

Marketing Plan for NUIA eyeCharm for Kinect:

An eye tracking solution from 4tiitoo



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Executive Summary

1. Introduction

This document is the marketing plan for NUIA eyeCharm for Kinect which is an eye tracking technology solution form 4tiitoo, a startup Company in Munich. First, the background and the logic behind eye tracking technology is described and the rest of the document will focus on the marketing plan of this product.

1.1. Eye Tracking Background

Eye-tracking has been one of the main areas of research in studying and understanding cognitive and behavior aspects of human's vision [1] and is widely used in neuroscience and psychology. The first well-know application of eye tracking is in reading and how human eyes move when reading a text and there is plenty of research in this area [2]. It goes back to early 1900 when scientists noticed that human eyes do not follow a smooth pattern when reading a text [3].

Eye tracking has been used in industry especially in advertising and marketing areas to a great extent. It is also been heavily used in human-computer interaction to measure human behavior and responses to web page designs, web advertisements, web search, etc. [4] [5]. Measuring the influence of ads and whether people are taking the intended message (e.g. measuring the attention of people to cigarette warnings) [6], creating the right design to the get the most attention, memory of brands, choosing the proper packaging for products are examples of applying eye tracking in marketing and advertisement. Eye tracking technology has also been used to help people with disabilities interact with computers and control programs.

Recently there have been significant advances in eye tracking technology which increased the sophistication and accessibility of this technology. It is not any more only a research tool that is used by specific organizations or people for specific purposed. Eye tracking technology can now be integrated to home PCs, game platforms and smart phones and can be used by almost anyone. Before, users often needed to use chinrest or a bite board or other similar equipment and it was not possible to be used in a typical users' environment. Eye tracking technology acts as if the machine is reading its users mind. Computer interaction is said to be revolutionized with eye tracking technology in the near future [7].

1.2. Eye Tracking Technology: How does it work?

Eye tracking is a technique whereby an individual's eye movements are measured to know both

where a person is looking at any given time and the sequence in which their eyes are shifting from one location to another [8]. Most commercial eye-tracking systems available today measure point-of-regard by the "corneal-reflection/pupil-center" method. These kinds of trackers usually consist of a standard desktop computer with an infrared camera mounted beneath (or next to) a display monitor, with image processing software to locate and identify the features of the eye used for tracking. In operation, infrared light from an LED embedded in the infrared camera is first directed into the eye to create strong reflections in target eye features to make them easier to track (infrared light issued to avoid dazzling the user with visible light). The light enters the retina and a large proportion of it is reflected back, making the pupil appear as a bright, well defined disc (known as the "bright pupil" effect). The corneal reflection (or first Purkinje image) is also generated by the infrared light, appearing as a small, but sharp glint (see Figure 1).





Once the image processing software has identified the center of the pupil and the location of the corneal reflection, the vector between them is measured and with further trigonometric calculations, point-of-regard can be found. Although it is possible to determine approximate point-of-regard by the corneal reflection alone (as shown in Figure 2), by tracking both features eye movements can, critically, be disassociated from head movements [9].



Directed below the camera

Directed at the camera

Directed down and to the right of the camera

Figure 2. Corneal reflection position changing according to point of regard

Today, there are three main types of solutions for eye tracking technology: Eye tracking using 3D glasses, eye tracking using an external gaze sensor and eye tracking using the embedded camera or

webcam of the target platform (i.e. tablets, smartphones or laptops). Eye tracking using glasses are mostly used for research when portability is required [10]. Eye tracking using gaze sensors or embedded cameras are two solutions that can be used by regular users and provide with another level of interaction with their computers or gadgets.

Eye tracking using an external gaze sensors have specific cameras that can detect eye movements with higher accuracy compare to the solutions that use embedded cameras. The trade-off is price. External gaze sensors are expensive compare to the other solution where it is technically only a software package that can be offered at very low prices. The focus of this study is on 4tiittos's NUIA eye tracking solution that will be extensively discussed further.

2. NUIA eyeCharm for Kinect from 4tiitoo

The NUIA eyeCharm is the eye tracking solution from 4tiitoo that allows the user to interact with the computer using their eye gaze and use it as an additional controlling tool besides mouse and keyboard. The hardware part is an infrared camera in a frame that attaches over a Kinect. The device attaches over the front of Windows-version Kinect (or an Xbox), and is placed below the computer's monitor and plugged into a USB port. The software side uses the 4tiitoo multi-sensor software suite called NUIA.

The eyeCharm will allow users to control their devices simply by capturing and processing their gaze. 4tiitoo hasn't limited the application of this device, or been targeting only certain user groups. Quite the opposite. They are now available on Kickstarter and are encouraging developers to bring their ideas and implementation into this device via a software development kit (SDK). It makes for a flexible and affordable application to control devices simply by moving one's own eyes. An article on gizmag reports that it literally, "takes less than ten minutes to get the device and software installed and running." The technology currently supports the Windows 7 and 8 operating systems, although its designers are looking at porting it to other systems, such as OS X and Linux [11]. For developers the NUIA technology provides a simple way to create applications based on the comprehensive NUIA SDK" [12].

