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Special Thanks to...

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IPRO315

iFideliity

Improving User Experiences with Mobile Devices and Intercoms: Optimizing Audio Quality & Energy Efficiency

Problem Statement

- A wired system takes several days to setup and it is necessary to run cables and even dig up the ground to bury the cables.
- An ordering system that depends on voice intercom increases variablity and incidence of error.

Objectives

- Convert the current wired link between kiosk and the server-side module into a wireless system
- Ensure quality standards are met.
- Enable the customer to place orders remotely, within a short range from the kiosk, via mobile device.
- Generate a sample food menu and test ordering.

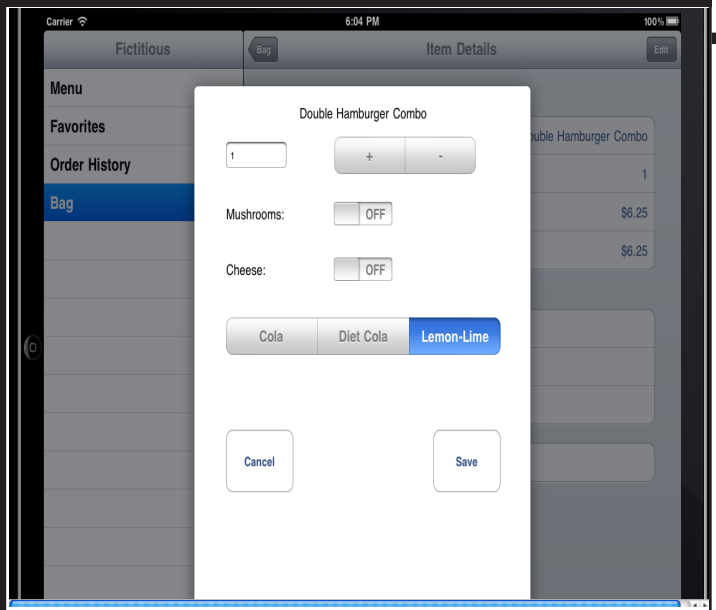
Background

- For five semesters IPRO 344 has been involved in audio testing and low powered audio, this has culminated the design and improvement of a fast-food ordering style intercom.
- An ordering Kiosk with improved acoustical properties was designed, built and extrensively tested.
- The previous IPRO was able to determine microphone type, positioning within the ordering kiosk and ordering distance for optimal performance.
- IPRO 315 is an extension of 344 and we have built off their research and chosen to further improve upon their system by removing points of weakness

Voiceless

- By utilizing an iPad we succesfully reduced order error by avoiding use of audio systems entirely.
- With our system we allow the customer to not only prepare orders ahead of time but visually inspect their orders to verify their correctness.
- Bluetooth sensors ensure that orders can only be placed when the customer is adjacent to the ordering kiosk. This avoids the logistical problem of allowing orders to be submitted from any location.
- Our system leverages Amazon Web Services infrastructure to provide low cost hosting and a high degree of scalability and availability.

Results

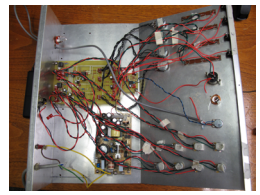


Conclusion

- Customers can verify order quantities at a glance and can do so before arriving at the establishment.
- Instant order submission.

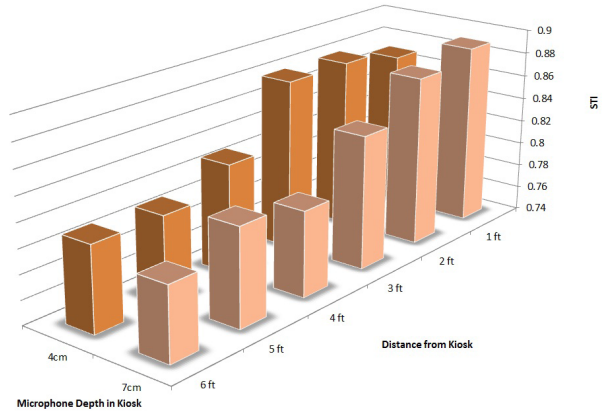
Wireless

- We used the Shure PGXD Series of Wireless devices because they were already designed to be used to in conjunction the Shure WL-185 which had been tested by IPRO 344.



- Digital Wireless systems like the Shure PGXD are much more resistant to radio frequency interference than comperable analog systems.
- Existing equipment needed to be modified because PGXD modules required different signal levels and impedances than previous designs of this system.

Results



Speech Transmission Index summary

Conclusion

- By adding wireless connectivity we were able to maintain audio signal quality while also providing the ease of installation that awireless system could afford.