King Design System

(Technical Paper)

Have video game inoculated a sence of virtual reality in its users?

(STS Paper)

A Thesis Prospectus Submitted to the

Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements of the Degree

Bachelor of Science, School of Engineering

Erin D. Hopkins

Fall, 2020

Technical Project Team Members

Jackie Mazzeo

Vinh Nguyen

Emma Peck

Kelcie Sattherwaite

On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

Signature _____ Date __11/02/2020__

Erin D. Hopkins

Approved _____ Date _____

Gregory J. Gerling , Department of Choose Department

Approved _____ Date _____

Kathryn A. Neeley, Associate Professor of STS, Department of Engineering and Society

I.		Introduction

There has been an exponential growth in the availability and commodification of gaming and mobile technologies within the past couple of decades. With this has grown plenty of gaming industry gurus across the various platforms available for online, console, and mobile gaming. King Digital Entertainment has an arsenal of "casual" mobile games which are used consumers of various cultural backgrounds, age, demographics, and technical ability. There are a plethora of both obvious and adverse design inconsistencies ranging from stylistic differences to disparity between the functionality of various user interactions. To address this, a design system is to be implemented such that a standardized framework is highlighted while still allowing for customizability and creativity of the developers and designers. This balance is critical to instilling a brand culture for King as well as capturing and engaging users most effectively.

In a similar vein, the evolution of gaming has come to be harmful to the way people interact outside of the game. Along with the introduction of touch screen and other technological usability advances has come an influx of gamification strategies and techniques by various industries that target the loyalty and attention of the masses. In a broader STS context, the nature of these games has been developed according to the social agenda, so to target the human psyche at its more vulnerable, sedentary states. The research project will dig deeper into the social construction of gamification strategies to highlight those psychological techniques and how they contribute to future human behavior. It will focus on understanding whether or not video games have inoculated a sense of virtual reality in gaming users and how their design influences both conscious and subconscious behavior.

II.	Technical Topic

Candy Crush Saga is King's most popular mobile game capturing 272 million users every month across the world (Smith, 2017). This being said, with its initial launch 2012 the intention was not for the game to continue to be used so many years later which is why there was not any forethought into creating a template or framework for Candy Crush Saga. Since 2012, King has added three more games to the Candy Crush Saga Series and have also launched numerous other game series. Paired with the creative and collaborative nature of both the company and internal design teams, the lack of a standard framework has created large gaps in communication across King games and many design inconsistencies that have now grown to affect the way that users navigate them. Not only have new games been added both the technological world has also metamorphosized even in just the past eight years. The integration of social media has allowed the competition to elevate in that in-game experiences have amplified real-world reward/consequence association. Additionally, technological hardware has changed, force touch, facial recognition, security and software upgrades have all occurred since the release of Candy Crush. All features should be considered when designing the way users interact with a product but caution should be taken to mitigate "feature overload". An excess of features and functionalities in any User Interface (UI) causes problems for both the designer and the user as only 10% of features are typically accessed by users so it is important to minimize ambiguity regarding which features are accessed by the user. This is achieved through proper usage of affordances and parameter specifications which also benefits the development process (Suess, 2014).

A Design System a set of by-laws in a sense which aims to group all of the elements in an interface and facilitates natural and effective design, realization and development of a product.

They should characterize the purpose and shared values of a product and make them apparent to the designers so that it is translated and understood by the user as well and enforced via Design Principles which are enumerated to guide design choices (Hacq, 2020). The technical project is focused on proposing a design system with consistent elements and best-practice guidelines broken down by usability parameters and associated specifications. King designers and developers should be able to use this tool to both redesign or update released mobile games as well as prospective unreleased applications. Research into established design systems such as Microsoft, Google and IBM as well as related UI criteria were conducted to gain a sense of proper display and organization of appropriate design specifications for the system as a whole. The flexibility of the design system is a key consideration as balance between standardizable and customizable needs to be maintained so that creativity and innovation are still able to thrive.

