Makeathon Competition

2019 Event Assessment

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Marketing and Analytics Committee

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Foreword

The Marketing and Analytics Committee (MAC) was created to centralize and standardize data collection about SEC events in order to ensure the fulfillment of SEC's mission. By compiling both quantitative and qualitative information about specific events and comparing this with past iterations of the event, we seek to provide useful context and advice to improve events in the future. Additionally, these reports can be used as a means to more effectively target future attendees of our events and ensure we are maximizing our impact on the Cockrell student body.

MAC's process is designed to be intimately connected with the planning and implementation of the event in order to ensure our analytics has proper context. We engage in 3-4 planning meetings before the event and attended the event to collect feedback and field notes from all parties involved. A post-event audit meeting is conducted with the primary MALs to identify areas for improvement.

Summary of Data Sources for this Event

This report was compiled from several data streams:

- A sign-in form collected general information and demographics about attendees.
- An MAL audit form was also used to gather qualitative feedback on operations.
- Day-of interviews taken from attendees throughout the event

Quantitative information from our surveys was analyzed through our database for processing and to identify trends among the data. Our advice is also informed by feedback compiled from past and current event audits, notes about the event planning process taken during committee meetings, and day-of field notes (here and here).

Overview

Summary of Event

Makeathon is an annual competition hosted by the Student Engineering Council. Participants form small teams (generally 3-5 members) and collaborate to build a prototype product to satisfy a given prompt. Teams are given a limited set of supplies and have access to the Texas Inventionworks (formerly Longhorn MakerStudios) equipment to build their product. Teams are also supported in their work by a number of student volunteers as well as Texas Inventionworks staff.

The 2019 Makeathon involved a kickoff on November 15th, 2019 from 5:30 PM to 7:30 PM in Mulva Auditorium, and the competition on November 16th, 2019 from 8 AM to 9 PM. An additional time window of 30-45 minutes was necessary for the Engineering Activities (EA) committee and volunteers to set up and tear down event materials, presentations, etc. The event was hosted in the Engineering Education and Research building (EER), primarily in Texas Inventionworks and the Mulva Auditorium. A sign-up cap of 75 was set and achieved. 104 total were recorded, with the first 75 being allowed to compete and the remaining 29 being placed on a waitlist. Of these 75, 67 showed up on the day of the Makeathon and competed in 14 teams.

Relevant Parties

This year's Makeathon event was planned and run by the EA committee led by directors Sam LeBus and Scott Brinen. Among the EA Members-At-Large (MALs) involved in planning Makeathon were Aashay Patel, George Marshall, Jacob Stokes, Kayla Wrobbel, Mark Infante, Meghan Lu, Mohit Gupta, Padmashree Pandy, Pooja Trivedi, Reva Vaidya, Sanjana Srinath, Tabitha Tran, and Tyler Kapadia.

Additional financial and organizational support for this event was provided by Chevron and the Engineering Student Life office, represented by Susan Higginbotham. Chevron's participation in the event led to the development of the safety-themed prompt. The continued success of Makeathon and other events led by EA will likely depend on the level of engagement EA keeps with these organizations.

Key Contacts

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Key Findings

MAC has identified the following areas for growth when planning Makeathon 2020:

1. **Planning**
    - **a.** Prompt
        - **i.** The prompt this year was found to be repetitive and vague. MAC suggests earlier communication with Chevron to ensure a more unique & well-defined prompt for the upcoming year.
        - ii. Drafting a prompt is difficult and can never satisfy all parties. Referring to former directors/MALs who worked on Makeathon or other case competition events in the past could be valuable perspectives to listen to.
    - b. Subcommittees
        - i. MAC suggests combining the Workshops and Relations subcommittees since both dealt with overlapping "pre-event" details that could be more efficiently addressed in a cohesive group.
    - **c.** Workshops
        - **i.** Include the fact that there are workshops & skill sessions into the marketing for Makeathon. Coordinate with Texas Inventionworks to offer multiple training sessions for those that can't make one or the other.
    - d. Outreach
        - i. Hold EA MALs more accountable in lecture and organization circuiting in order to bring in more diverse groups. MAC suggests creating a minimum required amount of presentation/publicity circuits per MAL. Investigate new ways to get team to sign up earlier in the application process to avoid last minute coordination.
    - e. Resources
        - i. MAC suggests that once the prompt is finalized, the Supplies committee should brainstorm possible solutions in order to choose supplies that better suit the needs of the participants.

