Laboratory Application: Voice Transcription with a Wearable

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PURDUE
P O L Y T E C H N I C

Customer Background

An Indiana pharmaceutical company has remained a significant player in the industry by using its innovative capabilities to build their success. Currently, their laboratory scientists utilize RealWear headset devices for voice transcription, image and video capturing, and data uploading. This allows them to view their research and access recorded experiments to analyze at a later time.

Problem / Scope of Work

Scientists are looking for resources to optimize their data collecting methods. After implementing the RealWear HMT-1 devices they discovered roadblocks such as background noise, unsuccessful cloud transferral, and transcription errors.

This company wants to seamlessly capture their in-lab data using this wearable in real-time. This project aimed to test multiple softwares to gather empirical data to demonstrate which software is the most accurate given the environment.

Requirements

#	Criteria	Description	Test Type (see Testing section)	Rationale
1	Noise canceling	Software must filter outside noise	Demonstration	Can still perform optimally with background noise
2	Platform capability	Integrates with other softwares and tools	Analysis / Demonstration	Users should not need additional training for software
3	Sustainability	Products must be approved by client	Analysis	Product must meet client's requirements regarding sustainability
4	Adaptability	Usage within multiple environments	Analysis within scenarios	Parameters should be adjustable

Experimentation / Concepts

| Software	Strengths	Weakness
WRITE BY VOICE	• Application responsiveness • Ease of use	• High percentage of missed words • High percentage of incorrect words • Transcription interruption
verbit	• Designed for commercial usage	• Input inaccuracy
Otter.ai	• Software response time • Transcription accuracy	• Application responsiveness • Ease of use

Testing

Tests were conducted in laboratory and quiet environments. Each test was scored out of 5 possible points, as shown:

		Application Useability Testing		
Step	Test	Details	Average Score: Otter.ai	Average Score: Write by Voice
1	Layout understandability	How intuitive it is for users to locate necessary items	3.57	2.71
2	Starting/Stopping	How often users repeated oneself once recording began	3.57	4.00
3	Navigation	How many steps it takes to generate transcription	4.00	2.71
4	Software response time	How responsive software is in seconds	4.29	4.00
5	Transcription interruption	How many interruptions there are per minute	5.00	2.43
The sum for each software is highlighted in gray. Based on our results, Otter.ai consistently had higher scores for each test compared to Write by Voice.			20.43	15.85

FMEA

FMEA - Failure Modes and Effective Analysis

Process Step/Input	Potential Failure Mode	Potential Failure Effects	SEV	Potential Causes	OCC	Current Process Controls	DET	RPN	Actions Taken
HMT-1 Device User Experience	User has issues operating the device	User is unable to effectively operate the device to its fullest potential	5	User is not trained in operating the HMT-1	2	RealWear's website can be referenced for detailed instructions	5	10	Reference RealWear's website and schedule a demo
Transcription Software	Software is not functional with the HMT-1	User is unable to utilize the transcription software	6	Software is not available as an apk or its layout is not optimized with the device	5	Android apps are compatible with the HMT-1 but not all are optimized	2	60	Test software with HMT-1 for functionality
Software Practicality	Software is not practial for making creating transcriptions in a productive manner	User is unable to produce transcriptions in a productive manner	6	Software requires too many steps to produce a transcription	5	Transcription softwares have their own number of steps needed to produce a transcription	2	60	Document the number of steps taken to create a transcription

Final Results

Comparison of Softwares
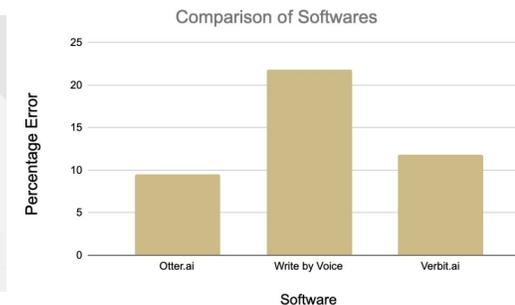
Comparing software % of errors were calculated by taking the average of errors from three parameters: incorrect input, missing words, and extra words for all three softwares. The average of these were then summed together to create an overall % of errors for each given software.