

IoT Efficiency Monitoring to Reduce Wastage

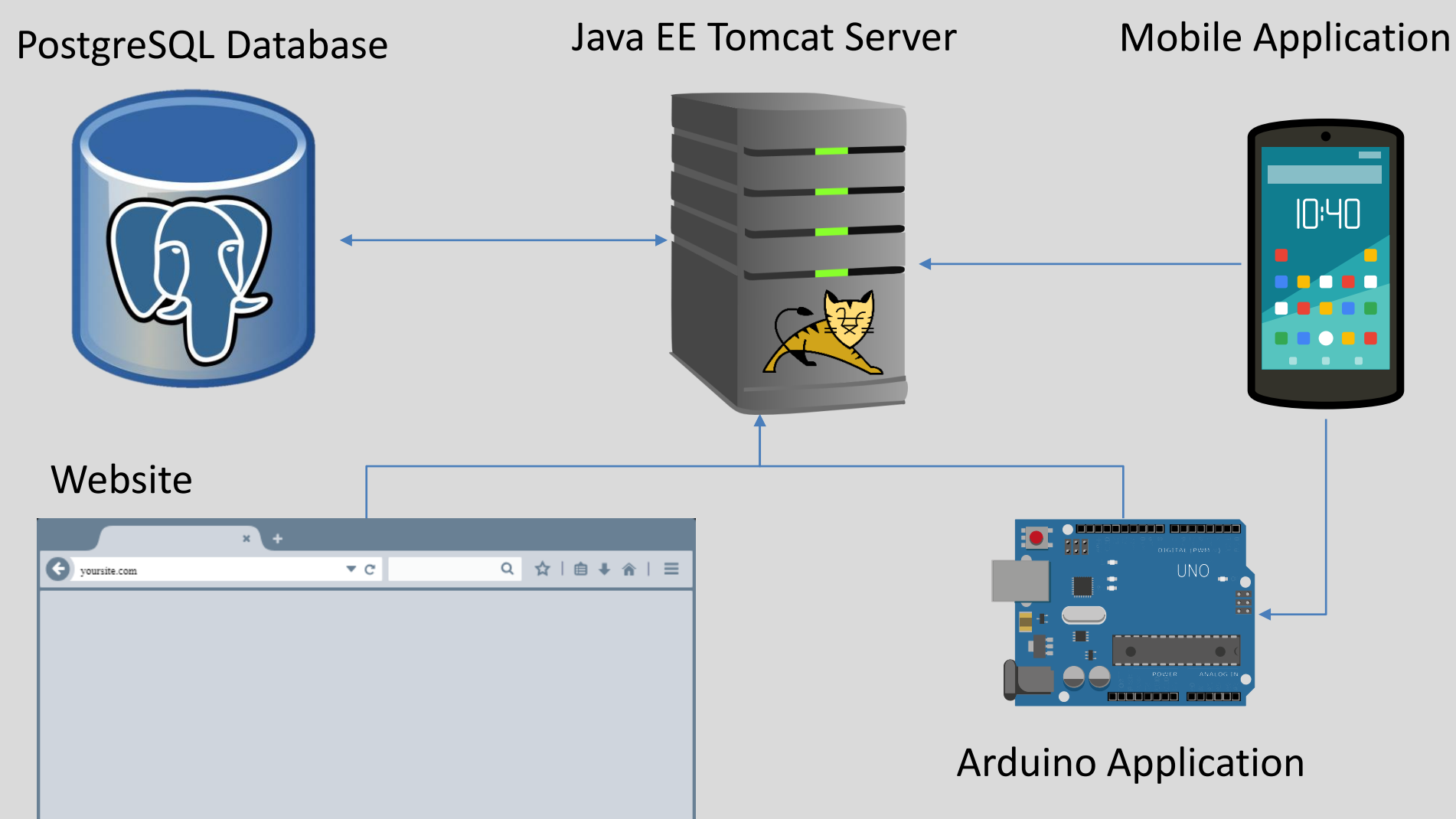
Jeremiah Cotter, Software Development
Department of Computing, Cork Institute of Technology Ireland
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Introduction

As fuel prices continue to increase in the future, using energy efficiently will become more important to a home owner. The proposed system will monitor a home with various sensors and store the results in a database. This will then be displayed back to the account owner with an interactive chart. The home owner can then adjust their habits to increase their homes efficiency and reduce excess usage.

