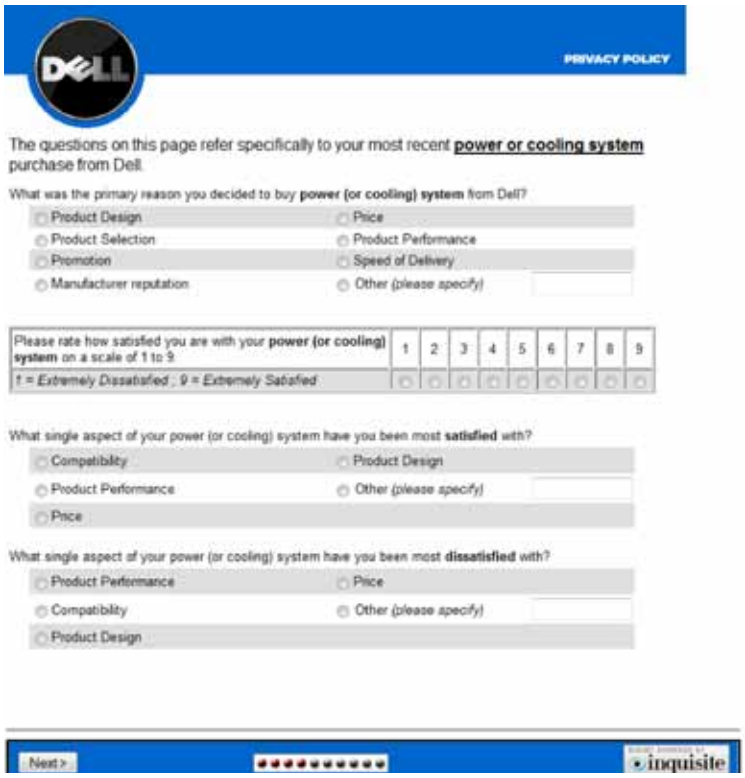
Qualitative data gained from testing prototypes can be particularly useful in validating concepts. In this example the audience is evaluating possible approaches to simplifying the design of parking signage in New York City. Research has shown that ten participants reviewing prototypes can uncover 80 percent of the problems with a design approach.

Significance

The Addison qualitative data approach in collecting feedback from an audience is a useful precedent for this thesis study because it helps understand the significance of feedback regarding design. In doing so, the designer can have a more structured understanding in what needs changing and above the needs of the majority of people viewing and understanding the design content.

Precedent B: Dell Customer Evaluation Poll

Company: Dell Online



Description

Video game polls are ways in which video game related content is evaluated by users who give their opinions in order for a video game to change or improve. The majority of times, video game companies depend highly on such user-generated feedback to give the products they create a new and improved outlook.

Significance

Using video game polls as a way of attaining feedback from an audience is a useful precedent for this thesis study. This is because one can see which specific areas of video game design are targeted for feedback using questions asked by companies in order to improve their games.

Precedent C: Participatory Design

Design Firm: Matter, Atlanta, GA

Description

Having users participate in the initial design planning process by having them help organize your project content. Using simple Post-it notes like in the example above, testers can sort content into the categories that make the most sense to them.

Significance

The user participant approach in evaluating feedback from an audience is a useful precedent for this thesis study because it gives a clear view of the value of the audience's opinion in the design process. This physical interaction with the audience can help the designer evaluate and improve his /hers design process.

Precedent D: Measurement of Customer Satisfaction

Company: EQUS Group Inc., Seattle, WA

Description

For more than a decade EQUS Group has successfully used Focus Groups, a traditional qualitative market research technique, for focused discussions with small groups of participants. Through their Focus Groups, such as the one in the above image, they are able to elicit customer behavioral patterns, attitudes, perceptions and product/service reactions.

Significance

A focus group case study is a useful precedents for this research. This is because it is an excellent feedback vehicle as it employes the qualifications of preselected individuals in evaluating trends, attitudes, and perceptions towards products and services.

Precedent E: Selection of Appropriate Terms for a Subjective Evaluation of Video Game Contents

Research Group: Utsunomiya University, Japan

Table 3. Standard deviation of evaluation term in each group.

gr.	term	S.D.
1	**innovative**	**0.873**
	novel	0.675
	original	0.557
2	**fantasy**	**1.151**
	magnificent	0.934
	elaborate	0.423
	good story	1.088
	dramatic	0.485
3	**long waiting time**	**0.981**
	high strategy	0.660
4	**real**	**1.169**
	full-scale	0.714
	presence	0.762
	craze	0.475
	powerful	0.808
	fine graphics	0.763
	high tension	0.997
	strong enemy	1.017
	difficult	0.951
5	**comical**	**1.338**
	good character	1.004
6	**enjoyable with many people**	**1.325**
	enjoyable	0.684
	fun	0.598
	high tempo	0.773
	exhilarating	0.857
	alive	0.999
	practical	0.577
	excite	0.698
	favorite	0.722
	speedy	1.091
	enthusiastic	0.562
	easy to control	0.692
	light	1.010
	simple	0.711
	comfortable	0.621
	stressless	0.653
	intelligible	0.868
	easy to play	0.884
	easy	1.057
	well-matched	0.473
	insatiable	0.459
	enjoyable for long time	0.617
	attractive	0.528
	full of curiosity	0.498
	good music	0.729

Description

The purpose of this study was to select the appropriate terms to be used in video game evaluation. Evaluation terms were collected from game magazines and user-directed questionnaires and were grouped together via cluster analysis. A representative term was then picked for each group after conducting statistical analysis using the frequency based on the frequency of terms used.

Significance

This method of analysis can be very useful in terms of analyzing qualitative data. The data can be received in a text form and then be converted to numbers in order for statistical analysis to be performed. The results can then be implemented into the graphic design problem-solving process.

Introduction

Research for this thesis develops in an inward fashion beginning from the investigation of various existing feedback collection and analysis methods leading to elements of video game design that can be examined by these methods. Elements of graphic design are also described in order to be compared to those of video game design; this will be used to extrapolate a connection between the two disciplines during the Synthesis section (p.34-35).

The goal of this research is to give an extensive picture of the various feedback vehicles and analysis methods available for attaining feedback from a large audience. In addition, it aims to cover the major elements of both graphic and video game design in order to gain a comprehensive idea of what the feedback can refer to.

Feedback Vehicles

Although there are many forms of existing feedback vehicles, according to William G. Axinn's *Mixed Method Data Collection Strategies*, these can be summarized into five types of data collection: surveys, semi-structured/unstructured interviews, focus groups, observations, and historical/archival data collection.

Selecting the appropriate feedback vehicle for a specific study is quite crucial as it would determine the type of data collected as well as the type of feedback analysis method that should be used. Here, a summary of each of the five basic feedback collection methods is shown.

A definitive feature of surveys is standardized questions. These questions are constructed based on the researchers' ideas on what should be measured and which evaluation method should be used to assess the information. The most positive aspect of using standardized questions is the fact that a larger population can be reached, as the feedback is processed quickly. In addition, the feedback is processed efficiently, as data taken from a larger audience is statistically more reliable than that taken from a smaller one.

Surveys

A definitive feature of surveys is standardized questions. These questions are constructed based on the researchers' ideas on what should be measured and which evaluation method should be used to assess the information. The most positive aspect of using standardized questions is the fact that a larger population can be reached, as the feedback is processed quickly. In addition, the feedback is processed efficiently, as data taken from a larger audience is statistically more reliable than that taken from a smaller one.

As technology advances, new ways of attaining feedback through surveys emerge. When one thinks of questionnaires the first thought may be a pencil-and-paper instrument; now, however, one can use internet-based questionnaires like ACASI, Audio Computer-Assisted Self Interviewing. This type of questionnaire allows the participants to give their responses directly to the computer without having to interact with the interviewer. This way, the results are not biased by the interviewer's views and can be immediately input into a quantification computer program like *Microsoft* Excel to convert them into numbers.

Many video game developers use online surveys and evaluation polls in order to attain feedback from their users. The questions are carefully construced to be very specific to the video game as well as efficient in their content; this is because the more accurate the questions are, the less questions need to be asked.

Feedback Vehicles *Continued*

Semi-structured / Unstructured Interviews

An important quality of less-structured interviews is that the degree of standardization is decreased for the questions asked. These interviews are much more flexible in terms of the direction; the participants are more inclined to develop new ideas and hypotheses through conversation with the interviewer. However, this method is limited to interviewing a small size population due to the time required to conduct all the interviews and analyze the data.