2. **Operations**
    - a. EA should both find new ways to ensure participants follow through with their commitment to participate and to coordinate event hiccups in the case of no-shows more efficiently.
    - b. The supplies committee should implement a way to ensure supplies are not taken home after the event by requiring participants to turn in some token, such as their UT ID.

3. **Financials**
    a. The amount spent on Makeathon this year was much closer to the allocated budget ($4,856.05/$5,000.00) compared to the previous year ($3,836.74/$5,000). Most of the increase of the amount spent was due to increased spending on supplies and food, although there was also less spent on prize money.
    b. MAC suggests a similar budget utilization and spending category breakdown for future years, with a continued focus on purchasing more relevant and useful supplies.

4. **Marketing**
    a. Focus marketing efforts on the underclassmen; no extra efforts needed specifically for upperclassmen. Any upperclassmen that sign up would be through affiliate marketing.
    b. There is no stronger feeling of commitment than an authentic, verbal pitch from an upperclassmen vouching for the creativity and opportunity of an event such as makethton to underclassmen.
    c. Marketing efforts should definitely concentrate on attending organization meetings such as ASME, IEE, etc. These groups have the highest concentration of underclassmen mechanical and electrical engineers.

5. **Impact**
    a. Engagement
        i. Engagement in Makeathon during the event continued to be high this year. The new 2-day format was successful, as many of the participants felt it was useful to have a day to get oriented & could show up to the main day feeling more informed and prepared.
        ii. This was the second year EA ran mini challenges throughout the event for Supply Store points, and they continued to be a success.
        iii. The returnable deposit system decreased the amount of teams that did not follow through with their commitment, and MAC suggests keeping this system in place for the following year.
    b. Satisfaction
        i. On average, participants were satisfied with the event. Based on day-of interview questions, there were only 2 consistent themes for improvement.

1. One of the issues that was commonly voiced by participants was the broadness & repetitiveness of the prompt. MAC suggests choosing a prompt that feels differently from previous years, and narrowing the scope while providing more examples. It may also be wise to begin brainstorming ideas for the prompt earlier than usual.
2. The second improvement that could be made for the following year is a continued focus on the choice of supplies. EA focused on cutting down on “fluffy” supplies and providing more useful supplies (many of which were electronic), and this focus should carry into the next Makeathon.

Planning	Operations	Financials	Marketing	Impact

Planning Outcomes

Prompt

The prompt for the 2019 Makeathon was as follows:

"Design a product or solution that will improve overall personal safety. The device must be non-violent. The product may enhance workplace safety, transportation safety, recreational safety, or a category of your choosing. Your product or solution must be a working prototype."

The theme of safety was chosen due to the event's association with Chevron. EA MALs and competitors expressed dissatisfaction with this prompt. MALs marked the prompt as being too similar to the Makeathon theme of workplace security. They remarked that this repetitiveness may contribute to less competitors returning to the participant in future Makeathons. This is supported by multiple teams who had participated previously commenting on being dissatisfied with the similarity to 2018's prompt. Competitors had mixed, but primarily negative reactions to the broadness of the prompt. Though it provided a large degree of freedom, some competitors would have liked a more clear, specific problem to solve. For comparison to a more specific Makeathon prompt, the 2017 prompt was to '*create an assisted device that makes a task easier for an elderly person such as cooking or changing clothes.*' Additionally, competitors without outside knowledge of coding and circuitry concepts found the prompt to put them at a disadvantage to their fellow competitors.

Though it was indicated early to the EA MALs that the prompt would likely pertain to safety, the final details of the prompt were not communicated to MALs until fairly late into the event planning process. Planning with this uncertainty led to vagueness in communication with external partners such as judges, speakers, and student organizations. Additionally, the Resources sub-committee remarked that they were unable to anticipate the high demand for certain supplies , such as sensors, due to their lack of knowledge of the prompt. Given more time with the final prompt, they may have been able to better predict what components that competitors would need to address the prompt and prepare accordingly.

Future suggestions:

- Prompt brainstorming should take place as early in the planning process as possible so that EA MALs can have this knowledge in mind throughout the planning process. We believe that this will allow for more clear communication with external partners.

Additionally, this will allow the Resources sub-committee more time to brainstorm potential solutions so that competitors are not limited in the scope of their problems by a lack of supplies.