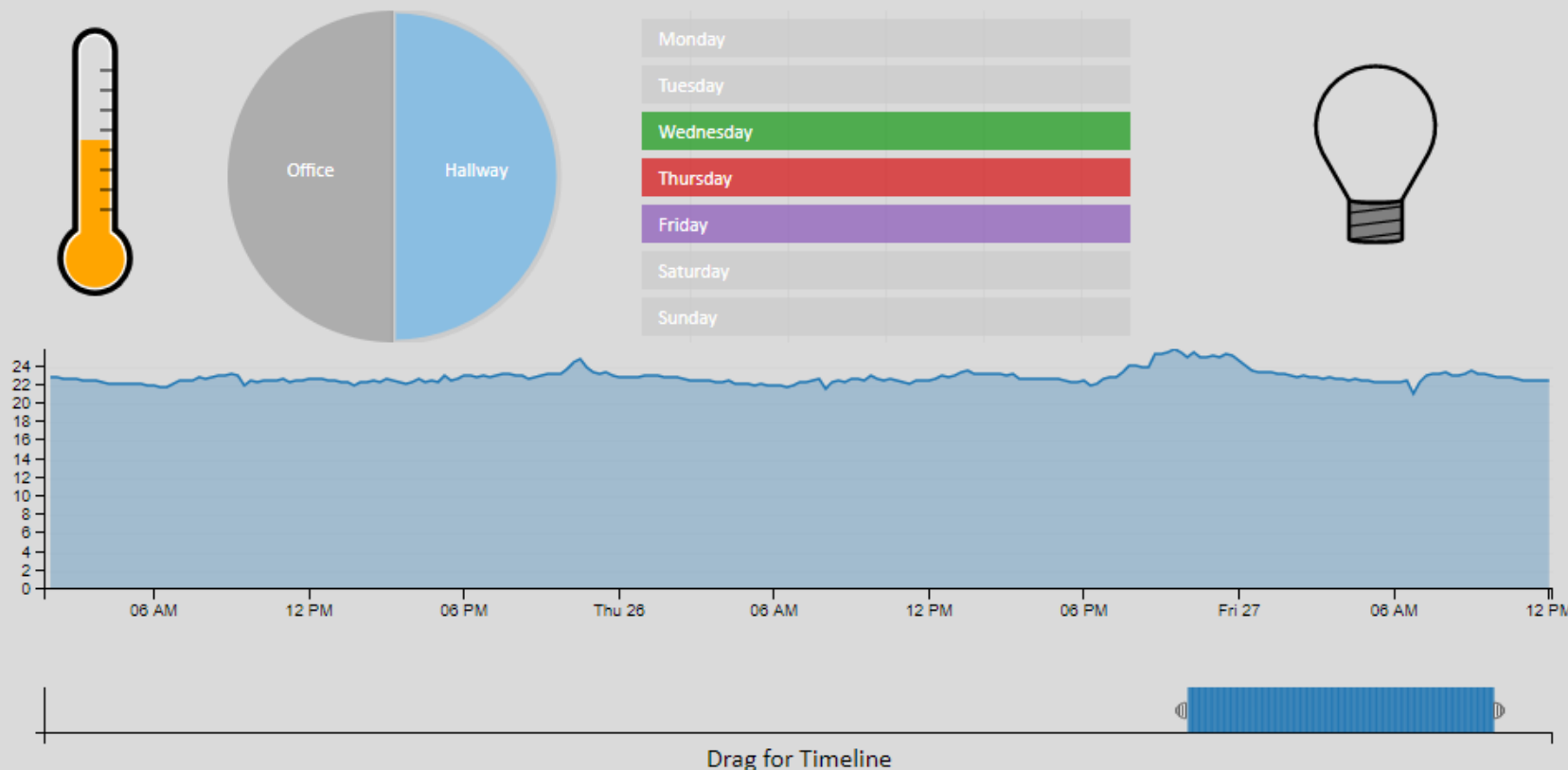
Overview



How the system works:

- Arduino running in each room
- Readings uploaded to server every 15 minutes
- Server saves readings to PostgreSQL database
- Mobile Application and Website can view interactive charts

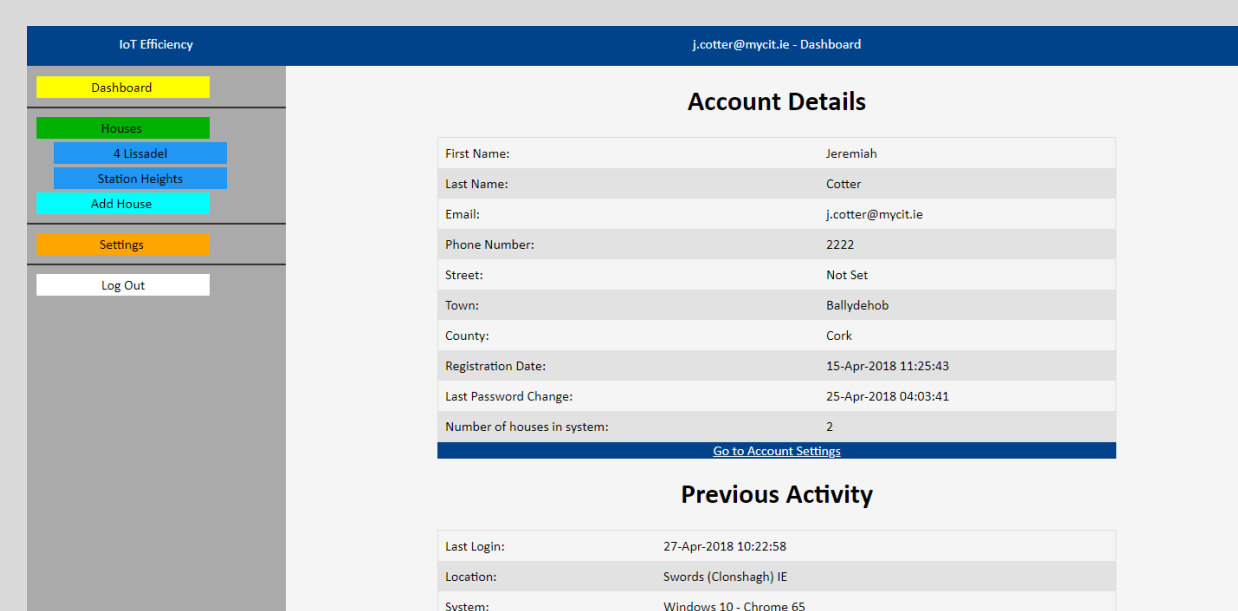
Interactive Charts



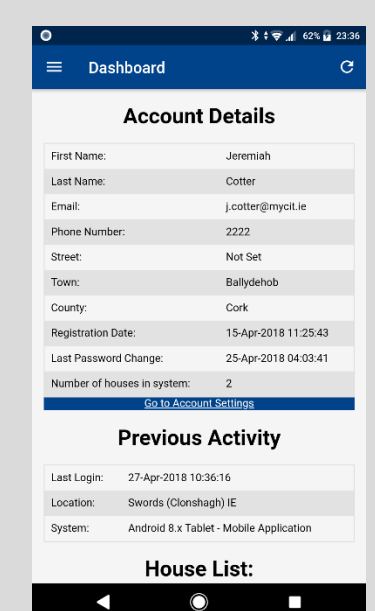
By incorporating an interactive chart, the user can see all the details that the system has collected. The user can recognize patterns in their usage and correct them, if necessary.