Although this method is not mentioned in William G. Axinn's *Mixed Method Data Collection Strategies*, blogging is another type of less-structured interview. According to the *Merriam-Webster Dictionary*, blogs are websites that contain an online personal journal with reflections, comments, and often hyperlinks provided by the writer. These can be related to this type of interview, as a designer may blog his remarks about a specific work and guide the audience to make a semi-specific response to his commentary.

Focus Groups

The unique feature of this feedback collection method is the fact that the participants must interact with one another in order to create a response to the interviewer's questions. This allows a build-up of greater confidence for the participants to elaborate on their responses, as well as generating well-thought responses, as conversation could lead to the completion and challenging of the various mentioned ideas. However, this method may also inhibit the participants from giving their true responses in front of their peers.

The nature of this method is also unstructured; thus, new hypotheses may develop. The interviewer would basically lead the discussion between the participants and record their responses. This implies that the size of the focus group is generally small.

Observation

This method of data collection is also relatively unstructured. There are three categories of observation based on the level of contact between the participants and interviewer: participant-observation, unobtrusive-observation, and direct-observation. This method allows the researcher to inhabit the shoes of the participant or just observe him or her and experience the world through his or her eyes. This method acquires data from the researchers themselves and can often be considered biased. On the other hand, once the researcher acknowledges his own inherit biases he/she can incorporate then into the research and view it in a different light.

Historical/Archival Methods

This method is useful in collecting data on a subject on which previous studies have been conducted. It is based on the notion that previous work can provide useful information on contemporary problems. This type of data collection is unstructured and will consequently lead the researcher to discover something he/she may not have thought of before when conceptualizing his/her project.

Feedback Analysis Methods

When analyzing feedback it is important to distinguish which evaluation method is most appropriate for the information at hand. Evaluation methods are categorized into two general approaches, quantitative and qualitative. Their use is dependent on the type of feedback vehicle employed to gather the information as well as the goals of the study.

The main difference between the two categories is flexibility. Questions purposed for quantitative research are standardized, whereas those purposed for qualitative research are open-ended. In addition, quantitative data can be presented as numbers whereas qualitative data is presented as text. The advantage of using quantitative analysis, according to Yvonne Darlington and Dorothy Scott's *Qualitative Research in Practice*, is that data can be analyzed very simply to answer many questions. In addition, it quantifies variation, predicts causal relationships, and describes characteristics of a population. Qualitative analysis, according to Natasha Mack's *Qualitative Research Methods*, systematically uses a predefined set of procedures to answer the question, produces findings that were not determined in advance, and also produces findings that are applicable beyond the immediate boundaries of the study. It also describes variation, and additionally explains relationships, individual experiences, and group norms.

It has been suggested that both methods of analysis are equally important when conducting an investigation. However, according to Hubert Blalock, a renowned sociologist, qualitative data and analysis cannot stand on its own to perform a complete study. It is therefore important that a balance is achieved.

Quantitative Analysis / Statistics

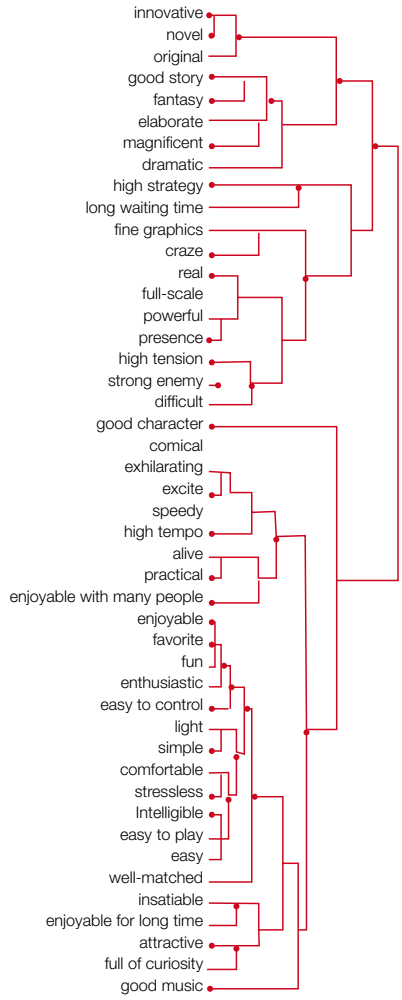
The most common way of analyzing quantitative data is statistics. According to the *Oxford English Dictionary,* statistics is the collection and analysis of numerical data in large quantities. In addition, patterns in the data may be modeled in a way that accounts for randomness and uncertainty in the observations, and are then used to draw inferences about the process or population being studied. The advantage of using this analysis method is that large amounts of data can be analyzed quickly and accurately.

Feedback Analysis Methods *Continued*

Cluster Analysis

According to StatSoft, one of the largest global providers of analytic software worldwide, the term cluster analysis (first used by Tryon, 1939) encompasses a number of different algorithms and methods for grouping objects of similar kind into respective categories. This method has been especially helpful, since data received as text can be converted into numbers in order for statistical analysis to be performed. An example of this is shown in the figure below taken from Selection of Appropriate Terms for a Subjective Evaluation of Video Games Content by the faculty of Engineering at Utsunomiya University, Japan.

Cluster Analysis Used to Summarize 46 Evaluation Terms. In the analysis shown on the right, evaluation terms which have a high correlation are grouped step by step.



Feedback Analysis Methods *Continued*

Qualitative Analysis

Methods that can be used in order to achieve this type of analysis are unique case orientation, inductive analysis, holistic perspective, and context sensitivity.

Unique Case Orientation

The term "unique case orientation" is a term best understood in Sarah Lawrence-Lightfoot's *Respect: An Exploration*. Sarah Lawrence-Lightfoot, an American sociologist, tells the unique stories of six different people who give their own views on the value and meaning of respect in a modern society. Only by reviewing all six different case studies is she able to construct an accurate meaning of the term "respect" in society. This is what is meant by the term "unique case orientation."

An actual definition of the term is described in Michael Patton's *Strategic Themes of Quantitative Inquiry*, which states that unique case orientation assumes each case is special and unique; the first level of analysis is being true to, respecting, and capturing the details of the individual cases being studied; cross-case analysis follows from and depends on the quality of individual case studies.

This method of evaluation is especially effective when feedback needs to be individualized in order to capture the unique background of the audience. This way, feedback can be examined in detail and in the context of its audience.

Inductive Analysis

This type of analysis is one that uses inductive logic in order to reach a final conclusion. This means that the analyst does not have any theories, hypotheses or presuppositions on the subject prior to the investigation. The strategy followed for this approach is to study the data and allow certain interrelationships between the variables to emerge. Therefore, it is important to use the appropriate feedback vehicles to collect data. For example, one cannot collect data via questionnaires and use inductive analysis to evaluate it; this is because the questions are constructed based on specific goals and presuppositions. On the other hand, blogging is an optimal feedback vehicle for inductive analysis as it allows free expression of opinion without any guidelines.

Once the data is collected and reviewed it is important to remain grounded in the context of each case when attempting to extract themes and patterns. A way to be alert to this is to keep the *Ground Theory* in mind, a research theory developed by Glaser and Strauss in 1967. According to their theory one should always meet the four criteria when extracting theories inductively: fit – the extracted theory fits the raw data; understanding – the theory must be comprehensible; generality – the theory can be applied in most contexts; and control – the theory should provide control of an action toward a phenomenon.

Michael Patton's *Strategic Themes of Quantitative Inquiry* gives a definition for inductive analysis which states that it is an immersion in the details and specifics of the data to discover important patterns, themes, and interrelationships; it begins by exploring, then confirming, and is guided by analytical principles rather than rules.

This method of evaluation is especially effective when the feedback is given without specific guidelines; it is an unbiased way to analyze the data at hand.

Feedback Analysis Methods *Continued*

Holistic Perspective

The basis of evaluating data with a holistic perspective lies in the attempt of seeking gestalt. Gestalt is a term developed by Fritz Perl; although it is used as an equivalent to a holistic perspective in psychology it can also be applied to tangible objects. To better understand the term, Perl used the example of three individual sticks placed in such a way as to form a triangle. The sticks are no longer just a random group of sticks, but an actual shape with meaning.