4tiittoo has been focusing on developing applications that incorporate eye tracking and give the user the ability of controlling their application with only a gaze. So far, the SDK includes extensions to gaze-enable applications like Adobe Photoshop, World of War Craft, Diablo 3, Arma2 and the Windows Metro control as well as supporting browsing with all major browsers. The eyeCharm Adobe Photoshop allows user to their eyes as a second mouse cursor and change tools or settings using their eyes and without moving a mouse [13]. The Company is actively seeking other applications that can benefit from gaze control to develop more plug-ins.

3. Company Analysis

3.1. 4tiitoo A Munich-Based Startup

4tiitoo (pronounced 42) is a Munich based start-up company (AG) founded by Tore Meyer and Stephan Odörfer in 2007 to bring a more intuitive and natural user experience to the daily computer interaction [12]. They are a pioneer in developing natural user experience and focused on solutions and next generation computing devices. Their main solution is the NUIA multi-sensor software suite. They have also launched a tablet "WeTab Info" in collaboration with other companies but it has since been terminated. They are a developer friendly company that is planning to open a NUIA® Dev Center soon for public use.

The NUIA multi-sensor is a powerful software suite that enables natural interaction with computers through gesture, voice and also eye movement. In 2012, 4tiitoo designed a winning application using the same software suite, called NUIA Imagine, a photo organizing and viewing application, for the Ultra Book Experience Software Challenge held by Intel [14] . In 2013, they initiated a Kickstarter project to fund their eye tracking product "eyeCharm for Kinect" using the same software suite. 4tiitoo has been successful in their Kickstarter initiative by achieving 102% of their target funding by April 7th, 2013 [15]. Their goal was to come up with an eye tracking solution that is more affordable than the existing ones in the market so more users can experience and use this technology. As they are focusing on next level of human computer interaction including eye control, more affordable solutions can promote eye tracking technology in the market, attract more users and bring more awareness in the market which will be beneficial for4tiitoo.

Compare to approximate \$1000 for other eye tracking device like Tobii REX, 4titoo's eyeCharm should be a sweet spot for consumers coming in as a \$60 alternative.

3.2. 4tiitoo SWOT Analysis

The figure below illustrates the SWOT analysis for 4tiitoo Company. The analysis covers the strengths, weaknesses, opportunities and threats for the eyeCharm product of 4tiitoo entering the market.

Strengths	Weaknesses
 ✓ Affordable with high accuracy eyeTracking solution for regular customers, one of the first ✓ Easily extendable to other applications using the available SDK ✓ Award wining eye Tech product (NUIA Imagine), Recognized as Gartner "Cool Vendor" 2013 ✓ Good recognition in Germany / European market ✓ Strong Software team , Cool Brand 	 ✓ Young Company ✓ Not strong financial stance ✓ More domestic reputation than international one ✓ Not strong brand ✓ Not end-to-end solution for their eye technology, dependent on other products
Opportunities	Threats
 ✓ Strategic Alliance (Tobii, etc) ✓ National and global expansion ✓ Growth of eyeTracking applications ✓ Extension of NUIA gesture suit 	 ✓ Other SW based eyeTracking companies, Low barrier market ✓ Uncertainty of the market and sales

Figure 3- SWOT Analysis for 4tiitoo

Strength

4tiitoo's staff has a strong vision towards their innovation and creative technology. Their technological skills are considered at the top of the field relative to their competitors. Their NUIA software is very well designed and can easily be expanded. The product quality and the lower cost to customers for the eyeCharm would position 4tiitoo very well within the marketplace. The company's achievements and positioning is confirmed through their successful Kickstarter effort, the awards they have won and technical reviews and discussions online [16]. 4tiitoo has a good market reach domestically and throughout Europe from their headquarters in Germany. Lastly, we believe they have a positive "cool factor" relative to other companies.

Weaknesses

While 4tiitoo has had good initial successful, they have a long way to go. There is no long term track record or massive financial backing, so we perceive some weakness to be present in "age" and "financial stability." A related weakness could be their brand (and logo) awareness. It is our opinion

that they could have been more creative with the logo. Initiating a Kickstarter project can be helpful in initial marketing of the product and promoting it in social media, it also can indicate a weak financial stance. The company also has not had enough experience in how to commercialize the new product as well as the service for a new product.

Opportunities

Technology advances are great opportunities to any company. EyeCharm technology will improve the name recognition for 4tiitoo as a company. As the new methods of computer control like gesture, voice and eye become more popular; 4tiitoo with its powerful software team can strengthen its feet in the market. In addition, 4tiitoo can partner with main players in eye tracking technology like Tobii. Partnerships such as these would be a huge boost for the company. It should allow 4tiitoo to expand globally, and improve its volume of sales while at the same time increasing awareness and brand recognition. Likewise, profit margin should be able to creep up from improved awareness and availability.

