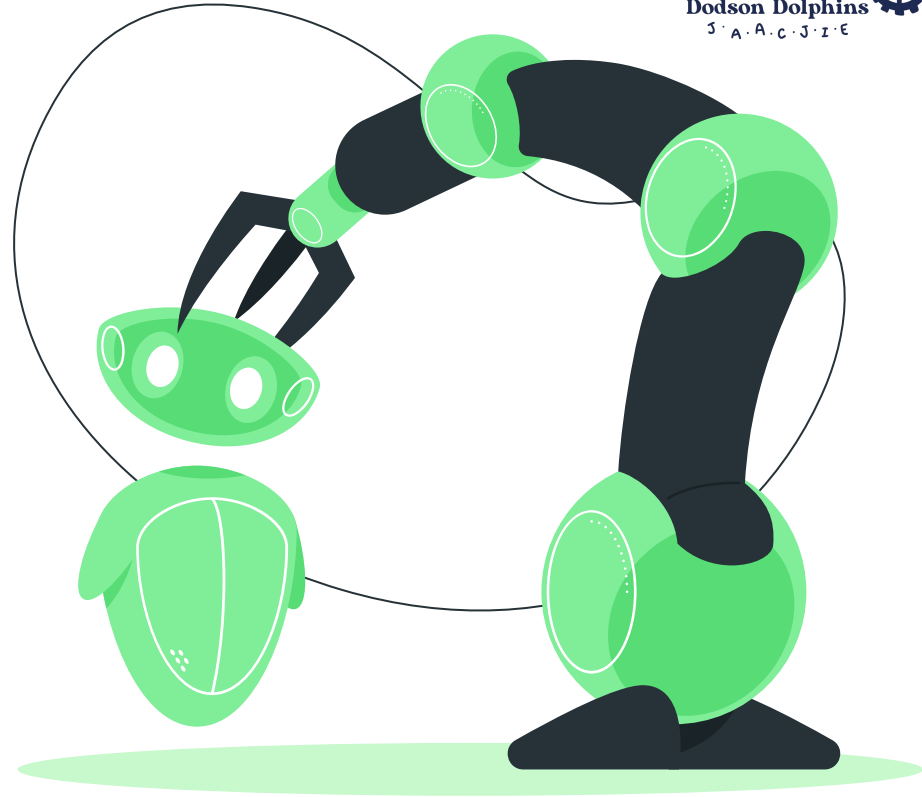


# Career Readiness Online Challenge: Northrop Grumman

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# Northrop Grumman

Northrop Grumman is a company profoundly known within the aeronautics, aerospace, and cyberspace communities. From its humble origins in 1939, Northrop Grumman has become one of the world's largest military technology manufacturers and providers.

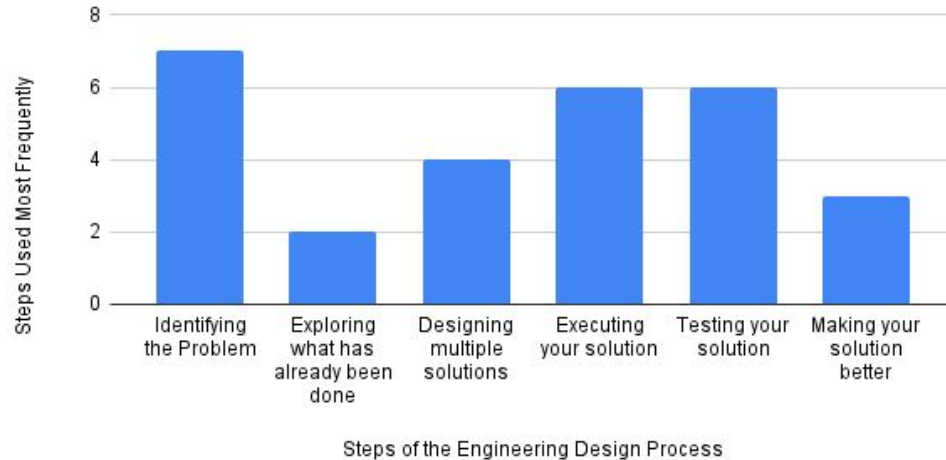
Our team chose this company not only for our close connections, but the influence that Northrop Grumman has throughout the international scientific community. We wanted to see how the engineering design process is used by employees of one of the largest scientific industries to date.

