TEAM PROJECT

Use of Hierarchical Decision Modeling to Choose the Best Game Console

Team - 6

Course Title : **Decision Making**

Course Number: **EMGT 530**

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Table of Contents

1. Introduction

Description of decision making problem and process

Over the past 30 years, video games have become an integral part of our culture. The video game industry has become a multi-billion dollar entity.

In the last decade, the diffusion of gaming consoles has increased in a very noticeable way. Although, many types and models have swept the market, 3 companies dominated the biggest share of it, which are: Sony, Microsoft, and Nintendo. In this report we are going to focus on the 7th generation only of these models, since it's an endless process to go back and evaluate all of the gaming consoles models.

Nowadays, gaming consoles are more than devices to play games with; you can browse the Internet, watch movies, listen to music, and perhaps burn some calories too. With so many options to pick from and the similarity of these options, a first time buyer would face a decision problem trying to choose a game console that "has it all". In order to specify the criteria that concern a console buyer, our team visited some popular stores that sell game consoles. We asked the experts and professionals gamers in these stores to define those criteria and weigh them.

Our team's mission was to build a Hierarchal model in which we can weigh the criteria according to personal and technical preferences. Pair wise Comparison was used in order to assess the relative merits of different game console. Moreover, we visited some websites and read reviews about the most popular game consoles. We applied the decision-making strategies we learned in “ETM 530” course to choose the best gaming console for a first time buyer adult. We took in consideration both personal and technical perspectives.

From the problem description we were able to identify a list of game consoles that we can consider in selecting the final one.

History

The origin of video games lies in the late 1940s. These programs were later adapted into other simple games during the 1950s. Ralph Bauer invented the concept of hooking up an electronic game system to a television set in the early 1950s. By the late 1950s and through the 1960s, more computer games were developed (mostly on mainframe computers), gradually increasing in sophistication and complexity. The first wildly popular home console was the Atari 2600, released in 1977. [1] Following this period, video games diverged into different platforms: arcade, mainframe, console, personal computers, and later handheld games. [2]

Nowadays, there are many advanced 3D games available such as shooting, sports, puzzles, action, horror, racing, etc. These games also include a high-quality surround sound and highly advanced graphics, and can be played on PS3, Xbox, and Wii. These consoles -as we mentioned earlier- have several other capabilities as well; they can run games, play mp3s, display movies, and even browse the Internet. [3]

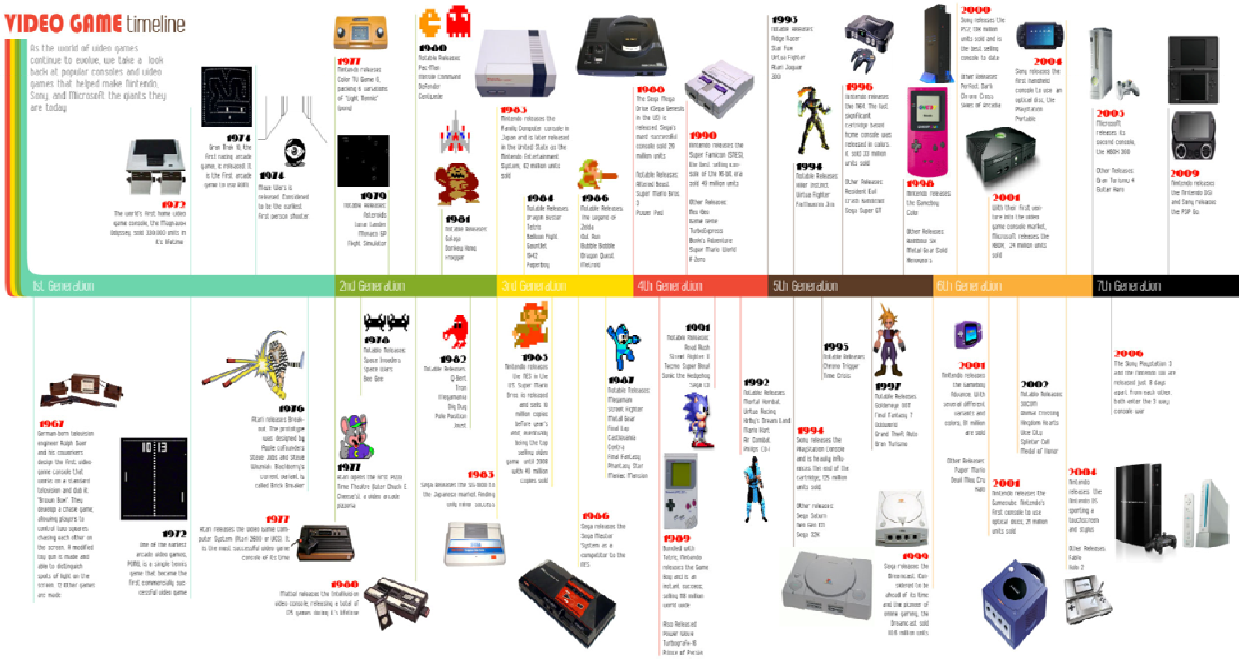

Figure 1: Video Games and Consoles Time Line [4]

2. Technology Overlapping

Technology devices nowadays have a lot of things in common. We called it technology overlapping. Most of the game consoles features can also be found in PCs and laptops; Tablets and smart phones. Here are some examples:

Their Hardware Features like CD/DVD/Blu-ray optical drives, Wi-Fi/Bluetooth wireless connectivity, HDMI, VGA/DVI and USB cable Connections can be shared together. Also software, such as: Taking Pictures & Videos; Social Networking; Video game verities, besides surfing the Internet; are all common ways of usage. The illustration below shows the intersections between those technologies. (The numbers represent the overlapped technologies):

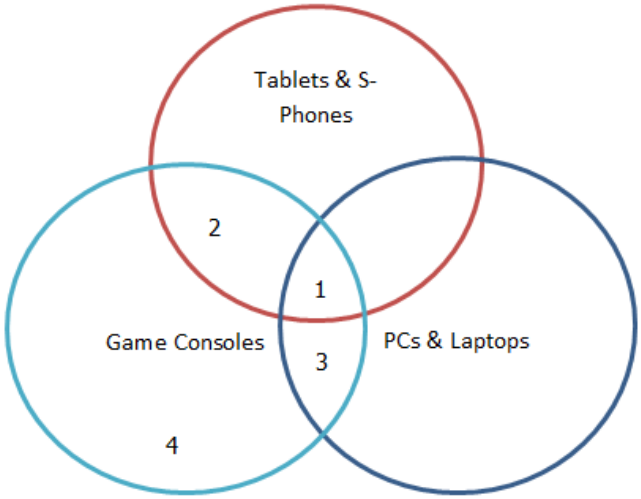

Figure 2: Technology Overlapping

1. Game consoles ∩ Tablets & Smart Phones ∩ PCs & Laptops
    a. Taking Pictures & Videos
    b. Social Networking
    c. Gaming
    d. Surfing Internet
    e. Watching Movies
    f. Wi-Fi
    g. USB
    h. Multi-using Apps
    i. Bluetooth
    j. IM/ voice, video
    k. HDMI
2. game consoles ∩ smart phones & Tablets
    a. Vibration Technology

3. Game Consoles ∩ PCs & Laptops
    a. High Graphic Games
    b. CD/DVD/Blu-ray
    c. VGA/DVI Connection
4. Game Consoles
    a. Motion Detector
    b. Handheld Game Accessories

Most of the features that we have found in the overlapped technologies have been used later in our model as factors. The motion Detector such as (Kinect for Xbox 360, PlayStations 3's Motion, and Wii's motion controllers) are one of the significant features for the game consoles. Mean the while, handheld game accessories have been and still dominating and widely used along with the game systems. We found this technology overlapping section was really important to highlight the connection and the multi-use of technology within the last few years. It's very noticeable when you go through the later sections of this paper, the intensive usage of these overlapped features to categories the main criteria, factors, and features to solve our decision problem.

3. Methodology

To help a first-time buyer make a decision on which game console is the best and most optimal for him or her, a decision model which is combined with Hierarchical Decision Model (HDM) and Pair wise Comparison along with PCM software will be applied in the decision making process. The Hierarchical decision model is essential and can be used to develop a solution to a decision problem. There are three main levels in the HDM structure; the Objective or goal at the top of the hierarchy, the criterion under the Objective which can be found or considered by online research or from customer survey, and the alternatives at the bottom.

According to The PICMET paper, "Application of Hierarchical Decision Modeling for Selection of Laptop", this paper has shown us the way to develop the Hierarchical Decision Model which can be applied in our decision problem [5]. In order to evaluate three alternatives and determine which game console is the best and optimal choice for a first-time buyer, there will be 9 steps to follow as shown in Figure 3.

