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Final Project Report

Frogger: Bridging the Gap Between Entertainment, Environment, and Ethnology

The entertainment industry has played a significant role in culture for generations, from the far-reaching influence of Hollywood stars resulting in the creation of modern high-class circles to the advent of multiplayer games forming a new method of interaction. These sorts of examples have had a surprisingly large effect on the zeitgeist of the modern world, and in particular, the cultural sway of video games cannot be overlooked. Titles such as *The Last of Us* have delved into social issues, products like *Minecraft* have developed multi-layered communities, and more. Games form more than just a pastime; they represent a change to society in subtle ways. *Frogger,* a simple program on the surface, exemplifies this quality. The mechanism bears no significant complexity: move a green dot, representing a frog, across traffic depicted by red dots. However, the underlying implications carry more weight than what meets the eye. Specifically, *Frogger* dives into issues regarding the environment and societal problems.

Every year, thousands of animals, if not more, meet their end via vehicular accidents, a pressing environmental issue that *Frogger* addresses. In the game, the protagonist is the frog, which is intended to bridge the gap between nature and humans by letting the player see through the eyes of the animal. This humanizes the frog and draws attention to the dangers that cars can pose to such animals, creating an argument for more stringent restrictions on traffic laws to protect the vulnerable. By placing the player in the struggle that countless creatures face every day, it fosters an appreciation for the lives that are taken without further thought. In terms of the environment, this symbolizes a step that humanity should take to preserve the existence of the fauna endangered by the progress of civilization. The game creates empathy by putting the player in the shoes of the frog. Empathy begets action, action begets change, and change begets improvement.

This also functions as a criticism of society's focus on efficiency at the cost of safety and compassion. The cars serve as the narrative's antagonist, a warning of man's negligence. Tellingly, the traffic lacks intent to harm since the cars simply move in a predetermined direction. Rather, it moves robotically, crushing everything in its path. As the game continues, the cars move faster. This symbolizes the societal problem of progress at all costs without measures to ensure security and quality of life. In the eyes of society, the improvement of the vehicle speeds seems an upgrade, but the lives sacrificed are forgotten. Historically, motor vehicles have been the epitome of such recklessness, from the increased pollution to the presence of tetraethyl lead in gasoline resulting in poisoning. This is the reason that cars were chosen as the obstacle in *Frogger:* to emphasize the dangers of advancement without safeguards. In short, the message of *Frogger* is that the pursuit of progress cannot come at the cost of humanity.

The simplicity of *Frogger* functions as a medium that conveys the complex intertwining of environment, safety, society, public health, and welfare, which gives rise to broader topics like international business and cultural decline. The portrayal of motor vehicles as antagonists

represents the dangers of societal negligence to health, security, and welfare, and the frog protagonist highlights the environmental problem of nature being destroyed by humanity. Though the game cannot solve these matters, it responds to them by accentuating them and forcing a response. On a higher level, the topics covered fall under the reach of global affairs since environmental health and public safety are major dilemmas across the globe. It also levies criticism against cultural norms of ignoring animal rights, provoking thought and debate about such subjects. Finally, connections can be drawn even to economics, as animal and human security naturally result in greater returns to the economy. *Frogger* cannot provide a comprehensive fix, but acknowledging and pointing out these problems equates to the first step to a solution.

Frogger was also shaped by and responds to external factors including efficiency to reduce power consumption and lowered cost to ensure economic stability. First, the game was made on an FPGA board in order to reduce cost and increase efficiency because they are cheaper to implement. This reduced the consumption of resources by using a common part instead of having to manufacture specific hardware. Though most arcade games require specialized controllers, displays, and chips, *Frogger* can be implemented on any FPGA board, streamlining the process of distribution. Additionally, the game is played on a 6x6 block, lessening the amount of power wasted. Though the entire board is sixteen blocks by sixteen blocks, using only thirty-six of them means that less electricity is wasted. The program itself was optimized by using logic rather than wire or reg, avoiding delays, and separating modules into finite state machines for faster processing. Many unnecessary variables were also removed. This naturally reduces the amount of consumed power. Overall, the nature of the hardware on which *Frogger* is implemented as well as the design choices with the game itself were built with efficiency, cost, and environmental health in mind. The metaphorical nature of *Frogger* combined with the logistical improvements made mean that *Frogger* responds to needs within society ranging from culture to economy.