- MAC suggests that the EA deviate from the traditional safety themed prompt for future iterations of the Makeathon. In previous years, the theme of safety was guided by input from a Chevron representative, but the Chevron representative for this year played a less active role in guiding the prompt. As such, we believe that choosing a more original prompt may promote more retention of participants for future Makeathon's.
- Look into prompts that allow students outside of Mechanical and Electrical Engineering, who take up roughly 66% of the participant pool, to excel in the competition. This distribution begs the question of whether ME and EE majors are participating disproportionately because they are the audience we have been marketing to, or if our prompts aren't inclusive enough to allow students of other disciplines to be reasonably confident that they can succeed.

Sub-committees

The EA directors split the EA MALs into subcommittees at the start of the planning process. These sub-committees were Operations, Outreach, Resources, and Workshops. Due to the complexity of planning a multi-day event, splitting into subcommittees helped prevent MALs from becoming overwhelmed by the large scale of the event. It also allowed them to concentrate their efforts into a specific component of the event. However, different sub-committees had significantly larger work loads during different times in the event planning process (ex. Outreach and Relations' work was frontloaded while Operations workload picked up closer to the event). Additionally, dividing into subcommittees began slightly cluttered closer to the event as details on the boundaries between subcommittees slipped through the cracks, leading to tasks such as the assigning of points and volunteer/judge coordination being dealt with at the last minute. However, thanks to the large number of EA MALs tasked to the event and their competency, these last minute tasks were dealt with promptly and effectively. Additionally, EA MALs remarked that, though working with the sub-committee system offered them complete knowledge over their sub-committee, they had limited knowledge of the details relating to other subcommittees that were not shared openly in planning meetings. This led to a lack of cohesiveness during the event, as when an EA MALwas asked a question outside the scope of their sub-committee, they had to spend time referring competitors to another MAL rather than being able to quickly answer themselves.

Future Suggestions:

- EA MALs commented that they would have liked the Workshops and Relations subcommittees to be combined, as they both dealt with many of the “pre-event” details such as acquiring external partnerships and organizing skills sessions. This would likely prevent details on the periphery of both committees from being overlooked.

Workshops

The Workshops committee ambitiously implemented workshops hosted by partner student organizations in addition to skills sessions held in the Texas Inventionworks for highly demanded skills, such as laser cutting. Attendance at these workshops enabled competitors to not only create more advanced products for the competition itself, but to leave Makeathon with technical skills such as CAD modeling (taught by ESW and UAV Austin) and practical arduino implementation (IEEE). Aaron Parker, who hosted the Solidworks training and was present onsite to help contestants with 3D modeling during the event, left the experience with glowingly positive reviews. Parker described it as fulfilling and enjoyable while remarking that he would gladly do it again given the opportunity. One caveat, however, is that the provided workshops and skill sessions could have had a larger focus in the advertising. Those in attendance found them an excellent learning experience, but the bulk of competitors did not attend the sessions. This was either because space had completely filled up in the sessions, or that they just didn’t place a priority on them. As a side note, partner organizations ESW and IEEE had little presence on the day of the event.

Future Suggestions:

- Due to the positive response from competitors and partners, we recommend integrating workshops/skill sessions into marketing. A potential model for this is a Makeathon weeklong graphic that shows the schedule of workshops/skill sessions, similar to those employed by Cockrell School Cares to advertise multiple events at once.
- EA MALs in Workshops noted that laser cutting was a skill that competitors were particularly interested in. However, laser cutting training spots were limited, so we suggest emphasizing to competitors that these spots fill up quickly, or if possible to arrange private sessions with Texas Inventionworks for the large amounts of competitors interested in learning this skill.
- Encourage partner organizations to contribute to the event on the day to make the Makeathon a more diverse event. Potentially look into adding more partner organizations if we want Makeathon to be a community event that unites all disciplines in Cockrell.

Outreach

Through methods such as tabling, flyer distribution, and lecture circuiting, the Outreach sub-committee was able to exceed last year's attendance of ~50 attendees, achieving 104 sign-ups (roughly 40% more than their goal) and 67 day-of competitors. However, the demographics of the 2018 and 2019 Makeathon remained nearly the same, with Mechanical and Electrical Engineering students taking up roughly 66% of the competition field. Outreach should consider new publicity methods to reach engineering majors typically not reached by Makeathon. One method of doing so is by lecture circuiting more majors' introductory courses as well as large major-specific student organizations from disciplines that aren't as represented traditionally in Makeathon. MALs in the Outreach sub-committee commented that though they promoted other EA MALs to circuit, very few did.

