DIG DEASON INNOVATION GYM

DIG IDC

Immersive Design Challenge

Project Report • January 2017

SMU LYLE SCHOOL OF ENGINEERING

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Flat-Packed Digitally Fabricated Solar-Powered Charging Station Immersive Design Challenge
January 2017

In January 2017, the Deason Innovation Gym hosted a week-long Immersive Design Challenge. Immersive Design Challenges (IDCs) provide opportunities for students to apply classroom learning a unique way, providing a direct connection to real, relevant issues. The DIG recruits corporate or nonprofit partners to aid students in their tasks and provide inspiration regarding the impact of their work. Students are encouraged to apply for this opportunity, regardless of their official major or area of interest. The interdisciplinary team of students and partners is another special aspect of the IDC, and students often cite IDCs as one of the highlights of their time at SMU.

For this IDC, we partnered with both a corporate and a nonprofit organization, Good Faith Energy and Better Block Foundation, respectively. Good Faith Energy, a company "inspired by climate action and social impact", designs solar power systems for residential and commercial applications. The Good Faith Energy team encouraged the students to consider access to sunlight, average energy consumption, and increased energy usage awareness when designing their charging station, and provided them with resources to further our training on solar power. Better Block Foundation empowers communities and their leaders to reshape and reactivate built environments to promote the growth of healthy and vibrant neighborhoods. They urged the students to think about what happens when we design urban spaces without thinking about the people residing in those urban spaces. This question became a motivating factor in the human-centered design research carried out by the students.

The deliverable posed by the partners was to create a design utilizing a solar component that would be published on Wikiblock, a website curating accessible, open-source public furniture designs to help improve urban spaces. This team of 20 SMU students produced technical schematics, a working prototype, a proposed budget for full scale fabrication, a marketing strategy, and plans for implementation. The team accomplished this by splitting into Solar, Form Factor, and Human Factor teams. Impressed with their prototype, Better Block is currently working on getting the design up on Wikiblock for anyone to use.

Design Principles

The design research the students conducted and synthesized into design principles were vital to our process. This part of the human centered design process ensures that the solutions we create meet the needs of the users we are designing for and the unique context they are in.

1

People seem to be unaware of how much subconscious work they put into their phone "charging schedules".

Through ease of implementation and accessibility, what if we can create something that removes this underlying assumption, helping people spend their energies elsewhere?

2

The design should use minimal hardware and require little to no expertise to assemble.

In order for a design to be worthy of posting on Wikiblock, the assembly instructions should be comprehensive, straightforward, and preferably not language specific.

3

Our design should be adaptable to a variety of use cases.

The designs on Wikiblock don't necessarily adhere to one specific type of use case, so why should ours? The more adaptable we can make our design, the more value it has to the spaces it inhabits. This question of adaptability should be tackled by making our design as modular and customizable as possible.

4

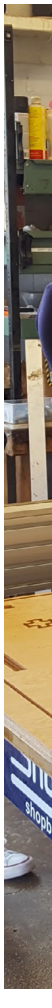
The design should enhance the spaces it inhabits.

In order to stay consistent with Better Block's mission, we should make sure that the design is as organic as possible The less corporate and obtrusive looking, the better. We want the design aesthetic to look appealing and inviting.

5

Charging a phone by itself may not be enough motivation for people to use our creation.

What extra functionality, whether it be social, practical, or entertaining, can we add to this charging station to encourage usage? As inspiration from Good Faith Energy, we can empower our user with solar usage statistics, transforming a simple charging station into an educational tool as well.

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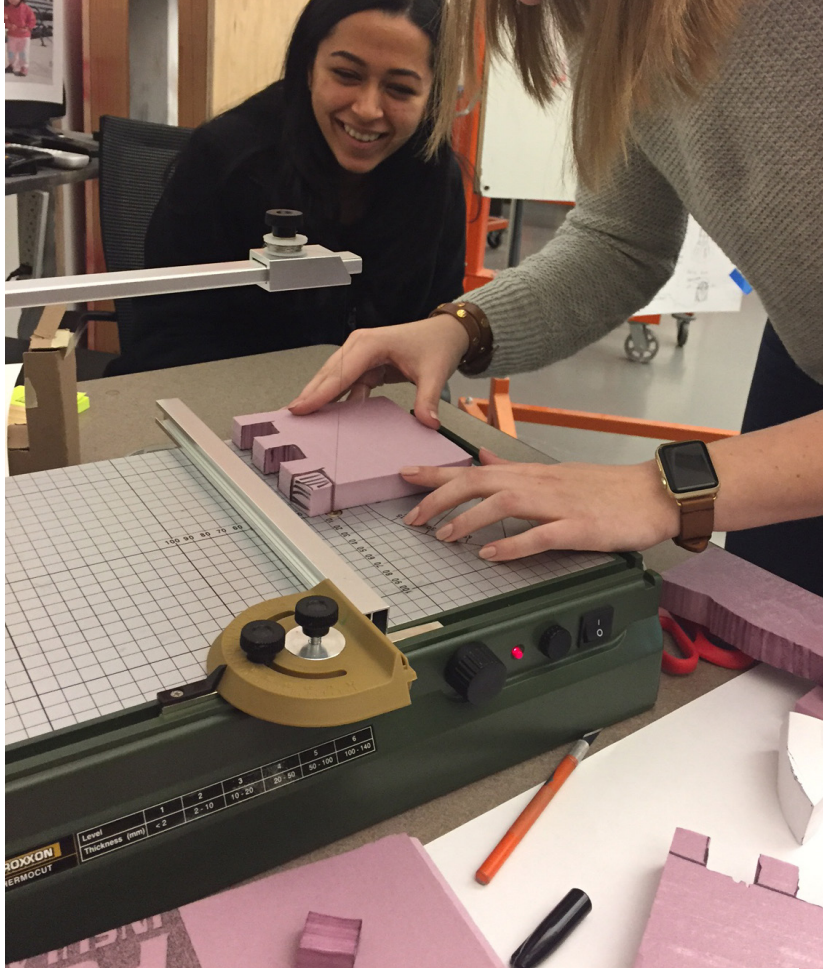