When using this approach the researcher needs to exhaust all aspects of the subject and create a complete view of the situation. This way, when examining the subject piece by piece the researcher considers each aspect as a member of a whole.

According to Michael Patton's *Strategic Themes of Quantitative Inquiry*, the advantage of using this approach is that greater attention can be given to interdependencies, complexities, idiosyncrasies, and context of the individual cases. In addition, the book gives a definition for this approach, stating that the subject is understood as a complex system that is more than the sum of its parts; it focuses on complex interdependencies and system dynamics that cannot meaningfully be reduced to a few discrete variables and linear, cause-effect relationships.

Context Sensitivity

Context sensitivity is the main notion that separates qualitative from qualitative data analysis. When conducting quantitative analysis it is assumed that the data at hand is context free; scientific quantitative approaches tend to generalize data and categorize it according to predetermined criteria. Qualitative data analysis presents the context of the different cases before doing any other analysis of data.

Michael Patton's *Strategic Themes of Quantitative Inquiry* defines context sensitivity as an approach which places findings in a social, historical, and temporal context, being careful about, even dubious of, the possibility or meaningfulness of generalizations across time and space; it also emphasizes personal perspectives and experiences.

This method is especially useful for evaluating audience feedback for existing graphic design solutions, as graphic design problems do not have only one solution; one's background will definitely play a role in his/her opinions. Thus it is important to assess feedback within its actual context.

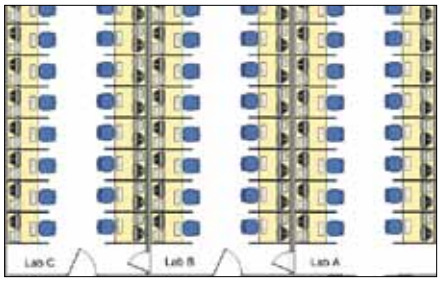
Principles of Video Game Design

Case Studies

Video games have seen an enormous success over the past decades. This is due not only to the evolution of technology but also the contribution of user-generated feedback. *A Survey Method for Assessing Perceptions of a Game: The Consumer Playtest in Game Design*, by John P. Davis, Keith Steury, and Randy Pagulayan, is an extremely inclusive article on how user-generated feedback has influenced video game design. The article describes a technique which combines various data collecting tools including surveys and controlled laboratory meetings. This technique is called "the playtest" and was designed to obtain both quantitative and qualitative data that could be eventually translated into numbers of statistical significance. Users answer questionnaires which are given to them before and after they play the game for about an hour in the laboratory. The first questionnaire is for screening and background purposes, whereas the second evaluates their experience and perception of various aspects of the game. The questionnaires consist of both standardized and open-ended questions. This way, although a number is given to represent the answer, the researcher can also develop a more comprehensive understanding of the reasons behind it.

Once the data was received, it was important for the issues to be identified and recommendations to be made. These would be made for various elements of the game including gameplay, music, graphics, and sound effects. The main goal is to use this playtest method as a tool to help designers understand the problem issues and come up with a workable issue. Also, it is important to set a numerical threshold in order to consider if it is worthwhile to look into an issue. For example, it could be predetermined that an issue should be reviewed only when the number of unsatisfactory responses surpasses 60%; if the unsatisfactory responses are 50% compared to the satisfactory responses the design/research team will not put any time or effort into altering that specific issue.

Playtest lab at Microsoft Games Studios. Headsets are helpful when many people in the same room are playing audio-intensive games.



Microsoft Games Studios. Floor plan for three labs.

Principles of Video Game Design *Continued*

Analyzing Data

In an article by the faculty of Utsunomiya University titled *Selection of Appropriate Terms for a Subjective Evaluation of Video Game Contents*, a method of determining the appropriate evaluation terms for video games is described. Terms were collected from magazines describing certain video games as well as from individuals who have played those games. The frequency of use for each word was calculated via statistical analysis. Then, the words were grouped into categories via cluster analysis, a method which allows grouping of words which are highly correlated in meaning. Then the word which had the highest standard deviation – a statistical measure of the dispersion of the numbers from their expected mean value – from each group was selected to represent its group. The advantage of using this method is that it can be used to convert qualitative data, such as text, into numerical values.

The following is presented in Using *Heuristics to Evaluate the Playability of Games* by Desurvire *et al*., as a summary of elements important for game playability evaluation:

Elements of Video Game Design

The following is presented in Using Heuristics to Evaluate the Playability of Game by Heather Desurvire, as a summary of elements important for game playability evaluation:

Game Usability: According to Heuristics and Usability Guidelines for the Creation and Evaluation of Fun Video Games by Melissa A. Federoff, this term includes effectiveness, meaning accuracy and completeness of users achieving set goals; efficiency, meaning the resources expended to complete goals; and satisfaction, meaning the users' attitudes.

Game Story: The plot which the game follows.

Game Mechanics: Physics of the game, which are developed through a combination of animation and programming.

Game Play: The process by which a player reaches the goal of the game.

Other elements which can be evaluated, mentioned in both Federoff's and Dacis' work, include game music, game sound effects, game graphics, and game Interface.

Principles of Video Game Design *Continued*

The Importance of Elements

A more cohesive study was conducted by Richard Wood, Ph.D. and colleagues in the 2004 article titled *The Structural Characteristics of Video Games: A Psycho-Structural Analysis*. In addition to a brief description of the different video game design elements, a survey was conducted aiming to identify the most important elements to the video game users. The following elements were investigated by having 382 representatives who playing a variety of the same video games answer the survey questions.

Sound: This includes the use of realistic sound effects, speaking characters, background music, and narration (Table 1, p.22).

Graphics: This includes the use of high-quality realistic graphics, cartoon style graphics, and full motion video (Table 1, p.22).

Background and setting: This includes whether the game is based on a story, film, or television program, and the use of realistic settings and fantasy settings (Table 2, p.22).

Use of humor: This refers to the use of humor in the game (Table 2, p.22).

Brand assurance: This refers to brand loyalty and celebrity endorsement, for example (Table 2, p.22).

Character development: This refers to character development over time and character customization options (Table 2, p.22).

Duration of game: This refers to whether the game is long (takes months or years to complete), medium (takes days or weeks), or short (can be completed within one session) (Table 3, p.23).

Rate of play: This is the 'absorption rate' and relates to how quickly the player gets into the game (Table 3, p.23).

Control options: This refers to whether a player can control the sound, graphics, and skill settings, choice of control methods, and physical feedback (Table 4, p.23).

Multiplayer features: This refers to multi-player option (online), multi-player option (LAN), multiplayer communication, building alliances, and beating other players (Table 4, p.23).

Game dynamics: This covers a wide spectrum of game behaviors. It includes exploring new areas, elements of surprise, fulfilling a quest, skill development, AI interactions, finding things, collecting things, avoiding things, surviving against the odds, shooting, different ending options, different modes of transport, solving puzzles, beating times, cheats/Easter eggs, solving time limited problems, building environments, mapping, and linear/non-linear game format (Table 5, p.24).

Winning and losing features: This refers to the potential to lose points, accumulation of points, finding bonuses, having to start level again, and ability to save regularly (Table 6, p.24).

Advancement rate: This relates to how quickly the game play advances.

Principles of Video Game Design *Continued*

This table presents the scores for 'Sound' and 'Graphics' video game characteristics along with their subcategories. It is evident that overall the two characteristics are important to users since a high percentage of the users scored them as 'important'.

Table 1: Participants' Ratings of Structural Characteristics

	Not important	*Important*
Sound		
Realistic sound effects	9.9%	65%
Speaking characters	20.6%	43.9%
Background music	31.1%	35.5%
Narration	35.2%	28.7%
Graphics		
High-quality realistic graphics	6%	80.7%
Cartoon style graphics	38.4%	23.8%
Full Motion Video (FMV)	26.4%	45.4%

The Structural Characteristics of Video Games: A Psycho-Structural Analysis, Richard Wood, 2004

This table presents the scores for 'Background/Setting,' 'Use of Humor,' 'Brand assurance' and 'Character Development' video game characteristics along with their subcategories. It is evident that overall all characteristics are important to users; interestingly though, celebrity endorsement is not statistically important to users.

