Interactive Wheel of Fortune Game

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Overview

- Introduction
  - Client
  - Project Objective
  - Previous Work Done by Others
  - Current Patents

- Final Design
  - Wheel
  - Base of Game
  - Clicker
  - Support System
  - Spinner
  - Methods of Spinning the Wheel
  - Audio Comments
  - Game Power
  - Voice Recorder
  - Questions and Answers Book

- Budget
- Conclusion
Adults at the ATCO sheltered workshop
- The adults have various disabilities, the most common disabilities are cerebral palsy and mental retardation.
- These disabilities often limit the adult’s mobility and dexterity.

Project will also be used at the Passion Works Art Studio
Project Objective

- The game is based on the television show “Wheel of Fortune”
- A number of specific special features are incorporated to accommodate the various disabilities of the adults
- Special Features
  - Bright colored plastic used for the wheel and base of game
  - LED’s placed on the base to light up when activated
  - Two different methods to spinning the wheel: push button wireless remote and motion sensor
  - Audio comments to be played when the wheel is activated
  - Two different ways to speak the questions and answers: by a staff member or through the use of a microcassette recorder
In 1997 students at Manhattan College developed “A Decorated Wheel-Mounted Wheel of Fortune for Nursing Home Residents”.

AllinPlay have adapted an interactive Wheel of Fortune game on the computer so that blind children can play.

The television game show “Wheel of Fortune” has certain shows in which all contestants must have some type of disability.
  - Rules are not changed for these contestants.
Current Patents

- **6,162,121**- December 19, 2000- Value wheel game method and apparatus- Morro, et al
  - This patent describes a game in which the wheel is placed distantly from the game's main frame due to the large diameter of the wheel.

  - This patent describes an electronic game apparatus for play of a poker card game using a Wheel of Fortune-like display. The wheel is used to display the random selection of cards.

- As seen in the patent results, there is no interactive Wheel of Fortune game for the disabled that has been patented.
Subunits of the Interactive Wheel of Fortune Game

- Wheel and Base of Game
- Wheel Spinner
- Methods of Spinning the Wheel
- Game Power
- Voice Recorder
- Questions and Answers Book
Wheel

- Wheel is made out of polypropylene plastic
- Dimensions: 60.96 cm in diameter and 5.423 cm in thickness
- Wheel divided into 14 even pie pieces
- Manufacturing stamps removed by use of sand paper
Wheel

- Pie pieces of wheel are colored blue, red, yellow and green
- Pie pieces colored by applying primer, spray paint then a clear top coat
- Point values are assigned to each pie piece through the use of stickers
- Dowels (15.24 cm long and 0.794 cm in diameter) are attached at the end of each pie piece
Base of Game

- Base made out of high density polypropylene
- Dimensions: 54.61cm x 33.02cm x 17.145cm
- Base acts as a storage unit for:
  - PCB board and SP03 in electrical safe box
  - Function Module
  - Support System
  - Motor
  - Batteries
Base of Game

Outside of base decorated with:

- LED’s
- Speaker
- Motion Sensor
- Battery enclosures
- Stickers
- Switches
Clicker

- Wooden block attached to the corner of lid of base
- Elastic tubing attached to wooden block
- Dowels on wheel come in contact with elastic tubing when wheel spins
- Provides clicking noise and determines which pie piece player has landed
Support System

- Hollow wooden block constructed to house motor and provide overall support
- Wooden planks attached on each side to add additional security as wheel spins
- Aluminum plate attached to the top to encase the motor
Spinner

DC Motor
- DC voltage operating range (VDC) 4.5 - 12 V
- Torque @ maximum efficiency = 2000 g-cm
- Speed @ maximum efficiency = 35 RPM
PIC 16F874

- Input
  - Motion sensor
  - Receiver for the function module

- Output
  - Pulse Width Modulation
    - 16 random number generated
      - Random number 1 causes the motor to spin for 2.3 seconds
      - Random number 16 causes the motor to spin for 4.5 seconds.
Methods of Spinning the Wheel

- **First method:** push button remote control to wirelessly activate the wheel.
- Remote has a 100 foot transmission range.
- Once the button is pressed, information will leave the encoder of the remote, travel through the airways and will be received by the decoder of the function module.
Methods of Spinning the Wheel

- **Second method**: motion sensor located on the base of the game
- Motion sensor has a beam angle of 38° horizontal and 22° vertical
Audio Comments

- A SP03 speech-to-text module was used
- 16 Different phrases were used
- Random saying of the phrases
- Audio amplifier circuit
  - LM386
    - 1 watt amplification
# Game Power

## Electrical component | Required Voltage
---|---
SP03 | 5 VDC
Microcontroller | 5 VDC
DC motor | 12 VDC
Keyfob remote | CR-2032 Button Lithium Battery
Function Module | 12 VDC
Motion Sensor | 3 VDC
Microcassette | 3 VDC (2 * “AAA”)

A total of 6 batteries were used and 4 voltage regulators.
Voice Recorder

- Enables the use of the game when staff members are not present.
- Set questions and answers will be recorded so that the adults can still play.
- Help the adults at the workshop to feel more independent.
Questions and Answers

Twenty questions and answers are provided with the game.

Questions will be of the elementary level.

Example of a typical question:

Q: What color is the sky?
A: Blue

They are inserted into a plastic report cover.
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| **FINAL TOTAL**               | **$663.82** |                                                                 |

Total Allocated Budget = $750

Total Unused Budget = $750 - $663.82 = **$86.18**
Conclusion

- Currently there are no Wheel of Fortune games for disabled people on the market
- Many of the games made for disabled people are very basic and are very expensive
- This game contains numerous features that will accommodate the adults and their disabilities
- It provides both visual and auditory enhancement
- The game is also able to be played both with assistance from a staff member and independently thus the adults will feel as though they do not need to rely on someone
Acknowledgements

- Dr. John Enderle, Advisor
- William Prueshner, Advisor
- Dr. Brooke Hallowell, Client
- Chris Liebler
- Dr. Martin Fox
- John Ayers
- Serge Doyon
- Rich Bonazza
Questions