Instructions

Go to

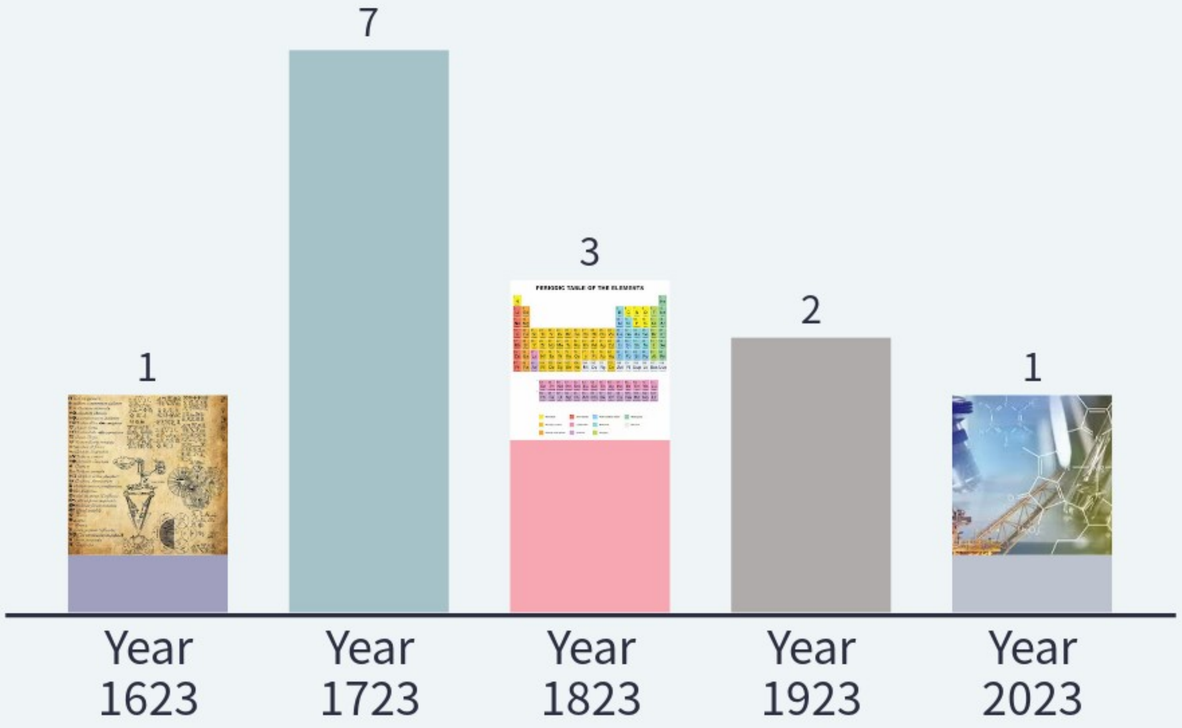
www.menti.com

Enter the code

Or use QR code

SE Maturity

From Alchemy to Chemical Engineering: How mature is Systems Engineering today?



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Experiment Feedback

What did you like about the experiment? 12 Answers

It was fun and relaxing.

Simple, once the aim had been understood it was quick and easy.

The teamwork. It was fun also.

Its interesting

Interesting concept. Good variation. Can relate to real life. Good challenge.

Fun

It was unclear for what it should be optimised: Length or number of paths. Otherwise: Fun!

Unexpected

Forced me to identify potential strategies, probe them, i.e. do some "guestimates" and go for one.

What did you like about the experiment? 12 Answers

It was some kind back to kindergarten experience. A task with no obvious meaningful objective

Teamwork and fu. Not so easy to understand instructions to optimize performances

More explanation , maybe

What did you not like about the experiment? What could be changed or improved about the experiment?

13 Answers

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Unclear if total road distance was a factor

Unclear goal at first. Please state the goal of the experiment

The goals (requirements) should have been clearly stated at the beginning.

Not so easy to understand instructions to optimize performances

Improve initial instructions.

The purpose wasn't clear and I forgot how the calculations will be executed.

I felt the there were some optimization constraints missing (e.g. total length of road that would have to be built)

Doing it with a software !!! ;-)=

The description was a little bit confusing, the performance indicator was not clear

What did you not like about the experiment? What could be changed or improved about the experiment?

13 Answers

Make it more meaningful by providing a background story! What were we really doing?

More and clear instructions

N/a

Refute as the rule did not include a cost factor for the total length of road

Do you believe that the experimental results will support or refute the First Law of SE?

10 Answers

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I'm not sure

Hopefully it will provide some initial insights, but we are in a long road before gaining any valuable insights

If the first law is refuted then it was not the first law. Too little complexity in the problem to draw meaningful conclusions.

