VOLVO

INNOVATION MANAGEMENT IN VOLVO

- Annamalai Vellaichamy

- Product Manager / Innovation Representative

Volvo Group

Group Trucks Technology

Practicalities

* It’s an online meeting in Teams, so
    - Please alert if the sound is bad or not audible
    - Please be on mute unless you want to speak
* Interrupt if you have questions while presenting.
    - Do not need to pile up your questions till the end.
* This material will be available for your reference later.

About me!











Topic Roadmaps

Volvo

Innovation Organization

What Innovation representatives do?

Innovation Phases

Innovation Frameworks

Innovation Tools

Activities & Events

Q&A



Topic Roadmaps

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Innovation Organization

What Innovation representatives do?

Innovation Phases

Innovation Frameworks

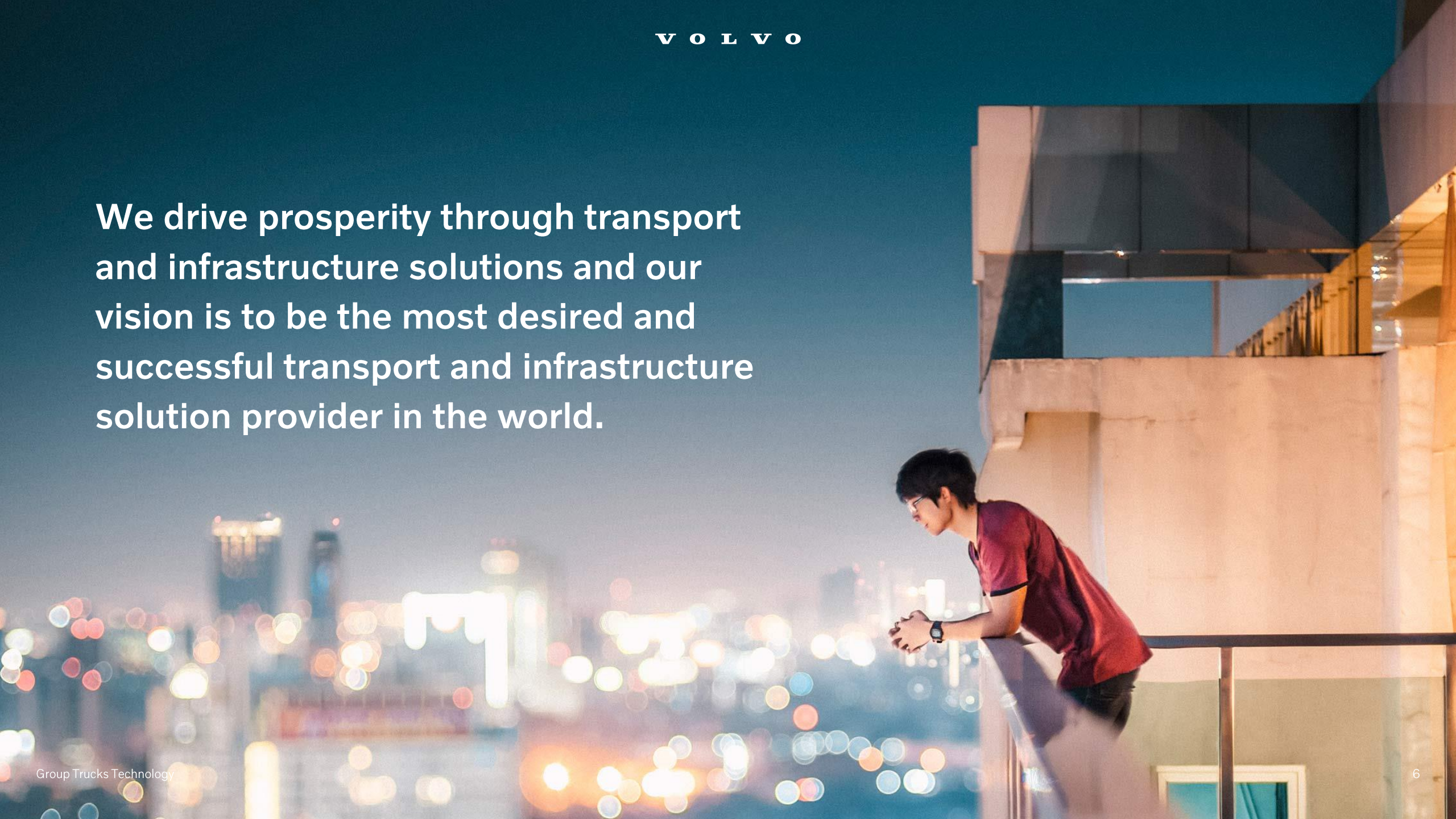
Innovation Tools

Activities & Events

Q&A



VOLVO



We drive prosperity through transport and infrastructure solutions and our vision is to be the most desired and successful transport and infrastructure solution provider in the world.

What we do

Volvo Group offers trucks, buses, construction equipment, power solutions for marine and industrial applications, financing and services that increase our customers' uptime and productivity.

We contribute to the development of electrified and autonomous solutions for the benefit of customers, society and for the environment.









Our brands

Volvo Group's brand portfolio consists of several distinct brands, targeting a variety of customers and segments.