Responsive Design

Website

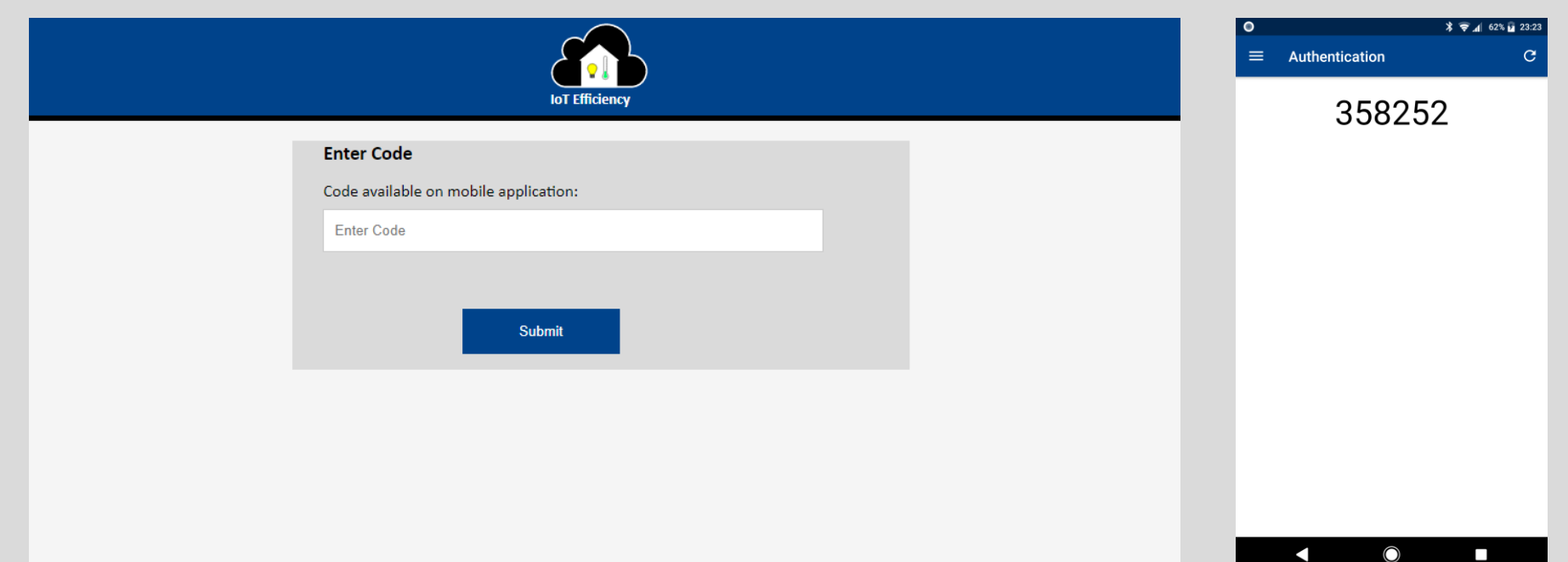


Mobile Application



By utilising CSS the website is a responsive design. This allows the site to adjust and change appearance depending on what screen it is being displayed on.

Security



As the proposed system is monitoring a home, security is a very serious concern. The following precautions were taken in the system.

- Stored passwords encrypted using jBCrypt
- Token generation to stop cross site request forgery
- All input prepared for entry into database to protect against injection
- All text output escaped for HTML to stop cross site scripting
- New Arduino token generated each upload
- Login attempts limited to 5 times for each account
- Two Factor Authentication
 - Limited to 5 attempts

Technologies Used



Conclusions

The system would allow users to see how their house is performing when it comes to efficiency and would be aware of any problems as they develop. This means they could keep their maintenance quality high and cost low.

Acknowledgments

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