Issue 12/2024

The Engineering City Journal

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The purpose of the Journal is to disseminate knowledge, experience, and best practice in engineering & manufacturing.
The articles are written by practicing professionals in the Engineering City (EC). They cover issues relevant to their projects, operations, and organizations.
The articles address the challenges of the time. As such, the Journal is also a chronicle of the evolution of the EC, its companies, and its individuals.
It is the aim of the Journal to advance the engineering & manufacturing practice, to enrich the engineering & manufacturing community, and to contribute to the worldwide discourse in engineering & manufacturing.

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ARC Corner

. Positioning the ARC within the Student Projects

by Rama, EA

In the EC we currently have the following student-project programs:

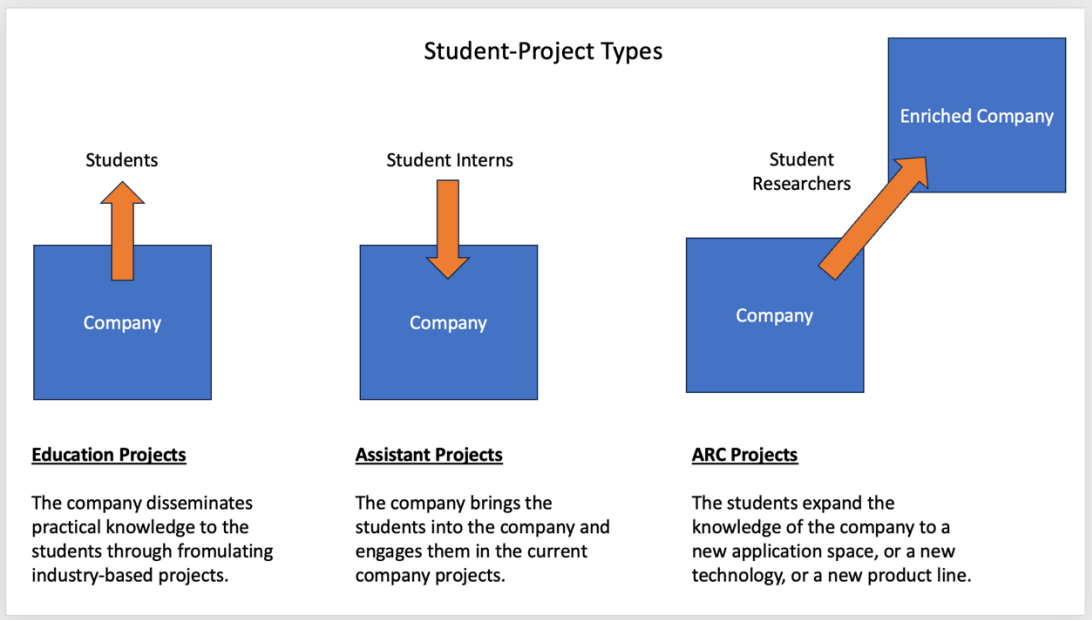
1. Bagrevand 21 projects (1st and 2nd year students)
2. Internship projects (usually 3rd and 4th year students)
3. BS Diploma projects (4th year students)
4. MS Thesis projects (5th and 6th year students)
5. PhD projects (PhD students)
6. Startup Projects (in any year)

The student projects could be categorized into the following three types:

1. **Educational projects**: these are projects given to students as educational. The works of the students here don't have a useful purpose for the companies. But this is the first interaction between company and students. It is the place where the companies get to know the students for future projects. And this by itself is very valuable.

2. **Assistant projects**: these are parts of current projects in the companies that get passed to the student interns as both useful work for the company and practice for the student. This work is usually done under the mentorship of one of the project team members.

3. **Future-looking projects (ARC projects):** these are projects that have elements of novelty for the company. Here, parts of the research is being passed to the ARC (Advanced Research Center) as there are no prior knowledge in the company, yet the company wants to acquire this knowledge through passing the research to the ARC and receive in return any possible outcomes from such research – a briefing, a POC, a prototype, an IP, a technology, an article, … – that will help the company make decisions on these new directions. These could also be projects that may lead to start-ups or spin-offs.