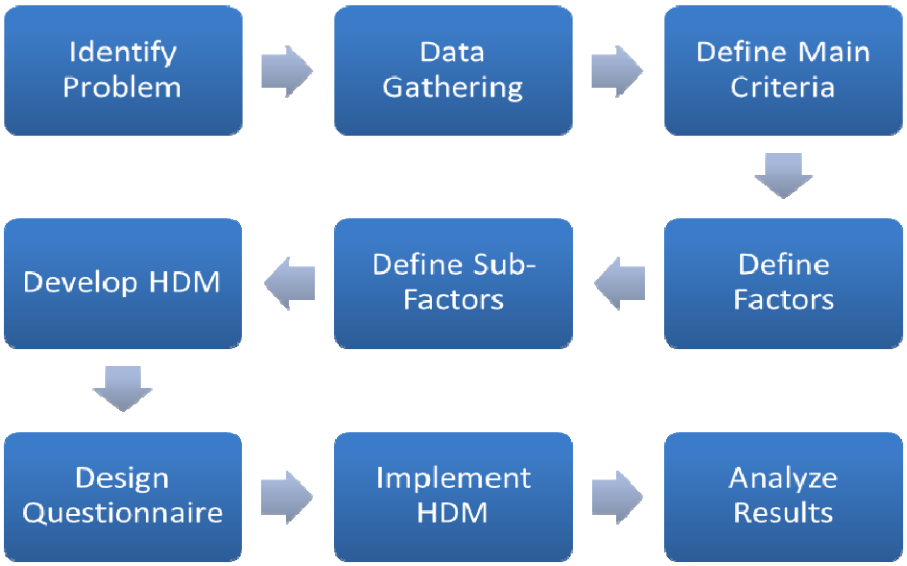

Figure 3: Methodology

First, we need to identify the problem and define the objective. The next step is Data gathering which we will research online and customer survey to gather all the information and data that can be used in our problem. In the step of Main criteria identification, factor identification, sub-factor identification and Develop HMD, we will use the data from our online research to identify the main criteria, factors supporting each criterion, and sub-factors supporting each factor and built the HDM. In the step of design questionnaire, we will develop a survey which is designed for enthusiastic and professional gamers and experts. The survey gives participants a chance to give their opinions on what they think about each game console and they also have a chance to weight on what the most important criteria is according to their judgment. In the step of Implement HDM, we will apply the result numbers

from the survey to the HDM with the help from PCM to calculate the normalized values of each criteria, factors, and sub-factors which finally we will be able to calculate the final weight of each game console and analyze the result which the higher value means better and the lower score means worse.

3.1. Model building

We developed our model according to the decision making approach and selected the main criteria, factors, and sub-factors based on our survey and online research [6] [7] [8] [9] [10] [11] [12], We finally got two main criteria, six factors, and fifteen sub-factors and the descriptions of each criteria, factor, and sub-factor is explained in detail below.

1. Technical criteria

1.1 Features

1.1.1 CPU (S1): CPU refers to the speed of the processor of each game console which determines the overall performance of game console.

1.1.2 Graphic (S2): Graphic refers to the speed of graphic processor which directly affects the quality of graphic and frame rate of that game console.

1.1.3 Storage (S3): Storage refers to the capacity of hard drive which will determine the space that gamers can store and save their games and movies.

1.1.4 Networking (S4): Networking refers to the capability to connect to the internet which directly affects to online gaming and internet serving.

1.1.5 Optical drive (S5): Optical drive refers to the type of optical drive which determines the capability of supporting a specific kind of media such as CD,DVD,HD-

DVD, or Blu-Ray. This also directly affects to the watching HD movies capability via optical drive.

1.2 Accessories: the accessories refer as the variety of accessories.

1.3 Geometry

1.3.1 Size (S6): Size refers to the dimension of game consoles which is including width, length, and height.

1.3.2 Color (S7): Color refers to the variety of colors of certain game console.

1.3.3 Design (S8): Design refers to the ease of accessing and use of buttons. This also refers to the how each button, port, optical drive located in the appropriate position which can be easily be reached and used.

2. Personal Criteria

2.1 Usage

2.1.1 Gaming (S9): Gaming refers to the importance of using a game console for gaming purpose.

2.1.2 Watching Movies (S10): Watching movies refer to the importance of using a game console for watching movie purpose which including streaming online and via optical drives.

2.1.3 Surfing the internet (S11): Surfing the internet refers to the importance of using a game console to browse the internet. It can be used for many purposes such as reading the news, email, and social networking i.e. Facebook.

2.2 Price: Price refers to costs of game console which is paid to buy a game console. Price can be found by online research and rated from very cheap to extremely expensive scale.

2.3 Game Variety:

2.3.1 Family (S12): Family refers to the quality of family game of each game console.

2.3.2 Sport (S13): Sport refers to the quality of sport game of each game console.

2.3.3 Hardcore (S14): Hardcore refers to the quality of hardcore game of each game console.

2.3.4 Arcade (S15): Arcade refers to the quality of arcade game of each game console.

The hierarchical model is shown in Figure 4. This model contains the objective, main criteria, factors, sub-factors, and all the alternatives.

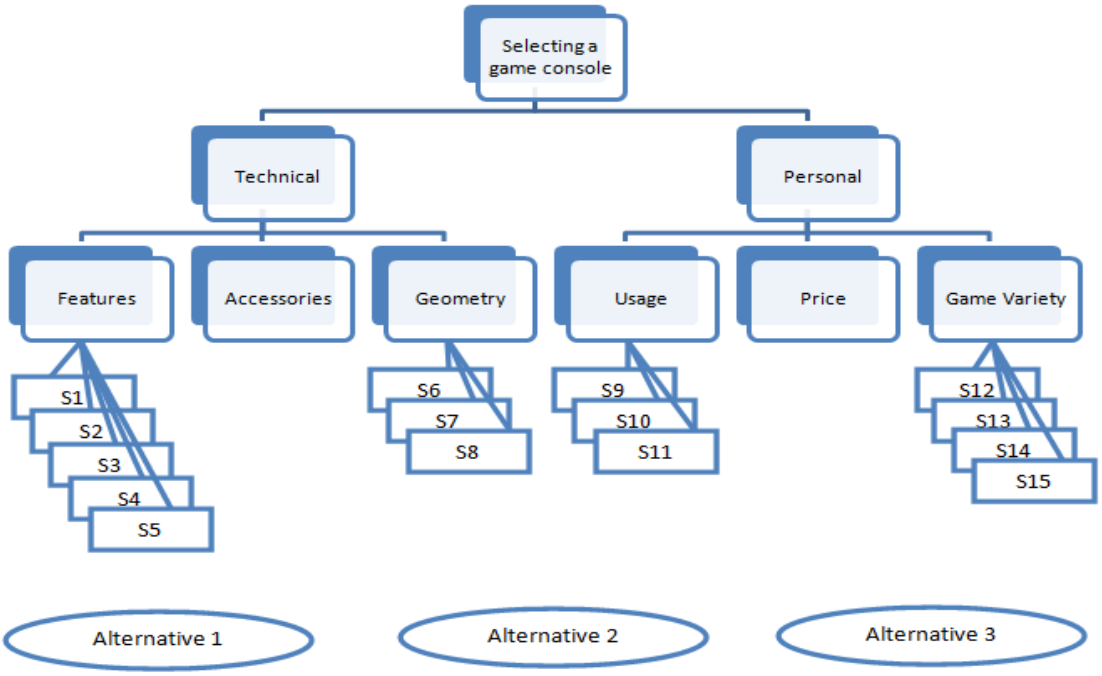

Figure 4: The Hierarchical Model of Selecting a Game Console

3.2. Alternatives

There are many alternatives for game consoles in the market at the present but most of them have many similarities except for the difference in the packaging which is including some accessories and game bundles and the capacity of hard drive which directly affect the total price. In order to select the right game console and to make it easy and appropriate for this decision problem, we have done the online research and a survey with sellers at several stores in local area and we decided to mainly consider only the game console itself which the results will be unbiased by the game console that comes with accessories. Finally, we selected the best-selling game console in three major brands as shown below.

1. Microsoft Xbox 260 Slim 250 GB

2. Sony PlayStation 3 Slim 160 GB

3. Nintendo Wii Sport 512MB

All of these game consoles have their own specifications and performance which will result in different final value in the process of calculation and the best alternative will have the highest score among other alternatives.

3.3. Assumptions

In order to make the decision making process right, appropriate, and easy, we have made the assumptions as shown below.

1. We took in consideration only the latest game console generation which is 7^{th} generation.

2. All of the smaller and portable game consoles have on effects on rating and reviews.

3. We assumed that Sony's PlayStations' Network did not happen and have no effects on buyer's decision.

4. We considered on buying the original-generic console pack only.

5. We considered only the best-selling game console of each brand.

6. Brand names have no effects on buyer's decision.

3.4. Survey

In order to evaluate the buyer's preferences and their factors, our team used a questionnaire form based on pair wise comparison theory. Assigned each individual of our team members to visit several stores around the Portland and Beaverton area, See the table below of the stores and locations that we have visited:

Name	**# Of the visited sites**
Best Buy Stores	3
Fred Mayer	2
Game Stop	3
Fry's Electronics	1
Wal-Mart	1
Total	10

The Stores

Eight potential users have been asked to answer these questions by their judgments, and they have done all of them individually without discussing. We ended up using only four out of the eight participant weights that we collected. The professionals and the expert, who also helped us on the Utility chart, are the ones who got chosen.

Enthusiastic	Professional	Expert
4	3	1

The Participants

This questionnaire consists of seven groups of questions. In the first group, participants needed to compare the two main preferences that we selected in our model: Technical and Personal. The second group of questions asked the participants to compare the sub-factors that belong to the technical factors such as features, geometry, and accessories. And the same for the third group of questions except it was for the Personal Factors. From the fourth to the seventh group of questions, the participants were required to compare the sub-factors such as CPU, GPU, Networking, Optical Drive, Gaming, and so on.

In each pair wise comparison question, the participants had to put the number in the blanks to present their judgments with two selected items. For example, when left-side item is feature and right – side item is Accessories, if one potential user puts 70 in the first blank and 30 in the second blank, it means that this user thinks the intensity of importance in feature is two times than reliability. The same principal was used in all following questions. Below is the questionnaire that we used for the expert participant:

Questionnaire for Users

Participant information

Name:	**Rob S.**			
Sex:	**Male**	Female		
Age:	10-20	20-30	**30-40**	
Type:	Enthusiastic Gamer		Professional Gamer	**Expert**
Employer:	**Best buy**			
Date:	**May 21, 2011**			

The purpose of this survey is to get information about user's judgment on game console's criteria. In order to complete this questionnaire, participants will be asked to allocate 100 for each question. Please follow the instruction below to answer the entire questions.

