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**About Us:**

During the Hackathon we have used 6 programming languages, designed and wrote code for 3 systems and formed an effective team. Together we have experience in Front end web design, back end server management, embedded systems and have used our interpersonal skills to effectively resolve issues, organize tasks and delegate per strengths. We aimed to create two solutions to real world problems and we believe we have done that as well as providing a potential solution to many other issues in other industries. We have integrated many systems and learnt many new skills to accomplish an effective SMS based internet chat system with natural language processing and chatbot as well as a web service for accessing the data produced by a network of LoPy boards with ultrasonic sensors.

**Addressing the problems:**

**Transport for Edinburgh: What are key gaps in data needed to inform transport policy and how could we use IoT to help fill those gaps?**

No need to implement new hardware at a cost. Your app already has the functionality to get GPS coordinates of the user over cellular network via the cycle functions. Thus, saving you money and time by simply hiring a software engineer to implement this simple functionality. The data would then have to be stored on a database and translated for business. Data includes time and location of ticket activation if used correctly and thus a map of the city with usage can be built.

**Uturn**

-LoPy network placed in an area for observation

- LoPy with 2 ultrasonic sensors picks up direction of movement, time stayed in location as well as time of movement. This allows for later analysis for size of object.

-Web based interface shows the location of the LoPy by assigned name and shows analysed data in useful and editable format

-Data can be used to create distribution maps, congestion or general movement.

- it will be able to distinguish between sizes thus differentiating a pedestrian from a bike from a car from a bus, allowing analysis of movement.

**The Science Festival: How can we develop ways of (i) improving the visitor experience in Edinburgh Festivals, and/or (ii) collecting better feedback from visitors about events?**

Using Time2talk visitors can interact with the performance by texting in. they will receive response via Tim the chatbot and or the performer. Creating a novel dialogue which with imagination could be incorporated into an event. Our system also allows Tim the chatbot to text out a response to gain feedback and as phones are essentially an extension of our human experience, people will find it easier to give valid feedback.

**Pycom: What uses of IoT could best enhance the student experience?**

Time2talk is an SMS based system that allows attendees to submit questions to event organizers and receive responses. The texts are ranked and displayed by importance and filtered for spam or offensive language. An included chatbot completes responses for frequently asked questions. This improves the student experience by allowing people to feel comfortable when asking questions by anonymising them as well as allowing instinctive and immediate contact. The lecturers on the other hand may not want to be constantly looking at a chat feed so we built a neural network for natural language processing to rank the questions or texts in order of popularity showing the top 10 in a separate window. This will act as a tool to improve contact between lecturer and student as well as being as useful tool for a two-way interaction such as Q and A and Feedback.

**Time2talk**

- SMS based messaging

- web based client for receiver

- natural language processing for a ranking algorithm which displays the most relevant and popular questions

- an intelligent chatbot for responding to users by answering FAQs and messaging users for feedback or dedicated task at a specific time.

**City of Edinburgh Council: How can we gain an understanding of mobility (e.g., cars, bikes, pedestrians) without using mobile tracking techniques?**

Uturn involves the use of the LoPy to collect anonymous movement patterns. Software is being designed to utilize the LoPy’s ability to generate and communicate this data to a server over a long range. A model on the server side has been developed to illustrate usefulness of the dataset by detecting movement patterns. The web interface allows analysers to select and view the key information as well as the locations that the LoPy is in.