No idea !

Not sure, I want to understand the first law first and see evidence that is is the first law. Otherwise we end up like the thermodynamics situation law 0!

50% each

Not the foggiest.

We have to test it, I am not sure

Not clear

Do you believe that the experimental results will support or refute the First Law of SE?

10 Answers

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The results of one experiment alone cannot serve as evidence for the law

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Overall Feedback

We are creating an inventory of existing SE Foundations. What do you consider to be other SE Foundations?

10 Answers

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Approach, methods and maybe tools

The value of exploring the problem and solution spaces. Probably not validated.

Knowing the difference between kind and degree of complexity

Rousseau's 3 scientific systems principles; SE Principles (Watson et al.)

Define the complexity of a system of interest by the number of interfaces it has with adjacent systems, outside the boundary of the system of interest.

SE improves product quality (not validated?)

Systems Engineering reduces the time for a project (empirically validated?)

The rule that spending X extra time up front on requirements has Y benefit later in lifecycle.

The value in investing in competence development. Validated

We are creating an inventory of existing SE Foundations. What do you consider to be other SE Foundations?

10 Answers

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Many of our heuristics

What ideas in SE need more validation & quantification?

15 Answers

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That requirements engineering helps!

Defect / integration issue Reduction

If we design the correct product

The benefits of MBSE - so much is said about it but never seen anyone convey a quatified value/ROI.

Our heuristics (at least many)

The importance of early validation and requirement concretion with stakeholders before we start with the system requirement specification

Degree of complication of a system

Quantify the benefits from using SE

Something around emergent behaviour

What ideas in SE need more validation & quantification?

15 Answers

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Return on investment for applying SE should (could?) be re-evaluated.

System of Systems (is this just a system?)

How to assess the maturity and authority of our tools, principles, and methods

Reusability

Our ability to effectively capture on paper the system objective and solution prior to starting realisation

Simplification and exemplify of principles

What are other experiments you think we should run? What SE Foundation would this experiment be validating?

13 Answers

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Something around classic SE vs MBSE.

Try to bring real examples from work floor

Simplifying overcomplicated thoughts

Simplicity with inner complexity !

We should define a number of research questions and run multiple field studies in representative projects . Multiple phd observers each covering multiple projects

Practical experiments from real usages. i.e. requirements definition and good writting

Adapting generic rules to particular environments to validate tailoring process

Seeing how well SE is working in fast moving 'new tech' companies outside the established Aerospace & Defence companies.

Something around the ratio of systems engineers in an engineering team. Is there an optimum? Too many can cause confusion

What are other experiments you think we should run? What SE Foundation would this experiment be validating?

13 Answers

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Include other non-technical processes as many people tend to forget them when talking about SE

A B Testing of teams developing s/th simple, where each team must leave out one of the major SE activities (e.g. architecting)

Software ISO standards

Lean / 6 Sigma

What are important resources to be included in a survey for SE Foundations?

11 Answers

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Value Engineering

Lean / 6 sigman

More reality, less theory.

Case studies in a diverse set or organisations and industries.

INCOSE Working Groups technical products

Time, money and competent and skilled personnel

Actual best practices, not textbook blahas

Software ISO standards

INCOSE Technical Products (e.g. SE Principles, Heuristics, Bridge Team, etc.)

What are important resources to be included in a survey for SE Foundations?

11 Answers

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Worst practices and collection of"failures" (to know what we should not repeat)

If it worked like the laws of physics

What would make the output and findings of SE Foundations operationalizable to helping you do great Systems Engineering?

13 Answers

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Practical guidance

Capturing the breadth and depth in terms of competence required to solve complex problems

Access to documentation with practical examples that can be applied

Quantifiable evidence

If it worked like the laws of physics

Evidence-based approaches that are accessible. These should be mapped as a system so that intervention guidance is available

Real case studies across wide range of industries & applications, with ultra clear quantifiable ROI.

Mentoring

Guidance for managers as well as individual contributors

What would make the output and findings of SE Foundations operationalizable to helping you do great Systems Engineering?

13 Answers

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More understanding, company culture, and budget

Relate things to existing software / me / ee processes

More diverse, less US centric.

Try to break down levels to less levels to be able to find the common

Any other feedback & ideas?

7 Answers

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Too many Qs in the feedback

Great exercise. Keep doing well!

The task was good but less questions at the end would help

Loved it!

Multiple Choice / Ranking questions

As the instructions (requirements) for exercise improve, see how the results change.

Finding the physical laws for SE might be impractical as we build unprecedented systems. Finding competence and complexity heuristics might be a good start

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Thank You.