Instruction

In order to answer each question, participants will allocate 100 points of importance between 2 criteria or sub criteria based on your experience or your opinion. For example, if you think "CPU Performance" is 4 more time important than "Storage" then you will allocate 80 on CPU Performance and 20 on Storage like example below.

CPU Performance	80	20	Storage

1. Weight of main criteria (Preferences)

Technical Criteria	50	50	Personal Criteria

2. Weight of Technical Factors

Features	70	30	Accessories

Features	80	20	Geometry

Accessories	65	35	Geometry

3. Weight of Personal Factors

Usage	30	70	Price

Usage	30	70	Game Variety

Price	50	50	Game Variety

4. Weight of Feature's sub-factors

CPU Performance	50	50	Graphic Performance
CPU Performance	60	40	Storage
CPU Performance	65	35	Networking
CPU Performance	75	25	Optical Drive
Graphic Performance	75	25	Storage
Graphic Performance	50	50	Networking
Graphic Performance	70	30	Optical Drive
Storage	30	70	Networking
Storage	60	40	Optical Drive
Networking	80	20	Optical Drive

5. Weight of Geometry's sub-factors

Size	90	10	Color
Size	80	20	Design
Color	30	70	Design

6. Weight of Usage's sub-factors

Gaming	60	40	Watching Movies
Gaming	80	20	Serving the Internet
Watching Movies	70	30	Serving the Internet

7. Weight of Game Variety's sub-factors

Family Games	30	70	Sport Games
Family Games	10	90	Hardcore Games
Family Games	40	60	Arcade Games
Sport Games	30	70	Hardcore Games
Sport Games	50	50	Arcade Games
Hardcore Games	90	10	Arcade Games

4. Data Analysis

4.1. Weights and Inconsistencies Calculations

From the last step, we asked the experts to weigh the criteria, factors, and sub-factors for us, once we had those numbers ready, the next step was to put those numbers into PCM software which basically helped us calculate the normalized weights, calculate the inconsistencies, and also calculate the mean values of every factor and sub-factor of each participant which was the main thing we were

focusing on. The results that we got from the PCM software represented the level of importance of each factor, and each sub-factor from the experts' perspectives.

The first result that we got was the final weights of the technical factors which were shown below.

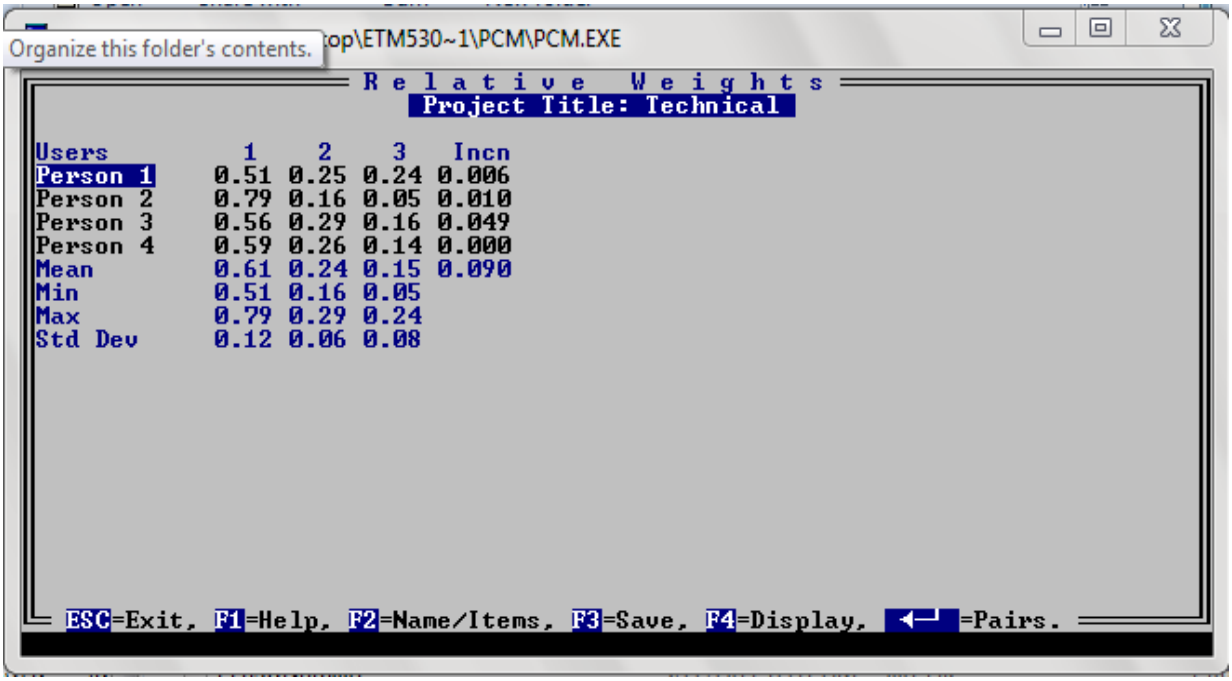

Figure 5: The Final Weights of the Technical Factors from the PCM Software

According to figure 5, it illustrated the weights of the technical factors that we got from 4 experts. All of them thought that features which could be classified as speed (CPU), graphic (GPU), storage, networking, and optical drive were the most essential for customers when they buy a game console if technical aspect was the only consideration. Accessories came second from those experts' views and geometries of the consoles were their least concerns.

The second result that we got was the final weights of personal factors which were shown below.

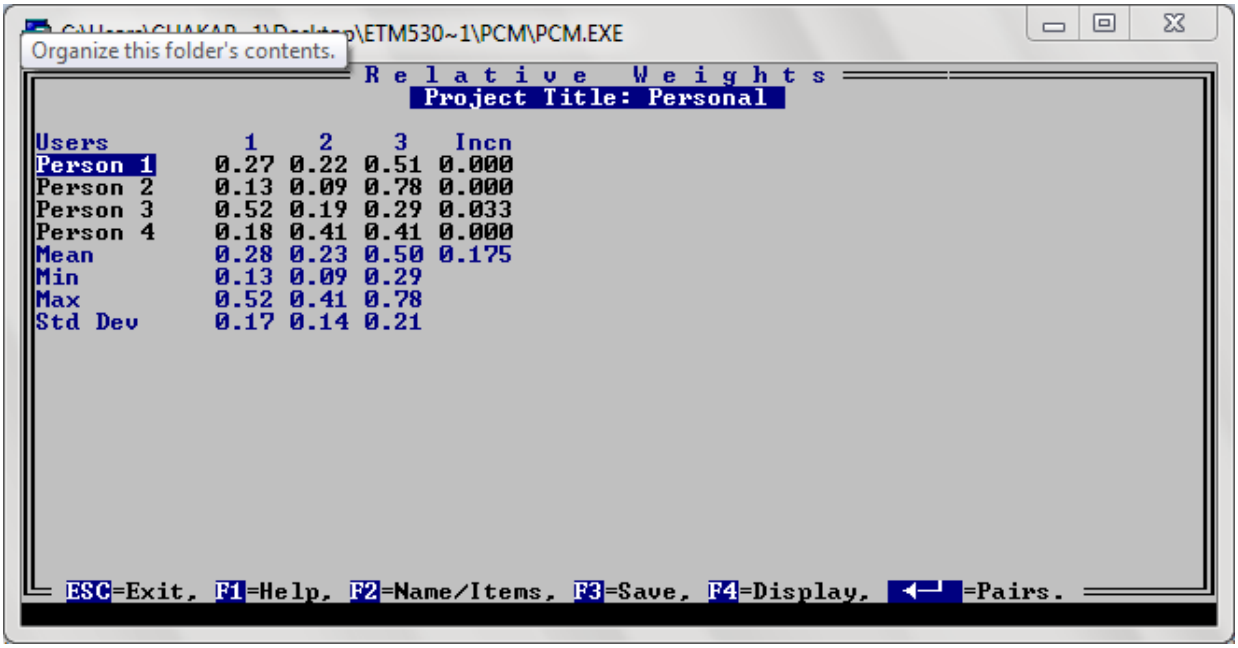

Figure 6: The Final Weights of the Personal Factors from the PCM Software

From figure 6, it showed that the experts got different ideas when they had to weigh the personal factors which were usage, price, and game variety. One expert thought the usages were his first consideration when buying a game console since it could be a 3-in-1 device which included game console, DVD player, and computer. In other words, he could play games, watch movies, and also surf the internet all in one. Another said price should be an issue since game consoles nowadays are not as cheap as it was in the past. So the buyers should consider the prices most. Another thought game varieties should be the most concerned since people buy game consoles for gaming. So those people know what kind of games they want to play first. To make a final decision, they search for which console got the best kind of games they like. Thus, personally the experts' points of views were distinct.

The screen shots of PCM shown above were just the weights of technical and personal factors. The rest of the results which were the weights of sub-factors will be displayed in appendix.

4.2. Utility Curve Method

In our project, it was necessary to use the utility curve method. Since we did not know exactly how to use for example the technical data that we got from CPU, GPU, storage, etc, the only way we could do was to convert those data to the relative values from 0 to 100. Once the questionnaires were done by all of the experts, one of them was asked to evaluate each alternative which related to the sub-factors.