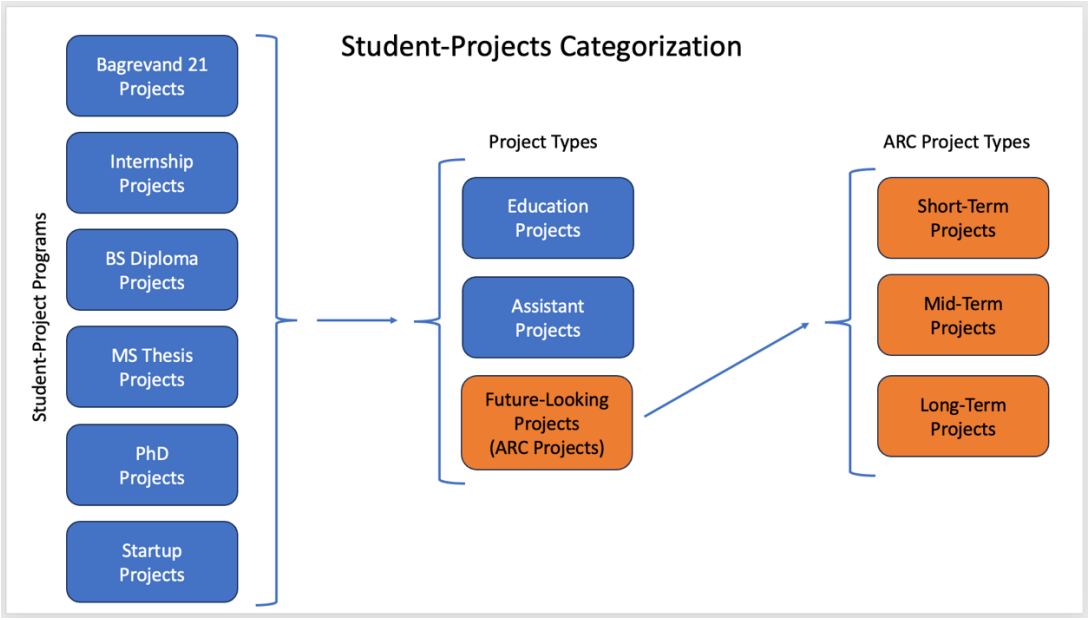


Pic. Student-Project Types

The future-looking projects (the ARC projects) could be categorized into three types:

1. **Short-term Research**: this is research done for a current project or for the assessment of a potential project.
2. **Mid-term Research**: this is research done for the next project or the next product.
3. **Long-term Research**: This is usually defined by the CTO of the company. CTOs are the individuals who look at technology and application trends and seek to incorporate them into their products and solutions.

Here is a summary slide:



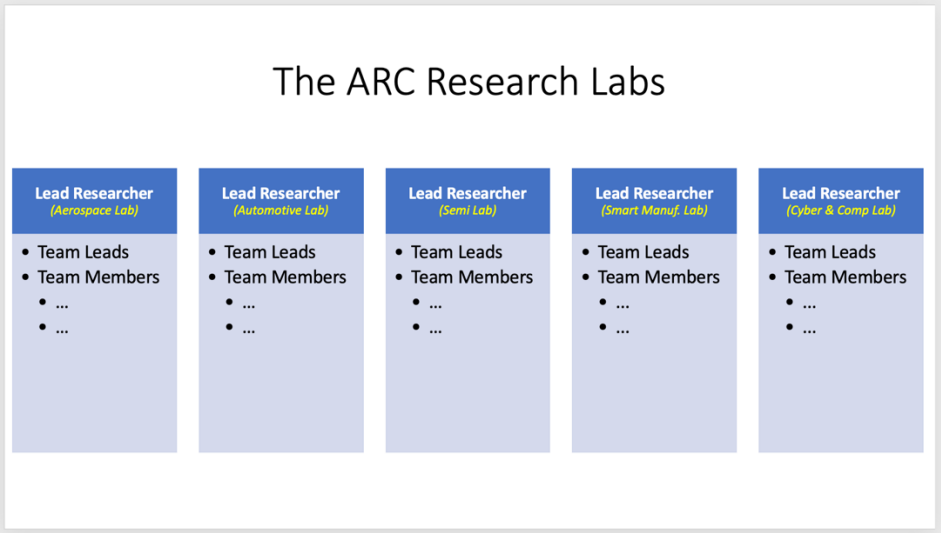
Pic. Student-Project Categorization

You can read this article in Telegram. Link.