Future Suggestions:

- If EA wants to increase the reach of Makeathon into more diverse groups, EA MALs need to be held more accountable to participate in lecture and organization circuiting. One potential incentive is providing a committee social contingent on every member participating in circuiting, so as to promote MALs to hold each other accountable to receive the incentive.
- In the future, Outreach should emphasize the participation cap for the event and it was easily exceeded this year. This may incentivize teams to sign up earlier instead of later.

Resources

Resources did well in getting the materials necessary for most teams to build their products. Some teams commented that an increased variety of sensors would've allowed them to build a better solution, though the reason these materials weren't available was likely due to the Resources sub-committee knowing the prompt fairly late in planning. The point system generally seemed fair. Although some teams began to find their remaining points for supplies limited near the end of the event, this prompted them to participate in the planned challenges as intended. Additional unplanned challenges were implemented for points so as not to stifle the creativity of the competitors. This year, more resources were invested into practical supplies rather than decorative supplies, avoiding a mistake that previous iterations of the Makeathon made.

Future Suggestions:

- Once knowledge of the prompt is finalized, those in charge of acquiring resources should brainstorm potential solutions so that they understand what components that teams will likely want access to.

- It may be useful to gather different ideas and solutions from students with different engineering backgrounds, in order to provide an unbiased, fair resource bank for all students' expertise.

Operational Outcomes

Overall the event was smooth and went as planned (prompt, t-shirts, etc.). There were a couple of hiccups throughout the day and leading up to the event which were solved, but can definitely be avoided in future iterations of the event.

One of the most beneficial changes to Makeathon this year was the implementation of a deposit system. This meant all teams registered to attend were required to put down a refundable deposit that they would only receive back if they attended the event. This was the first year this system was in place, and it worked well. There were about 75 people registered for the event, and 67 people showed up (90% conversion rate).

One of the biggest issues was the absence of the registered orgs slated to help out EA MALs. Because of this, the MALs on the event had to redistribute and add on responsibilities on the fly (i.e. Jacob Stokes had to spend 2 hours helping out a team).

Another issue was that several teams showed up in the last 10 minutes purely to use their points and grab supplies to take home. Next year, there needs to be strict monitoring of who is taking what. For example, one team took home an exacto knife kit which definitely puts a dent in the event budget and comes back to hurt SEC the most.

Lastly, something that was out of MAL's hand was the late delivery of Cabo Bob's lunch. There is not much that could have been done here other than the fact of double and triple checking with the point of contact to ensure guaranteed delivery time. Regardless, we applaud EA's adaptable management of the event, even under these less than ideal conditions.

Future Suggestions:

- Keep the refundable deposit system in place
- Just in case people don't show up, have back-up responsibilities for the MALs to cover up slack so it's not chaotic last minute.
- Monitor the supplies with a "library card" method (UT id-card to turn in while the supplies are checked out) to ensure that no one takes equipment home

Financial Outcomes

Budget Breakdown

At the highest level, the 2019 Makeathon Committee organized this year's event with a baseline allocated budget of $5,000. In previous years, funding for Makeathon has often come from a combination of support between Chevron (or other corporate sponsors), the Engineering Student Life office, and the Student Engineering Council budget. The financial support of the Chevron corporation has continued to grow in the past few years, to the point where all $5000 available came from Chevron. Of the $5000 budget, EA spent a total of $4756.05 (95.1%) with $243.95 (4.9%) left unused. This is ~58% more than the amount spent for the 2018 Makeathon, which used $3836.74 of the available $5000 budget (76.7%). The year prior (2017 Makeathon), $3015.89 was spent on an allocated $4000 budget (75.4%).