Table 2: Participants' Ratings of Structural Characteristics

	Not important	*Important*
Background / Setting		
Based on a story	19.6%	56.1%
Realistic settings	20.4%	53.8%
Fantasy settings	30.3%	35.2%
Based on film or TV	36.3%	30.8%
Use of humor	15.4%	52.2%
Brand assurance		
Brand loyalty	25.6%	48.3%
Celebrity endorsement	53.3%	21.7%
Character development		
Character development over time	9.4%	65.8%
Customize character	17.5%	58.5%

The Structural Characteristics of Video Games: A Psycho-Structural Analysis, Richard Wood, 2004

Principles of Video Game Design *Continued*

This table presents the scores for 'Duration of game' and 'Rate of play' video game characteristics along with their subcategories. It is evident that overall all characteristics are important to users; interestingly though, a short game duration is not statistically important to users.

Table 3: Participants' Ratings of Structural Characteristics

	Not important	*Important*
Duration of game		
Long (months or years)	27.4%	42.0%
Medium (days or weeks)	11.5%	47.5%
Short (e.g., one session)	50.4%	21.7%
Rate of play		
Rapid absorption rate	7.0%	76.5%
Rapid advancement	12.0%	57.2%

The Structural Characteristics of Video Games: A Psycho-Structural Analysis, Richard Wood, 2004

This table presents the scores for 'Control options' and 'Multiplayer features' video game characteristics along with their subcategories. It is evident that overall all characteristics are important to users.

Table 4: Participants' Ratings of Structural Characteristics

	Not important	*Important*
Control options		
Sound and graphic settings and skill levels	9.9%	67.1%
Choice of control methods	18.0%	57.4%
Physical feedback	44.1%	29.2%
Multiplayer features		
Multiplayer option (online)	19.3%	53.3%
Multiplayer (LAN)	17.8%	50.9%
Multiplayer communication	19.8%	40.2%
Building alliances	14.6%	45.4%
Beating other players or NPC	11.5%	58.0%

The Structural Characteristics of Video Games: A Psycho-Structural Analysis, Richard Wood, 2004

Principles of Video Game Design *Continued*

This table presents the scores for 'Game dynamics' video game characteristic along with its subcategories. It is evident that overall this characteristic is important to users.

Table 5: Participants' Ratings of Structural Characteristics

	Not important	*Important*
Game dynamics		
Exploring new areas	4.7%	76.0%
Elements of surprise	4.2%	75.2%
Fulfilling a quest	5.0%	74.4%
Skill development	5.7%	68.1%
Sophisticated AI interactions	8.4%	67.1%
Finding things (e.g., secret doors, levers, passages, hidden levels, characters)	9.7%	65.3%
Surviving against the odds	8.6%	62.7%
Shooting (enemies, targets, etc.)	14.6%	61.9%
Different ending options	14.4%	59.5%
Different modes of Transportation	14.6%	58.7%
Collecting things (e.g., objects, keys, chalices, components)	15.1%	56.7%
Solving puzzles	17.5%	56.1%
Beating times	15.1%	52.0%
Cheats/Easter eggs	23.0%	50.1%
Avoiding things	15.4%	49.6%
Solving time limited problems	17.8%	45.4%
Building environments	32.6%	33.4%
Mapping	35.5%	29.0%
Linear game format	44.6%	18.0%

The Structural Characteristics of Video Games: A Psycho-Structural Analysis, Richard Wood, 2004

This table presents the scores for 'Winning and losing features' video game characteristic along with its subcategories. It is evident that overall this characteristic is important to users.

Table 6: Participants' Ratings of Structural Characteristics

	Not important	*Important*
Winning and losing features		
Potential to lose points	14.6%	53.8%
Points accumulation	28.5%	38.4%
Finding bonuses	15.9%	52.2%
Having to start level again	39.7%	24.0%
Ability to save regularly	4.4%	81.2%

The Structural Characteristics of Video Games: A Psycho-Structural Analysis, Richard Wood, 2004

Graphic Design Considerations

As Richard Wood's study included feedback collection on elements of video game design, a study on attaining feedback for a graphic design problem must include feedback on specific graphic design elements. A selection of major elements in graphic design is described below by summarizing *Design Concepts* by Jane Mills and Janet Smith.

Line

A line is a form with width and length, but no depth. Artists use lines to create edges, the outlines of objects. A line is created by the movement of the artist's pen. A line has different characteristics which include direction, contour and gesture, and value.

Shape

A shape is an enclosed object. Shapes can be created by line, or by color and value changes which define their edges. Some characteristics include mass and volume as well as the distinction between positive and negative shapes

Texture

Texture is the surface quality of an object. Texture is the artist's way of mapping these tactile impressions on to the two-dimensional picture. Texture is created by varying the pattern of light and dark areas on an object.

Color and Value

Colors appear different depending on whether you view them under incandescent, florescent or natural sunlight. Colors also change according to their surroundings. The characteristics of color include hue, color value and intensity. On the other hand, value refers to the relative lightness or darkness of a certain area. Variations in value are used to create a focal point for the design of a picture.

Space

This can be used to create an illusion of depth using overlapping objects, size and vertical location of objects, their linear prospective, and attention to detail in their atmospheric prospective.

Movement

Motion can be displayed on a medium by creating fuzzy outlines of subjects, unstable body positions, multiple overlapping images, curved and circular patterns and optical illusions.

Balance

It can be affected by both the size and value of the objects. Balance includes symmetrical, when mirror images are balanced, asymmetrical, when small objects on one side of the medium are balanced out by a large one on the other side, and radial balance, when all elements radiate out from a center point on the medium in a circular fashion.

Emphasis

This term implies the creation of a focal point on a page in order to attract the most attention on a specific element. This can be achieved by contrasting the object with the background, isolating it from a group, or placing it in the center of the media.

Unity

This term refers to a sense that everything in the artwork belongs there, and makes a whole piece. It is achieved by the use of the proximity of objects to each other, repetition of color, shape, or texture, and continuation of a line or an edge from one area to another.

Introduction

This thesis synthesis aims to describe interrelationships and patterns which have been discovered during the research process. Firstly, it is important to understand the evolution of the relationship between feedback implementation in the video game design problem-solving process and the actual improved solution. Secondly, a connection must be made between video game design and graphic design in order to be able to apply the same feedback attaining and analysis methods to the graphic design process.

The Significance of Feedback in Video Game Design

Is feedback the main contributor to video game evolution?

The main purpose of this thesis is to improve an existing graphic design solution by using feedback from the audience. One of the reasons video game design can serve as a model of feedback implementation in the design process is because of the wide response from users of all backgrounds. This is evident from the improvement of video games over the course of time, as illustrated below for the video game series, Doom.

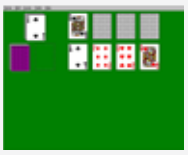
This panel displays a snap shot from the 1993 video game Doom 2-D.
http://www.pixeljoint.com/pixelart/28483.htm

This panel displays a snap shot from the 1995 video game Doom 2.
http://www.jameswoodcock.co.uk/?tag=enhanced

This panel displays a snap shot from the 2004 video game Doom 3.
http://chandu83.wordpress.com/2008/03/

The Significance of Feedback in Video Game Design *Continued*

However, one might argue that technological advancements are also main contributors to this improvement. Although this might be true in some aspects of the games, the fact that certain games are preferred over others - even though they are of the same category and have been released at the same point in time - shows that there is an additional contributing factor, user-generated feedback. A variety of different games of the same category is shown below.

