What The HACK

A Study on Innovation and creativity through hackathons

Introduction

Hackathons are 24-48 hour competitions that challenge one's ability to work under pressure to create something new and innovative with existing technologies or proprietary technologies that aren't available for commercial use yet. In general, hackathons act as a catalyst for innovation, by forcing rapid prototyping to test ideas.

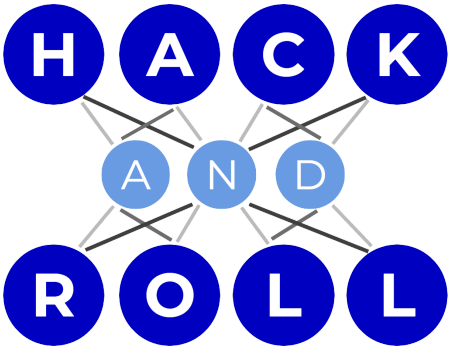
There are several types of hackathons. Some have severely restricted problem scopes that hope to keep participants centered on a specific kind of problem, whilst others seek to allow participants full reign over how they wish to ideate.

What the HACK is designed to prove the following, that giving participants an open approach to ideation generally results in a greater variance of ideas given the proper equipment and motivation. At What The Hack, we believe that this hackathon will help to boost the hacker culture in SUTD, whilst allowing us to network with other talented individuals from other universities, sharing ideas and working together as one team.

Precedence Study

Since we have broken down hackathons into two different kinds of categories, we should take a look at past hackathons that have been conducted by other universities or companies in Singapore to illustrate our novel approach when creating What The Hack. The hackathons we will look at consist of Hack and Roll - a student-run hackathon organized by the NUS Hackers, AngelHack Singapore - run by a global organization, and Fishackthon - organized by the US Secretary of Global Partnerships.

NUS Hack and Roll is a 24-hour hackathon which aims to encourage innovation through the use of software or hardware solutions. NUS Hack and Roll has a unique prize structure, where they award the top 8 groups with the grand prize, and have smaller prizes such as the "Most Entertaining Hack" or the "Best Hardware Solution". NUS Hack and Roll automatically signs up all submissions to take part in the top 8, and groups have a choice to indicate which award they are aiming for. This helps with the judging process as it makes it easier when allocating judges to different categories. It also helps promote innovation as the participants are not forced to build on a single theme, but instead, they are able to have fun while doing what they want to do, and potentially being rewarded for it.



Similarly, AngelHack Singapore follows a model similar to NUS Hack and Roll, but instead, it has specific challenges for the participants. For example, AngelHack Singapore 2017 had 6 different challenges set out by different companies, and participants could compete for the prize by building something that falls within the specifications of the particular challenge. With such a model, it allowed for participants to be able to try to learn and integrate new technologies into their solutions.

These kind of open-ended hackathons are gaining popularity because it provides full control to the participant. The participant is able to take a project that he / she is constantly thinking about and is actually able to present a rough proof-of-concept as a form of product validation.

In contrast, another kind of hackathon is those that have a specific scope. For example, Fishackathon 2017 Singapore was a hackathon which encouraged individuals to build solutions that could protect marine life, make fisheries and aquaculture more sustainable and equitable as well as preserving the future of our planet. With such a narrow scope that was only looking for hacks to address the problems associated with marine life, this hackathon highlights how a narrow scope can allow for great ideas to be discovered and improved upon when it comes to solving a specific problem.

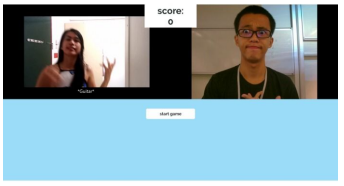
While these two different kinds of hackathons prove to be very different events, both events have a clear purpose and manage to achieve the intended effect. Our team, after analyzing these two different kinds of hackathons, decided that a more informal, open-ended event would be best suited to the participants. The rationale behind this was that it allowed for greater innovation, as well as creating a good learning environment for first-timers.