. How to Engage the ARC

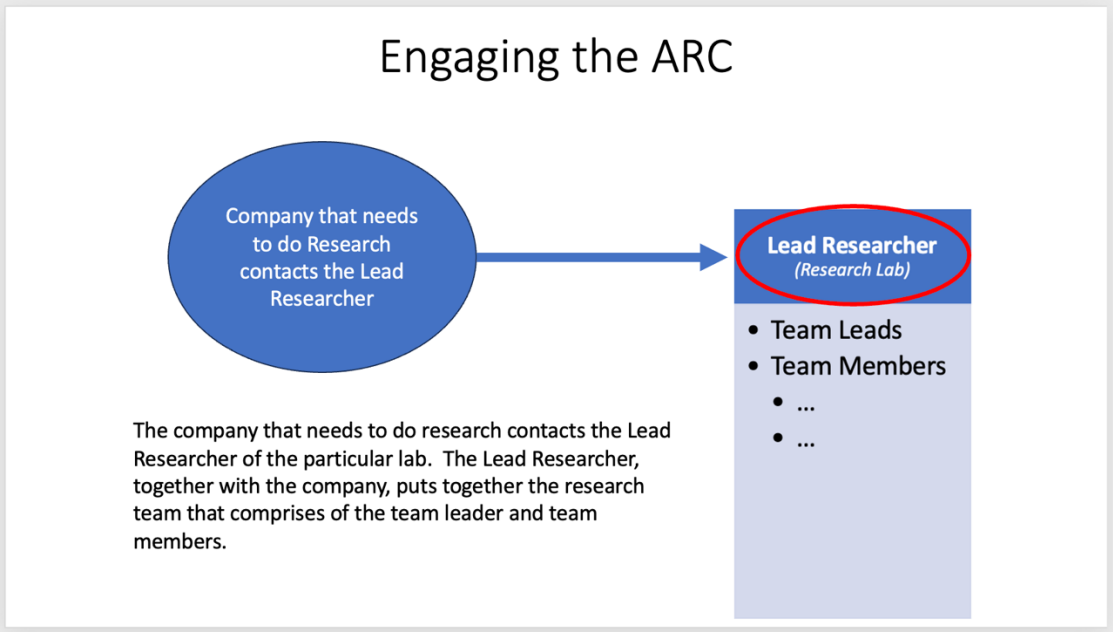
by Rama, EA

The research part of the ARC has the following structure:



The process of engaging the ARC must be very simple.

The company that wants to do research contacts the "Lead Researcher" of the appropriate lab.



The "Lead Researcher" is responsible for putting together the Research Team that must include the Team Lead and the Team members.

The team will be formed depending on the research scope, the deliverables, and the timelines. This team will be discussed with the company before it gets finalized.

The "Lead Researcher" will be responsible for coordinating the work and delivering the outcome to the company.

It must be as simple as that.

To read this article in Telegram, please go to link.