Threats

Competition is the biggest threat for 4tiitoo. Its competitors will compete by making their cost lower and provide a high quality product. A new technology might not be popular among people, and sometime it will be hard to adapt among people. Thus, falling sales and loosing reputation are other threats that 4tiitoo will face in the future. Finally, we think that the company could end up becoming too dependent on a partnership with Microsoft to hit their sale targets, so that is certainly a threat that will need to be well balanced.

4. Potential Markets for NUIA eyeCharm

In order to find out the potential markets for NUIA eyeCharm, we looked into the current applications of eye tracking technology that are explained below.

4.1. Current Applications of Eye Tracking Technology

Eye tracking technology has revolutionized research in many fields and enabled ever-expanding array of solutions; From communication aids and research tools to gaze interaction technology and interfaces in consumer electronics.

Eye tracking technology is very useful in determining web usability and also advertisement analysis. Analysis on user interaction between the clicks, how much time a user spends between clicks can bring insight into which features are the most eye-catching and which ones are ignored altogether. Analysis on commercials, print ads, online ads and sponsored programs allows researchers to assess in great detail how often a sample of consumers fixates on the target logo, product or ads. The NUIA eyeCharm has the eye tracking infrastructure but the software is designed to provide a means of control rather than focus on eye tracking itself. There are other eye tracking solutions from Companies like Tobii with a very strong software for research applications that seem to be a better option for these types of usage. NUIA eyeCharm is an affordable and easy to use eye tracking technology that can be used by regular users. However, researchers can still benefit from eyeCharm to add an additional level of control when interacting with their computer doing research.

Besides research, eye tracking technology can be used as an additional control in video games, computer metro controls and in applications like Photoshop and AutoCAD that require a lot of user interaction. These applications fit more with what eyeCharm can offer. The respective use cases are illustrated below.

Interaction in gaming

- In a flight combat game, gamers can have eye-controlled missiles that instantly lock on the enemy plane they are looking at when pushing the button to trigger the missile.
- In real-time strategy games, gamers can interact with the map moving from one part to another in an instant by zooming at their destination with their eyes.
- Gamers are about to score a penalty kick in a soccer game and the goalkeeper reacts on their body language and jumps in the direction where you are looking.

Gamers will be the main target market for these types of application.

Interaction in main stream computers

• Open windows or browsers just by looking; toggle among open windows or browsers automatically, scroll web pages as progressing in reading, increasing or decreasing volume, selecting menu items etc.

General computer users can benefit from these applications. It can be especially useful for administrative tasks using computers that require navigations among many applications and browsers. People with disabilities are another target market for this type of application. eyeCharm is more affordable and is easier to use compare to former solutions.

Interaction in design / image applications

• Users can benefit from eye control in certain application more than others. Application like Photoshop, AutoCAD etc. that requires heavy interaction with user can be easier to use by

adding eye control. Users can zoom in, select tools, toggle between several windows and etc using their eyes.

Designers, architects or Engineers can be a target market for these types of applications.

Other potential applications

Eye tracking technology can also be used as a driving assistance to monitor the driver and prevent accidents that happen due to drivers' drowsiness. In the operating room, surgeons can zoom into images and control the computer interface using just with their eyes. This provides decreased risk of disorientation in laparoscopic surgery, multi-tasking and hands-free computer control. These types of application however require more accuracy and especially an eye tracking technology that works very well in distant which is not the case with eyeCharm.

Figure 4 shows the initial market segmentation based on the above applications and similar needs that each segment have. Researchers and people with disabilities are the known target markets are eye tracking technology and the rest are the potential new market as eye tracking technology becomes more accessible.



Figure 4-Market segmentation for eyeCharm based on different applications and needs of users

5. Target Market Selection

Among the 6 different users, the recreational group has been chosen as the primary customer segment from 4tittoo's company perspective and also in this marketing plan. 4tittoo has already developed several gaze enabled versions of popular games i.e. Diablo 3, World of Warcraft, Minecraft, Call of Duty and Arma 2. They will also develop the eye control plug-in for Son of Nor and are actively seeking other 10

potential games that can be gaze-enabled. Other than games, their software support eye control in Photoshop, Microsoft words and web browsing. There are more games ready to market compared to other applications and it makes sense to focus on those applications.

Gamers are a very huge market. There are 157 million Americans and 92 million Europeans that play video games of some kind. In 2012, the revenue from video gamers market was \$67 billion and it is expected to reach \$82 billion by 2017 with Diablo 3 and Minecraft being among the best sellers [17]. 70% of American household own a dedicated game console and 65% of them own a dedicated PC for playing video games [18].

Moreover, the video game market is very active in terms of number of new games coming to market every year. This is a key advantage for 4tiitoo as they can develop eye control plug-in easily and expand their customers.

6. Gamers Market Segmentation for eyeCharm

We are focusing at U.S. gamers market as there are more video-gamers in this market compare to Europe. As NUIA eyeCharm requires connection to a PC or Console, the gamers who play with smartphone or tablet or any kind of handhold will not be our target market.