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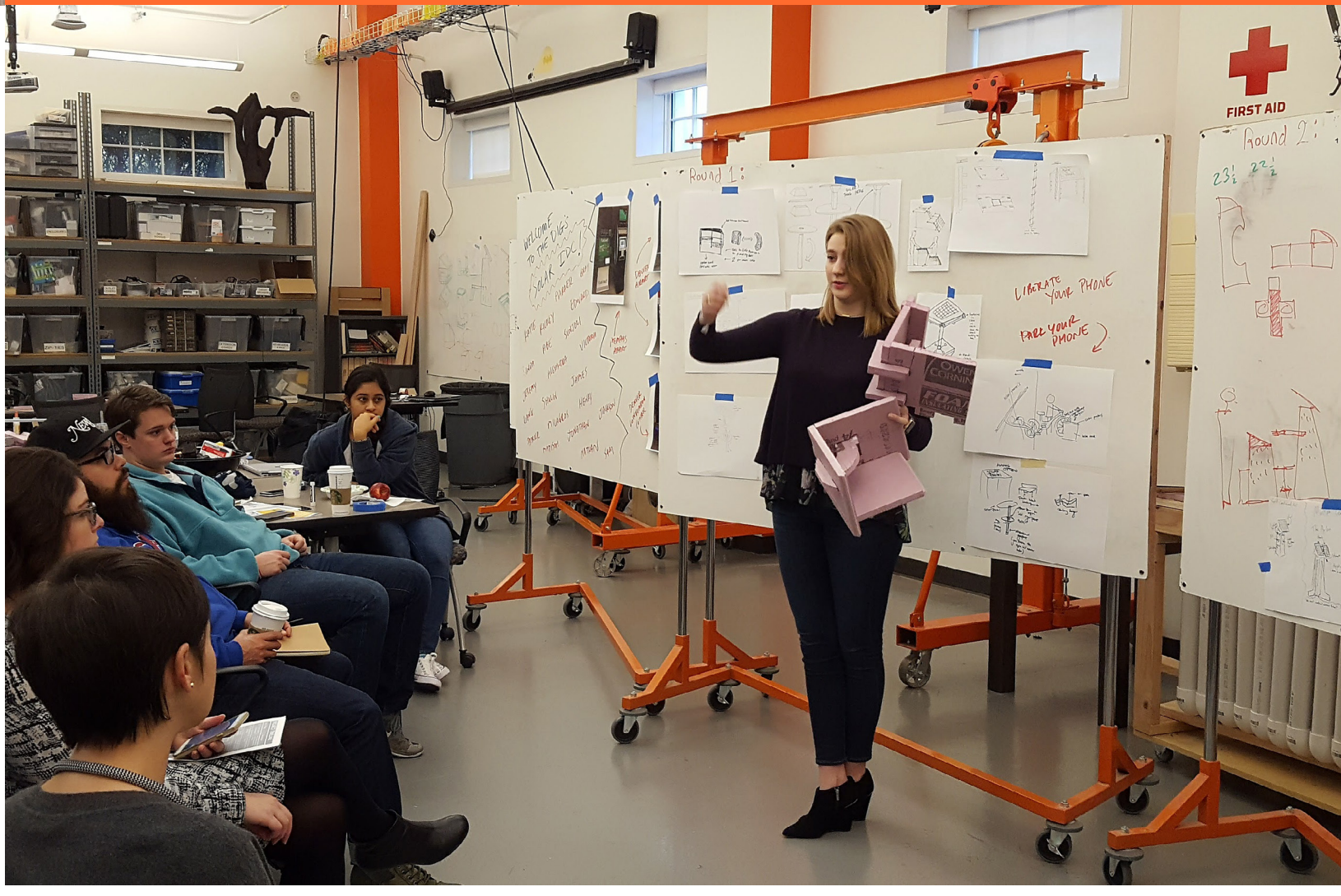
Learning Outcomes

Despite not being compensated for their work, students fulfilled their commitments to the team with everyone staying motivated and engaged throughout the project.

Keep reading for some of the reflections about their learning that the students shared after the project was completed.