III.   STS Topic

Mobile phones have become a staple for the majority of people of any age and are accessible at virtually any time and place. The development of mobile and video gaming is one that follows the principle of Social Construction of Technology (Wiebe, 2016). It can be argued that these technologies are shaped by human action rather than the technology determining the human action (Klein, Kleinman, 2002). This immediate availability of virtual entertainment has indeed amplified everyday personal and interpersonal life efficiency, but has also led to premature introduction of the vacuum of mobile and online gaming to children in their most influential and foundational years. Used for both entertainment and education, reception of the addictive nature of gamification is influenced by the perceived benefit of the technology (Clements, 2002). Although technologically assisted learning practices have proven to be beneficial in improving

3

self esteem amongst disabled users, computer, console and mobile games have served as a catalyst for social isolation as these technologies are integrated into the mental framework of learning, from isolation stems boredom and the growing natural tendency to revert to the comfort of a screen. This research is applicable to people of all ages and technological proficiency as it is important to be aware of false senses of reality that users may be falling victim to so to keep the detrimental effects of addiction at bay. Addiction is an impulse stemming from the loss of both control and limitation of a given source of dopamine and adrenaline to the brain. Abstaining from these methods of temporary "euphoric" experiences leads to various negative emotional states such as anxiety and dysphoria due to lack of perceived necessary stimulus to the Pre-Frontal Cortex and Hippocampus. (Koob, 2010). Similarly, online and mobile gaming has been revealed to have taken into consideration various personality traits and psychological tendencies to most effectively develop and maintain the attention of mobile and online gaming users (Mehroof, 2010). These psychological tendencies are the human nature that have guided the development of highly addictive game platforms.

As mobile device usage and gaming becomes increasingly available and integral to an everyday routine, various design strategies have been employed in order to commodify the gaming experiences. Design and in-game purchasing systems employ tactics which incentivize users' spending by capitalizing off of informational advantages and data manipulation. There are 13 patents for in-game monetization within the gaming industry that refer to these systems and methods that encourage excessive online purchasing whether the user is aware of it or not. Accordingly, this had led to difficulties in users' ability to delay gratification and an increase in their vulnerability to overspending especially since many offers are designed to provide immediate benefit (King, Delfabbro, Gainsbury, Dreier, Greer & Billieux, 2019). Consumers

4

need effective protection against these tactics targeting their cognition. The development of "brain-games" have created a cognitive correlation between the repetitive, monotonic user interactions performed in these games and perception of received satisfaction and happiness (Green, 2015). Consistently falling victim to psychologically dangerous, monetary traps can translate the associated feeling and behavior to other, non-related situations. The effectiveness of techno-economic developments surrounding player strategy are amplified each time an interaction occurs and eventually leads to a deep personal relationship between users and their mobile or gaming devices. There are few public policies in place that aim to lessen the strength of the grip that gaming developers and designers may have on users. Still, various usability and user experience principles are often used to draw and maintain the attention, desire, and money of consumers (Fiejoo, 2012). Without appropriate protection against unethical consumer practices, users will still fall vulnerable and addiction in the gaming industry as well as addiction pertaining to other sources of stimuli will continue to dangerously grow and flourish.

   Research Question and Methods

   This research will unpack the Social Construction in a way that looks at the resulting human behavior from the technology that was initially shaped by human nature. Now that video games have been created and designed so strategically to best capture the attention and dopamine of users, how has this design impacted how they perceive reality? Although these growing virtual reality techniques have grown and put to effective use for rehabilitation purposes, the dysphoria experienced by a majority of users is harmful to understanding true value outside of the game. (Sokolov et al., 2020). Census and poll data should be collected at multiple stages of product use for given video game consumers as well as non-video gamers. This data will be focused on the perceived value of life as well as dig deeper into whether or not these users are aware that their

habits have changed over time. Spending habits should also be collected to understand the impact of digitized transactions on the associated value in the real-world (King & Delfabbro, 2014). Some limitations include that the data regarding feelings would be self-reported and may not necessarily depict honest trends as well as the fact that there could be other factors besides video and mobile games that lead to a change in conscious or subconscious behavior. Gamification and its threats to individual's perceived realities is a genius way to employ control over and remove agency from users. With games infiltrating their way into the majority of what used to be "free-time" as well as other realms such as rehabilitation and education, people should know that these tools are affecting the way that they interact with the world around them.

IV.   Timeline and Expected Outcomes (179)

The Technical Project will have a deliverable of an interactive website or tool that outlines a design system, foundation, and guidelines for product designers and developers so that a clear understanding of its UI and UX efficiency is achieved.