VOLVO

VOLVO PENTA

ROKBAK

RENAULT TRUCKS

PREVOST

NOVABUS

MACK

ARQUUS
DEFENSE · MOBILITY · SYSTEMS

JOINT VENTURES AND STRATEGIC ALLIANCES

SDLG

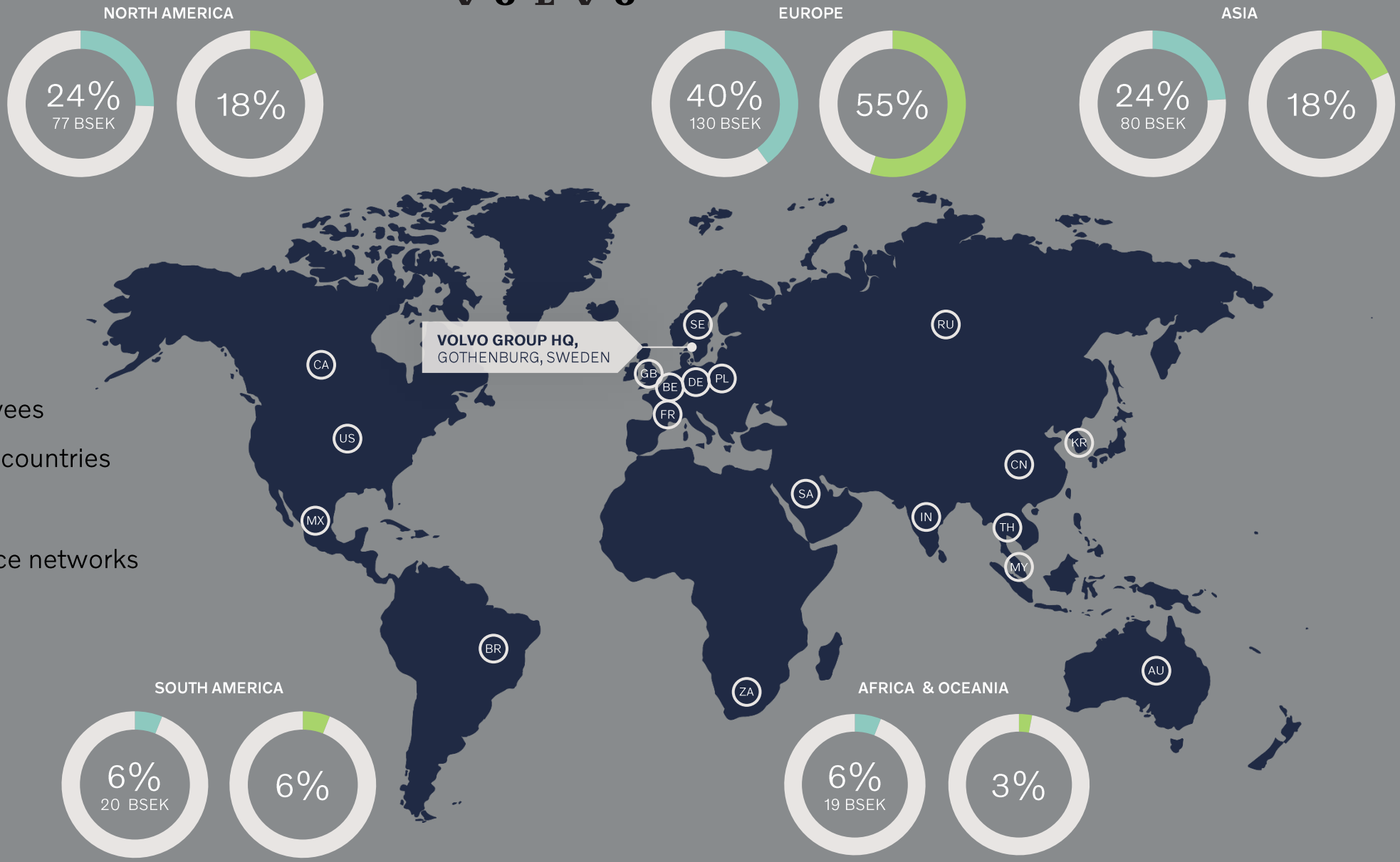
EICHER

DONGFENG Trucks

cellcentric

Global presence

- → 100,000 employees
- → Production in 19 countries
- → 190 markets
- → Worldwide service networks and dealerships



Share of net sales by market (2020)

Share of total employees (2020)

Countries with Volvo Group production

Innovation Objective in Volvo

The objective of innovation is to ensure competitiveness by engaging people with a supportive way of working



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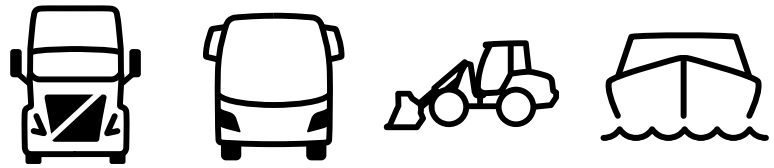
Innovation Tools