The NUIA eyeCharm can be used for any kind of gaze-enabled games. However, the types of games that are currently available fits into specific genres of game that we want to focus. Diablo 3, World of Warcraft, Minecraft and Call of Duty all fit in to the "Actions, Sports and Strategy" genre of games. We will refer to this genre as "Action" genre through the rest of this marketing plan. According to the Gamer Demographics available at [19], 23% of Gamers play only with their handheld and 77% play video games using PC or a gaming console with 62% of them playing online games. Figure 5 shows the distribution of game genres played by the gamers playing online games. As it can be seen, 25% of the video gamers fit into the "Action" genre.



Figure 5- Game genres distribution for gamers using PC/Game Console

According to the same source, 52% of video gamers are male and 47% of them are female. However, a study at Wichita State University on gender and video gamers show that male gamers have a different profile than female gamers [20]. Table 1 shows the general profile of female vs. male gamer. The male players put more hours per week on gaming and spend a lot more. More importantly, their game genre preference is the "Action" that we want to target. Although whoever buys and plays these types of genre are our target customer regardless of their gender, based on table below we expect our target customers to be mainly from male population rather than female. The average age of a video game player is 30 years old [18] and we did not find any information that suggests a specific range of age for "Action" game genre.

	Male Player	Female Player
Hours per week spent playing games on a	17.46	6.51
desktop/laptop computer		
Average \$ spent on video games and game-	\$333.92	\$87.19
related purchases per year		
Type of video game player classified	Frequent / Expert	Occasional / Novice
Gaming device preference	Desktop / Laptop Computer	Console / Handheld / Mobile
Game genre preference	Strategy, Role Playing, Action	Social, Puzzle/Card, Music /
	and Fighting	Dance, Educational and
		Simulation

Based on the analysis above, our final target market can be defined. We are targeting video gamers in U.S. market who use Desktop/Laptop computer or gaming console as their gaming platform, play "Action" game genres. These target customers are typically male players and we expect their average age to be 30 years old.

Figure 6 illustrates the top-down approach in identifying the final target market and the population of that market based on the gamers' demographics.



Figure 6-Final Target Population, Top-bottom population

As it is illustrated in the figure, the final target market population is expected to be 30 million. In this market plan we assume a 25% market share of this population and based on 4tiitoo's background and company size it is rather an aggressive, yet achievable goal. A 25% market share means anticipating selling 7.5 million NUIA eyeCharm to our target market.

7. Analyzing eyeCharm Target Market

7.1. Value drivers of our Target Market

There is extensive research on understanding why gamers play video game. The main reason is game players have fun playing video games. A sense of belonging to another story or as it is called among gamers "immersion" is another important factor in bringing pleasure for gamers. Gamers also gain pleasure in accomplishment in a competition [19] [20].

In order to investigate the above findings with our target market, we conducted a survey and distributed it among video game players that we believed fit with our target market. We received 18 responses, from 17 male and 1 female respondents. We removed 3 of the responses as their preferred genre and also gaming platform did not match with our target market definition. The rest of the respondents were video game players, playing "Action" genre who use PC or Console as their main gaming platform. They were all from 18-35 age section. Below graphs show what factors are more important in terms brining more pleasure and when selecting a game.



Figure 7- Factors that bring pleasure and their ranking



Figure 8-Important factors when selecting a game and their ranking

Table 2- Target market perceived interest in eye control technology

Do you perceive eye controlling an appealing addition to other controls in a game?				
Total Respondents	Yes 44% vs. No 56%			
Target Market	Yes 50% vs. No 50%			

Table 2 shows the results of perceived interest in adding eye control to the games. The results got improved as we removed the 3 responses that were not from our target audience. The 50-50 interest is expected as the respondents did not have any experience in using their eyes to control the games and for most of them it was not really clear how that would work.

According to our results, accomplishment, adventure and being part of another reality (immersion) are the most important factors that bring pleasure for gamers. They also are looking for an appealing story and value level of control in the game. Based on our conversation with savvy gamers, they are looking for controls that help them play there and accomplish more. We believe that eye control can provide a more natural user interaction with the games, bring more accuracy in gamers' control and also take the gamer more into the game and therefore brings more immersion and improves the adventure of playing a game. Other studies that evaluated the gaze control by having game players experience the eye control while playing game, support our statement. Jonson compared the mouse and gaze control in playing game and her results showed that gaze control was more accurate and the game players perceived controlling their game with their eyes as a more enjoyable and committing experience [23]. Nacke *et al.* also assessed game play experience by studying several players while playing a gaze-enable 3D game. Their results indicate that playing gaze-enabled games is a positive experience and adding the gaze control to other controls improves the flow and feeling of immersion of the game [24]. The below graphs show the results of these two studies.





Figure 9-Using eye control in playing game Nacke et. al.



Figure 10-Rating on how fun the gaming experience was compare to mouse, Jonsson



Figure 11-Rating on how fast the interaction was perceived, Jonsson

7.2. eyeCharm value proposition

Based on our survey results and also other studies on what gamers are looking for, we define our value proposition as below:

Our product will be appreciated by savvy gamers by bringing them more adventure, immersion, challenge and help them take their gaming experience to the next level, where they become part of the story through intuitive and fast eye movement controller.