Focusing on the technical side, for the storage sub-factor, when the console had 512 MB, the expert gave 1 out of 100 to show that this console was far from the potential buyers' satisfaction. When the capacity was bigger, the relative value would be increasing as well. After the expert identified enough rough scores referred from the exact data, he could plot a graph and draw a line by connecting each dot together. As a result, we could see which console got the best score in terms of storage sub-factor. The utility curve and the final result of the storage sub-factor were shown below.

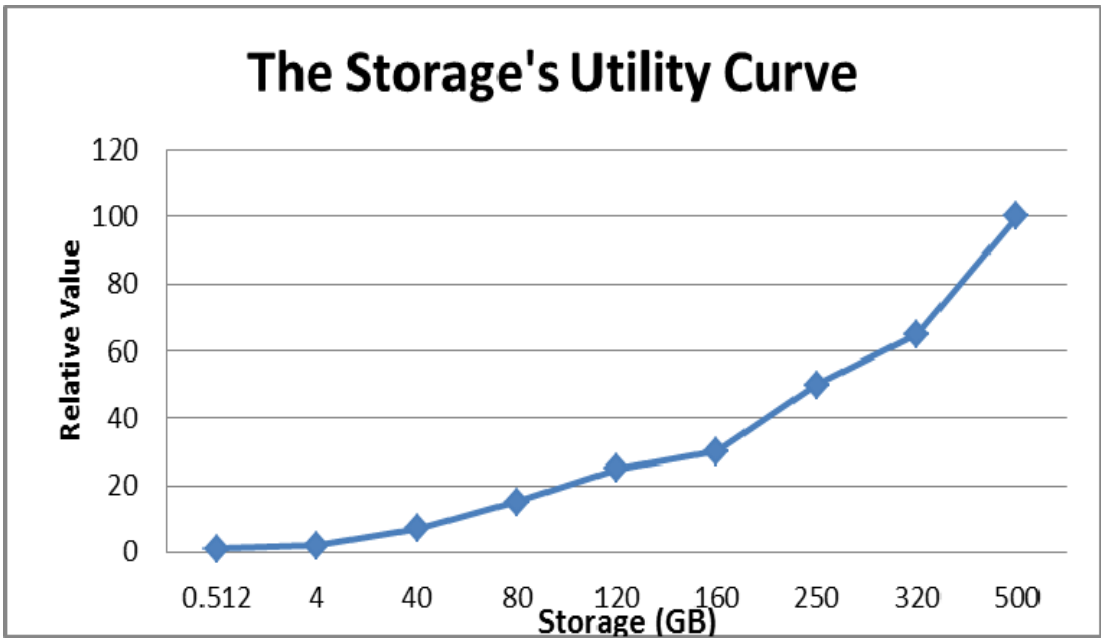

Figure 7: The Utility Curve of the Storage Sub-Factor

Alternative	Xbox360	PS3	Wii
Storage (GB)	250	160	0.512
Relative Value	50	32	1

The Actual Storage Data and the Relative Values of the Storage Sub-Factor

On the other hand, from the personal view, when the sport games which was the sub-factor of the game varieties was considered, the survey was used to determine the scores of each alternative based on the experts' preferences. Since every expert had played quite a few of sport games on each console so they definitely knew which console had provided the better sport games compared to the other two. As a result, the experts could judge and fill out the score from 0 which meant very disappointed to 5 which meant very satisfied. We also asked the same expert who did the all of the technical utility curves to evaluate the personal utility curve for us again. Finally we brought the mean score of each alternative to plot on the utility curve as illustrated below.

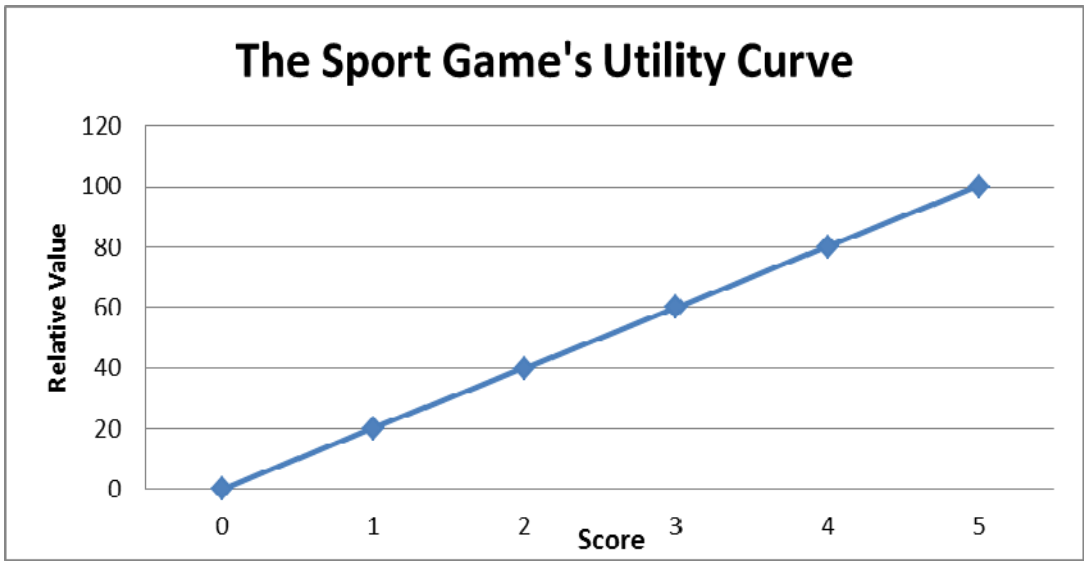

Figure 8: The Utility Curve of the Sport Game Sub-Factor

Alternative	Xbox360	PS3	Wii
Score (mean)	3.6	3.6	4.2
Relative Value	72	72	84

The Actual Scores and the Relative Values of the Sport Game Sub-Factor

The utility curves shown above were the examples of one technical and one personal sub-factor. The rest of them were shown in appendix. Once the expert who did the utility curves was done with plotting and drawing the lines for all of the sub-factors as well as for all of our alternatives, we could determine the relative values for all of our alternatives which will be utilized in the calculation part.

4.3. Final Result

Before we could decide which console should be choosing, there were two main things that we had to know for the calculation: global weights and relative values.

For the global weight, it was determined by multiplying the local weight of the sub-factor with the local weight of its factor and the local weight of its criterion. For example, if the speed of CPU sub-factor was considered, its global weight would be 0.0854 (0.28*0.61*0.5). If there was no sub-factor, the multiplication would be between the local weight of factor and its local weight of criterion. For instance, if the accessories factor was considered, its global weight would be 0.1200 (0.24*0.5). The below table clarified the global weights of each factor and sub-factor which the sum of them were equal to 1.

Criterion	Local Weight	Factor	Local Weight	Sub-factor	Local Weight	Global Weight
Technical	0.5	Features	0.61	• Speed	0.28	**0.0854**
				• Graphic	0.36	**0.1098**
				• Storage	0.09	**0.0275**
				• Networking	0.15	**0.0458**
				• Optical Drive	0.11	**0.0336**
		Accessories	0.24			**0.1200**
		Geometries	0.15	• Size	0.44	**0.0330**
				• Color	0.16	**0.0120**
				• Design	0.39	**0.0293**
Personal	0.5	Usages	0.28	• Gaming	0.66	**0.0924**
				• Watching Movies	0.23	**0.0322**
				• Internet	0.12	**0.0168**
		Price	0.23			**0.1150**
		Game Varieties	0.50	• Family	0.13	**0.0325**
				• Sport	0.26	**0.0650**
				• Hardcore	0.43	**0.1075**
				• Arcade	0.18	**0.0450**
Total	1					1

Local Weights and Global Weights of Selecting a Game Console Project

Finally, once we knew the relative values of each alternative and the global weights of each factor and sub-factor, we put all of them into the table which will be shown next. All of the relative values as mentioned earlier which were from the expert designation and also the global weights from last part were shown in the table below. To make the table look clearer, everything in light blue was about technical criteria whereas everything in light green was about personal criteria.

Criteria	Xbox 360	PS3	Wii	Global Weight
CPU	43	81	1	0.0854
Graphic	40	61	3	0.1098
Storage	50	30	1	0.0275
Networking	100	70	30	0.0458
Optical Drive	60	100	60	0.0336
Accessories	56	67	56	0.12
Size	50	50	100	0.033
Color	20	20	75	0.012
Design	90	80	90	0.0293
Gaming	92	92	82	0.0924
Watching Movies	85	94	62	0.0322
Internet	14	62	70	0.0168
Price	36	36	78	0.115
Family	48	50	100	0.0325
Sports	72	72	84	0.065
Hardcore	98	94	40	0.1075
Arcade	84	86	84	0.045
Total Score	63.4502	70.2694	53.8985	1

The Relative Values of Each Alternative and the Global Weights

Based on sum-product of the alternatives' relative values and the factors' and sub-factors' global weights, we concluded that Sony PS3 was the best game console choice in terms of both technical and personal for those who want to buy a game console based on its highest final value (70.2694). Microsoft Xbox360 came in the second place with 63.4502 in total. Nintendo Wii came in the last with 53.8985 in total.

5. Recommendations

According to our model, PlayStation3 gets relatively higher outcome than the other two products. However, there are several things the other two consoles can improve based on each unit's utility analysis, so they can get higher results in the future. Generally, here's our recommendation for all three products:

As far as Microsoft's Xbox 360, all of our team members agreed that its optical drive is pretty generic and its DVD player definitely needs to be upgraded to a Blu-ray drive. Mean the while, and as we noticed in the utility curve; the speed's performance (CPU) need some enhancements. Besides adding a calling facility (like Skype) would be nice, as long as the console's hardware had all the potentials to do have it working perfectly.