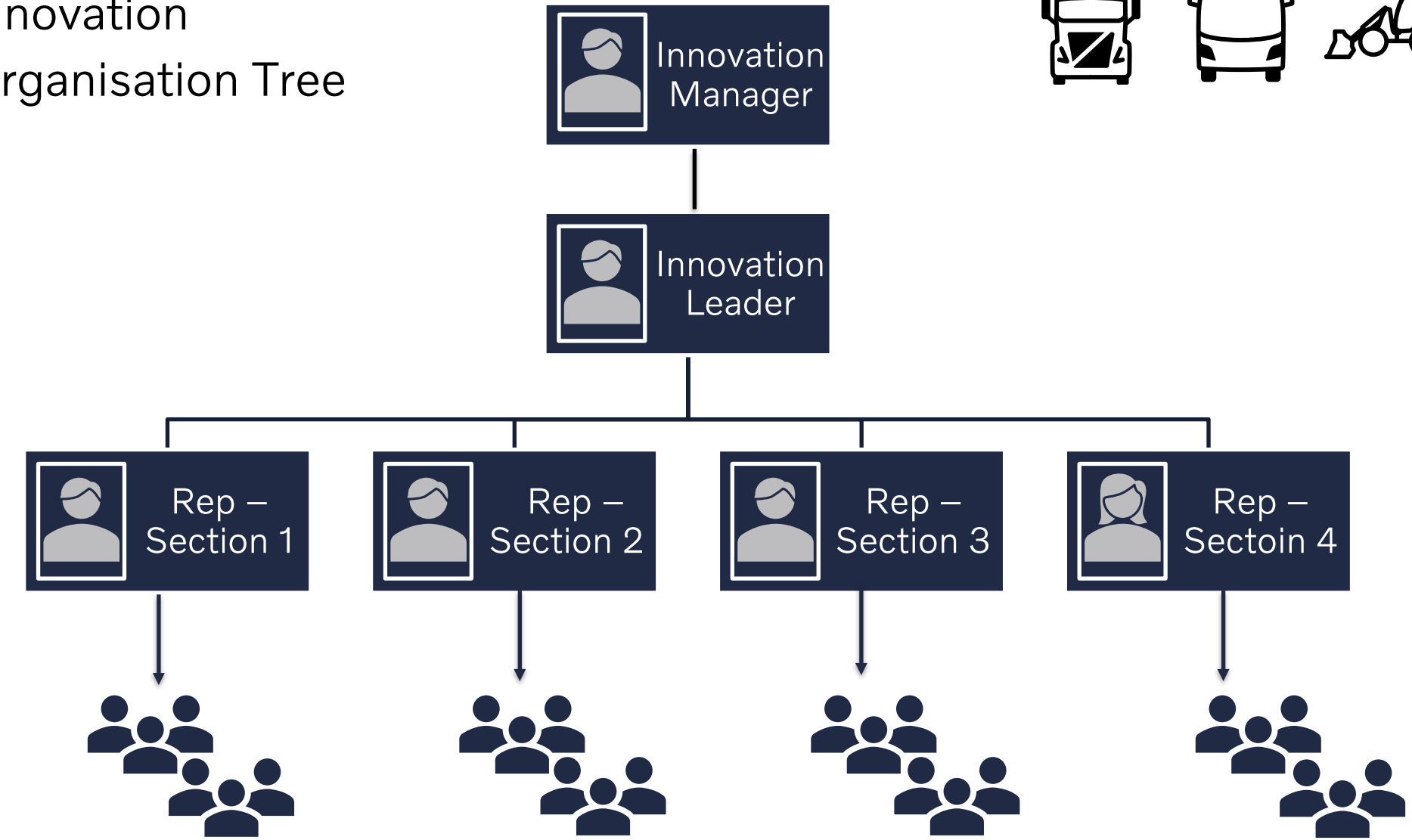
Activities & Events

Q&A



Innovation Organisation Tree





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New Ideas

Are responsible for filling-up the backlog of new ideas. Normally, they do not generate ideas themselves, but they stimulate others to generate new ideas

- Promote innovation, people must know that they are here to support them
- Every new idea must be presented with slides and with certain quality
- Facilitate prioritization, their ART must be presented with the ideas to accept or reject them and to take them into PI planning

Ongoing

They are responsible for keeping track of ongoing initiatives

- Ensure ART commitment to initiatives in PI planning
- Follow-up development progress and report about it
- Sometimes a new idea can form a thesis or an IP, in that case ensure they get started and follow progress

Done

They are responsible for terminating initiatives with a publication. The publication can be a recorded demo, proof of value, etc

- Make use of terminated initiatives to inspire others to come up with new ideas

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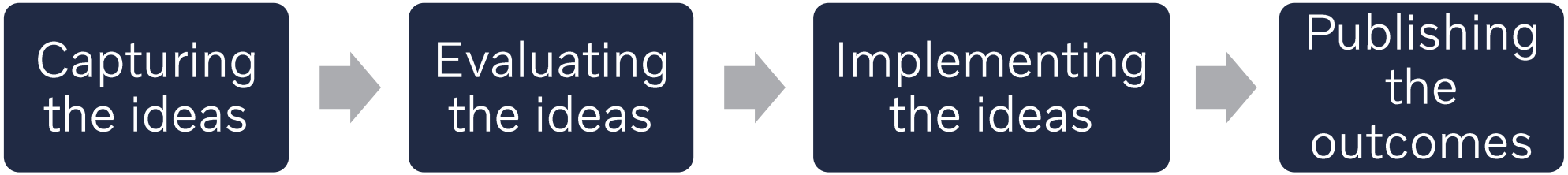
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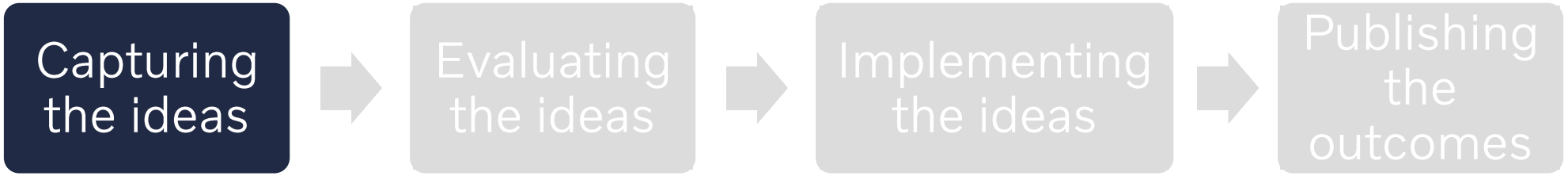
Q&A



Innovation Phases in Volvo

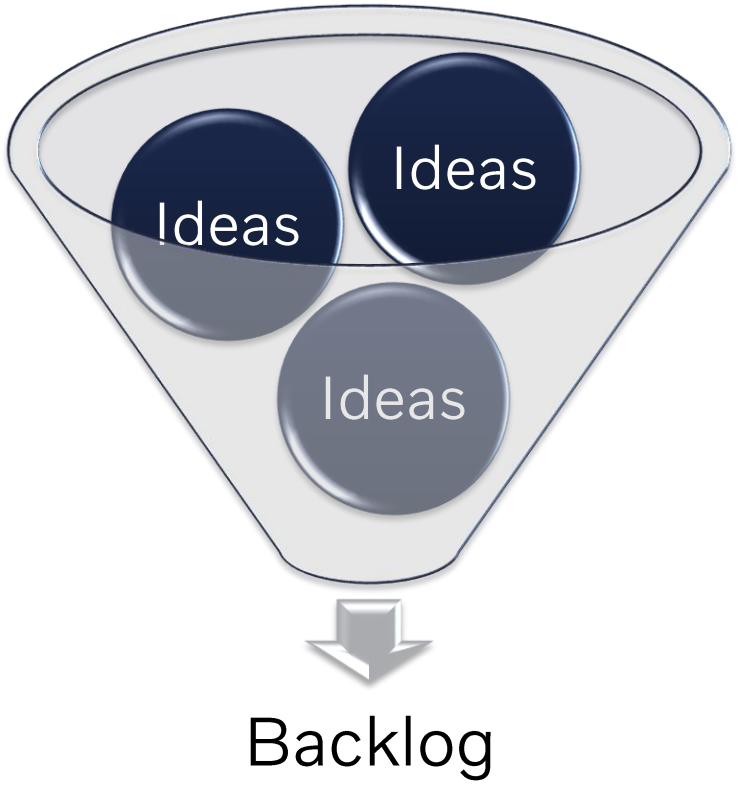


Innovation Phases in Volvo



1. Innovation Representatives

- Innovation representatives takes part actively in capturing the ideas by colloborating with employees in his/her section
- Supports/encourages the employees to focus on innovation, apart from the usual product deliveries
- Conducts awareness session once in every quarter
- Connects to the right network who can assist the idea initiator technically



2. Web portal

- Simplist and easiest way to share your ideas
- Just a click away
- Not very effective today