Results

Throughout the duration of the hackathon, our participants presented to us a wide variety of projects ranging from smart windshields, to plasma ion space thrusters. We thoroughly enjoyed the prototypes built by the students and felt that we had achieved the intended effect of having people of different backgrounds coming together to build a prototype that addresses the issues laid out for them in What The Hack 2017. Listed below is the table of winners as well as pictures of other submissions.

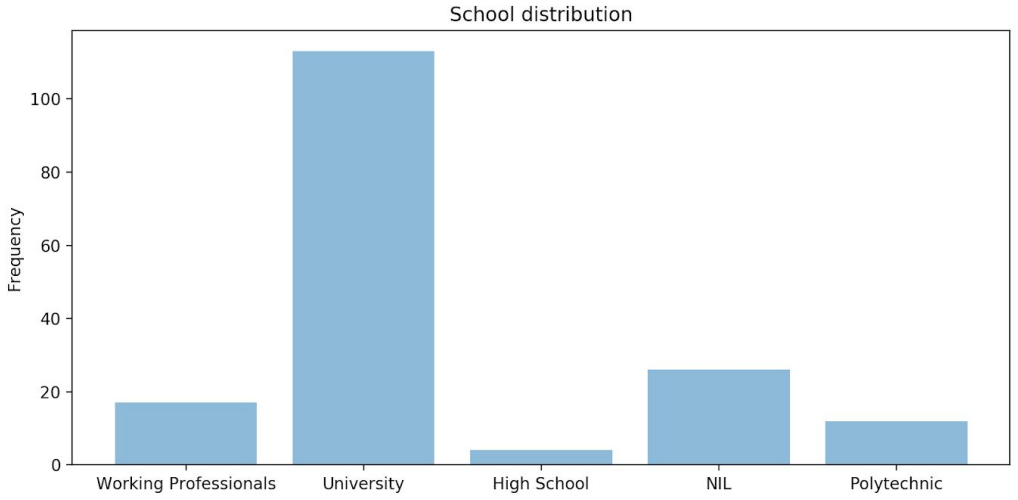
What The Hack 2017 Winners		
Team Name	**Project Description**	**Prize**
EyeVR	A VR headset powered by machine learning that helps the disabled actively control their activities.	Best Software Hack / Best Security Hack
Windshield	A visualization of air currents by using an air curtain to create a positive pressure gradient between the user's nose and the exterior of the design.	Best Environment Hack / Best Hardware Hack
WriteOn	A tool designed to analyse the user's handwriting, via the use of optical character recognition.	Best Educational Hack
Duct Tape Hax	A plasma ion rocket thruster that uses high currents and high pressures to create thrust via the dissociation of argon electrons.	Best Space Hack

Listed below are photos of some submissions accompanied by a short description.

What The Hack 2017 Submissions		
Team Name	**Project Description**	**Product**
SIGNify	SIGNify was built around the art of singing, as a way of interpreting the lyrics to a song via the use of sign language	
EyeVR	A VR headset powered by machine learning that helps the disabled actively control their activities.	
Duct Tape Hax	A plasma ion rocket thruster that uses high currents and high pressures to create thrust via the dissociation of argon electrons.	
Sentinel	A smart bin that classifies waste into different materials for recycling purposes. It then credits the user with money into their EZ-link card.	
Spaces	Spaces is a human-machine interface that makes your smart automation appliances even easier to use. It is a 3D virtual space that allows you to control a real environment equipped with smart automation appliances, be it smart switches, sensors, or even other novel internet-of-things devices.	

PERFORMANCE REVIEW

Aside from the outstanding submissions we received from our participants, we also managed to achieve a total of 173 signups. Compared to our initial projection of 150 participants, we managed to get 23 more than the expected amount. 65% of our total signups came from students currently studying in University (113), which was our primary target audience. What was interesting to note was that we had a high number of working professionals who also decided to take part in this competition. As our hackathon was tailored towards university students, those who signed up as a working professional were allowed to participate but unable to win any of the prizes. In the graph below, we are able to observe the distribution of our participants based on their current position. To facilitate our efforts when analyzing the data, we grouped all participants who are currently serving their National Service as well as participants who failed to indicate their position as NIL. Attached below is the distribution for your perusal. Based on this data, we can see that our current model is popular with University students and for the upcoming hackathon in 2018 we plan to continue working on



raising the percentage of University students signing up to 75 - 80%.