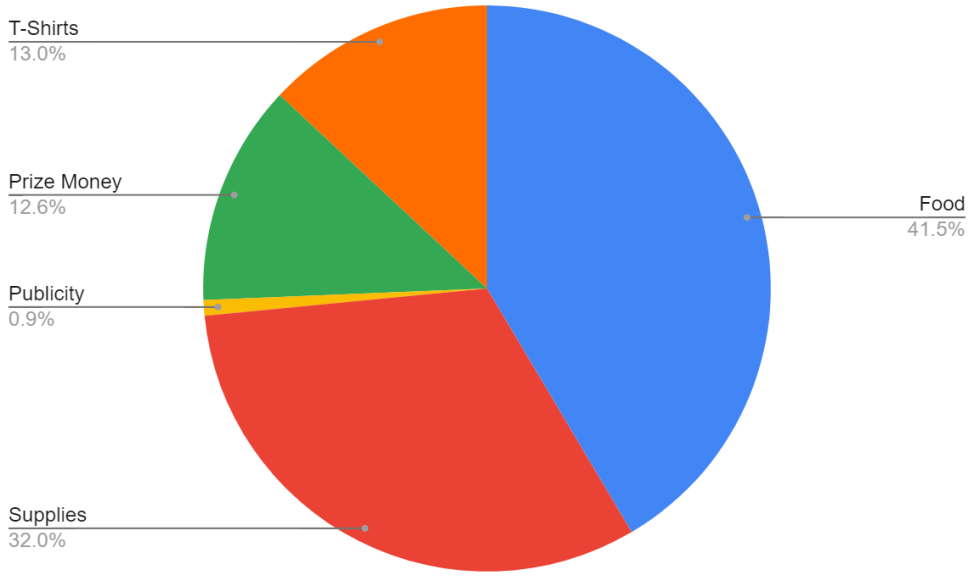

Figure 1: 2019 Makeathon Budget

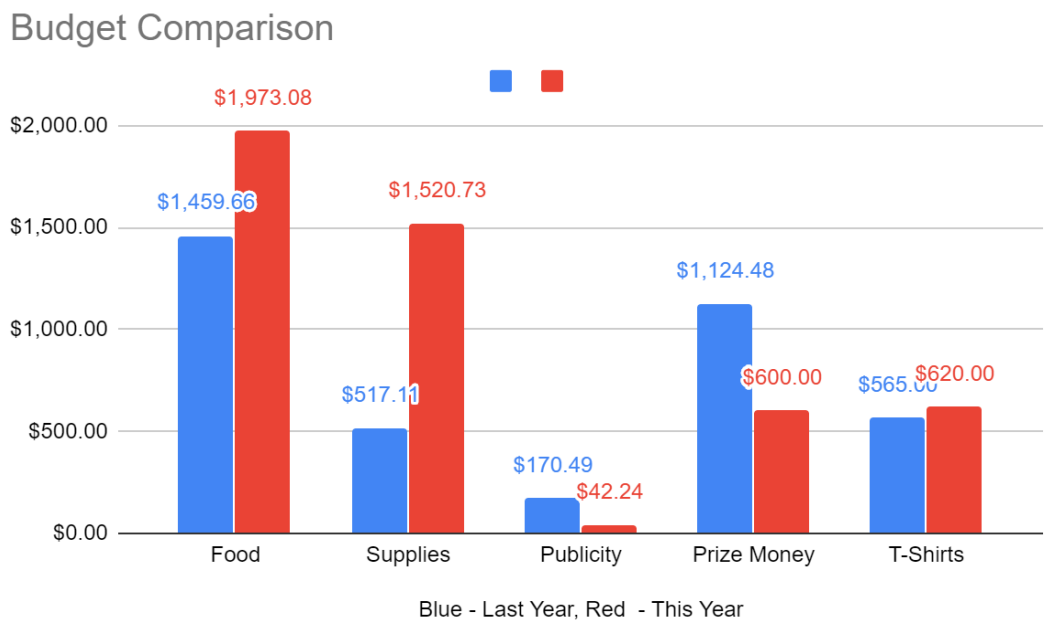

Figure 2: 2018 & 2019 Comparison

Food

Of the total spent money ($4756.05), 41.5% of the budget went to food. This category was the largest overall, corresponding with last year's spending as well. This expenditure includes catering from Domino's for the event kickoff, breakfast supplies from Sam's Club for breakfast, catering from Cabo Bob's for lunch, catering from Potbelly for dinner, and various snacks from Sam's Club.

Last year it was noted that there was a lack of snacks throughout the event, however this year's committee did a great job of balancing the budget to purchase enough food and snacks for the participants throughout the day.

This year, spending on food was slightly increased, but not without reason. The overall number of participants increased in comparison to last year. The inclusion of a kickoff portion of the event, where dinner was provided also contributed to the food budget. Outside of this, spending on food was relatively similar to last year.

Supplies

The second largest category of the budget was on Supplies. This was the second year that EA incorporated electronics into the event. In the 2018 Makeathon, many of the electronics purchased did not end up working together and required additional wiring and pieces to function completely. This year, the committee ensured that they were buying all necessary components for the electronic supplies to work together, such as basic sensors, wiring, and circuitry. For this reason, spending on supplies was higher than in previous years. The total spent was $1,520.73, compared to last year's $517.11. From the feedback received from participants, this increase was worth it as participants were more satisfied with the electronics available this year. This was made possible by decreasing spending on less complex, more cosmetic supplies, such as pom-poms, popsicle sticks, or even lumber.