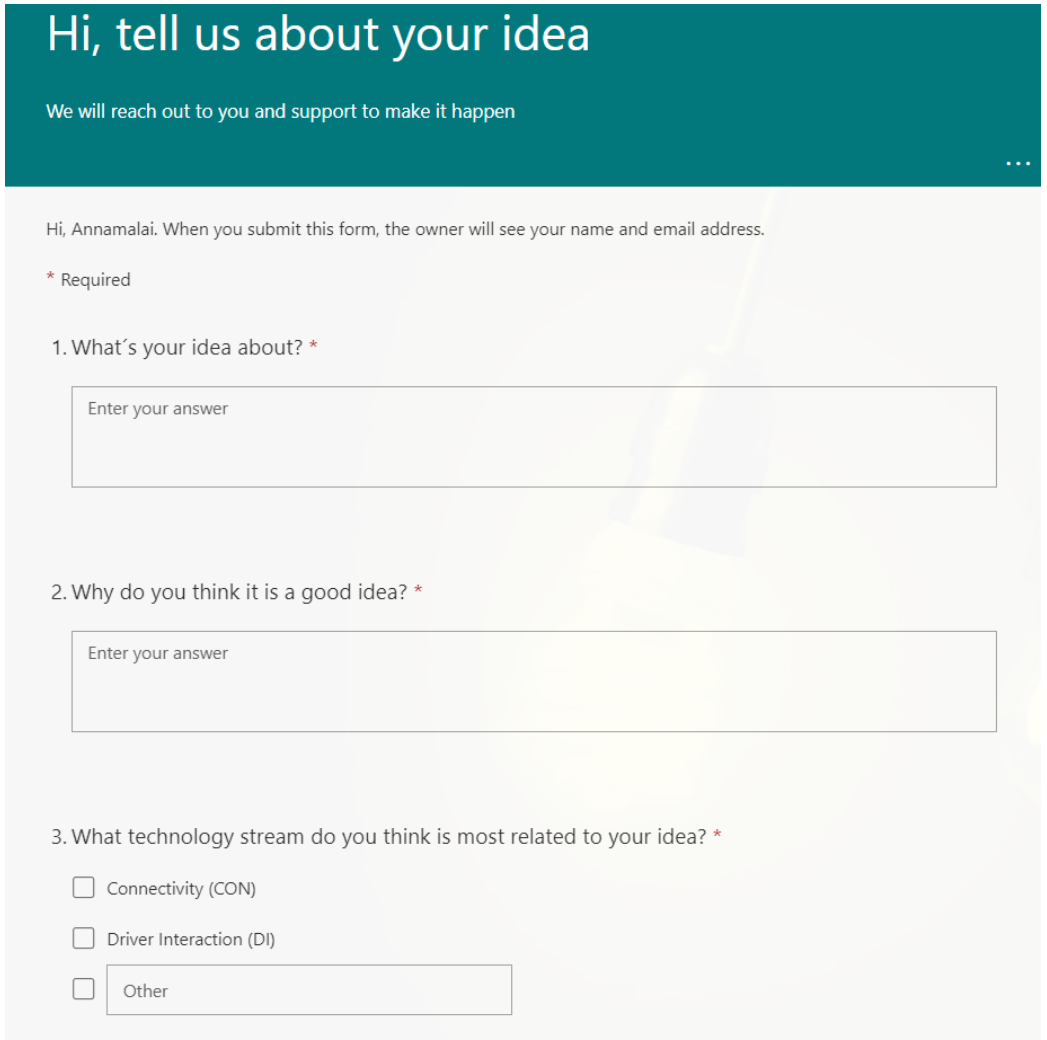


SHARE YOUR IDEA

Would you like to share your idea with us?
Click the picture to write to us

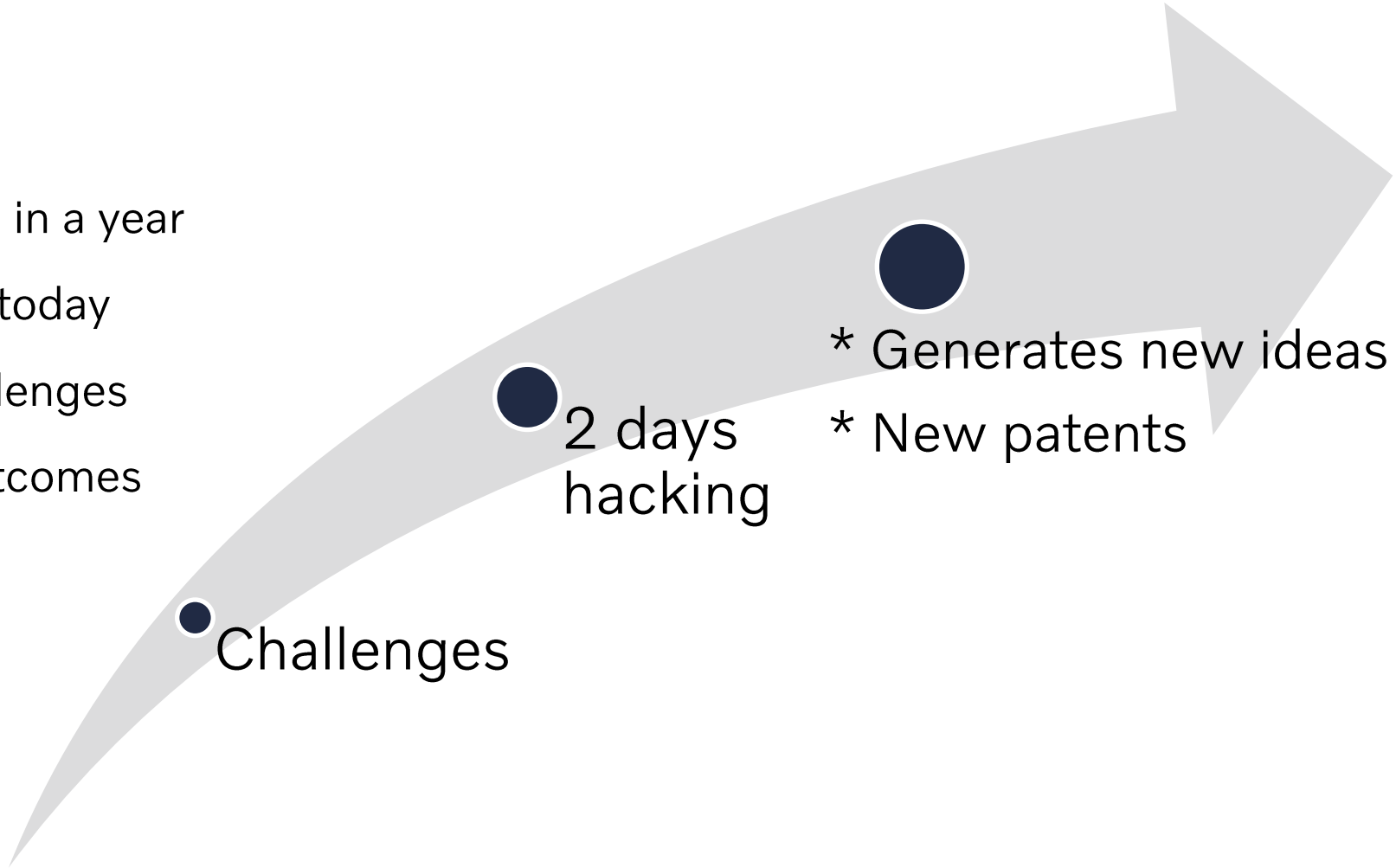
Idea Collection Form

- Not anonymous
- Minimal description about the idea
- Idea processing team



3. Hackathon

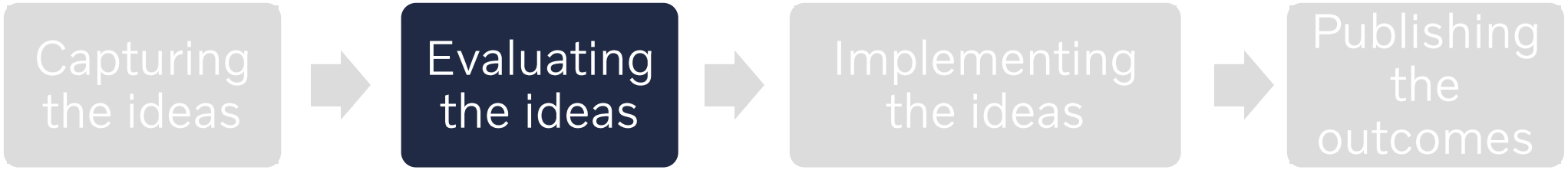
- 2 days event
- Happens once in a year
- Very effective today
- Industrial challenges
- Immediate outcomes
- Global event



4. Innovation Days

- A full day event in every PI (Program Increment)
- Not an organized event, rather self organized;
- Anyone can list any idea in a specific template which he/she wants to explore
- On an innovation day, work with ideas either individually or as a team
- Geared up recently in Volvo

Innovation Phases in Volvo



Evaluating the ideas

- On what Criteria:
  - What today's problem is addressed?
  - Novel idea?
  - Business oriented?
  - Viable?
- By whom:
  - Innovation Reference Team (IRT)
  - 12 members team
  - VPs, GTMs, PMs

* Higher the budget, Higher approval is needed (IRT, Sub-Technology Committee, Techology committee.

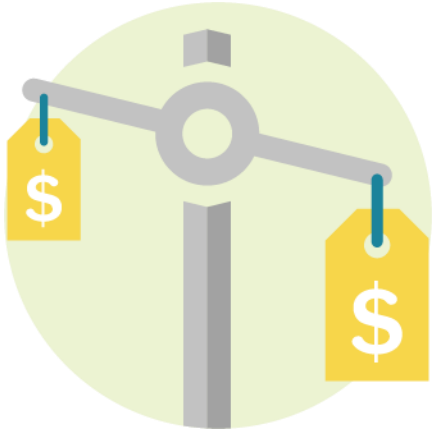
- How:
  - Summary Card
    - Provides an overview about
      - Author & the team
      - Estimated Budget
      - Value proposition
      - the problem & the solution
      - Business model

The 3 lenses of innovation



Customer Desirability

Does anyone need it?



Business Viability

Can we make money?



Technical Feasibility

Can we build it?

- Source: https://designthinking.ideo.com/

Customer Desirability

- Does someone enjoy your solution so much?