8. Technology Adaption Life Cycle for eyeCharm

8.1. From Innovators to Early Majority

Eye tracking technology as a new way of human computer interaction that is accessible for everyone is in its very early stages. In CES 2013 several companies like Tobii, Haier demonstrated their eye tracking technology to bring awareness to the market [25] [26]. However, the consumer version of the technology is still not available. 4tiitoo will start sending the NUIA eyeCharm ordered by their backers at Kickstarter starting from August 2013. In terms of the technology adaption life cycle, NUIA eyeCharm is at the innovator phase. Figure shows the technology adaption life cycle of the NUIA eyeCharm for the next two years.



Figure 12-NUIA eyeCharm Technology Adaption Life Cycle

The vertical access shows the number of products that we expect to sell. The total number of eyeCharm products to be sold by first quarter of 2015 will be around 7 million which is the 25% market share of our target market (explained in chapter 6). We believe that the NUIA eyeCharm will reach its early majority with the value proposition that was defined. In order to gain more market share and sell more, other applications and games should be developed, therefore we have only projected the sales to early majority phase. We define each group of adapters as below:

Innovators, These people are the technology savvy people that want to try the new technologies in the market. The Kickstarter backers for NUIA eyeCharm will be the innovators in this case. Approximately 1400 backers pre-ordered the product. This group can expand by networking of the backers, through social media advertisements (facebook, twitter, google +).

Early Adapters, We identify the early adapter of the NUIA eyeCharm as those who play Diablo 3, World of War Craft, Arma 2 and MineCraft. Since the eye control plug-ins of these games are already ready, we believe that those who have been playing these games will be the first people to buy eyeCharm to experience the eye control in their favorite games. We are expecting to sell around 2.5 million in this phase. Only Diablo3 has sold 10 million copies in 3rd quarter of 2013 [27]. According to the statistics available at MineCraft site, 10 million have bought the game. We also performed a Google trend to find out the search hits for MineCraft and the result showed an increasing trend of search of MineCraft which can increase the likelihood of gamers buying next version or gaze-enabled version of this game. The vertical axis is an indicator of number of searches for MineCraft. With all these evidence, expecting a 2.5 million purchase of eyeCharm to play the gaze-enabled versions of these games is not unrealistic.





Early Majority, Once the early adaptors start playing the game using their eye control, other gamers are very likely to do the same. Especially in the case of on-line games like World of War Craft that gamers play against each other, in order for other gamers to stay competent they are very likely to also add eye control to their gaming experience. Moreover, as more gaze-enabled versions of other games become available, more gamers will adapt to the technology. We identify the early majority as the World of War Craft players, Diablo 3 and other online games that the eye control versions of them become available. Also, the early adapters will expand through networking, game forums and social media advertisement.

8.2. Crossing the Chasm

A chasm is very likely to happen for NUIA eyeCharm and other eye tracking technologies. As mentioned before, although eye tracking has been used in research, advertising, etc. it is not still a conventional control tool that regular users have experience with. There is uncertainty in the market, and users do not know how it exactly works and gamers are not an exception. Until users start experiencing the technology, it is not clear how the market will embrace the technology. However, with the strong value proposition that NUIA eyeCharm have for savvy gamers, we believe it can cross the chasm. Below arguments and actions are the reasons.

- Actively search for new games to develop the eye-tracking plug-in for them. As it is already 4tiitoo strategy, develop the eye-tracking plug-in for best selling games.
- 4tiitoo can benefit from networking effect to a great extent. Developing the gaze-enabled version of the online games will rapidly extend their market. Once some game players start adapting it, their opponents will soon do.
- As NUIA has a strong SDK for other game developers, 4tiitoo should attract game developers by attending in gaming conferences like Gaming Developers Conference. Attending popular

exhibitions like CES can also promote both their solution and SDK. Kickstarter is itself a very good platform to attract game developers. Games category is the most funded category, 21 million, in Kickstarter according to their stat data [28].

- The eyeCharm value proposition is aligned with what makes a game attractive. According Prensky, players engage with video games because video games are fun, bring ego satisfaction, adaptive, challenging, represent a story and are interactive. As gamers start adapting eye control, all above value drivers can then be achieved by having eye control as an addition or the game may not be attractive anymore. Therefore game developer will add eye control to their games.
- As other Companies and competitors start making their eye tracking solution available in market, people become more familiar with the technology. This can decrease the uncertainty in the market and may in fact attract more gamers towards solutions like eyeCharm.