Other

The remainder of the Makeathon budget was spent on T-Shirts (13.0%), Prize Money (12.6%), and Publicity (0.9%).

The amount spent on t-shirts ($620) was relatively similar to last year ($565). There was some feedback that it would have been nice to have more t-shirts, as some sizes ran out prematurely. If there is room in the budget, spending on t-shirts should be increased or at least better optimized next year. Tying t-shirt orders to the event sign-up Google Forms can further control spending on t-shirts by ensuring only as many t-shirts as are needed for every participant are printed.

This amount spent on prize money ($600) has been reduced from the prior year ($1000). One of the main reasons for reducing the amount of money allocated for prize money was to allow more money to be spent on food and supplies, which worked out well.

The amount spent on publicity this year ($42.24) was reduced from the prior year ($170.49). This was mainly due to the decision to not print stickers this year, which cost $107.51 in 2018.

Marketing and Social Media Effectiveness

Makeathon Poster by the Publicity Committee

Campaign Success

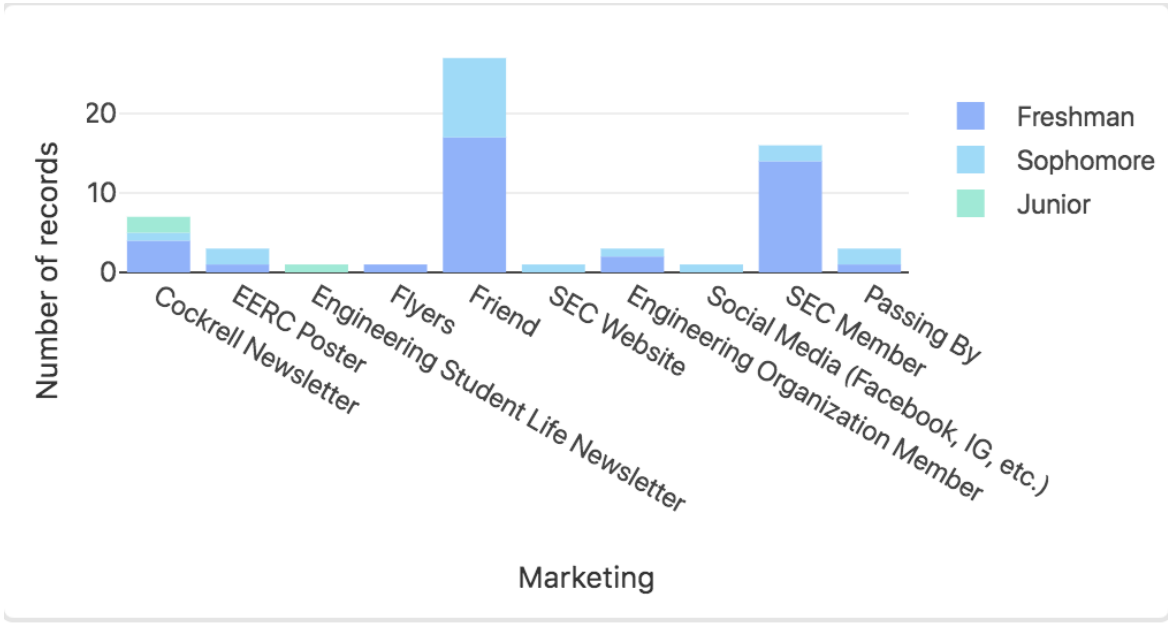

Figure 3: Campaign Types

Demographic Distributions

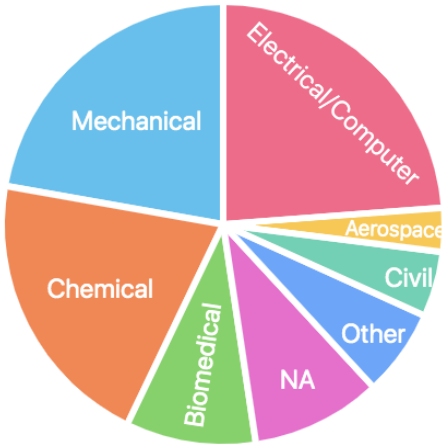

Figure 4: Major Distribution

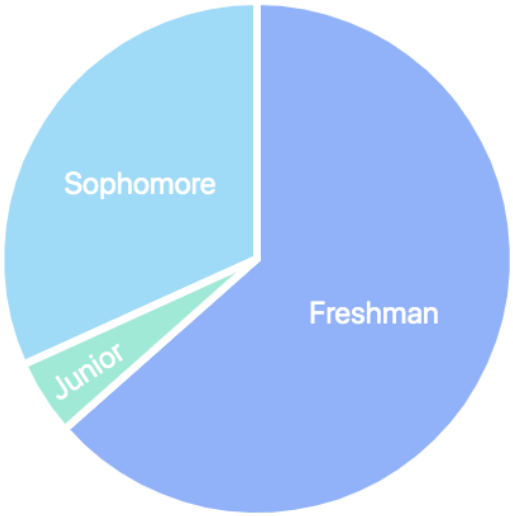

Figure 5: Year Distribution

After taking an in-depth look at the numbers in the Airtable (summarized in F*igure 3, 4, and 5* above), there are three main takeaways that must be noted. These takeaways are essentially an analysis produced from the combination of the publicity audit, the Airtable block chart from this year's attendee list, and a comparison to Fall 18 Makeathon.

The first takeaway is that marketing for an event as large as Makeathon is very cumbersome and must be done effectively. It has become clear from the data in the last couple of years that the majority of attendees that complete the entire event cycle (registration, onboarding, and participation) are majority underclassmen (first-years and sophomores). Just in comparison from Fall 18 makeathon, we can see that the few senior and graduate students dropped off to 0 this year, meaning they are truly not interested. The cause for this appears straightforward: by a college student's 3rd and 4th year, they have found their niche and only participate in events associated with their organization affiliations rather than exploring other events. In contrast, underclassmen are more curious and receptive to outreach about learning more and exploring different events, such as Makeathon. We strongly recommend EA focus marketing efforts on the underclassmen next year; no extra efforts are needed specifically for upperclassmen. Any upperclassmen that sign up would be through affiliate marketing.

The second takeaway is a consistent trend in marketing campaign types. It is clear that "online advertising" and "poster boards" publicity efforts are not as effective as they are gauged to be. The top two forms of publicity by a huge margin in numbers is the "word of mouth" advertising from friends and SEC members. This shows that it is more important for the members of the Makeathon committee and the associated publicity MALs to focus on physically going out to organizations with strong concentration of freshmen such as FIGS or first year networking events and vouch for the event. From a qualitative perspective, there is no stronger feeling of commitment than an authentic, verbal pitch from an upperclassmen vouching for the creativity and opportunity of an event to underclassmen. FIGs were utilized this year, and they should continue to be heavily utilized next year.