- Do you have an evidence, e.g., statistic data, to prove that your solution is wanted by our industry and/or by our customers?
- Does your solution satisfy the underserved need of someone and add extraordinary value to the society?
- If yes, then your solution provides a **realistic and solid product-market fit.**





Customer Desirability
Someone will enjoy your solution so much!



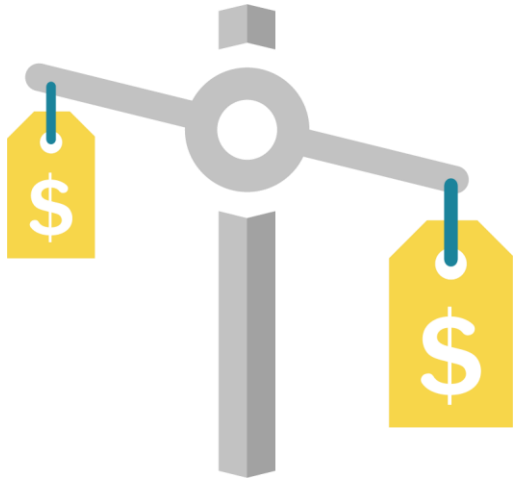
Business Viability
Your solution will make us lots of money!



Technical Feasibility
Your solution is easy to develop with current state of technology

Business Viability

- Will your solution make us lots of money?
- How much time and money our customers will save by using your solution?
- Can your solution lower our production cost by a lot?
- Can it help us to get rid of some “unnecessary” hardware or Can it help us optimize some process?
- If yes, then your solution provides a **compelling business case.**





Customer Desirability
Someone will enjoy your solution so much!



Business Viability
Your solution will make us lots of money!



Technical Feasibility
Your solution is easy to develop with current state of technology

Technical Feasibility

- Does your solution easy to develop with the current state of technology?
- Can our truck architecture very easily handle your solution, and Can you prove it?
- Perhaps, found a third-party supplier or startup that already commercializes part of your solution.
- Then, your solution is an **elegant technical solution, prototype and/or a roadmap to implement your idea.**





Customer Desirability
Someone will enjoy your solution so much!



Business Viability
Your solution will make us lots of money!