Information accessed from  
<https://www.northropgrumman.com/>

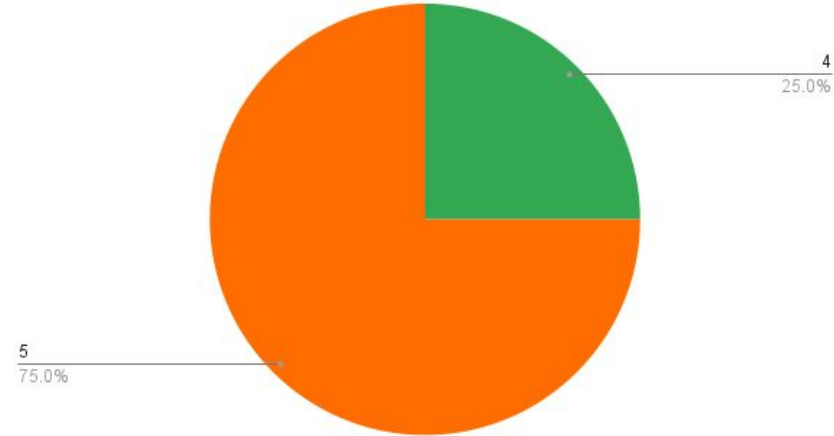
**NORTHROP**  
**GRUMMAN**

# Professionals and the EDP

Steps of the Engineering Design Process Used Most Frequently According to Engineers at Northrop Grumman



Use of the Engineering Design Process on a Scale of 1-5



In order to gain our research, our team members decided to create a survey with a variation of questions, and this allowed us to learn more about the use of the engineering design process amongst engineers. However, some decided to stay anonymous, though they had accepted the use of their information for data.

# Professionals and the EDP

After conducting our research with the use of a survey at Northrop Grumman, out of the 8 people that participated in the survey, it is needless to say that the engineers surveyed had all used the Engineering Design process frequently, as it is incorporated into their everyday lives. Everyone had rated their use of the EDP 4 or higher, indicating the importance of the Engineering Design Process on their careers. However, we had also asked these professionals about the steps they had implemented the most towards their careers, and we concluded that identifying the problem and executing and testing the solution seems to be the most prevalent step of the Engineering Design Process. One key idea many have mentioned in our survey is the common aspect of failing as engineers. Billy Lee, a Software Engineer that we surveyed stated that, "The act of creating anything and then watching it work is fantastically fun...Because the times when it fails (oh yes, lots of failing in engineering), is awful". Another engineer (prefers to stay anonymous) had encouraged that in the engineering design process, failing as quickly as possible and learning from it allows you to move forward for the betterment of your ideas and other solutions.

# Professionals and the EDP

Though it is shown by our graph that there are certain steps used more in the Engineering Design process than others, Amish Daya, a senior software engineer and the manager for a satellite communications project asserted that the Engineering Design Process as a whole is also especially important. When having a “structured process”, it is close to having a map to guide you in order to get a job done efficiently. However, because we did not focus on a certain career but rather a company, the most evident rationale for our most frequently used steps is a variety of engineers have a variety of jobs. More than a quarter of the engineers surveyed have a job of identifying issues or problems. An example can be shown with Elias Karam, an engineer digital who troubleshoots test equipment for aerospace programs says that, “For my job in test engineering, I am constantly being asked to investigate why a certain piece of equipment is not working as expected. We are often given very limited pieces of information and have to use our engineering background and intuition to figure out the source of the problem”. Karam also proves that steps in the engineering design process do not occur just once. One step may lead to another, as after Karam figures out the issue, multiple solutions are created to eventually choose a solution. He is even occasionally given work that is underway the Engineering design process, demonstrating the different steps different engineers execute, almost working as a team to perform the whole Engineering Design Process.

# Professionals and the EDP

As we made it an option to not share the names of the engineers we surveyed, one of the software engineers who remain anonymous describes how continuously executing and testing your solutions are a key part of the Engineering Design Process. It is often that brainstorming solutions are plenty once you have initiated your understanding for a problem. However, the negative part about this is that not all of your solutions will execute themselves successfully like you pictured. The more often you test these solutions can allow you to gain a better understanding of what is failing and learning from your failure, which is one of the most important parts of the Engineering Design Process. This engineer had advised to not dwell on the failures, and to quickly move on to implement new ideas into your original solutions. To conclude, though engineers can definitely agree on the significance of the Engineering Design Process in terms of the impact it has on their careers, some engineers may focus on various areas of this process while working together as a whole.

# The Comparison

## Similarities

Our team ends up trying to find problems and executing our solutions the most, like professionals.

Many professionals also admit to failure and many trials before coming to a working solution.

No design is considered perfect and there are always ways to modify a design. Always go back and try again!

## Differences

Our team had our problem and multiple designs laid out for us, allowing us to use and modify designs rather than come up with entirely new ones.

Our team feels like we have explored a lot more existing content that professionals have, using the different designs available to us.

# Preparation for Our Careers

We are able to see that the use of the Engineering Design Process continues to be prevalent throughout professional careers. Failing, renovation, and trials seem to be a common part of any engineering project. There seems to be a constant cycle of finding problems, creating solutions, and testing them, in order to create the best solution possible.

It was difficult to find differences between how professionals work and how our team works throughout our time in VEX. A lot of professionals seem to express experiences that we, as a group, have experienced ourselves. This only seems to show how prominent the Engineering Design Process and the work we put into our project is in the professional setting of today.



# **Thank you for those who participated!**

All information, either consented or  
sourced, were credited  
accordingly.