9. Market Strategy

Market strategy considered from two aspects:

- 1. How to attract Video Gamers
 - a. Develop eye Tracking plug-in for popular games & expand the eye Tracking features(e.g. Mine Craft, Call of Duty)
 - b. Having clear roadmap to reach to the point of end-to-end solution, where they provide solution without dependency on any other product y eliminating external hardware or cheap, all in one, external hardware.
- 2. How to expand the integration of this kind of natural control with eye movement in Video Games
 - a. Increase the popularity of their solution to integrate eye movement in Video Games, if possible to set their solution as standard (cross-platform)
 - b. Engage in game developer's forums, conferences (GDC) and involve developers to make themselves known and also to expand their network and try to gain more popularity through the expansion.
 - c. Look for possible partnerships / alliances to gain more market share and more powerful stance (4tiitoo & Tobii partnership to integrate eye movement control in Mine Craft)
 - d. Actively demo their solutions in exhibitions and try to inspire participant how to employ this solution (for example, CES exhibition)

10.Competition Analysis

Figure 14 below shows the companies currently in the market, or coming in soon, with product(s) that have eye tracking capability or a package that enables devices to use this kind of natural interface. Also prospective followers according to their field of activity, and the possibility of using this technology in those fields on the vertical axis, and the horizontal axis shows different platforms that eye tracking technology can be used on. Also figure 14 shows the current partnership around the eye tracking technology and potential one. This kind of information can give a decent understanding of the eye tracking market which somehow can let a company pick the right strategy. For example, for choosing target market, alliance, field of activity and detecting the threats and take preventive action.



Platform

Figure 14-Current and Potentail competitorss of 4tiitoo

GL Glasses, PC Personal Computer, LP Laptop, TB Tablet, PH Phone, TV Television, GC Game Console.

As discussed earlier, there are different solutions for eye tracking technology. Some of companies like UMoove and Fujitsu focus on eye tracking software development and use front face camera embedded in different kind of devices. These solutions are and can be used on laptops, smart phones and tablets. What differentiated this type of approach from each other is that on what type of OS, their software work. The potential growth for this approach is to expand the OS range that their software can cover and make software compatible to work with any low resolution external camera in case there is no embedded front face camera.

4tiitoo and other companies like Tobii and EyeTech use an external gaze sensor. In the PC and Laptop industry Eye Tech and Tobii's products are around for disables, web developers and customer behavior analysis for a while. But 4tiitoo as a new comer distinguished itself by its low price and to make it available for almost everyone. Besides partnering up around eyetech solution, the other kind of partnership can be made to expand the application with eye control capability like partnership between 4Tiitoo and Tobii Company to develop PC-based game with eye-movement control capability. It helps them to gain popularity and set themselves as the standard in the market.

To understand the position of current 4tiitoo's competitors, it has been noted in the below table 3, to distinguish technical factors that help to understand the level of competition between 4tiitoo Company and other competitors according to those factors. The chosen factors are as follows:

- Availability of software
- Capability of software to work with low resolution embedded front face camera
- Needs for External devices to detect the eye movement and gather the data
- Price
- New product generation with eye movement tracking in their field of activity
- Providing new interface solution for electric devices

	Software	Uses embedded camera (low resolution)	Uses external dedicated camera	New generation of device with eye tracking capability		Available interface for others
4tiitoo	Х	-	Х	Fairly Low		Х
Umoove	Х	Х	-	Low		Х
Tobii	Х	-	Х	High –Fairly High		Х
Fujitsu	Х	Х	-	Fairly High	Х	-

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Table 3- Comparing	competitors a	against	amerent	Tactors

Haier	Х	-	-	High	Х	-
Samsung	Х			Fairly High	Х	-
LG	Х			Fairly High	Х	-
Eyetech	Х		Х	High		Х

As table 3 shows all the companies have software, some of them have capability to track the eye movement by processing data acquired by low resolution embedded front face camera, and some of them need more accurate data to do tracking that make them to use external devices with higher resolution camera. By viewing the price column it's obvious that price of software is lower than combined (software plus hardware) solution which makes sense. The last two columns show the activity field of the companies, for example, Samsung is a company that produces electronic devices, so it most probable that this company uses this technology in its next device generation rather than selling the interface solution.

According to our discussion in the previous paragraph, the mentioned factors show the position of the companies which currently have this technology in comparison to the 4tiitoo. The availability of the software shows that company has something that considered as threat for 4tiitoo, capability of available software with low resolution camera can shows that company has something extra to be threat for this company or not. Having the external device with same usage as 4tiitoo's product shows the directness of the competition between those companies. Any product with a low price and decent quality can always be a threat. As said before, the last two columns are about each company's field of activity which shows the directness of the competition between those companies of the companies and 4tiitoo.

With respect to how many of those factors each company has, fall in high-threat or low-threat and direct and non- direct, we came up with below figure, showing the position of 4tiitoo's competitors.



Figure 15- Competition Analysis Threat / Direct Evaluation

As figure 15 shows, Umoove has the highest threat for 4tiitoo though it's not as direct as Tobii and Eye Tech. Umoove is to make eye tracking technology available for everyone and they claimed that they have been collaborating with large device manufacturers for several months to achieve their goals [29]. "Umoove will make its tracking technology available to anyone from app developers to smartphone and tablet makers and they predict that applications integrating Umoove's tracking tools will be available within three to four months [30]." It sounds that UMoove aggressively tries to get as much smartphone and Tablet market as possible, since it has a cheap solution and expands the compatibility of the software with more OS it can be on many devices since it works with low resolution camera.