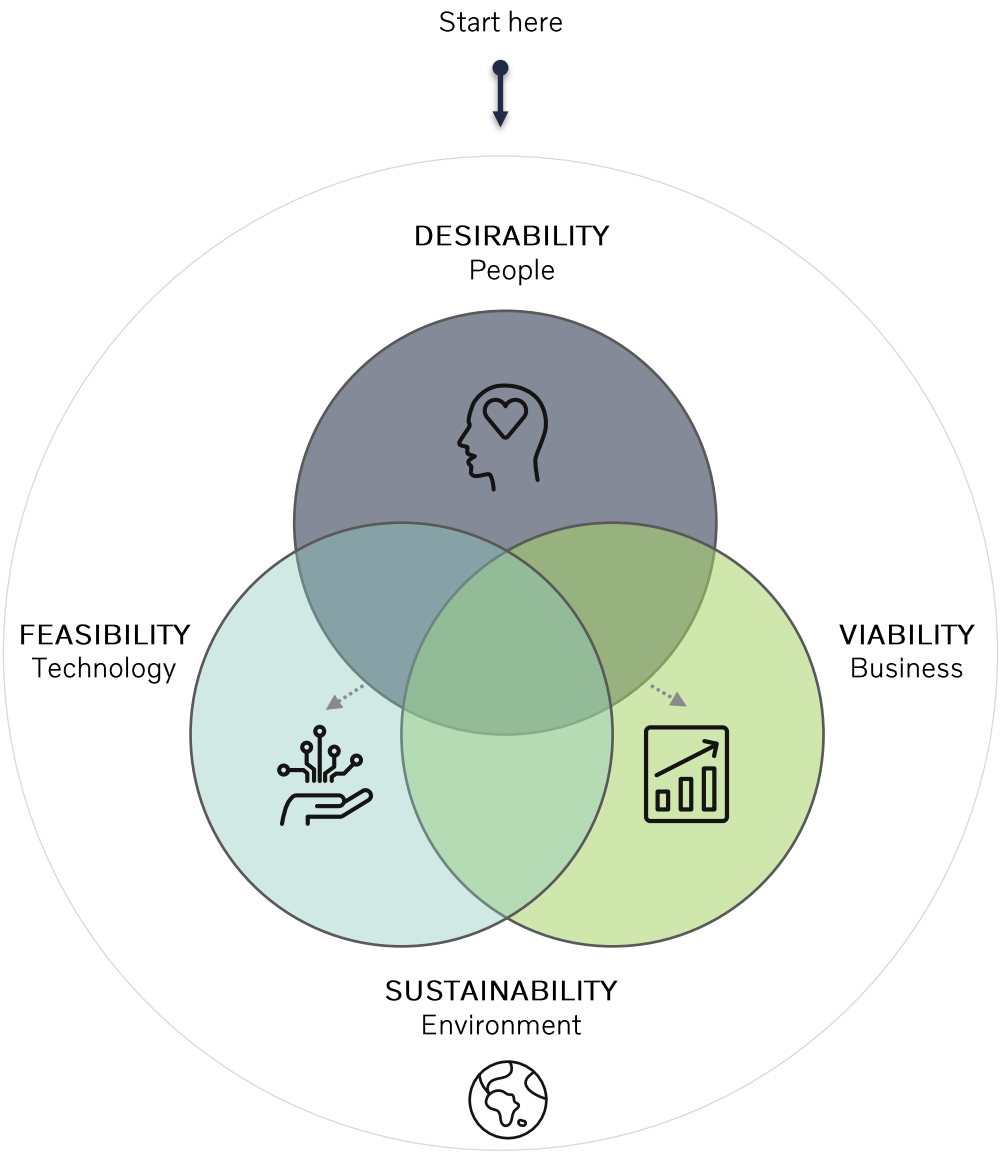
Technical Feasibility
Your solution is easy to develop with current state of technology

The 3 lenses of innovation

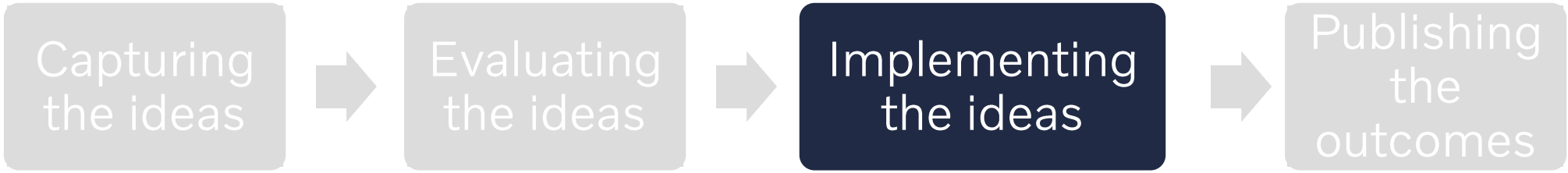
Approach

The process begins by examining the needs, wishes and behaviours of the people we want to affect with our solutions. We seek to listen to and understand what they want. We call this as the desirability lens. We then begin to view our solutions through the lens of viability and feasibility throughout the design process while keeping planetary boundaries always into consideration.

1. **Desirability** - What do people desire?
2. **Viability** - What can be financially viable?
3. **Feasibility** - What is technically and organizationally feasible?
4. **Sustainability** - What impact does the solution have on the environment?