The final takeaway that comes from assessing this year's data with previous years is the fact that this event is definitely skewed towards Mechanical and Electrical engineers as the concept of the event itself highlights the forte of those two majors. The hands on design and structural nature of makeathon's prompt is clearly attractive for the above two majors listed. This

point is accentuated by the fact that the overall percentage of mechanical and electrical engineering majors increased 7%. This would be the third year in a row where there is an increased domination from these engineering disciplines. This is further justified from the second takeaway above: that word of mouth advertising is the strongest form of marketing. As more mechanical engineers find about the event, they will tell their friends in their classes/major to join teams, etc. Marketing efforts should definitely concentrate on attending organization meetings such as ASME, IEE, etc. These groups have the highest concentration of those two majors and the underclassmen.

Future Suggestions

- Write the event description (name, date, time) on whiteboards of large EERC, CPE, ETC, and RLM classrooms. Just having that on the top corner where it's not a distraction is a great form of publicity as people bother to read and get curious as to why they're seeing it everywhere. Definitely requires a lot of manual labor but worth it as you are directly marketing to every engineering student attending class.
- This was an initiative that was suggested from the previous Makeathon, that was implemented successfully and should continue to be leveraged for upcoming years. Continue to increase direct advertisement of the event to underclassman groups like FIGS and intro classes. It is vital that members of the Makeathon committee are actually going out to the FIGS and first year programs and advertising. Freshmen are the most excited about these opportunities and will be incentivized if they see upperclassmen vouching for an event. Power of face to face advertising.
- Email subscriptions to larger organizations such as ASME which can forward Makeathon information to all their members.

Impact

Engagement

Just like last year, EA MALs and MAC MALs observed a high level of engagement from participants in the competition. Maintaining the periodic challenges for extra points seemed to heighten engagement, as it did in 2018. Engagement was also likely increased by the new deposit system and the new two-day format.

Participants were largely satisfied with these bonus activities, reporting an average score of 4.350 out of 5 for bonus enjoyability (Figure 6). The participants also tended to think that the bonuses were of appropriate difficulty, giving a rating of 4.05 out of 5 (Figure 6).
Regarding the two-day format, participants generally liked the change, giving it a score of 4 out of 5 (Figure 6). According to their audits, EA MALs also remarked that having a kick-off event on an earlier day made the day of the competition go more smoothly by offloading some of the work and planning.