Musings Corner

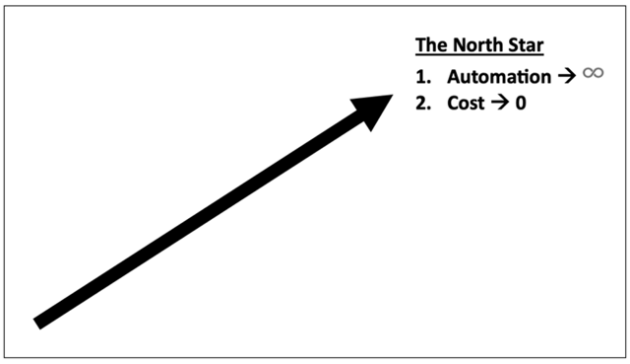
. Impact of the Engineering Guiding Principles on Humanity

by Rama, EA



. The Thesis

In a previous article titled "Engineering Guiding Principles" (*EC Journal 10/2024 edition*) we started with the following slide:



In that article we stated that there are two main principles that engineers are guided by:

1. Automate everything, meaning creating technologies, products, processes that will be doing everything on our behalf.
2. Continuously drive down the cost of everything that we have and do.



We mentioned that by having these two principles in mind at all times we can generate an enormous amount of product, technology, and process ideas – for both the customers and for us internally in the our organizations.

This article will expand on this.

Driving automation to infinity will lead to a dramatic increase of our free time:



Having an unlimited free time means that there is an unlimited time for self-realization:



Driving cost down to zero will lead to creating abundance of everything and for everybody:



Having abundance of everything and for everybody means that we will have reached genuine peace and security (both physical and social):

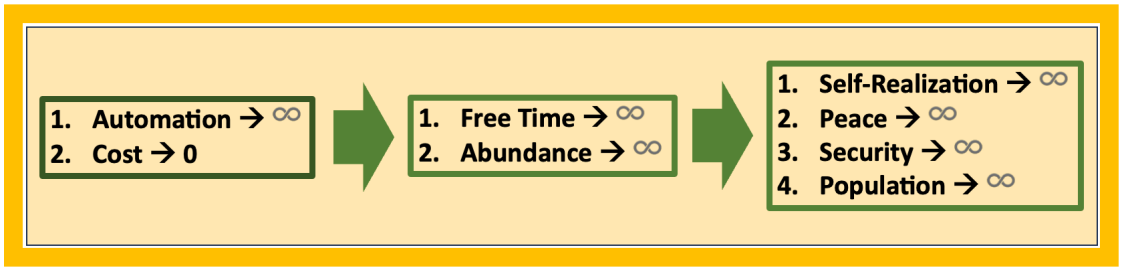


And with such peace and security, the population of the world will dramatically increase. This is because the world will become such a beautiful place that you will want to pass it on to as many generations as possible.





So, the humanity formula takes the following shape:



Humanity reaching and realizing its true purpose – self-realization, peace, security, population.

And all this because of engineers working on these two main parameters – automation and cost.

. Appendix

1. Meaning of Automation → ∞

There is a long road to full automation. It will need knowledge and skills to dramatically increase; it needs number of teams and the team sizes to dramatically increase (the MNCs are good examples); it needs inventions and innovations to dramatically increase.

Meaning of Automation → ∞

1. Science → ∞
2. Knowledge → ∞
3. Skills → ∞
4. Number of Teams → ∞
5. Team Size → ∞
6. Inventions → ∞
7. Innovations → ∞
8. ...

2. Meaning of Cost → 0

There are many parameters that must be driven to their minimum to reach a zero cost. Here are some parameters:

Meaning of Cost → 0

1. Time → 0
2. Energy → 0
3. Size → 0
4. Weight → 0
5. Material → 0
6. Transport → 0
7. Communication → 0
8. Safety → ∞
9. ...

Each one of these parameters need technological innovations by themselves.

3. Meaning of Free Time → ∞

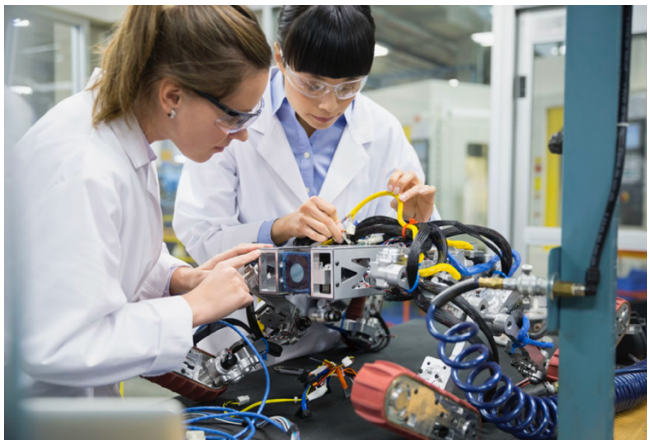
And here we come to the most difficult topic – free time. What to do with free time?