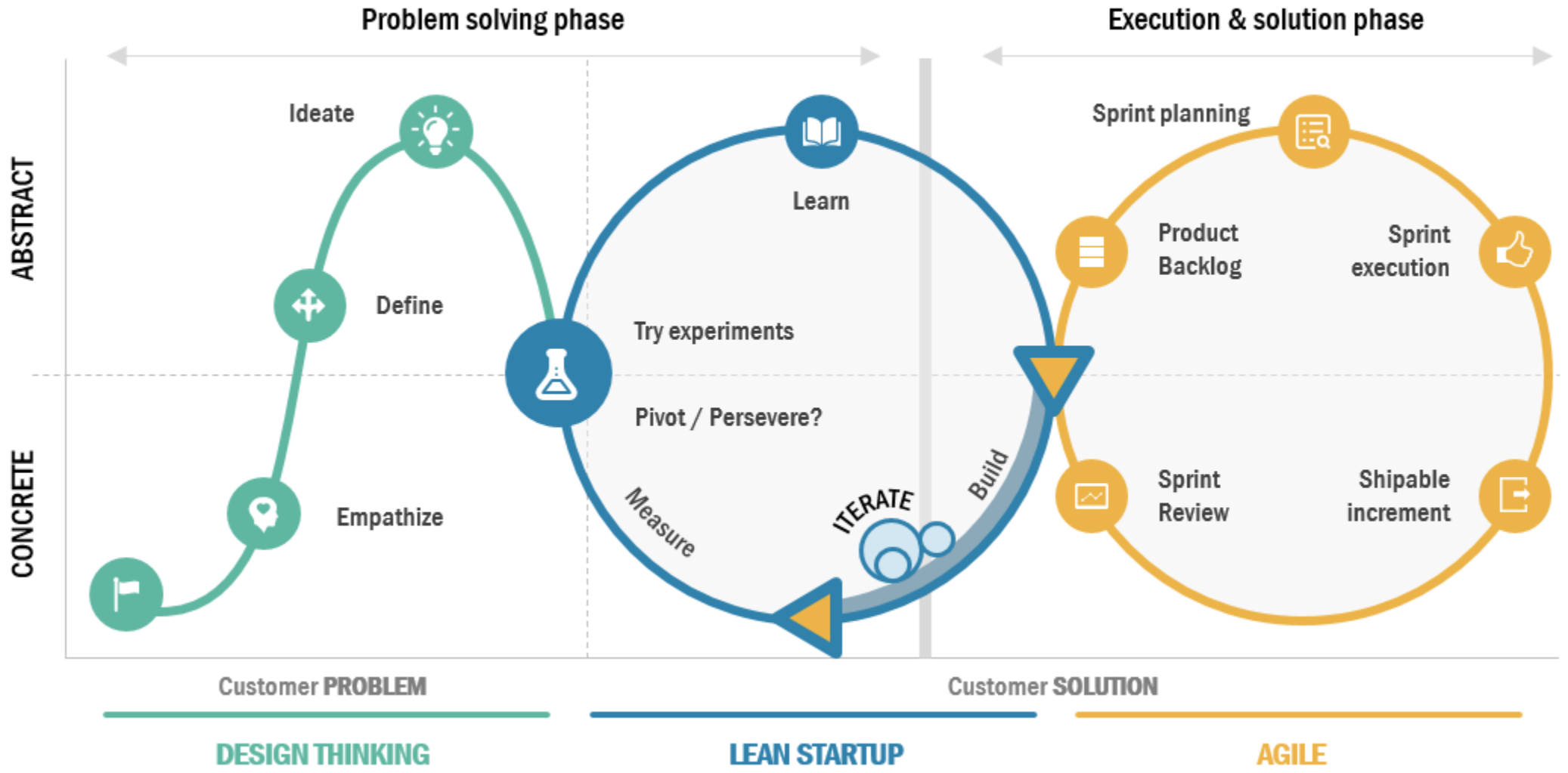


Innovation Phases in Volvo

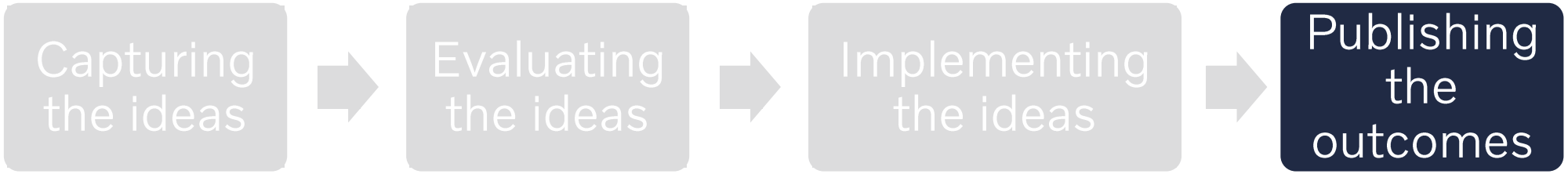


Implementing the ideas

- Ideas are implemented
  - By ART(Agile Release Train)
    - Simple & easy to implement
    - More relevant to the daily activities → Product backlog
    - Less time required
    - Possible to derive capabilities/features
  - Master thesis
    - Newer technology
    - Needs lot of prework
    - Moderate time required
  - R&D Division
    - Idea that needs lot of experiments and analysis
    - Unknown outcomes
    - Long time project
  - Patent
    - Novel idea


Problem solving phase
Execution & solution phase
ABSTRACT
CONCRETE
Ideate
Define
Empathize
Learn
Try experiments
Pivot / Persevere?
Measure
ITERATE
Build
Sprint planning
Product Backlog
Sprint execution
Sprint Review
Shipable increment
Customer PROBLEM
Customer SOLUTION
DESIGN THINKING
LEAN STARTUP
AGILE

Innovation Phases in Volvo



Publishing the outcomes

- Innovation fika
  - It’s a 30 minutes open event to inspire the minds at Volvo
  - Aims to spread innovation knowledge, culture, listen to visionaries and demo projects from around the Volvo Group
  - Swedish FIKA is served after the presentation
- Achievements:
  - 1 new startup are found from ideas last year → Fyrqom (automatic identification and localization of truck wheels)

Fyrqom

New venture spin-off company partially owned by Volvo

Roman Iustin (Volvo Employee) invented technology for automatic identification and localization of truck wheels integrated sensors. The invention became as an asset of a new startup venture, participated by Volvo Technology, Roman and other partners. The newly founded company, Fyrqom AB, will develop and commercialize technology and services for assembly lines, workshops and tire fitting centers within the area of automatic wheel sensors localization and readings. For workshops and assembly lines, the solution will automatically detect the wheel location on a vehicle and therefore automatically calibrate its Tire Pressure Monitoring System (TPMS).