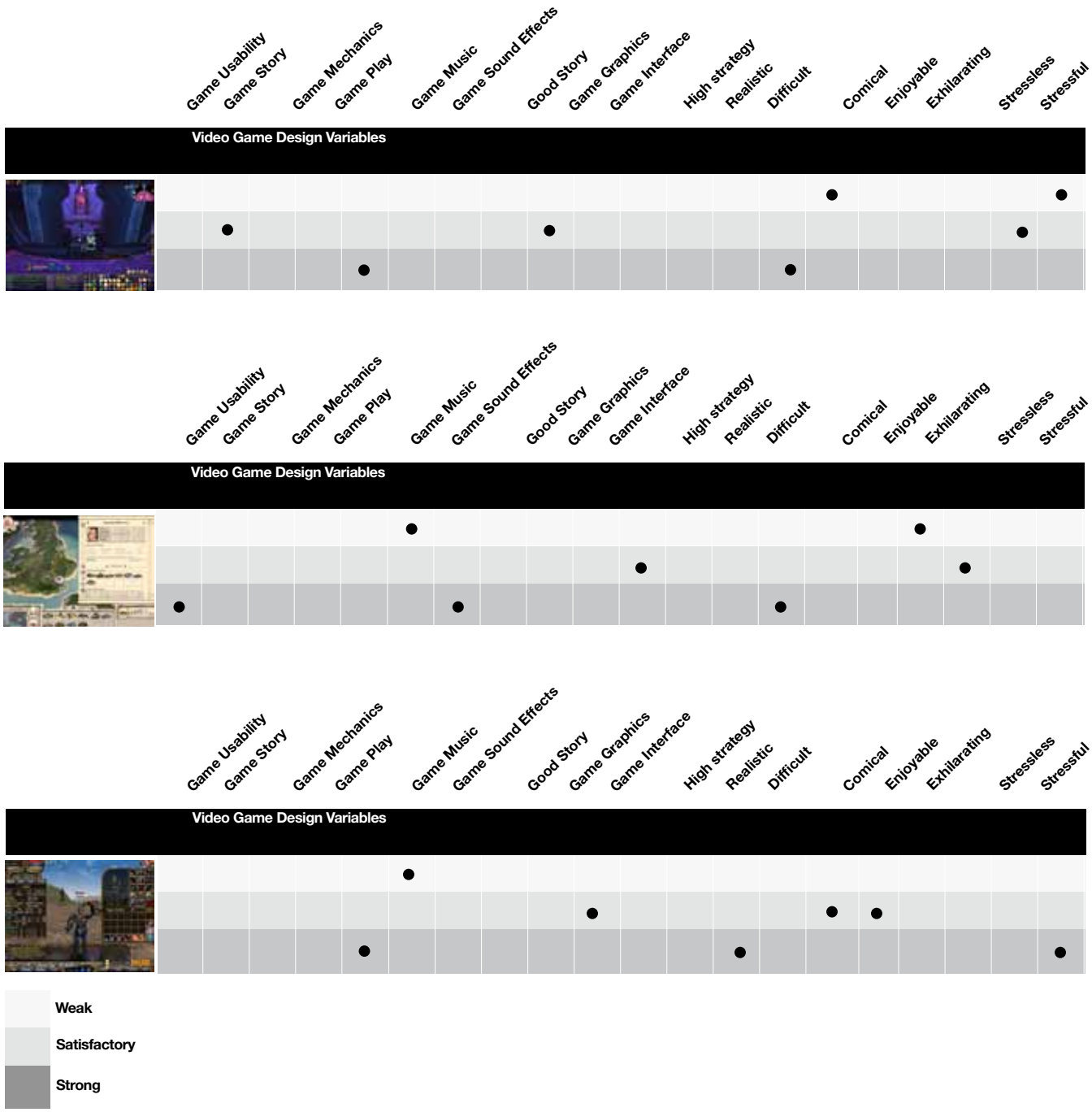
Video Game Design Applications	Existing Solutions		
First Person Shooters			
Role Playing Games			
Massively Multiplaying			
Online Games			
Strategy Games			
Simulator Games			

www.gamespot.com

The Significance of Feedback in Video Game Design *Continued*

How specific does the feedback need to be?

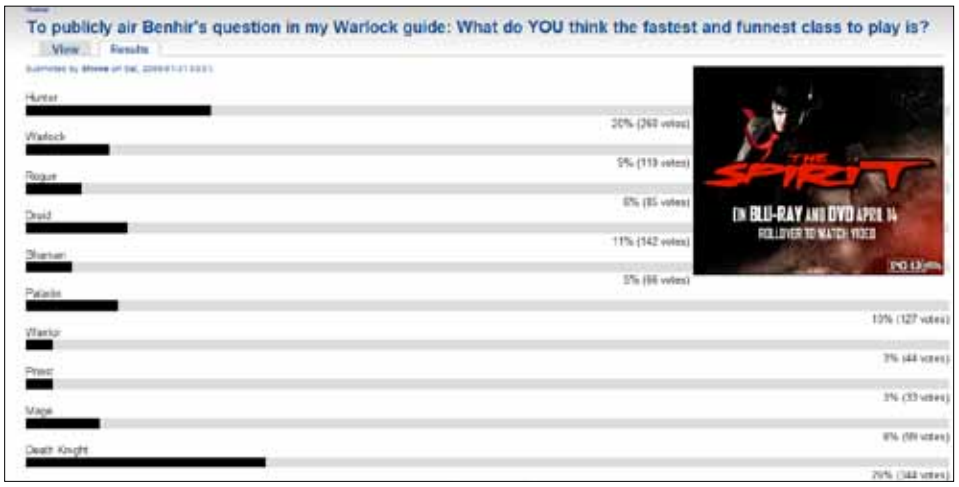
It is apparent that the feedback attained must refer to the specific elements of video game design in order for it to be inserted into the process of problem solving. An example of how this information can be narrowed down to the essential elements as well as to the success of each individual element within the design is shown below.



The Significance of Feedback in Video Game Design *Continued*

The question of specificity is also answered when looking at the type of questions asked in evaluation polls for certain video games. The following images portray polls conducted for the game World of Warcraft; the top image indicates the poll questions and the bottom the results of that poll.

http://www.wow-pro.com/poll



http://www.wow-pro.com/node/2280/results

Video Game Polls

Video game polls are one of the strongest forms for attaining user-generated feedback. Game developers take advantage of the world wide web by posting strategically constructed questions on game-related websites. The purpose of this is to gather enough information from the users in order to identify which areas of the game needs improvement. Ultimately, the information will be implemented into the video game design process, and will generate a new and improved solution, which will again be assessed by the users by way of evaluation polls.

The Significance of Feedback in Video Game Design *Continued*

Which feedback vehicles and analysis methods are best for Video Game Design?

When investigating which feedback vehicles are the best for gaining video game feedback from users, it is important to look at which ones have had the most response so far. As evident from the amount of website visitors, that could exceed sixty million annually, most users refer to video gaming sites. These sites include reviews and ratings on all recently released video games which can belong to any genre of game. In addition, these sites include forums, which allow users to write and post their own reviews and blogs. By combining the number of visitors and posts, video gaming sites are one of the most prevalent modes of feedback collection and access.

The feedback vehicles mostly employed in the forums is blogs and evaluation polls. This is evident in many gaming sites such as *www.mmorpg.com*, *www.gamespot.com*, *www.videogamer.com*, etc. Therefore, the method of users accessing websites to post their opinions on particular games, either in the form of evaluation poll answers or blogs, is very successful.

According to the Research section (p.15-18), there are many feedback analysis methods that can be used to evaluate feedback which are categorized into two groups, quantitative and qualitative analysis methods. The analysis method chosen is directly dependent on the type of method used to collect feedback – the feedback vehicle. Blogs are a type of unstructured interviews, which according to Axinn's *Mixed Method Data Collection Strategies* are qualitative feedback vehicles. Therefore, a qualitative feedback analysis method must be employed to evaluate the data from this vehicle. This could be any of the analysis methods mentioned in the Research section of the thesis (p. 17-18). However, in order for this information to be used in the design process, the data must be assessed quantitatively as well (p.15-16). This is because statistical analysis must be conducted in order to get a statistical significant number about the users' opinions; otherwise, every opinion must be considered even though the majority of users might disagree. Having this in mind, the best analysis method for blogs in this situation is inductive analysis.

This analysis method calls for inductive logic which will allow the designer to reach a specific conclusion from a piece of text which the user would supply. Then, this one conclusion can be grouped according to context with conclusions from other users and using cluster analysis derive the frequency of that conclusion. Finally this frequency will be subjected to statistical analysis in order for a statistically significant number to be generated and be used to quantify the users' opinion. In addition, evaluation polls, the second feedback vehicle mostly employed by users, is a type of survey, which according to Axinn is a quantitative feedback collection method. Therefore evaluation poll feedback can be analyzed directly by statistical analysis.

In addition, once an improved solution has been created, it is again subjected to the users' critique in the form of feedback starting another loop of feedback analysis and integration into the design problem solving process. This feedback loop is what will ultimately provide the best solution for a design problem.