Second, Even if Sony's PlayStation 3 was the winner in the final results, but we thought of several recommendations that can enhance its overall ratings. For instance: For the last couple months Sony's network has been hacked and went completely down, so enhancing their network's security and fix it is a priority. PS3 should have 'n' band wireless and add a calling facility (like Skype)

And finally we had several recommendations for Nintendo's Wii that we thought they were important. For example:

- Consider more hardcore games
- More storage (More than 4GB)
- Enhance the GPU & CPU performance
- Upgrade Its DVD player to a Blu-ray drive
- Enhance their Network services connectivity
- Adding a calling facility (like Skype)

6. Conclusions

Currently, there are several main game consoles in the market. Most of them have similar features, functions and usage. When adult people want to buy a console, they usually select three or four models and put them on their looking list. Then they compare these alternatives to make the final decision.

In our paper, we built a hierarchal model so it can help us to compare three game consoles: Nintendo-Wii, Microsoft's Xbox360, and Sony's PlayStation3. We used official-professional websites and salesmen's resources in our project to select the criterion and decide which factors that we should look at. Then based on the salesman's survey, we knew the weights for each criterion and applied the utility theory to make the decision under the chosen factors. Through each alternative's outcome, we concluded that Sony's PlayStation3, 160GB's Console is the best. We also discussed the potentials for the other two products.

In our hierarchical model, we split the criteria into two main preferences: Personal and Technical. Each one of them had several main factors and sub-factors 'sub-criteria. 'As a total, they were 21 factors while in the beginning of our research they were more. But we ended up eliminating some other factors due to their similarity, unimportance, and difficulty of measurement. The model that we used needed a clear measurement as in order to calculate the outcome, besides we've had to know the utility function for each alternative of each single factor. We excluded Sony's big network's shutdown and buyers' bias in our model approach. In this case we came out to a conclusion that buying a technological device such as a game console cannot be enough to the point of satisfying if one of the preferences has been neglected.

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[10] http://reviews.cnet.com/?tag=hdr;brandnav

[11] www.amazon.com

[12] www.gamespot.com

Appendix 1

PCM Outcomes

C:\Users\CHAKAP~1\Desktop\ETM530~1\PCM\PCM.EXE

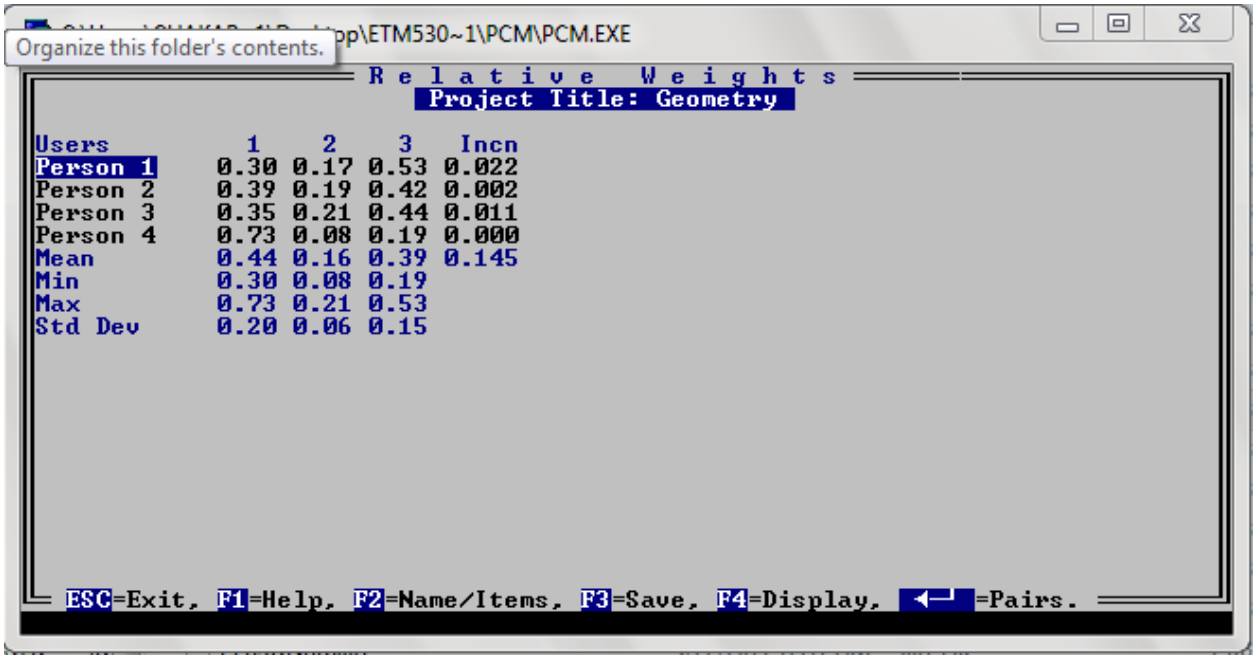
Relative Weights

Project Title: Features

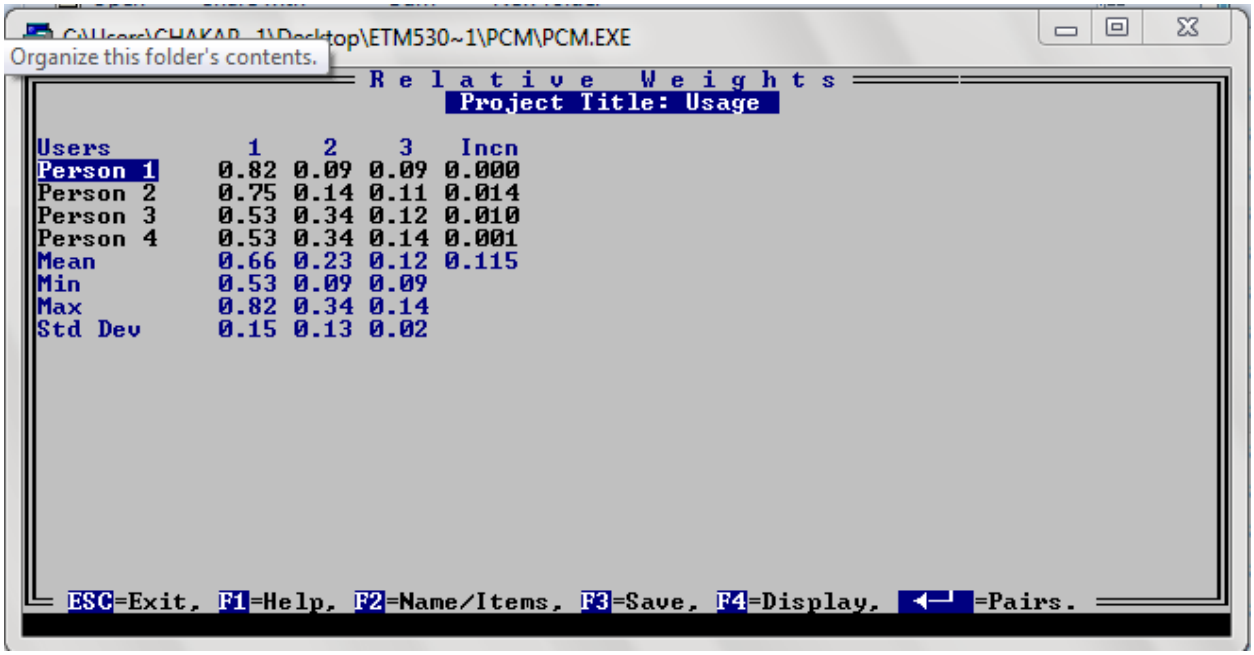
Users	1	2	3	4	5	Incn
Person 1	0.25	0.36	0.10	0.20	0.09	0.008
Person 2	0.31	0.48	0.10	0.06	0.05	0.010
Person 3	0.27	0.35	0.06	0.10	0.22	0.039
Person 4	0.28	0.27	0.12	0.25	0.09	0.022
Mean	0.28	0.36	0.09	0.15	0.11	0.066
Min	0.25	0.27	0.06	0.06	0.05	
Max	0.31	0.48	0.12	0.25	0.22	
Std Dev	0.02	0.09	0.03	0.09	0.07	

ESC=Exit, F1=Help, F2=Name/Items, F3=Save, F4=Display, ↵=Pairs.