"I used to feel that everyone in the DIG was extraordinarily skilled and always seemed to know exactly what they were working on, which was intimidating. I wanted to reach a point where I felt comfortable going to the DIG. The application form for the IDC really emphasized that no previous experience with DIG tools was necessary, which made me feel extremely comfortable and excited to apply. By the end of the challenge, my goal was definitely met, and the DIG feels like home!"

- IDC Participant



"The winter IDC was a unique and beneficial experience. It was rewarding to be able to contribute just as much to the project as a graduate student did, despite being a first-year. It really helped me learn a blot about the engineering design process as a whole as opposed to the targeted learning from the classroom."

– IDC Participant

"I 100% would apply for another IDC, and recommend this experience to anyone and everyone."

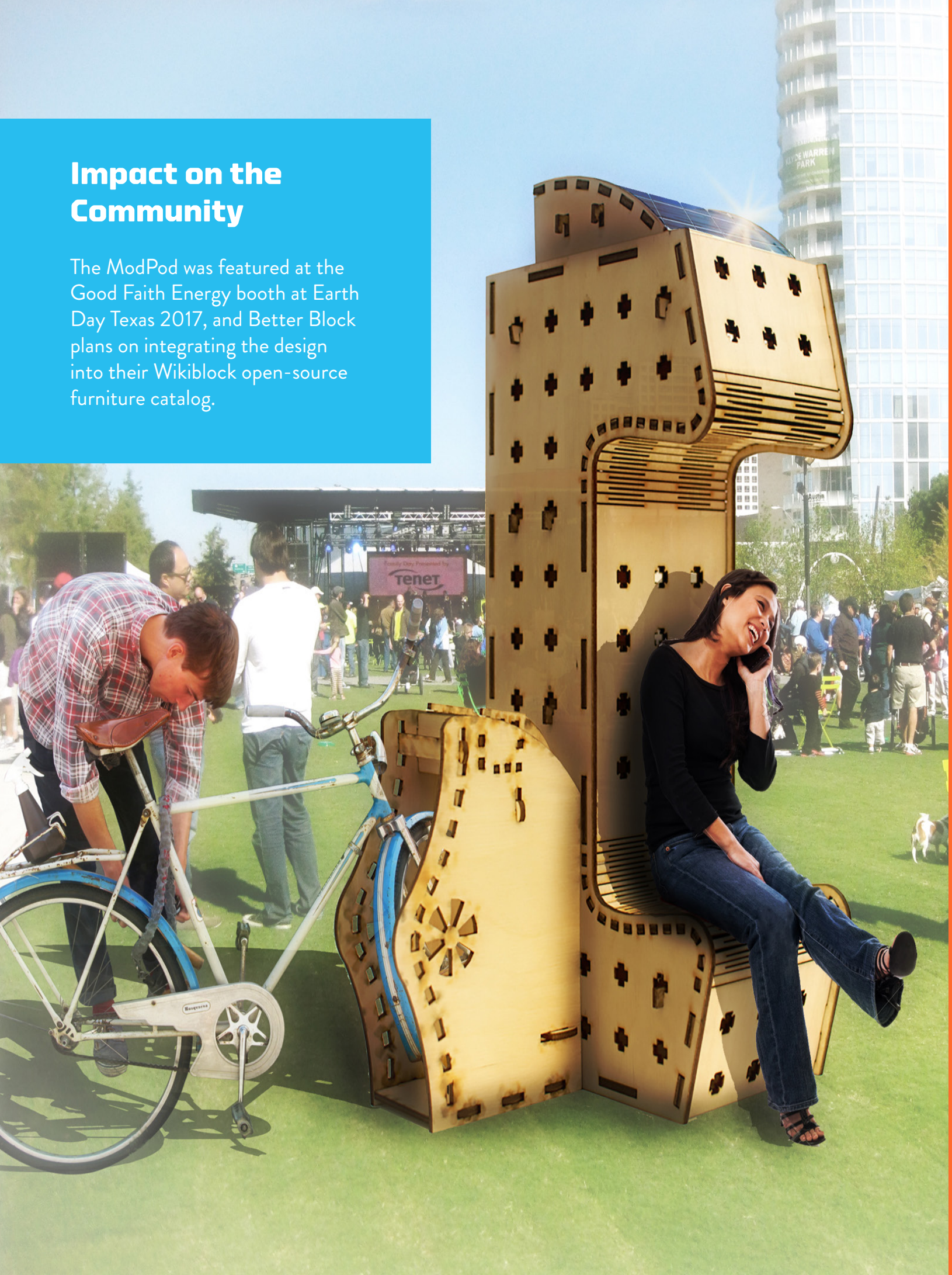
– IDC Participant

"The experience was amazing. The most fun times for me were when some of us would stay at the DIG until 12am, blasting music, working hard, and having fun out of our own free will/ excitement about the project. The excitement was definitely enhanced by getting to meet our business partners and be told that what we build can actually make an impact."

- IDC Participant

Impact on the Community

The ModPod was featured at the Good Faith Energy booth at Earth Day Texas 2017, and Better Block plans on integrating the design into their Wikiblock open-source furniture catalog.



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