It is obvious, however, that only through evaluation polls is the designer or developer able to attain specific information on the areas which can be changed in a game. Thus, these questions should aim to target specific elements of video game design – described in the Reasearch section (p.20-21).

The Significance of Feedback in Video Game Design *Continued*

Which element(s) does each evaluation poll question target?

Featured below are a number of questions found in different evaluation polls. These polls refer to games of different genres including first-person shooter games (FPSs), massively multiplayer online games (MMOs), and role playing games (RPGs). When looking closely at these questions, it is clear that they each attempt to evaluate one or more specific elements of the video game design in such a way that is both specific to the actual game and easy for the user to answer. The associations of video game design elements and the evaluation poll questions are listed in the following matrixes.

Matrix A **First Person Shooter Evaluation Poll Questions Related to Video Game Design Elements**

What feature do you want to see the most in the next GTA?	Game Usability	Game Story	Game Mechanics	Game Play	Game Music	Game Sound Effects	Game Atmosphere	Game Graphics	Game Interface
	Video Game Design Variables								
Bigger map area									●
More weapons				●					
More Cars				●					
Space and Spaceships / Starships			○	●					
More customization in game			●				●		
The whole world as a map									●
Longer missions	●	●							
More difficult missions	●	●							
Easier Missions	●	●							
Snow or Extreme weather								●	
A version with no bugs	●			●					
More than one of the above									
Other									

Video Game: Grand Theft Auto
http://grandtheftauto.filefront.com

The Significance of Feedback in Video Game Design *Continued*

Matrix B Massively Multiplayer Online Evaluation Poll Questions Related to Video Game Design Elements

Evaluation Poll Questions	Game Usability	Game Story	Game Mechanics	Game Play	Game Music	Game Sound Effects	Game Atmosphere	Game Graphics	Game Interface
What is the best weapon ?			●					●	
What Profession is the best for money making?	●	●							
Which race do you think has the best racial abilities?		●		●					
In the case of End-Game PvE Raiding in WotLK, what do YOU think is the best DPSing class?	●			●					
What is your native language?	●		●				●		
What do you think is the best healer class in end game raids?		●		●					●
What kind of realm would you prefer to play on in case of wow-pro in-game community?	●	●		●	●				●
What do you think of the new logo?								●	
Which of the following is your favourite zone?									
What class do you prefer?	●	●			●				

Video Game: World of Warcraft
http://www.wow-pro.com/poll

Matrix C Role Playing Game Evaluation Poll Questions Related to Video Game Design Elements

Evaluation Poll Questions	Game Usability	Game Story	Game Mechanics	Game Play	Game Music	Game Sound Effects	Game Atmosphere	Game Graphics	Game Interface
Who is your favorite partner?	●	●						●	
What place do you like better?		●			●	●			●
What place do you like better?		●		●			●		
Better Brobot?	●	●		●					
What is your favorite chapter?						●	●		
What is your favorite appearance of classic Mario?		●		●		●		●	
Favourite boss?						●		●	
Favorite playable character?						●		●	
When playing Super Paper Mario, which do you like better?			●					●	●

Video Game: Super Paper Mario
http://www.fanpop.com/spots/super-paper-mario/picks

Similarities Between Two Design Disciplines

In order to use the system of user-generated feedback integration into the video game design solving process for graphic design problem solving, a link between the two disciplines must be discovered. Although they are both disciplines of design they do differ in many aspects from the media selected to the actual elements of design being addressed.

Similarities, however, can be found in the actual applications/design problems of the two design disciplines. These are presented below for different pairs of video game design and graphic design applications which included pairing between different types of video games with those of graphic design. These pairs are MMOs with way-finding signage (Environmental Design), FPSs with instructional manuals (Information Design), and RPGs with posters (Communication Design).

Video Game Design Applications Compared to Graphic Design Applications

Massively Multiplayer Online Games and Wayfinding Signage		
Characteristics	Massively multiplayer online games (MMOs)	Way-finding signage
Longevity of task completion	Time spent to complete the game's task	Time spent to reach a destination
Cost of asking for help	Game money; trades; time spent	Time spent; cellular phone charges
Facing obstacles along the way	Battles between game characters; objects that physically inhibit a path in the game	People or cars inhibiting a path; one-way paths; staircases
Sense of accomplishment	Completing a task successfully	Finding your way efficiently
Objects needed to help you along the way	Weapons; health points	Cellular phones; maps
State of user as an influence on task completion	Low health points for game character; game-user fatigue	Fatigue; impatience; frustration
Character characteristics influence on task completion	Traits of playable character: strength, agility, weapon mastery	Traits of user: patience, good navigation skills
Pleasant environment as an influence on task completion	Game background; game music	Clean hallways or streets; legible signs
Distracting noises as an influence on task completion	Game sound effects; game music	Car noises; people chattering
Who to ask for help	Game 'help' option; game instructions; other characters; other players	The help desk or information center; other people

Similarities Between Two Design Disciplines *Continued*

First Person Shooter Games and Instructional Manuals		
Characteristics	First-person shooter games (FPSs)	Instructional manuals
Following directions dictated from a device/media	The user must follow directions for his task dictated from the beginning of the game	The user must follow instructions by reading first and then applying
Asking for help	The user can only refer to the game help options or other websites	The user can only refer to websites or phone help
Making individual decisions to deviate from the instructions	The user might choose to use a shortcut for faster and more efficient results; the instructions might not be clear enough	The user might choose to do something differently due to lack of equipment or time; the instructions might not be clear enough
Obstacles inhibiting the completion of a task	Unclear instructions; lack of technique; physical objects in the game inhibiting a path	Unclear instructions; lack of technique; lack of equipment

It is evident that there are enough similarities between applications of the two disciplines to conclude that the use feedback will improve the graphic design problem solving process just as it does for the video-game design problem solving process.

Introduction

The purpose of any potential application would be to integrate the feedback collection and analysis system discussed in the Synthesis section (p.31-35) into the problem solving process of any graphic design problem. These problems could derive from any field of graphic design being environmental, information, or communication design.

As discussed in the Synthesis section (p.31), evaluation polls seem to be the most popular and successful methods of feedback collection as well as the most efficient for feedback analysis. Although this feedback vehicle and its appropriate analysis method (p.31) can be used for graphic design problems, carefully constructed questions must be available that target a specific graphic design element needing improvement. The questions should also be easily understood by the audience. Therefore, evaluation poll questions must be constructed for a specific graphic design problem which are not only easy to answer but also specific enough to target graphic design elements.

In addition to feedback collected from users, there are two more sources of feedback that can be used to solve a graphic design problem. These include personal observation, described in the Research section (p.14), and improved video game solutions which have derived from user-generated feedback.

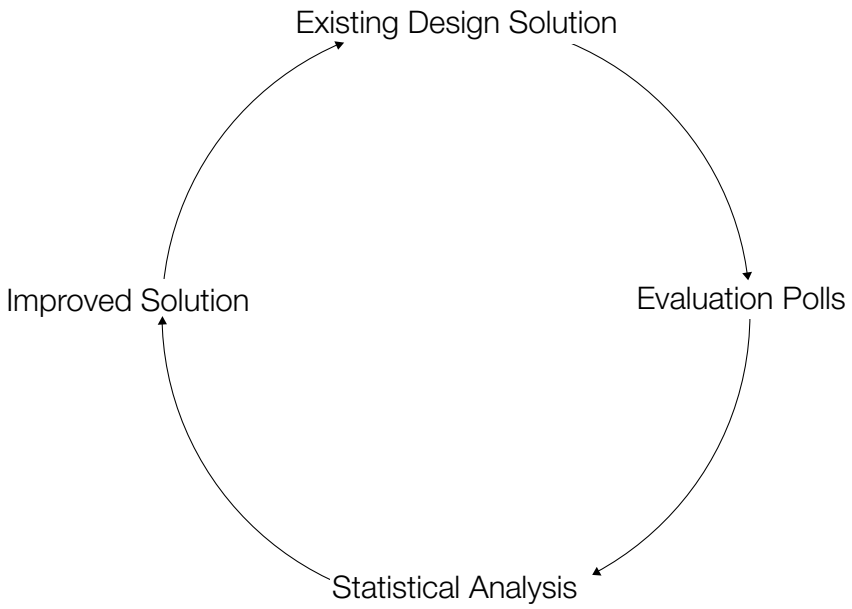
Analysis

Which feedback collection vehicle and analysis method should be used to attain graphic design information?