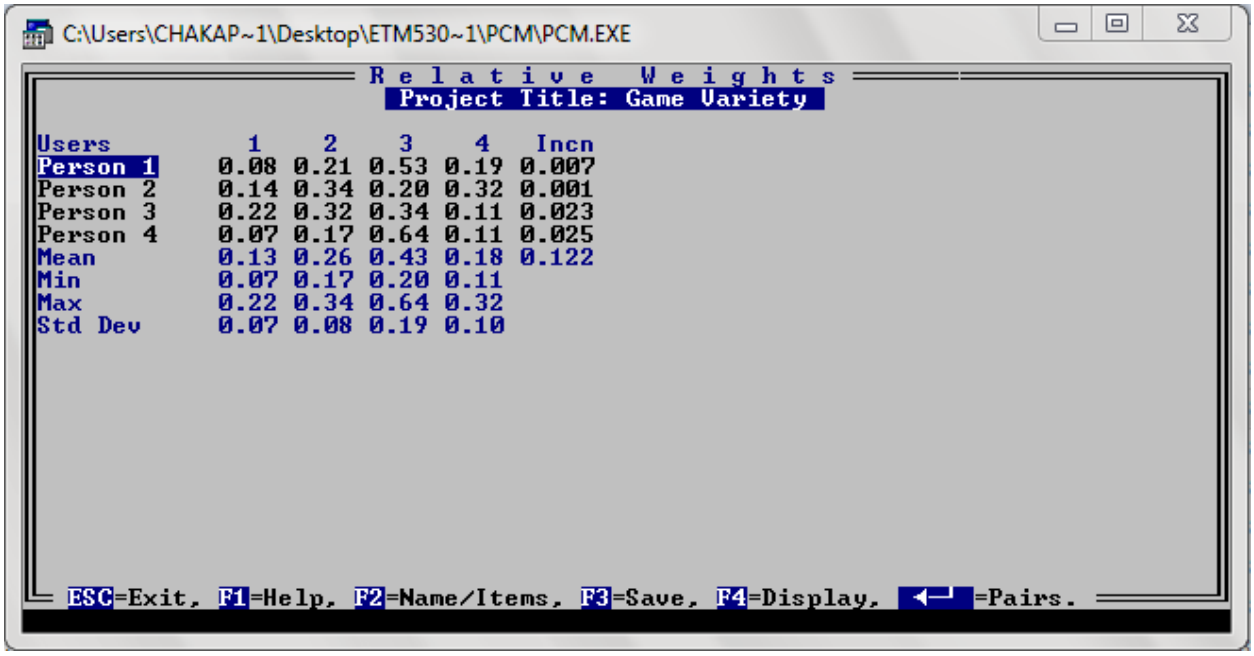
The final weights of the features sub factors from the PCM software



The final weights of the geometries sub factors from the PCM software

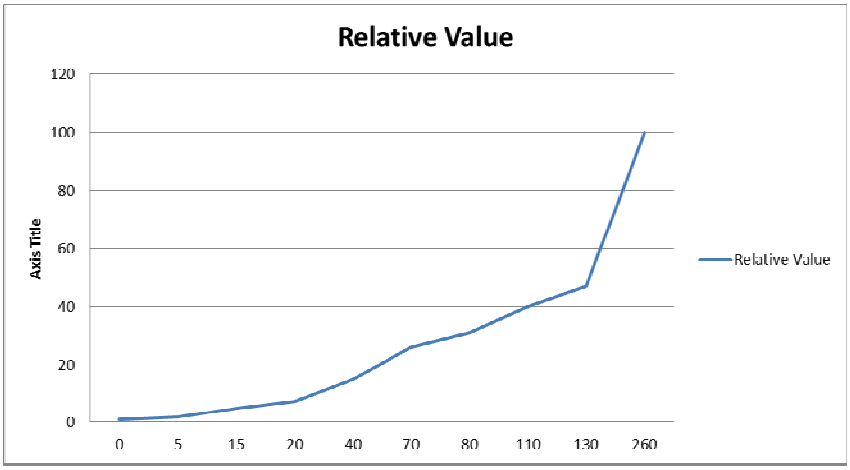


The final weights of the Usages sub factors from the PCM software



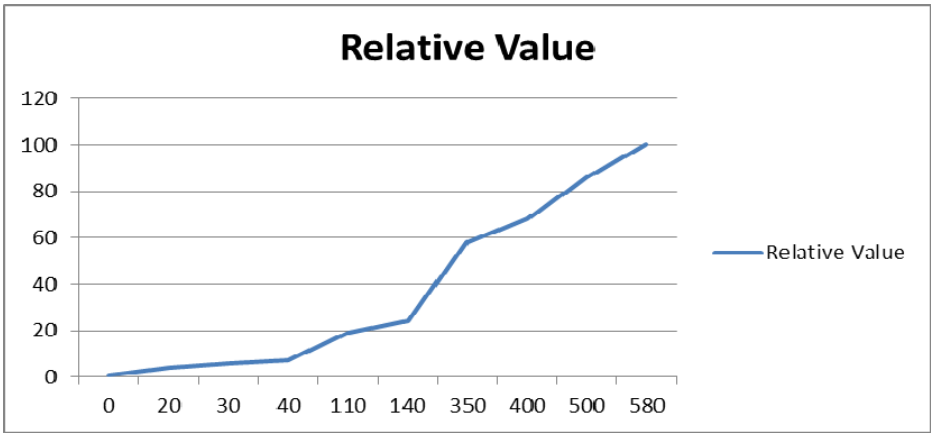
The final weights of the game varieties sub factors from the PCM software

Utilities Curves and Data



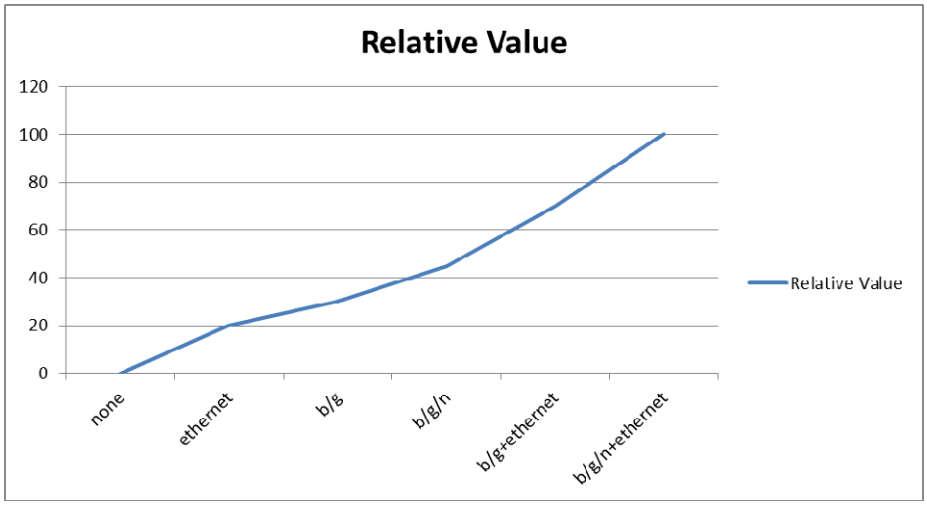
The utility curve of the CPU sub-factor

Alternatives	Xbox 360	PS3	Wii
Gflops	115.2	218	2.9
Value	43	81	1



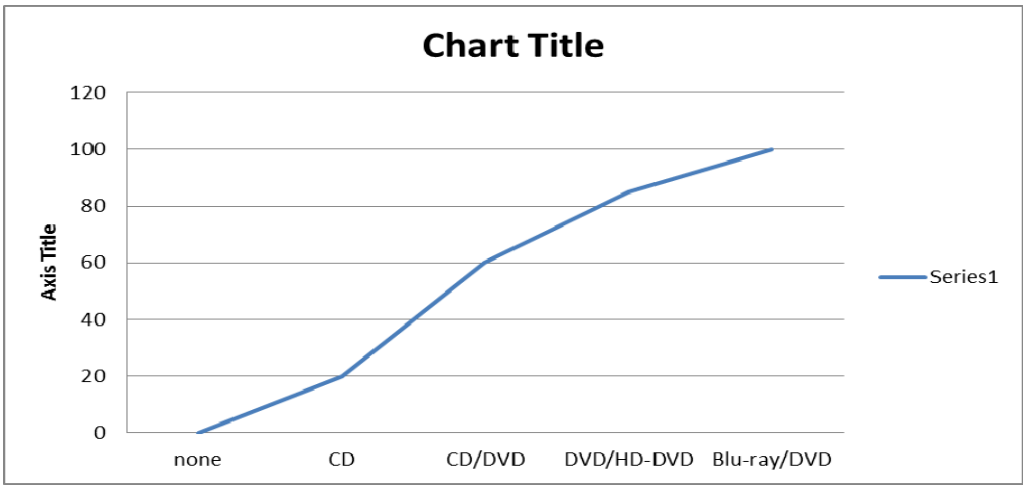
The utility curve of the GPU sub-factor

Alternatives	Xbox 360	PS3	Wii
Gflops	240	364	12.9
Value	40	61	3



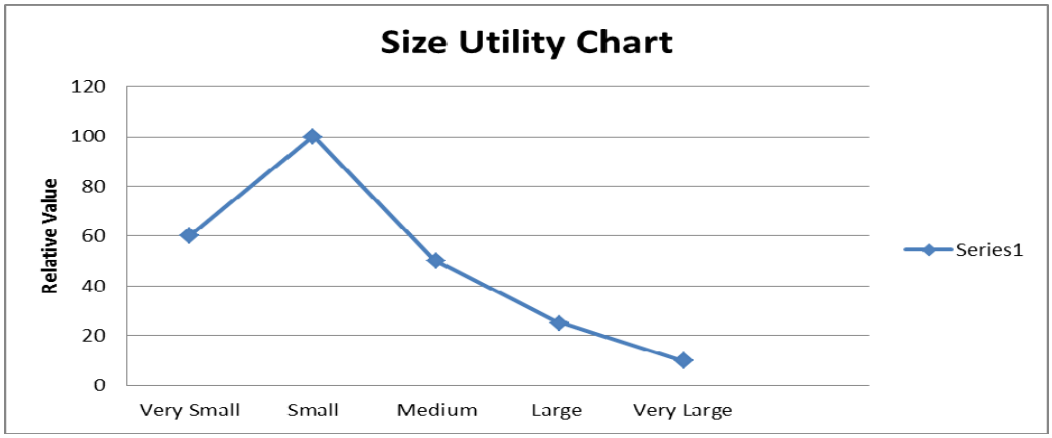
The utility curve of the Networking sub-factor

Alternatives	Xbox 360	PS3	Wii
Networking	b/g/n + ethernet	b/g + ethernet	b/g
Value	100	70	30