Aside from analyzing the current positions of our participants, we also take to the data to look at the general age of our participants. Understanding our demographic better is one area in which we need to focus on in order to see how we can modify our outreach efforts to be even more effective. If we look at our age distribution, it takes on a normal distribution with mean of **21.564**, and a standard distribution of **4.331** and the graph is currently right-skewed. This is ideal for us as it shows us that we are indeed targeting the right age group, and is indeed something we hope to continue achieving as we plan for What The Hack 2018.

If we were to look at our initial goals that we had set at the start of the hackathon:

- To boost SUTD's presence in the tech / maker scene in Singapore
- Tackle hard and abstract problems which plague today's society
- Have fun and learn while building cool projects
- Providing students across Singapore with the tools to prototype hardware and software solutions

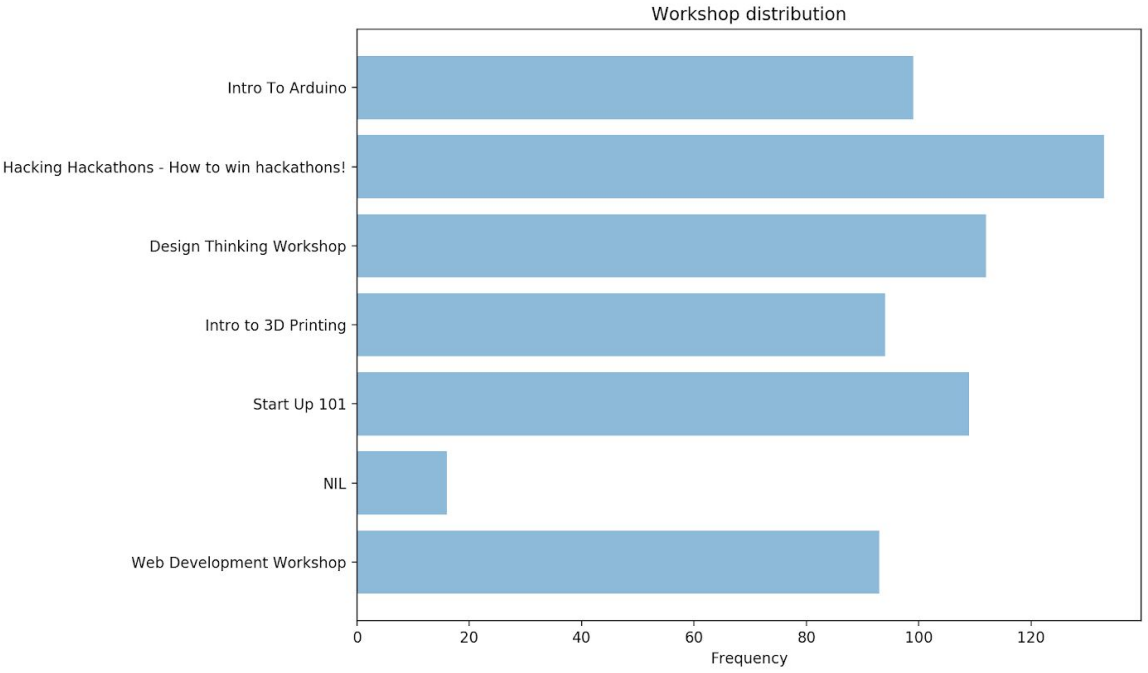
We can gladly say that we have managed to leave a strong imprint on the industry in Singapore. This is observed through us working closely with leaders in the tech industry, such as Accenture and Stripe. For What

The Hack 2018, we have sponsors such as Google, Amazon and AsiaVR who have expressed interest in their being sponsors for What The Hack 2018.