Evaluation Poll Questions

As mentioned in the Synthesis section (p.31) the most popular and successful methods of collecting feedback is through blogs and evaluation polls. These vehicles are readily available to any game user on gaming sites which provide forums. Thus, the game user is able to express his opinion after experiencing the game either by writing and posting his thoughts (blogs) or by answering specific questions (evaluation polls).

When comparing the two vehicles, it is shown in the Synthesis section (p.31) that evaluation polls are the most efficient, as specific questions targeting design elements can be asked which can later be improved. In addition, feedback analysis can be achieved with just statistical analysis as opposed to blogs which require inductive, cluster, and statistical analysis. This system is shown below:



Since the applications of video game and graphic design have been found to be similar (p.34-35) it can be assumed that the same feedback collection and analysis method can be as successful in graphic design as they are in video-game design. Therefore, evaluation polls and statistical analysis can be used for graphic design problems.

Analysis *Continued*

Observation / Personal Experience

Since an existing graphic design solution is under evaluation, a designer's personal observations on the solution can be very helpful to its improvement. Again, the specific elements of graphic design should be evaluated as to whether they are correctly represented in the existing solution. In order for that to be achieved, a designer must become involved in the design just like any user would.

Improved Video Games

Since similarities have been found between video game design and graphic design applications, one could observe the method of feedback incorporation in the problem solving process for video game design and adapt it to graphic design. Just as certain design elements are improved after video game user-generated feedback is obtained, graphic design elements can be improved in a similar way for graphic design applications.

How should the evaluation poll questions be constructed?

In order for the previously described system to be successful for graphic design problems, evaluation poll questions must be carefully constructed. These questions should be specific for both the design problem as well as the elements of graphic design. In addition, the questions should be formulated in such a way that the answer can be given in a yes/no format or be chosen from a series of options.

According to the Research section (p.14), there are various graphic design elements that need to be addressed during the problem-solving process. These include line, shape, texture, color and value, space, movement, balance, emphasis, and unity. By looking at the definition of each element and relating it to a specific graphic design problem, the questions can be formed. This will be shown in the 'Potential Applications' subdivision of this section.

How can statistical analysis be used?

After feedback has been collected, the responses can be categorized according to the elements targeted. Then each element would be scored according to if it is weak or strong and statistical analysis can be conducted. The mean would be taken by counting the "weak" and "strong" marks for every element using the formula:

$$\bar{x} = \frac{1}{n} \cdot \sum_{i=1}^{n} x_i$$

Potential Applications

A potential application would aim to demonstrate how feedback can be incorporated into a graphic design problem-solving process in order to improve an existing solution. Therefore, an existing solution must be chosen that could correspond to a video game design application, could be fully experienced by a designer, and for which evaluation poll questions will be generated. The answers will then be analyzed statistically for which elements require improvement and the new improved result will be displayed and subjected to audience feedback once again.

Wayfinding Signage

Wayfinding refers to a system of navigation that enables people to find their way quickly and easily in a built environment. Design elements such as pictograms, words and colors are used as aids to orientation. Some examples of where this system is used are hospitals, libraries, and supermarkets.

As shown before, wayfinding signage systems share very similar characteristics with massive multiplayer online games (MMOs). Just like video game evaluation polls, the public would provide information on areas in need of improvement. These suggestions could be incorporated into the design process through a feedback loop intended to modify or revise the signage system as appropriate.

Therefore, improving existing wayfinding signage systems through the three different feedback sources – personal experience, user-generated feedback, and improved MMOs – is an optimal application for this study.

Hospitals

Hospitals can often be a confusing maze of departments and corridors, especially for the first-time visitor. Therefore, it is necessary for a clear and easily understood wayfinding signage system to be available, especially since visitors and patients entering a hospital are often stressed, preoccupied or disoriented. Such systems are particularly important in complex environments such as the hospital. Good wayfinding systems allow ease of navigation while bad systems can confuse and frustrate users. Wayfinding systems in the hospital should strive to be, as far as possible, intuitive and well integrated with the environment. They should orient visitors properly and make them as self-sufficient as possible in finding their way.

Libraries

Libraries are also locations where navigation can be frustrating, especially for first-time visitors. An effective wayfinding system should aim to assist the public to the different broader areas of a library, such as the different sections and utility areas. Additionally, more specific regions, such as those within the book stacks themselves, should also include better wayfinding systems.

Potential Applications *Continued*

Supermarkets
Supermarkets are often large and crowded spaces which do not allow much time for individuals to stop and read individual signs. Therefore, the wayfinding signage system has to be created in such a way to allow the minimal amount of time for an individual, especially a first-time visitor, to locate where the item he/she is looking for is placed.

How can evaluation poll questions be constructed in order to be specific for wayfinding signage systems?

Wayfinding signage systems are a graphic design application which necessitate the use of environmental space. It is then important to realize that the graphic design elements described in the Research section (p. 25) are used here according to their literal flat definition as well as their spatial definition. For example, the term 'line' literally means the movement of an artist's pen on paper. However, its spatial definition implies the line created from an individual's eye perspective by multiple art works. The same type of spatial definition can apply for the other terms as well. The following table shows evaluation poll questions specific to wayfinding signage systems as well as which elements each question target.

Evaluation Poll Questions Specific to Wayfinding Signage Systems

Evaluation Poll Questions	Answer Options/Format	Element targeted
Did you ask for help in order to reach your destination?	Yes No	Overall rating of elements
What stood out the most on the signs overall?	Text Size Color Arrows and Symbols	Color and value, Line, Shape, Emphasis
Which signs did you find the most helpful?	Mounted on walls Hanging from ceiling Hung on bulletin boards Mounted on stands/poles	Space, Unity, Emphasis
Were the different locations of sign placement helpful or confusing?	Helpful Confusing	Balance, Shape, Line
Did you know where to look for signs?	Yes No	Line, Shape, Space
Could you distinguish the signs from other art works/posters/objects nearby?	Yes No	Emphasis, Balance, Texture, Unity, Color and Value
Did the distance between the signs seem small or large?	Small Large	Balance, Movement

Application

The final application consists of the following steps:

1. First round of feedback collection on a design problem from three different feedback vehicles: personal observations, evaluation polls, and improved video games.
2. Analysis of feedback through the correlation of feedback data to graphic design elements.
3. Implementation of feedback by creating improved design options.
4. Second round of feedback collection: subject design options to public and collect feedback via an evaluation poll.

Chosen Problem:
Strong Memorial Hospital, Rochester, New York

The hospital wayfinding signage at Strong Memorial Hospital, Rochester, NY was chosen to demonstrate how feedback can improve an existing graphic design solution. The application was specifically focused on the signage system related to the multiple elevators in the hospital. Personal observations were made and the elements of design were scored as weak and strong. Subsequently, twenty users were asked to fill out a questionnaire concerning the existing wayfinding signage in the hospital.

First round of feedback collection

Personal Observations:

1. When reaching the elevators there are no signs to inform the public about their destination.
2. The number of telephones in the hallways is a definite indicator that the existing signage is causing confusion for visitors since they have to ask for directions.
3. The color system which is incorporated into the hospital's signage seems to be too distracting ass all the colors mesh together when viewed from a distance.
4. The existing signage seems to contain too much information causing the overall text to become very hard to read while people are walking by.
5. The signs throughout the hospital are different shapes and sizes.
6. Small colored tags hanging from the ceiling exist to navigate towards the elevators, which are not very efficient to view from a distance.

Elements	Strong	Weak
Line		**X**
Shape		**X**
Texture	**X**	
Color & Value		**X**
Space		**X**
Movement	**X**	
Balance		**X**
Emphasis		**X**
Unity		**X**

Application *Continued*

Improved Video Games as a Feedback Vehicle:

As it has been shown previously, Massively Multiplayer Online (MMOs) Games share many similarities with wayfinding signage systems. Therefore, MMOs which have been improved through user-generated feedback can be used as a source of graphic design feedback. This can be done by translating certain improvements into graphic design terms; examples of this are shown below.

Example 1

Check-Point is a point in the level that you should pass through, either to get time extended in time limited games, or a point that you'll return to in case your health meter reaches zero. These were developed after the acknowledgement of the users' distress on having to start a video game level from the beginning after exiting the game or loosing the game, even though they had completed most of the level. Particularly in MMOs, they also serve as a recognisable feature during a task, which can reassure the user that he is going in the right direction.

