THE DESIGN PROCESS AT MERCK

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WHY MERCK?

https://www.merckgroup.com/en/publications/media-gallery-logos-tube-blue.html

Merck is a leading science and technology company, contributing to the development of healthcare, life science, and electronics around the world. With their innovation and research, Merck has become one of the top 5 pharmaceutical companies in the world. Merck's long history of creating the first vaccines for multiple diseases and its success in developing new technologies highlights its excellent design process. This, combined with their honorable mission of developing products to "save and improve lives around the world", is why we selected Merck ("About us." 2020).

To research Merck's design process, we used Merck's public sources online along with interviewing Ashok Kumar, a senior product manager at Merck, to discuss Merck's design process. We then drew connections between Merck's design process and my team's design process.

https://emergingbiotalk.com/?utm_source=linkedin&utm_medium=social-media-organic&utm_campaign=ps_corp_emerging-blog_msig&utm_content=100004755805788

DESIGN PROCESS

In the interview, Ashok Kumar explained the design process at Merck. They have 4 different phases to make an idea become a product that is mass-produced and sold around the world.

1. DISCOVERY PHASE

First, experts at Merck ask themselves “Is there an issue to solve?” and “Will customers buy a product to resolve those issues?” To answer these questions, they do market surveys and talk to their biggest customers about different problems they face. By doing this, experts at Merck can ideate different solutions to the problems that matter to their customers.

2. CONCEPTUAL DESIGN

Next, they research what type of features the product will need and different ways to create those features. They then create multiple rough designs, thinking of how to reduce the cost of manufacturing it and how to make it as efficient as possible.

3. PROTOTYPING AND TESTING

The experts at Merck then move on to prototyping the best rough designs they thought of to see how they work in real life. This eliminates many of the initial ideas they had but they keep the aspects that work well.

4. DETAILED DESIGN

After they do prototyping and testing, they encounter many flaws in their designs, so they go through a cycle of redesigning and small-scale testing, improving their design each time. Once they create a prototype and have data on how their best design works, they create a more complicated and detailed version of it. This process allows Merck to create an innovative design that can be manufactured and sold across the world.

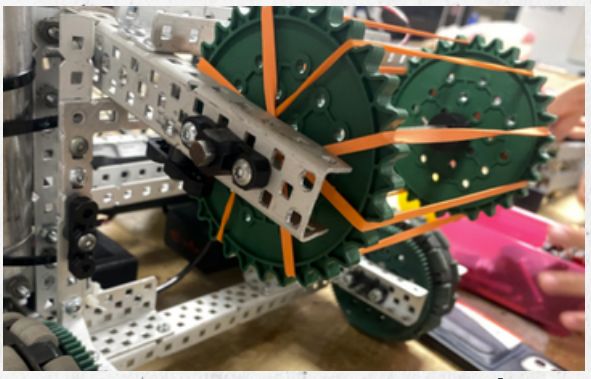
MERCK VS VEX

OUR PROCESS

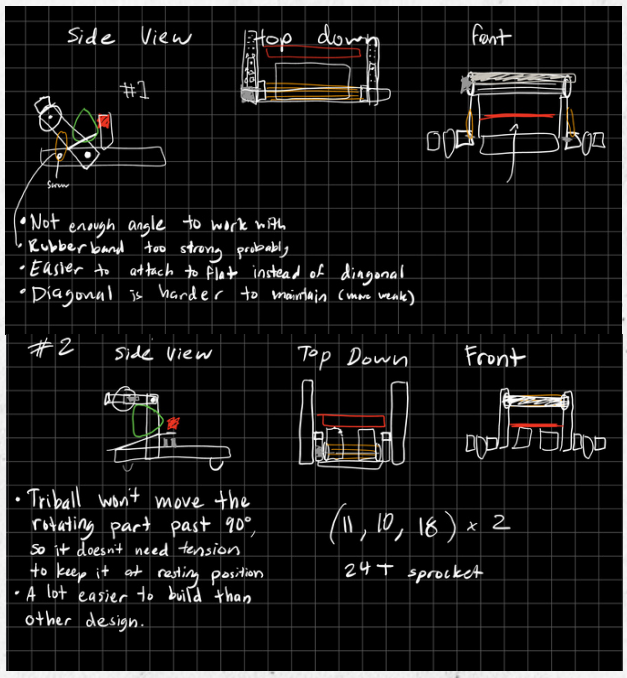
On the other hand, our team's design process is a cycle of discussions, trials, and comparisons. We initially come together to outline the pros and cons of various potential designs. Then, we decide on a specific design and begin constructing it. Once the design is constructed, we test it out and compare it to other teams' designs. After the testing, we analyze the outcomes in our Engineering Notebook, focusing on what parts of our design could be improved. We then construct the new design with the flaws fixed. By repeating this process, we root out the design flaws, improving each time we try again.