Satisfaction

The participants tended to be satisfied with the event overall, as one can see in Figure 6 below. The data in this figure was sourced by MAC MALs during the competition from ten different Makeathon teams. While the teams were overall satisfied, two consistent issues came up during interviews: supplies and the prompt.

While some teams liked the prompt, many voiced the concern that the prompt was too broad. A few teams that had participated last year felt that the prompt was essentially the same as last year. Regarding the supply shop, there were several issues teams raised. Some teams were unaware of the scarcity of some of the supplies, and wished they had an inventory that included the number of each part available as well or had the opportunity to walk through the supply shop during kick-off. On the topic of the inventory, a team felt that it would be easier to use if it was split into sections such as “fasteners”, “electronics”, etc. There were also some supplies teams thought they would have access to, but were not there on the day-of, so for next year we should make sure we have an accurate inventory of supplies.

Lastly, many teams raised issues concerning the electronics available as supplies. For the electronics we supply, data sheets (or at least part numbers) should be available so that teams can figure out how to interface with the electrical equipment properly. We should also think about

buying more Arduinos, as there was a team that wanted to be able to use one, but all the Arduinos were already taken. Teams also wished they had more sophisticated electronics such as sensors and motors available.

Question	Mean Score out of 5	Score Standard Deviation
Did you like the prompt?	3.575	0.817
How well planned was the event?	4.15	0.944
How was the supply shop?	2.9	0.994
Were the rules reasonable?	5	0
Were the bonuses enjoyable?	4.35	0.58
Were the bonuses of appropriate difficulty?	4.05	0.956
Did you like the two day format?	4	1.247

Figure 6: Day-Of Interview Questions and Results

Conclusion

MAC recommends that future iterations of the Makeathon focus on defining the prompt as early in the planning process as possible to allow for EA MALs to plan the event with this prompt in mind. We also recommend deviating from the traditional safety themed prompt, as the repetitiveness of the prompt may dissuade people from participating in the event from year to year. We believe that the workshops and skill sessions should be better integrated into marketing due to the positive volunteer and participant feedback. Lastly, EA should consider expanding the amount of participants they plan to accommodate due to overshooting their sign-up goal this year. If they choose to keep the cap similar, then the waitlist system should be better outlined to participants to prevent people who sign-up last minute from losing out on the opportunity to compete in the Makeathon.

From a planning and operational standpoint, MAC would recommend seeking a more specific prompt, in particular one that dials in on a more specific problem indicated by this year's prompt. It might also be of use for the committee to attempt to 'solve' the prompt in order to come up with issues or points of confusion that participants might have during Makeathon. Of course, as many participants noted, providing more electronic supplies would almost certainly improve the competition experience. Attempting to reuse many of the Arduinos and sensors in multiple years would also ensure that this does not become too burdensome of an investment in the long term.

With regards to the marketing of the event, MAC recommends a continuation of effort invested toward in-person presentations at Freshman Interest Groups and large engineering student organizations. This seems to be a proven method and will continue reaching younger students at a higher rate than social media efforts. Moreover, MAC recommends exploring the use of boosted content on social media channels like Facebook or other marketing techniques, excluding stickers or a poster. Current marketing expense is essentially zero, so a small increase in investment might be helpful to prove whether boosted content greatly supports SEC's effectiveness. It should also be stressed that the marketing avenues used for Makeathon 2019 should all include sufficient description for participants to understand what Makeathon actually is.

With regards to impact, we believe that this event was successful. A disproportionately large amount of students were underclassmen, and to the end of introducing students to on-campus resources and facilitating engagements between strangers, this was the intended

audience. This truly is an event that all types of engineers can participate in and gain a meaningful experience.

Finally, it should be stated that all of these recommendations are given with the expectation of similar or greater availability of financial and/or volunteering resources as compared to the 2019 Makeathon.

Suggested Future Targets

- Increase attendance rate of 67 people out of 75 sign-ups to 72+/75
- Continue presenting Makeathon to Freshman Interest Group and/or Engineering Student Organization meetings as they appear to be a target demographic for this event
- Boost second-year attendance in addition to first-year attendance, aiming for a combined total of 75% of the total attendee distribution
- Improve prompt satisfaction rating to at least a ⅘ from this year's rating of 3.575 (Figure 6)