Do we do this?




Boredom

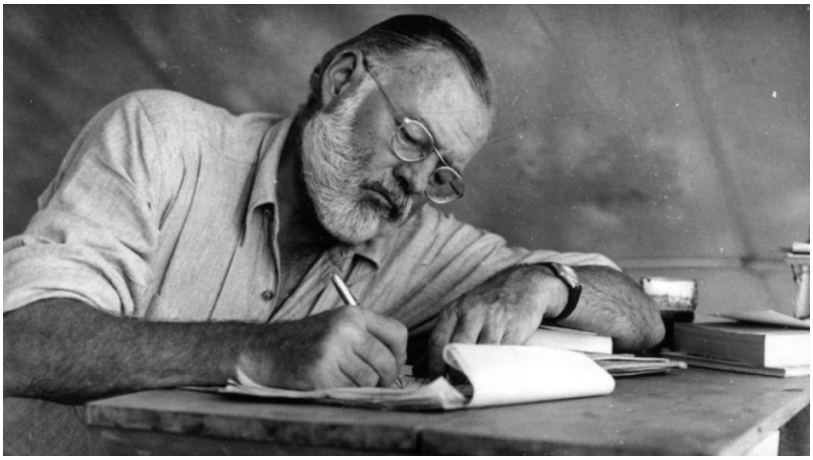
Or, do we do this?

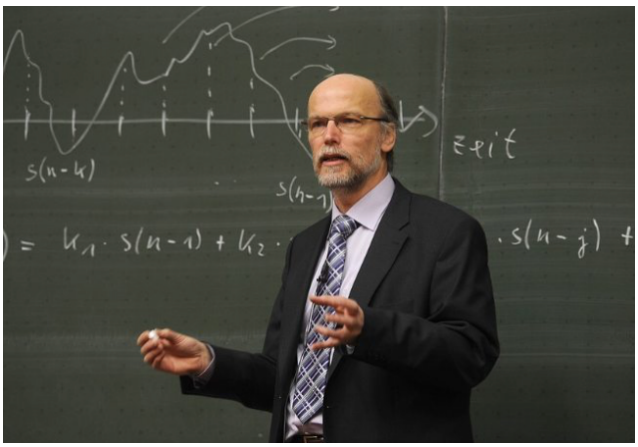
Researching and Creating




Reading




Writing

Teaching

…

…

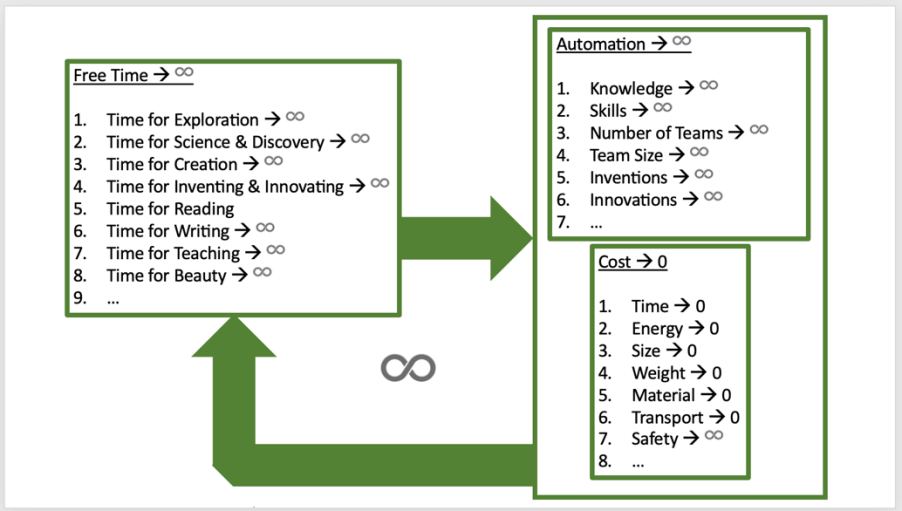
Having infinite free time will mean that we will have infinte time to explore & discover, to create, to invent, to innovate, to read, to write, …

