**Good morning! My name is Egor Batarin. I’m a third-year DREC student at MIPT.**

**The subject of my presentation is systems engineering.** **This is a rapidly developing direction in project management, company management and harmonization and establishment of links between business processes of various nature. At the beginning, I will tell you who a system engineer is and what he does. Next, I will talk about how system engineering appeared and what it consists of. At the end, I will list the skills and knowledge that a system engineer should have. My presentation will take ten minutes. I’ll be glad to answer all your questions at the end of my presentation.**

**Let’s start.**

Who is a system engineer? For a better understanding, consider the following analogy.

Let's imagine a collection of groups of people from different countries communicating in different languages. Each group of people has its own culture and customs, each group is unique. All groups are united by the fact that all these people live on the same planet and have the same influence on the processes taking place in the world. In order for life on Earth to be harmonious, there were no wars between groups, there should be mutual understanding between groups and the ability to act harmoniously in the name of a common goal. How can this be implemented taking into account the fact that groups of people do not understand each other's language and have different cultural thinking, which means different beliefs, values, etiquette, and so on?

A polyglot diplomat comes to the rescue. He knows all languages and understands the culture of people from different countries. This does not mean that he is a specialist of the highest profile in every language. On the contrary, he thinks in breadth, not in depth, taking the most necessary knowledge about each culture. This allows him to establish a language between groups, make friends with each other and help all groups solve a single task.

A system engineer is the same polyglot who has an idea of each area of knowledge and is a kind of glue between specialists of various profiles.

**Now let’s consider the history and definition of systems engineering.**

The term systems engineering comes from Bell Telephone Laboratories. The need to identify and control the properties of a system as a whole, which in complex engineering projects may greatly differ from the sum of the parts' properties motivated many industries. When it was no longer possible to rely on the existing tools which were not sufficient to meet growing demands, new methods began to be developed that addressed the complexity directly. It lead to creation og new branch: Systems Engineering.

The need for systems engineering arose with the increase in complexity of systems and projects. A system can become more complex due to an increase in size as well as with an increase in the amount of data, variables, or the number of fields that are involved in the design. The International Space Station is an example of such a system. The development of smarter control algorithms, microprocessor design, and analysis of environmental systems also come within the purview of systems engineering. Systems engineering encourages the use of tools and methods to better comprehend and manage complexity in systems. Some examples of these tools are: Statistical Analysis, Optimisation, Decision making, Reliability analysis and so on.

Taking an interdisciplinary approach to engineering systems is inherently complex since the behavior of and interaction among system components is not always immediately well defined or understood. Defining and characterizing such systems and subsystems and the interactions among them is the main goal of systems engineering.

**Now let’s see what skills must systems engineer have.**

1. Interdisciplinary knowledge in order to understand different specialties and the connections between them
2. Leadership and communication skills to effectively interact with specialists of various profiles, coordinate work between them, resolve conflicts, motivate people to move towards a common goal.
3. The ability to solve complex problems, the desire to deal with abstract tasks that include many subtasks related to a variety of profiles

**So, I have come to the end of my presentation. Now I want to summarize what I have said.**

System engineering is a young and rapidly developing field that allows you to multiply the efficiency of large systems. A system engineer requires a very broad outlook, good communication skills and the ability to solve large and complex system tasks. This is a difficult but interesting job.

**Thank you for your attention.**

**Now I’m glad to answer all your questions.**