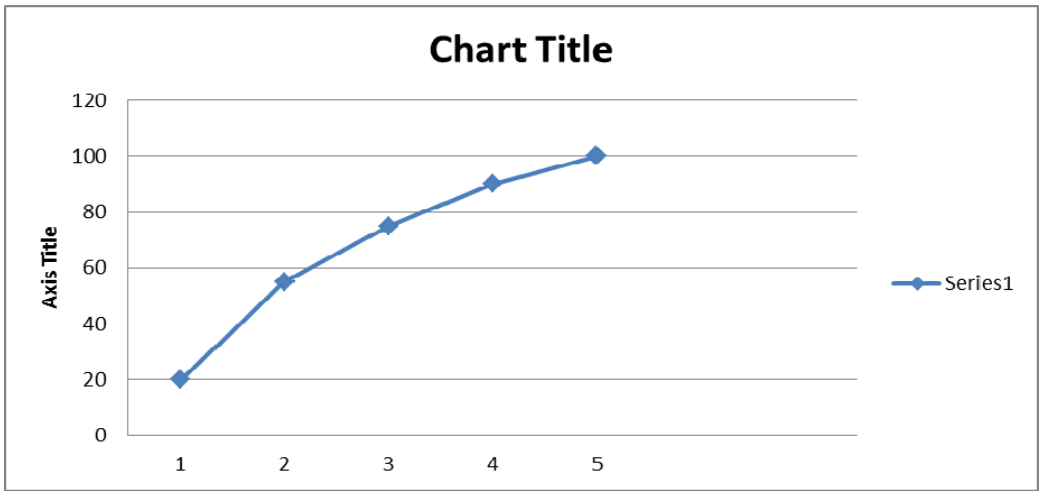
The utility curve of the Optical Drive sub-factor

Alternatives	Xbox 360	PS3	Wii
Optical Drive	CD/DVD	Blu-ray/DVD	CD/DVD
Value	60	100	60



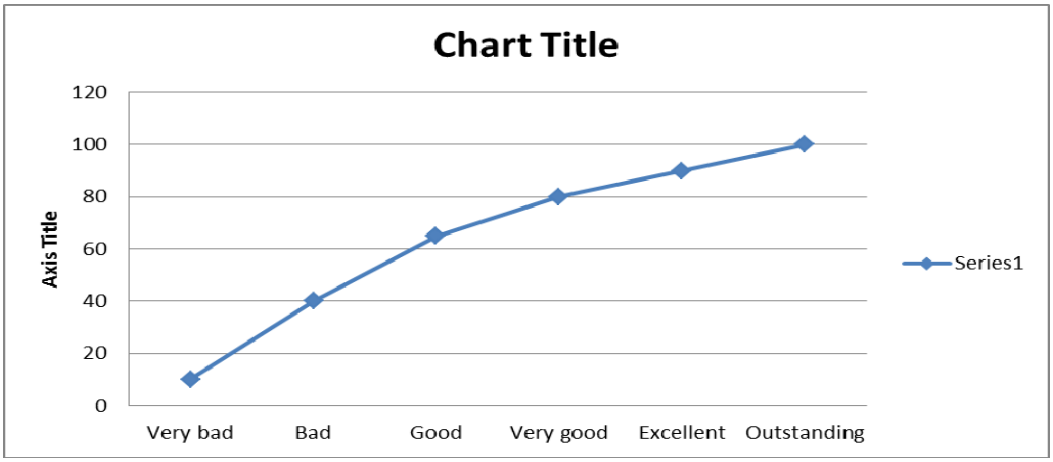
The utility curve of the Size sub-factor

Alternatives	Xbox 360	PS3	Wii
Size	12x11.5x7.2 in	11.4x11.4x2.6 in	2.18x8.88x1.73 in
Value	50	50	100



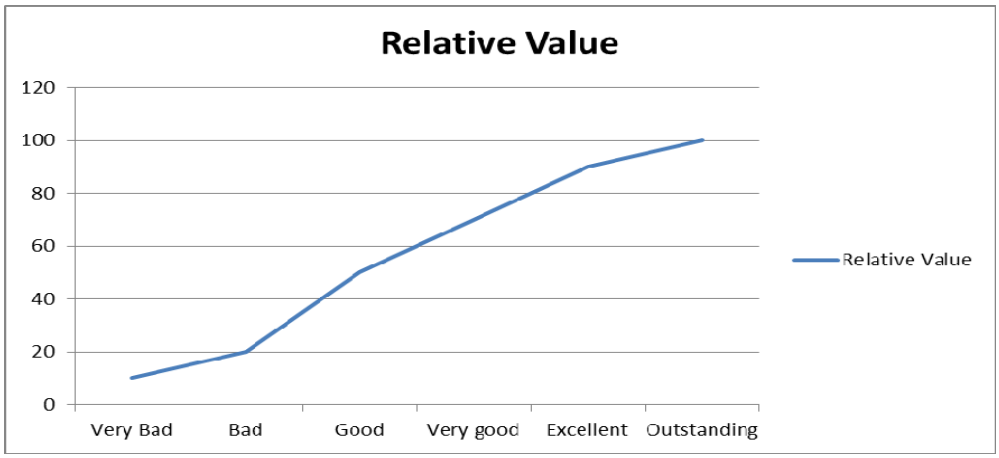
The utility curve of the Color sub-factor

Alternatives	Xbox 360	PS3	Wii
Size	B	B	B/W/R
Value	20	20	75



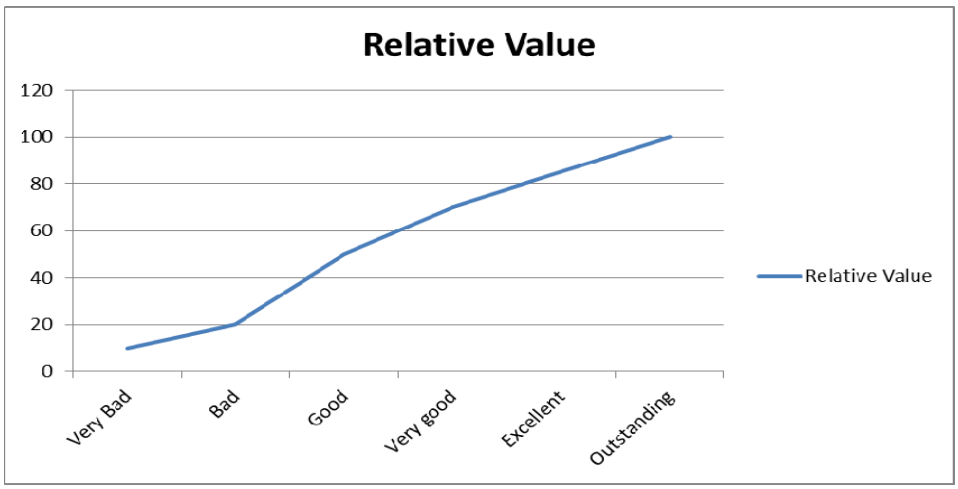
The utility curve of the Design sub-factor

Alternatives	Xbox 360	PS3	Wii
Design	Excellent	Very Good	Excellent
Value	90	80	90



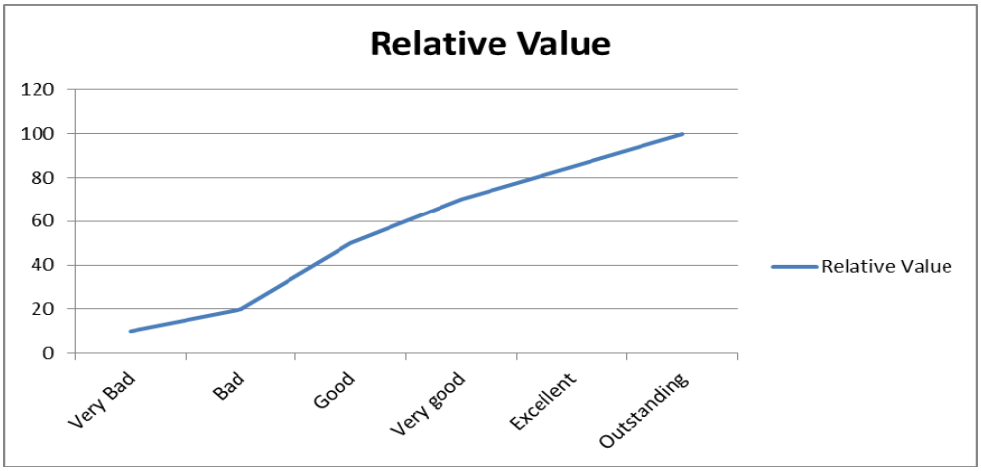
The utility curve of the Gaming sub-factor

Alternatives	Xbox 360	PS3	Wii
Gaming	4.2	4.2	3.6
Value	92	92	82



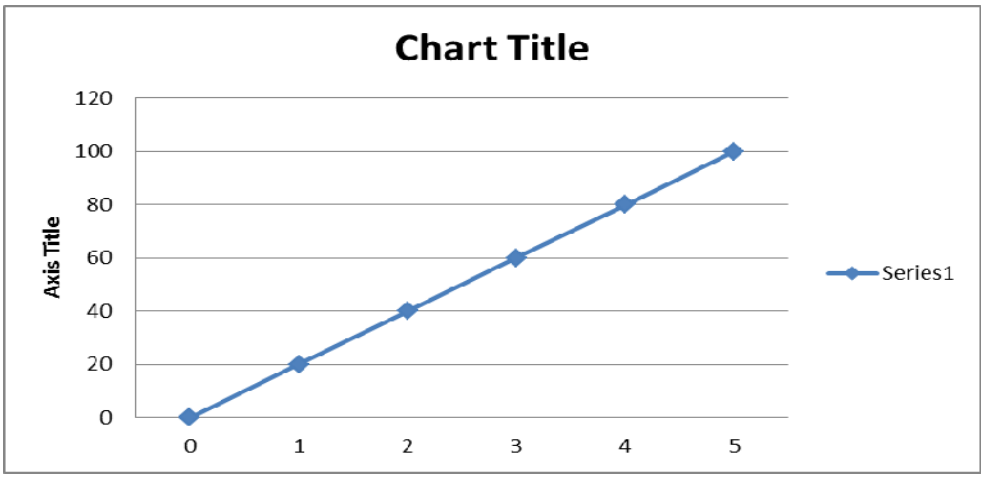
The utility curve of the Watching Movies sub-factor