Ideas	Pros	Cons
Flywheels	Better for our structure Durable	More complex Hard to get the angle right
Rubberband Method	Simple Consistent	Gets in the way of the puncher Rubber Bands may break
Claw	Cover more area	Inefficient Takes more vertical space

Ideating: listing pros and cons



Prototyping: constructing and testing



Ideating: Sketching ideas

SIMILARITIES & DIFFERENCES

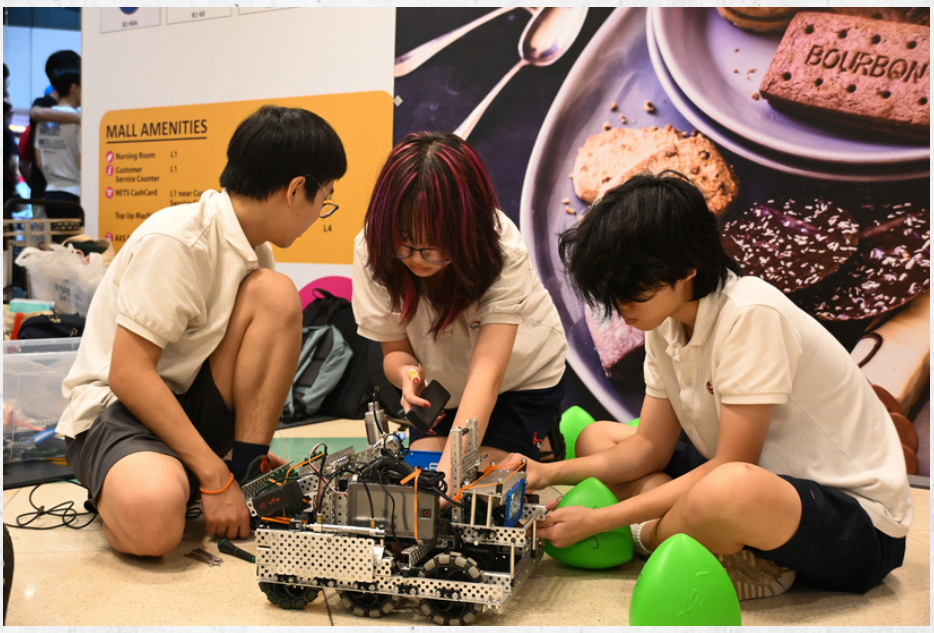
Both Merck and my team go through a cycle of ideation, prototyping, and testing, allowing us to improve our design each time we repeat the cycle. However, Merck prioritizes manufacturing costs and the market's opinion on the product while my team prioritizes winning points and having a well-rounded robot. Although our design processes are very similar, our approaches to the process are very different, so the changes we make to our designs will tend to our priorities.

THE FUTURE

HOW DOES VEX ROBOTICS HELP?

Team 6546A

Merck and my team's design processes have many similarities, which shows how VEX robotics prepares students to apply the design process in other contexts such as in a future engineering career. Robotics has taught me to be more open to change and not commit to just one idea, which is a lesson that experts at Merck have to apply when they create their products. Additionally, robotics builds collaboration and teamwork skills, which are essential in STEM jobs. At Merck, teams of scientists and engineers work together to create their desired product. VEX robotics helps students build these vital skills, preparing them for future careers.



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We are Merck KGaA, Darmstadt, Germany. (n.d.). https://www.emdgroup.com/en/company.html