After research about the company and client meetings to define the scope, multiple iterations of the ideal website or tool were under way. By December 2020 a product that effectively supports aforementioned deliverables should be complete and integrated into King. The next few months will focus on feedback from designers on its effectiveness and iterations will continue. By March 2021 the design system should be extended to upcoming projects as well as has undergone testing by real users. The technical team will complete a report for the Systems and Information Engineering Design Symposium (SIEDS) by April 1, 2021.

The STS Research will bring light to potential long-term effects of video gaming in the sense of perceived reality and ideally help bring awareness to users not to deter them from engaging but rather to reduce the detrimental psychological and subconscious effects.

<center>**References**</center>

Clements, D., & Sarama, J. (2002). The Role of Technology in Early Childhood Learning. *Teaching Children Mathematics*, *8*.

Green, S. C., & Seitz, A. R. (2015). *The Impacts of Video Games on Cognition (and How the Government Can Guide the Industry)*.Retrieved November 2, 2020, from https://journals.sagepub.com/doi/abs/10.1177/2372732215601121

Hacq, A. (2020).*Everything you need to know about Design Systems | by Audrey Hacq | UX Collective*. Retrieved November 1, 2020, from https://uxdesign.cc/everything-you-need-to-know-about-design-systems-54b109851969

Kellogg, W. A. (1987). CONCEPTUAL CONSISTENCY IN THE USER INTERFACE: EFFECTS ON USER PERFORMANCE. In H.-J. Bullinger & B. Shackel (Eds.), *Human–Computer Interaction–INTERACT '87* (pp. 389–394). North-Holland. https://doi.org/10.1016/B978-0-444-70304-0.50068-6

King, D. L., Delfabbro, P. H., Gainsbury, S. M., Dreier, M., Greer, N., & Billieux, J. (2019). Unfair play? Video games as exploitative monetized services: An examination of game patents from a consumer protection perspective. *Computers in Human Behavior*, *101*, 131–143. https://doi.org/10.1016/j.chb.2019.07.017

King, D. L., & Delfabbro, P. H. (2014). The cognitive psychology of Internet gaming disorder. *Clinical Psychology Review*, *34*(4), 298–308. https://doi.org/10.1016/j.cpr.2014.03.006

Klein, H. K., & Kleinman, D. L. (2002). The Social Construction of Technology: Structural Considerations. *Science, Technology, & Human Values*, *27*(1), 28–52. https://doi.org/10.1177/016224390202700102

Koob, G. F., & Volkow, N. D. (2010). Neurocircuitry of Addiction. *Neuropsychopharmacology*, *35*(1), 217–238. https://doi.org/10.1038/npp.2009.110

Mehroof, M., & Griffiths, M. D. (2010). Online Gaming Addiction: The Role of Sensation Seeking, Self-Control, Neuroticism, Aggression, State Anxiety, and Trait Anxiety. *Cyberpsychology, Behavior, and Social Networking*, *13*(3), 313–316. https://doi.org/10.1089/cyber.2009.0229

Seok, S., & DaCosta, B. (2012). The world's most intense online gaming culture: Addiction and high-engagement prevalence rates among South Korean adolescents and young adults. *Computers in Human Behavior*, *28*(6), 2143–2151. https://doi.org/10.1016/j.chb.2012.06.019

Seuss, M. (2014). Beware of Feature Overload—And what to do About it. *Michael Suess*. https://michaelsuess.net/products/beware-feature-overload/

Smith, C. (2017). *20 Amazing Candy Crush Facts and Statistics*. VGS - Video Game Stats. https://videogamesstats.com/candy-crush-facts-statistics/

Sokolov, A. A., Collignon, A., & Bieler-Aeschlimann, M. (2020). Serious video games and virtual reality for prevention and neurorehabilitation of cognitive decline because of aging and neurodegeneration. *Current Opinion in Neurology*, *33*(2), 239–248. https://doi.org/10.1097/WCO.0000000000000791

Wiebe B. (2016). *The Social Construction of Technological Systems, Anniversary Edition | The MIT Press*. The MIT Press. Retrieved November 2, 2020, from https://mitpress.mit.edu/books/social-construction-technological-systems-anniversary-edition