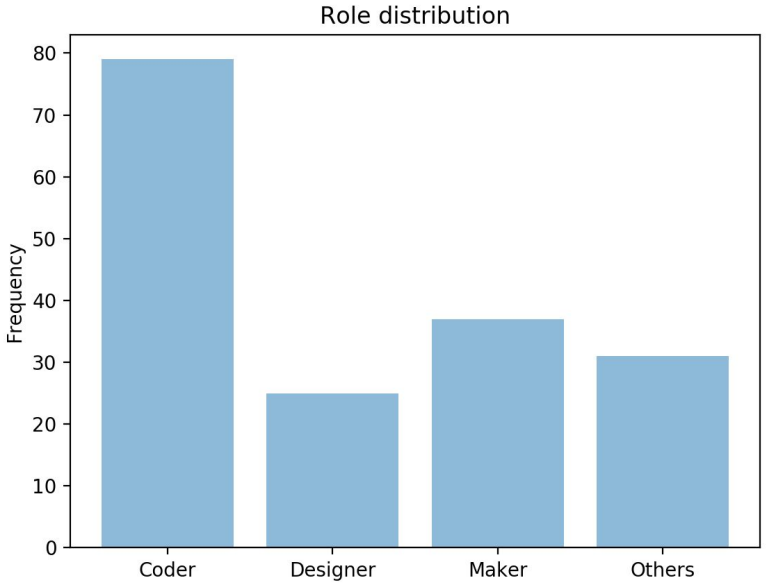
Looking at the projects that the students created throughout the entire event, we are glad to see that the students made full use of the tools provided to them.

At the end of the day, we feel that the team worked well to achieve the goals we set out at the start, and the results are evident from the prototypes that the students built as well as the renewed interest in monolithic tech companies when it comes to sponsorship.

Another area to review would be the workshops that we conducted during the hackathon itself. Hosting the workshops itself was a difficult task as we had to decide and prioritize skills that would be necessary to learn during this event. However, by looking at the data, we can effectively see and understand the popular workshops that stood out to our participants. In What The Hack 2017, we can see that the top 3 workshops were “Hacking Hackathons - How to win hackathons!”, “Design Thinking” and “Start Up 101”. This was not something that we expected as we felt that based on previous hackathons more students would be inclined towards having technical workshops but the technical workshops during What The Hack 2017 were the least popular. Based on the data observed, we can use this information to better plan for the workshops that we will hold during What The Hack 2018. A possible explanation for this phenomenon might be due to the prevalence and popularisation of startups as well as design thinking in today’s context. Keeping this information in mind, the team will plan to look at a broad range of topics which are new and interesting and consider implementing them in What The Hack 2018.



Lastly, one important metric to consider was the amount of people that signed up as designers, coders and makers, which could help facilitate the direction that we want to move towards for What The Hack 2018. While most of our sign ups were coders, we had a number of makers and designers as well (Others in this instance applies to people who have no interest in any role). While we are happy with the general distribution, as we want to perpetuate the idea that hackathons are not solely software based, but can be hardware based as well, we would like to focus on improving the number of makers that attend What The Hack 2018. A possible way to entice them would be to have greater emphasis on the prizes for the best hardware hack as well.



Conclusion

What the Hack 2017 has shown to produce quite a large variance and high quality in terms of the solutions created. We can see that when we allowed participants to pick and choose how they wished to interpret the problems, they could create really interesting ideas that can be used in other fields.

As we bring What The Hack 2017 to a close, the team is extremely happy with the way the hackathon turned out, as well as how the sponsors worked so well with the team, we look forward to What The Hack 2018 and to a better, much more impactful and productive hackathon for the participants. Managing a nation-wide hackathon for the first time with a team of students was indeed a daunting task, but to be able to constantly promote innovation and initiative is definitely one of the goals that the team at What The Hack strives for.

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