DIY Gamer Kit: An Open Ended Product

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ABSTRACT

For the Object Outcomes workshop, I would like to present the DIY Gamer Kit, a device designed when I was the lead designer at London based education tech start-up, Technology Will Save Us. It is a handheld games console kit, launched and designed for Technology Will Save Us. The device was designed to teach young children the principles of electronics, programming, and design. Launched in October 2013, to date it has been purchased and used by over 10,000 individuals. The device's design is unconventional, since it is purchased in an unfinished state. It is up to the user to then complete the device by soldering it, gaining skills in the process of doing so. I will discuss the process of designing open-ended devices, and describe novel uses observed in the DIY Gamer's user base.

Author Keywords

Design; commercial design; digital making; education

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

The DIY Gamer Kit is a handheld games console in the form of a soldering kit, based on the Arduino platform. It features amongst other features four directional buttons, a light dependent resistor, a buzzer, an 8 by 8 LED matrix display, as well as infrared multiplayer functionality. At the point of purchase, the device is supplied in boxed kit form, with all electronic components enclosed in separate bags. The circuit board is designed to be instructional and suggestive of the final position of each component. The Arduino microcontroller is pre-loaded with a sample game, which tests the functionality of most components, but also provides the user with a rewarding end to their soldering experience.

The device was developed with financial help from the UK innovation charity Nesta. The aim of the project was to design education tools that truly resonate with young people and motivate them to become makers, not consumers of technology [1]. The design process began with a series of focus groups across the UK to understand the interests of young people. Using the resulting report, three themes were chosen and a kit was designed for each theme. The outcome was three "minimum viable kits" which were tested in workshops. Young people of ages between 10 and 18 assembled and programmed the devices to various levels, and gave qualitative feedback about their experiences. Finally, the most commercially feasible and well reviewed device was chosen for manufacture, passing through a final "design for manufacture" phase.

Through this process, we realised that designing kits is different to designing products since the device must be completed by the end user. We found that this home assembly not only enables the user to gain valuable skills, but it also creates a personal bond between the maker and their creation. This creates a desire to spend time with the device and learn new skills in the process of doing so. Furthermore, the designer must create multiple entry levels, as well as multiple activities in order to widen the variety of engagement and include as many users as possible.

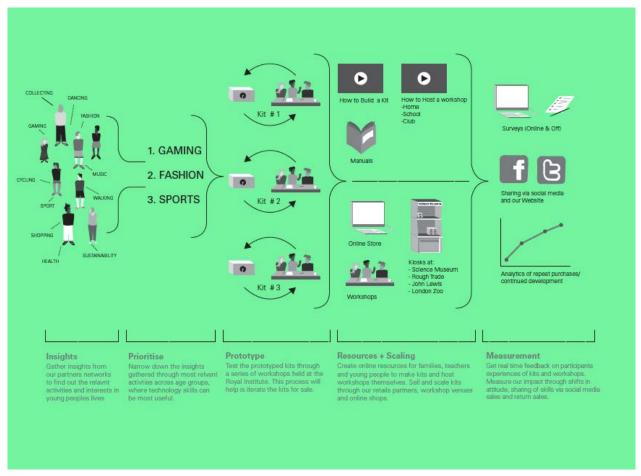**Figure 1: The DIY Gamer Kit**

Figure 2: The design process behind the DIY Gamer Kit

The DIY Gamer Kit was released in October 2013. Since then, the device has been purchased over 10,000 times, with many customers getting in touch with us to show their creations. In addition, the Technology Will Save Us team has run multiple workshops in different environments, with children from a variety of backgrounds and skill levels, which have helped the team gather insights about the types of outcomes people like to create with the device.

DISCUSSION

During the workshop discussion, I will go through a typical out-of-the-box experience a user may go through, as a way to get familiar with the device. I will then investigate uses and adaptations of the device, drawing on selected examples from the DIY Gamer's wide user base. I will discuss the process of designing open-ended devices and any differences to traditional product design practice observed in research or commercial applications. Finally, I will discuss the degree to which designers can shape the issues and experiences elicited by devices when they are delivered in kit form rather than as a fully finished prototype.

ACKNOWLEDGMENTS

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1. Livingstone, I. and Hope, A. Next Gen: Transforming the UK into the world's leading talent hub for the video games and visual effects industries. (2011) http://www.nesta.org.uk/publications/next-gen