Alternatives	Xbox 360	PS3	Wii
Watching Movies	4	4.6	2.6
Value	85	94	62



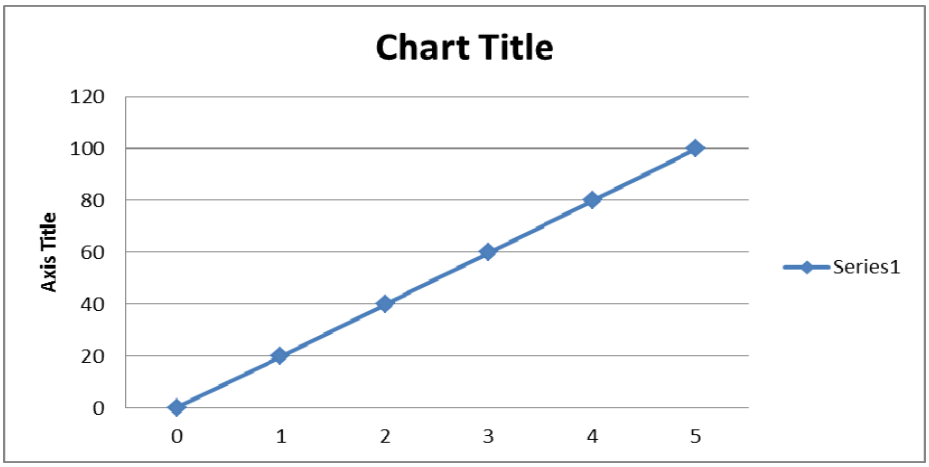
The utility curve of the Internet sub-factor

Alternatives	Xbox 360	PS3	Wii
Serving the Internet	0.4	2.6	3
Value	14	62	70



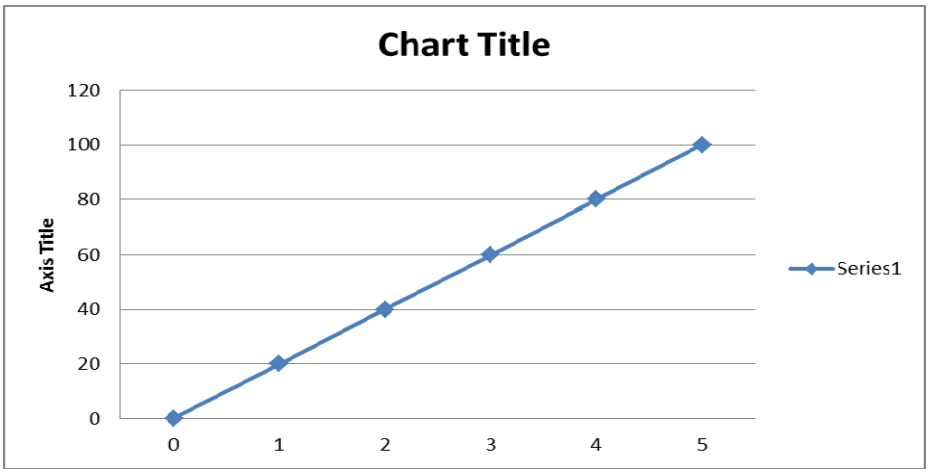
The utility curve of the Family Games sub-factor

Alternatives	Xbox 360	PS3	Wii
Family	2.4	2.5	5
Value	48	50	100



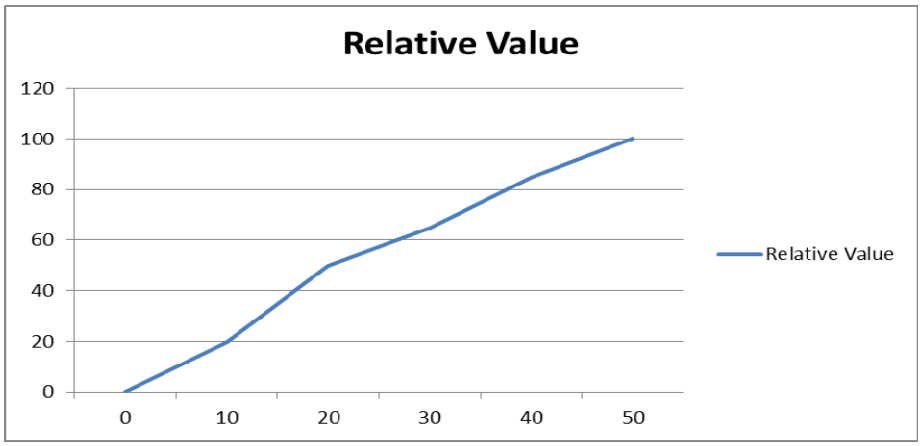
The utility curve of the Hardcore Games sub-factor

Alternatives	Xbox 360	PS3	Wii
Hardcore	4.9	4.7	2
Value	98	94	40



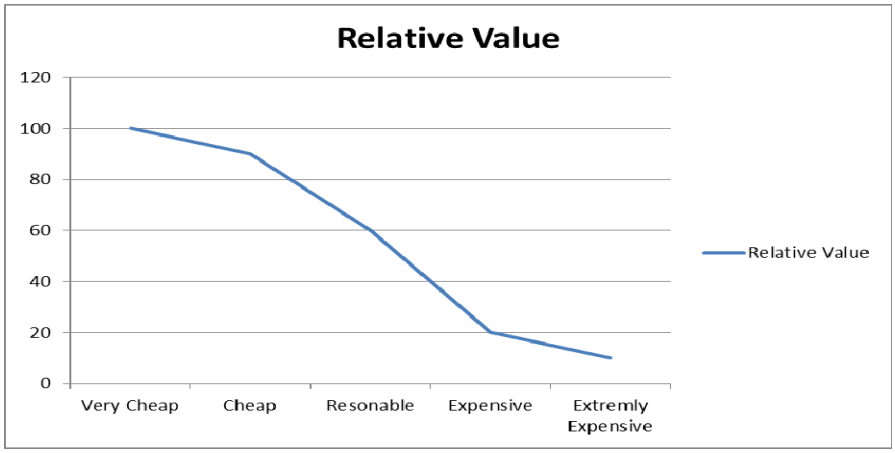
The utility curve of the Arcade Games sub-factor

Alternatives	Xbox 360	PS3	Wii
Hardcore	4.2	4.3	4.2
Value	84	86	84



The utility curve of the Accessories sub-factor

Alternatives	Xbox 360	PS3	Wii
Numbers of accessories	24	32	24
Value	56	67	56



The utility curve of the Price sub-factor

Alternatives	Xbox 360 250GB $299	PS3 160GB $299	Wii Sport Bundle 512MB $159
Price	2.4	2.4	3.6
Value	36	36	78

Appendix 2

Websites Reviews

In our Data Gathering we visited and used information from several Websites, such as:
www.amazon.com
www.bestbuy.com
www.us.playstation.com
www.xbox.com
www.cnet.com
www.facebook.com
www.wii.com
www.gamespot.com

Console	Xbox 360 Slim 250 GB	Nintendo Wii Sport 512MB (Black color)	PlayStation 3 Slim 160GB
Models	• Xbox 360 250GB • Xbox 360 250GB with Kinect. • Xbox 360 4GB, or with 250GB.	• Nintendo Wii Console (Black) • w/Wii Sports, Wii Sports Resort . • Wii Remote Plus, Nintendo	• PlayStation 3 160GB. • PlayStation 3 250GB . • PlayStation 3 Move Bundle 320 GB
Rating	• Overall Rating = 4 out of 5 stars • Design : 9/10 • Features : 9/10 • Performance : 8/10	• Overall rating = 4 out of 5 stars • Design = 9/10 • Features = 7/10 • Performance = 8/10	• Overall rating = 4 out of 5 stars • Design = 8/10 • Feature = 9/10 • Performance = 9/10

Cnet.com Reviews

Console	Xbox 360 (4GB Console with Kinect)	Nintendo Wii (Black color)	PlayStation 3 (Slim 160 GB)
Reviews were according to 4 criteria:	1. Value of price 2. Functionality 3. Performance 4. Graphics	5. Value of price 6. Functionality 7. Performance 8. Graphics	9. Value of price 10. Functionality 11. Performance 12. Graphics
Rating	4.5/5 based on 371 reviews	4.6/5 based on 335 reviews	✓ 4.7/5 based on 260 reviews

bestbuy.com Reviews

Console	Xbox	Nintendo -Wii	PlayStation
Official Page	8,439,662 people likes http://www.facebook.com/xbox	150,000-400,000 people likes • None of them said Official	13,487,196 people likes http://www.facebook.com/PlayStation

Facebook.com Reviews

	Your site	Site 1	Site 2	Site 3
		Xbox.com	Wii.com	Playstation.com
First impression		120	114	123
Navigation		80	86	76
Content		122	119	126
Attraction		48	43	49
Findability		70	68	63
Making contact		70	70	69
Browser compatibility		29	29	29
Knowledge of Users		30	30	30
User Satisfaction		50	50	50
Other		38	37	40
Overall		✓ 657	646	655

Criteria for the official websites evaluation