Just as MMOs have developed recognisable features, so can the wayfinding signage system in hospitals in the form of visual symbols.

Example 2

In the attempt to make certain MMO games more appealing, developers add more elaborate background content to the game. This content can include elaborate landscapes, buildings, trees as well as additional background characters carrying out various activities. Although this might enhance the graphics of a game, it has been expressed through online blogs and forums that navigation is impaired due to this enhancement. This is why game developers now strive to include a more simplified yet visually appealing background content.

Just as MMOs strive to eliminate background clutter, so can hospital wayfinding signage by the elimination of unnecessary redundancy of information throughout the system. This can be achieved by improving the hierarchy of information on signs as well as the placement of these signs within a space.

Application *Continued*

Evaluation Poll:

Twenty users were asked to fill out a questionnaire concerning the existing wayfinding signage in the hospital.

Elevator Wayfinding Signage

1 *Choose all that apply:*

☐ First time visitor ☐ Staff ☐ Male

☐ Second time visitor ☐ Faculty ☐ Female

☐ Frequent visitor ☐ Student

2 **How easy was it to find the appropriate elevator for your destination?**

Difficult *Easy*

5 4 3 2 1

3 **How easy was it to follow along a direction to reach the elevator you need?**

Difficult *Easy*

5 4 3 2 1

4 **How certain were you that you had reached the correct elevators?**

Uncertain *Certain*

5 4 3 2 1

5 **Which type of signage do you consult the most when attempting to reach the elevators you need?**

Please check all that apply:

☐ Mounted on wall ☐ Color coded

☐ Protruding from wall ☐ Monochromatic / Single color

☐ Hanging from ceiling

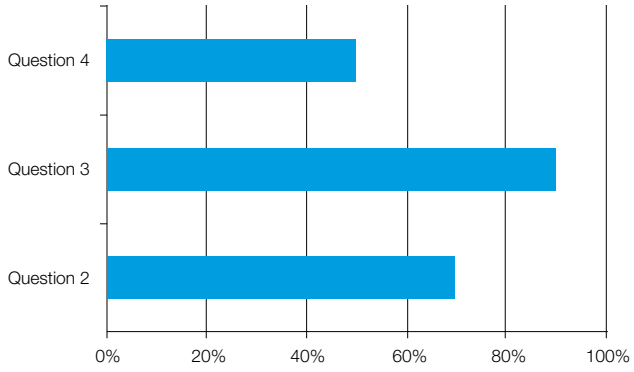
Application *Continued*

Feedback Analysis:

The questions asked in the poll target specific elements of graphic design (refer to example in table Evaluation Poll Questions Specific to Wayfinding Signage Systems on p.40). Specifically:

Question 1: Gives information if this is a first time user
Question 2: Space, Shape, Emphasis, Line
Question 3: Balance, Movement, Unity
Question 4: Color and Value, Texture
Question 5: Deciphers which signage display is the best

The following graph summarizes the feedback from the evaluation poll. The information was quantified by averaging the results from 20 users for questions 2, 3, and 4. The y-axis represents the magnitude of a problem area as a percentage.



The results of the evaluation poll suggested that the biggest problem for the users is with balance, movement, and unity. Specifically, this can be addressed by creating a cohesive design concept for the user to follow from the entrance of the hospital to the elevators. This could be achieved by color or shape cohesion along the hospital hallways. Another problem seems to be emphasis. This could be addressed by improving the hierarchy of information with the use of efficient typographic choices.

Additionally, according to feedback attained by the improved video games, it seems that the addition of visual symbols will improve navigation of the public. This especially true for the elevator symbol shown below:

Application *Continued*

Implementation of feedback

The following represent the development of a cohesive wayfinding signage system. The original design is marked as *Existing Solutions*. The improvement of this design concept through the implementation of feedback is shown from numbers 1-30.

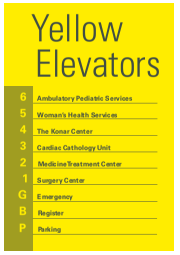
Existing Solutions




Application *Ideations*

Improved Solutions

1



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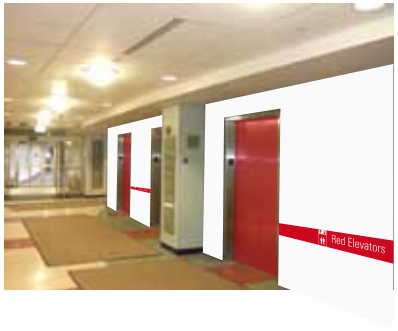
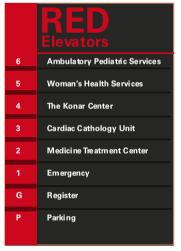


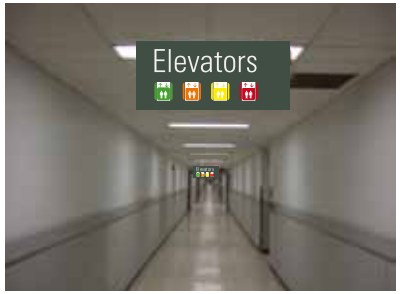


3

Application *Ideations*

Improved Solutions

4



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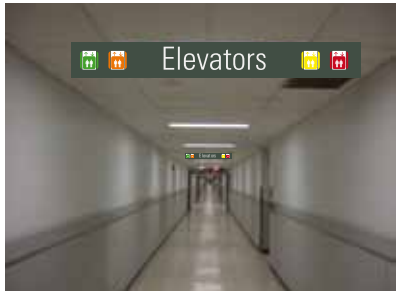
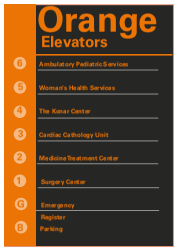


6

Improved Solutions

7



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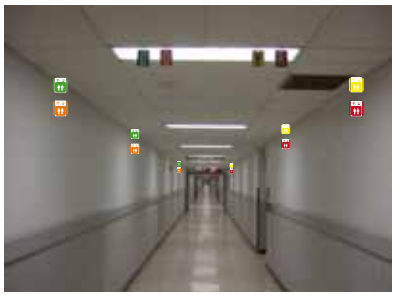

9

The Implementation of feedback

The improved solutions were presented to hospital visitors and the graphic design team of the Strong Memorial Hospital's public relations department. The general feedback from these users was very positive. Specifically, they responded positively to the following:

- The cohesive color bar that could be implemented down the path to help them get to their elevator destination much easier.
- The better use of symbols and color coating of elevators that were implemented into the improved solutions, as they helped the user get to their elevator of choice and destination much easier.
- The positioning of directional symbols, color coated arrows in key locations, were another favourite when the improved solutions were shown.
- The use of good typography when users actually got to the elevator needing to read which floor consisting of points of interest based on the elevator of choice, helped them after viewing the improved solutions.
- Therefore, the concept of feedback implementation for the improvement of existing way-finding signage systems was shown to be successful.

Conclusion

The aim of this thesis was to research and demonstrate how graphic design problem solving can benefit from a user generated feedback system. The results of the research presented were two fold; video game design incorporates and widely benefits from user-generated feedback, and evaluation polls is the most efficient feedback vehicle for use in the video game design solving process. The synthesis section of this thesis established a relationship between video game design and graphic design through massively multiplayer online role playing games and wayfinding signage systems. This allowed for the interpretation of design features of these games for inclusion into wayfinding signage system design. Additionally, this section evaluated how evaluation polls can be constructed by considering video game evaluation poll construction – in order to translate user generated feedback into graphic design elements. Finally, three feedback vehicles were chosen to assist with the graphic design problem solving process: personal observation from the designer, interpretation of video game design solutions, and evaluation polls targeted towards the user public.

Once a user-generated feedback system was established, it was implemented into the problem solving process of creating a more efficient wayfinding signage system for Strong Memorial Hospital in Rochester, New York. This resulted in the creation of three cohesive design concepts for the Hospital that can be again evaluated through the three point feedback system.

The results of this thesis demonstrate that graphic design problem solving can be benefited from incorporating feedback systems based on and for video game design. Moreover, this system can be used as a cycle since whatever solution is created can go under the same cycle of evaluation.

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