Meaning of Free Time → ∞

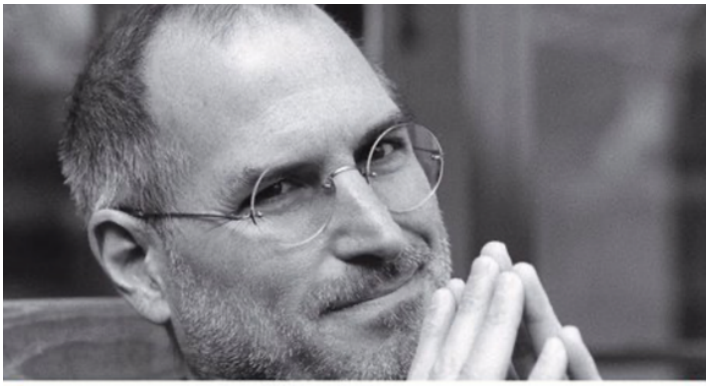
1. Time for Exploration → ∞
2. Time for Science & Discovery → ∞
3. Time for Community --> ∞
4. Time for Creation → ∞
5. Time for Inventing & Innovating → ∞
6. Time for Reading
7. Time for Writing → ∞
8. Time for Teaching → ∞
9. Time for Beauty → ∞
10. …

As you can see, free time does not mean to do nothing. In the contrary, free time means full engagement. But now not as a forced engagement, but as a free choice, as enthusiasm, as romanticism, as natural necessity for self-realization.

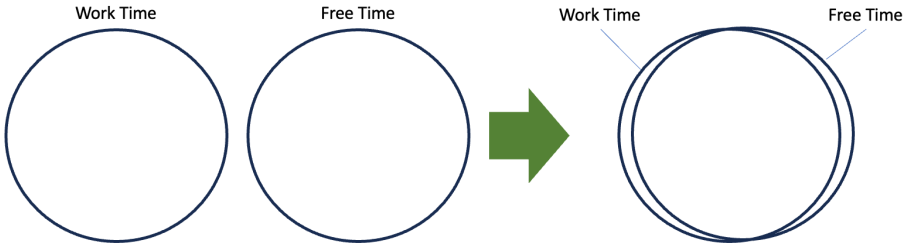
As such, free time activity will feed back to automation and cost reduction, but now as an expression of free time. And this by itself is an infinite loop. We will never fully reach infinity, but we will get closer to it on every iteration.



Here is a good quote from Steve Jobs:



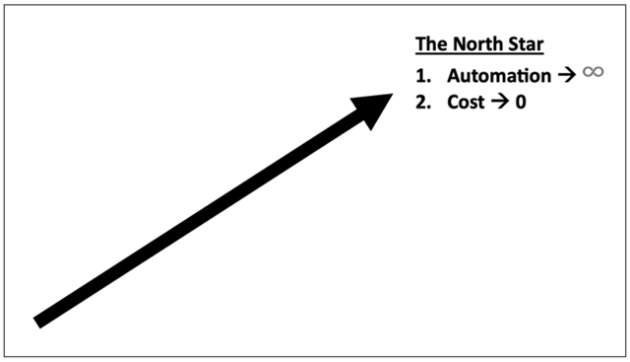
For him, work time and free time were the same. He invented, innovated, designed - all as free time activity.