The other competitor is Fujitsu that has the similar software as Umoove's, but this company with partnering up with Tobii and NTT DoCoMo announced eye tracking iBeam tablet, which first look scheduled for October. So as shown in figure 15 Fujitsu is a high threat competitor but not direct because it seems selling software interface solution is not in the company's field of activity.

According the mentioned factors in table 15 the other competitor positions are determined with the same logic described for Umoove and Fujitsu. We considered the competitor's main product in their field of activity and compare that company with regard to that product to 4tiitoo. For example in Haeir case, since producing the TV is their main field of activity, it compared to 4tiitoo without considering the role of Tobii in producing that product.

11.Market 4Ps

Product

eyeCharm can bring the gamers' experience to another level. Using the eye control, virtual reality environments will display a world that is truly immersive and feels like reality more than ever. eyeCharm is an affordable eye control solution and provides new experiences which are elaborated below.

Affordable price

Eye tracking is extremely intuitive and natural but at today's price points of \$ 995 to \$ 20,000+ it stays inaccessible for most game users. NUIA eyeCharm provides an affordable price with innovative technology in hardware and software solution. It allows game users to experience the game based on eye tracking without worry for cost.

Providing new experience

The gamers can expect a new experience based on eye tracking technology providing intuitive interaction. It will allow game users to enjoy a more fun and exciting experience.

- ✓ Fast: If the gamers want to operate an object in the interface, they look at it and then use an input device. Hence, the eyes will provide input faster than any other input device.
- \checkmark Easy: interacting with the eyes can be intuitive, natural and easy to learn.
- ✓ Contact free: Point of gaze can be detected without physical contact. The gamers can interact with a computer even if they can't use their hands.
- ✓ Extra input: If both hands are used for input, the use of eyes can offer a "third hand". The use of several inputs and modalities can be used to enhance interactivity.
- Reduce fatigue: If eyes are used as input instead of a manual input device, arm- and handmovements will be diminished. This can reduce fatigue and prevents injuries like Repetitive Strain Injuries.

Place

As people become more connected, more online games become available, and next-gen consoles like Microsoft's Xbox One essentially require the internet to run, digital distribution is becoming just as important to getting games in player's hands. Gamers have the option of skipping the store for physical copies and downloading games straight to their consoles. In addition, 4tiitoo is in the position of a Start-Up company, therefore it is risky for them to use their own distribution channel. Considering these environments in game market, a simple distribution strategy and focusing on online market is a suitable place for NUIA eyeCharm. 4tiitoo can partner with online companies that will distribute and sell NUIA eyeCharm. Customers can purchase the product in on-line market such as Amazon, e-bay and their own web-site.

Promotion/Advertisement

Playing games using eyes as a control method is very new and gamers are not accustomed to it. 4tiitoo has to promote the NUIA eyeCharm by bringing awareness to the market. Such can be achieved by attending gaming conferences and exhibitions. Web 2.0 advertisement is also another important media to focus. 4tiitoo has to invest more on advertisement in the beginning and also to cross the chasm. Below are the different methods of advertisement suitable for NUIA eyeCharm.

<u>Kickstarter</u>

Kickstarter is not only a crowd funding platform, it's a good advertising media especially if the target audience are savvy gamers. As mentioned before, game projects in Kickstarter are very popular and are the most funded category (21M) [28].

Web Marketing

Web marketing is a cheap and effective advertising media. Web marketing is useful in the early phases and also along the way. Online advertising digital contents (IGN, GameSpot), Google AdWords program, Social Media (facebook, twitter, etc), on-line game forums and also you-tube home page takeover and you tube ads are all effective methods of advertising to attract both gamers and game developers.

Events

Exhibitions, conferences and formal parties are very useful methods to introduce the NUIA eyeCharm to technical savvy people and also attract game developers. Game developing contest for developers is another event that 4tiitoo can highly benefit from. Inviting game developers and have them develop creative games with eye control make developers' familiar with the SDK and also bring more game ideas that suits well with eye control.

Off-line advertisement

Printing ads in Gmaers' Magazine, free swag in places like PSU Engineering building, theater advertising before action movies and also advertising through Amazon shipments (for game related purchases) are effective off-line methods that can bring publicity of the product and 4tiitoo into the market.

Price

According to Gamespot and WSU research, 69% of gamers spend \$300-\$800 annually on game hardware. Considering the other available controllers (Joystick, mouse, PC rumble pad, PC steering wheel control) are within \$30 to \$100 [31]. Moreover, our survey shows that expected price is around \$42 which could be due to biased responses and incorrect pricing options. Yet, considering the amount of money that are target market spends on game and the fact that our target market is not price sensitive, \$60 is a very competitive price. For \$ 60 customers get the NUIA as an add-on to your Kinect (Xbox or Windows version). Customers also get the NUIA Apps we have already created for eye control PLUS the powerful NUIA SDK in case you want to teach your favorite applications and games some great new tricks.



