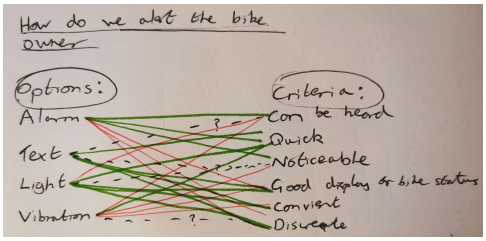
Design Challenge Essay

Zi Chen

I will be discussing the ideate stage in the UCD lifecycle. After filtering our ideas, we moved onto enhancing the best ideas by using design techniques. The general idea of our product is an easily attachable smart bike lock with a fob that connects to the lock.

QOCs were used to refine our idea. Within our group, questions were generated by brainstorming what aspects of our lock were open ended such as “How do we alert the bike owner?”. We then went around our group suggesting possible options that would solve this issue such as an alarm, text, light or vibration. Once completed, we listed all the key criteria for the alert system as well as adding extra criteria for the ease of use of the user. In doing a QOC, it gave our group a way to express various different options and opinions for each question. Coloured lines are drawn based on how well each of the options accomplished the list of criteria. Red meaning not at all, dotted for irrelevant and green for successful. After completing this, we found that a text is the best solution that would alert the biker. However, seeing that other methods have various other benefits, one of our members suggested the use of combining some of the options as there was no reason why we would be restricted to one. Hence we used the text message along with a light on the fob to indicate the safety of the bike.

We also carried out a QOC for the types of attachment mechanisms for the lock onto the bike but instead of drawing this, we displayed it in a table format so that it was easier to view as the overlapping lines before was a cause for confusion shown in Figure 1. Also we used only red or green just to simply show what each option achieves. We chose the extending rod attachment mechanism for the lock as it achieved most of our criteria required such as the ease of installation, securely attached etc.



	Extending Rods	Rivet	Unique Screws/Bolts	Simple Cylinder
Ease of installation				
Ease of uninstalling				
Simple mechanism				
Easily attached to any part of the bike				
Securely tightened				
Minimal parts				
Difficult to remove using portable tools				

Figure 1: Written and table format QOC

These are just a couple of the QOCs we’ve carried out and more can be seen in various parts of our slides. QOCs are also useful in the prototyping phase as it helped us decide on the lock’s battery. Therefore, by using QOCs, they challenged us in imagining different ways to fulfil our

set criteria and thus choosing the best option to move forward and to be implemented into our design.

To review our design, we carried out the 6 thinking hats technique. Our idea was generated based on our personas and questionnaire, aspects of which were generated by ourselves meaning that there may be parts that were overlooked or biassed towards. So this technique provides a way to challenge and gain a greater insight of our idea. To set up the 6 thinking hats technique, we allocated either 1 or 2 of the roles to each of us within the group as there were 6 hats but only 5 of us. Carefully we read through the role of each hat and kept in mind the key areas that each of us were responsible for and what to express such as a more stubborn response for the cautions hat, a cheerful approach to the benefits hat, a logical view for the process hat, etc. Then we discussed our idea after the changes that occurred through the SCAMPER technique, sketches and QOCs beforehand. By involving emotions into our roles, it helped us in finding further issues/benefits of the lock that were not considered before such as the material of the lock.

From the fact that each hat focusses on a certain category, we were able to see underlying issues as well as the positives of our design. The results for each category is summarised by:

- Facts - Helped us view the plausibility of our concept and whether the communication between the lock and fob works.
- Creativity - Helped us explore future concepts and ways to modernise the lock and fob by designing a separate device with multiple functions instead of a lock, similar to a car key. Even though this gave us possibilities for the future, they added complexities that weren't needed for our product yet.
- Benefits - Helped confirm the positives of our idea and reinforced that fact amongst us.
- Cautions - Challenged our design and pointed out major flaws which in this case was our use of a thin cable that wraps around the bike to lock it. We proceeded to act upon this and to change the material and modify the size of the cable and instead use a thick wire. This ensures that the issue found by this hat would be resolved in our next iteration of design.
- Feelings - Reflects on what a target audience likes about our lock such as the fob can be placed on a keyring.
- Process - Describes how to test out our design such as the use of a physical prototype which we carried out after this technique.

Some quote extracts of our discussion seen in Figure 2.

Figure 2: 6 Thinking Hats Technique

Therefore, the 6 hats gave us various different views, their positives and drawbacks, where each category benefitted us in different ways and enabled us to make positive changes before the physical prototype.

In conclusion, these techniques are extremely useful in looking for modifications that benefit the design. They can be applied to wider design problems because the use of QOCs encourages more creativity which provides various solutions for a problem. This means the optimum solution can be found that matches the majority of the criteria. The use of the 6 thinking hats technique means that multiple different perspectives are brought in which highlights major key points to the design. Therefore these techniques help shape and generate improved ideas for the ideate stage of the UCD which then leads to better prototyping and thus a better end product.