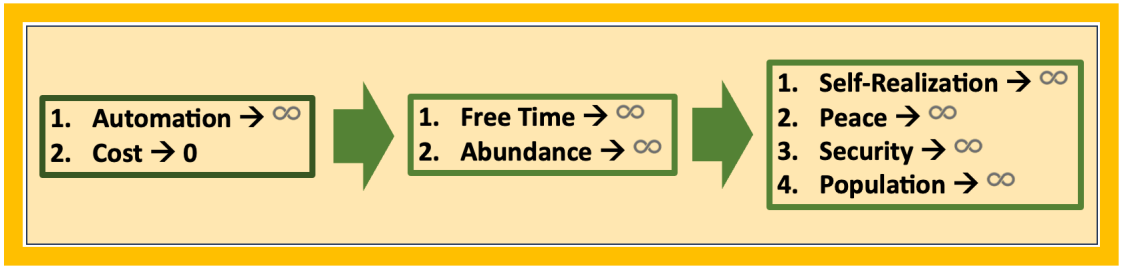
Pic. The Merger of Work Time and Free Time into the Same Time.

. Conclusion

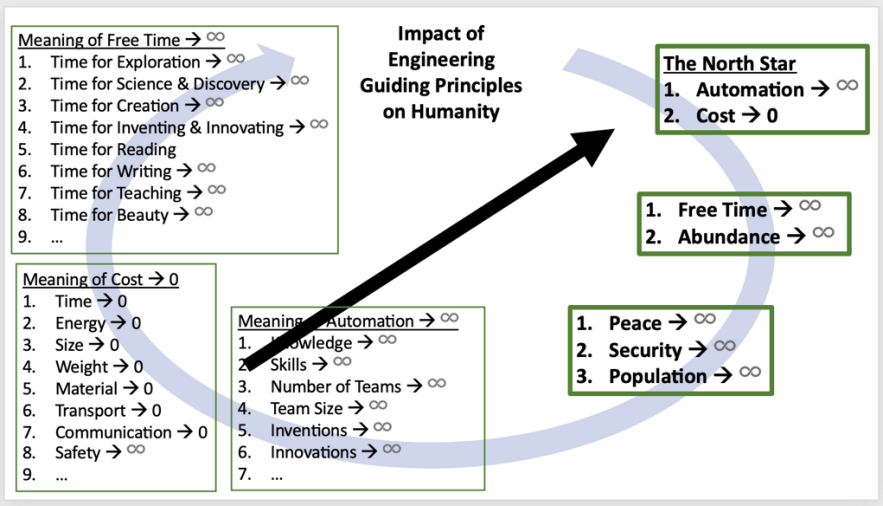
We started with this:



And derived the following humanity formula:



Here is everything on one slide:



And finally, it must be mentioned that to deal with free time is a very serious question that humanity must solve since free time will only increase and very quickly (especially that AI will play a dramatic role in automation). And I think that it will be more a matter of upbringing (воспитание), rather than education (образование) to know what to do with free time. Besides knowing what to do, it will require an enormous amount of self-discipline and self organizing as not to waste this precious free time. This by iteself will require the development of a strong will power in people.

Would like to finish with this song:



Take a listen Link

Lyrics of the song:

I see trees of green
Red roses too
I see them bloom
For me and you
And I think to myself
What a wonderful world

I see skies of blue
And clouds of white
The bright blessed day
The dark sacred night
And I think to myself
What a wonderful world

The colors of the rainbow
So pretty in the sky
Are also on the faces
Of people going by
I see friends shaking hands

Saying, "How do you do?"
They're really saying
I love you

I hear babies cry
I watch them grow
They'll learn much more
Than I'll ever know
And I think to myself
What a wonderful world
Yes, I think to myself
What a wonderful world
Ooh, yes

Automation and cost reduction are fundamental engineering principles.
As such, engineers have an immediate impact on the future of humanity.
With the Engineering City playing its part in this endeavor, the future must be very bright.

You can also read this article on Telegram Link.

Events Corner

. International Conference on Broadband Communication, Graz, Austria, July 9 – 11

Some EC companies will take part in this conference on Broadband Communication for next generation networks and multimedia applications.

Other companies may want to join.



Link

Telegram Link.

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