Figure 16-How much are you willing to pay for an eye control product, survey result

12.Sales Forecast

Table shows the marketing expenditures of 4tiitoo based on our proposed promotion plan for the next two years. Total revenue in each quarter is estimated based on the expected number of items to be sold. The \$60 price is assumed to remain the same in the coming years. A 30% margin is also considered and based on that the profit in each quarter and the cumulative profit is shown. As the table shows, in innovator and early adapter phases, a greater portion of sales is allocated to the marketing budget. (All the numbers are in 1000 unit)

	Innovators		Early Adapters			Early Majority		
	2013 Q3	2013 Q4	2014 Q1	2014 Q2	2014 Q3	2014 Q4	2015 Q1	2015 Q2
Expected number of sales (K)	1.4	140	348.6	630	1,050	1,400	1,680	1,750
Marketing Budget (Percentage o f Sales)	5%	6%	10%	7%	3%	2%	2%	2%
Marketing Budget(K)	\$10.5	\$519	\$1,992	\$2,613	\$2,063.1	\$1,632	\$2,262	\$1,982
Kickstarter (K)	\$10	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Web Marketing(K)								
Online advertising digital contents (IGN, GameSpot)		\$5	\$50	\$50	\$50	\$50	\$50	\$50
Google AdWords program		\$1.1	\$100	\$1.1	\$1.1	\$100	\$100	\$100
Social Media (Labor cost)	\$1	\$1	\$1	\$1	\$1	\$1	\$1,000	\$1,000
You tube-Homepage takeover	\$0	\$200	\$200	\$400	\$400	\$400	\$400	\$800
You-tube ads	\$0	\$0	\$300	\$500	\$300	\$300	\$300	\$300
On-line game forum operation	\$0	\$2	\$1	\$1	\$1	\$1	\$1	\$1
Events (K)								
Exhibitions (CES, G2E, Comicon)	\$0	\$0	\$1,000	\$1,000	\$1,000			
Conferences (GDC)	\$0	\$30	\$0	\$100	\$0	\$20	\$0	\$20
Marketing events (Formal parties)			\$100	\$200				
Gaming contest (for developers)			\$100					
Conference Sponsorship		\$200		\$200	\$200		\$200	
Offline Advertisement								
Gamers' Magazine	\$0	\$30	\$100	\$100	\$50	\$200	\$200	\$200
Free Swag (Publicity blitz)		\$50	\$30	\$50	\$50	\$50		
Theater Adversiting (Action/ Violent/ Scifi)						\$500	\$1,000	\$500
Amazon Shipments / emails	0	\$0	\$10	\$10	\$10	\$10	\$10	\$10
Total Revenue(K)	\$84	\$8,400	\$20,916	\$37,800	\$63,000	\$84,000	\$100,800	\$105,000
Margin	30%	30%	30%	30%	30%	30%	30%	30%
Profit (K)	\$25.2	\$2,520	\$6,274.8	\$11,340	\$18,900	\$25,200	\$30,240	\$31,500
Cumulative number of items sold (K)	1.4	141.4	490	1,120	2,170	3,570	5,250	7,000
Cumulative Profit (K)	\$25.2	\$2,545.2	\$8,820	\$20,160	\$39,060	\$64,260	\$94,500	\$126,000

Table 4- Sales Forecast and Marketing Expenditure for NUIA eyeCharm

13.Conclusion

In this report we proposed a marketing plan for NUIA eyeCharm. We chose savvy gamers who play "Action" genre as our target market. The currently available games all fit into this specific genre and those who are already playing those games are more likely to adapt to the gaze-enabled versions of them. Our target market is looking for fun, accomplishment, immersion and challenge and is appealed by a good story. NUIA eyeCharm can fulfill all these expectations and bring the gamers' experience to another level by offering a more natural interaction while playing games and make the gamer feel as if they are part of the story. Gamers are not price sensitive, and for a good product they are going to spend money. Our market strategy focuses on attracting both gamers and game developers. As more games adapt the eye control plug-ins, more gamers will start using them. 4tiitoo has to focus on developing eye control for on-line games as the can benefit massively from the network effect.

We have projected the expected Sales for the next two years and we are expecting that by then, the early majorities will start to adopt. To attract more customers, more games and applications of eye control have to be developed and that was out of the focus of the marketing plan and required more investigations through other target markets. We are expecting a profit \$31 million in 2015 with cumulative profit of \$126 million by that time.

As mentioned before, 4tiitoo is focused on its NUIA multi-sensor software suite which is easily expandable and provides multiple interfaces for different platforms and languages. 4tiitoo wants to be part of the next level of human computer interaction through their strong software suite and offer the software infrastructure. In order to do that, they have to make the market of regular users, familiar with eye tracking technology. They wanted to come up with a solution that is affordable for everyone. NUIA eyeCharm was a smart solution and a smart move from 4tiitoo. They can gain profit by selling their product and also have regular people experience eye tracking technology. That is a great way to promote their software suite, as more and more Companies want to offer eye tracking technology as the market starts to embrace it.

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