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Q&A



Innovation Framework

Focus Areas



In-house Deliveries

Mature tech and services developed in-house. i.e., POC



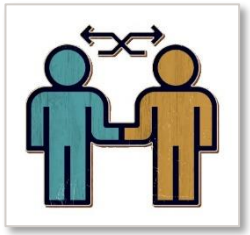
Innovation Fika

TED Talks in 30 minutes format with motivational speakers



Academia

Pool of thesis proposals with student guidelines



Publicly Funded

Publicly funded research, collaboration with third-parties



Innovation Days

One dedicated full day for innovation per PI



Patents

Heroes panel, follow-up on IP targets



Start-ups

Ventures that we start and the best from incubators



Hackathon

Real-life challenges to be solved in a 2-days competition

Hackathon



Innovation Days



In-house Deliveries



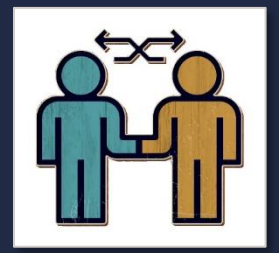
Start-Ups



Patents



Publicly Founded



Academia



Innovation Fika



Create Backlog

Take Action

Share Results

VOLVO

Innovation Framework

Homogeneous method to manage bottom-up innovation across streams

Description of ideas/scope

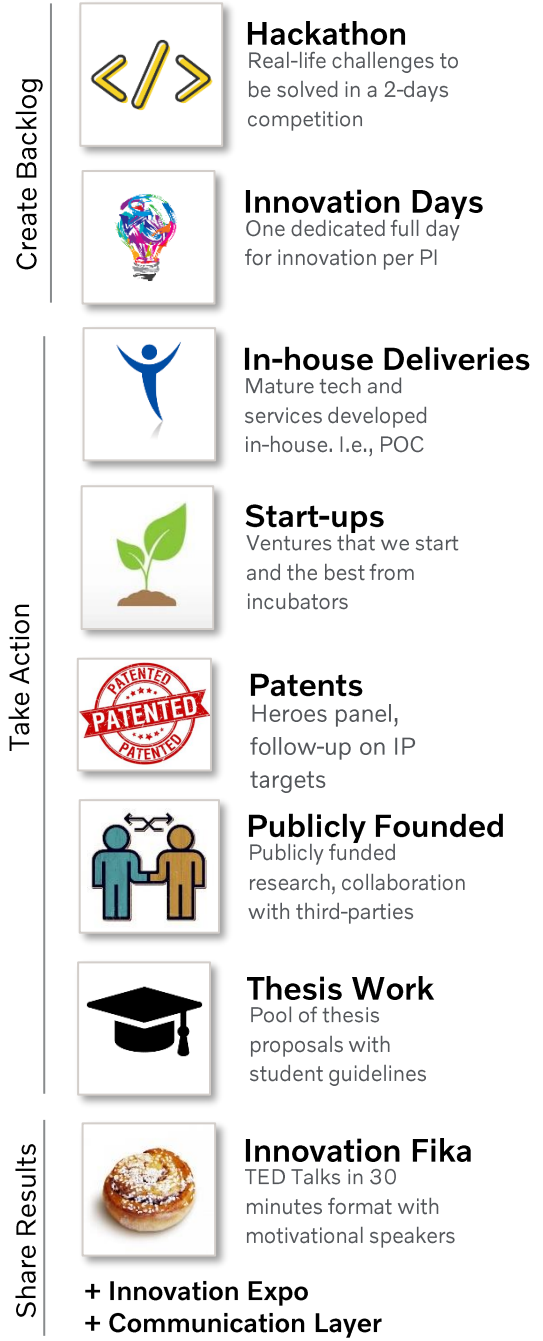
- Management framework to guide focus of innovation leaders

Expected benefits

- Synergies and backlog collaboration between participating streams
- We all leverage a common way of working off-the-shelf

Efforts/cost

- Every stream must have an Innovation Leader. It must be clear who runs the Innovation Framework, that work requires at least 50% dedication per stream
- One Innovation Coach to onboard and support innovation leaders with framework implementation
- Time and material cost related to every focus area, e.g., pay and supervise thesis students, time to attend innovation events, etc.



8 Focus areas

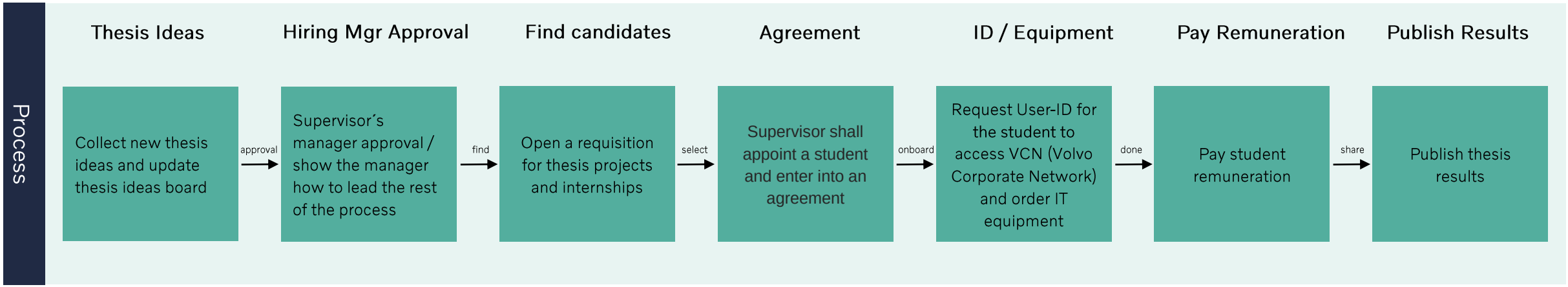
- In house deliveries
  - –To mature the product and services developed in house.
  - –Such ideas gets into the product backlog
- Publicly funded:
  - –External collaboration with governments and academia

- Startups:
  - Focus is to partner with startups to co-create sustainable transport solutions in areas of logistic services, electromobility services, and shared mobility.
  - Volvo Group partners with world leading startup incubators to speed up innovation process
    - DriveTLV (https://www.drivetlv.com/),
    - MobilityXlab https://www.mobilityxlab.com/)
    - Plug and Play (https://www.plugandplaytechcenter.com/)

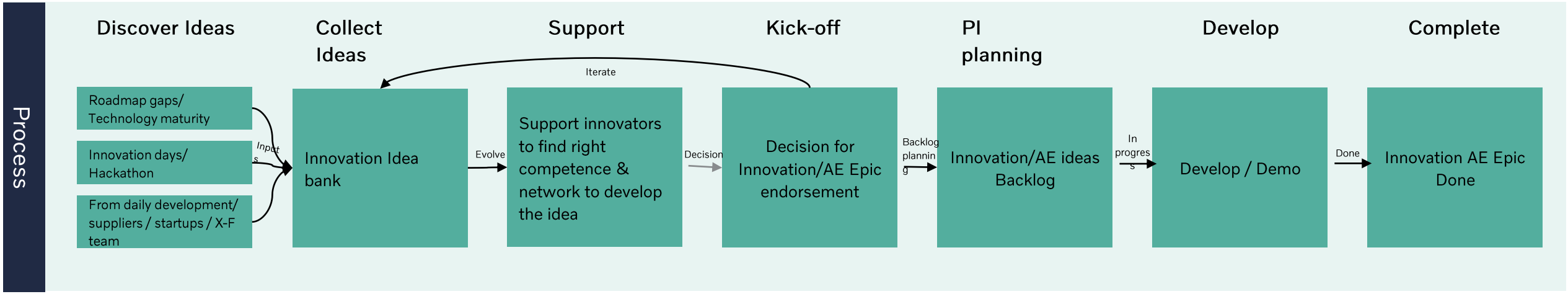
8 Focus Areas – Contd.,

- Innovation Fika:
  - –Publishing the outcomes to inspire more minds in Volvo with FIKA
- Innovation Days:
  - –1 full day to work on something that is interesting for you
  - –Occurs once in every 10 weeks
- Academia:
  - –Thesis proposals are presented to the academia
  - –To attract fresh and unbiased minds
  - –Can come and work with us
  - –Opportunity to spread the volvo culture to students

Process: Thesis



Process: In-house Deliveries



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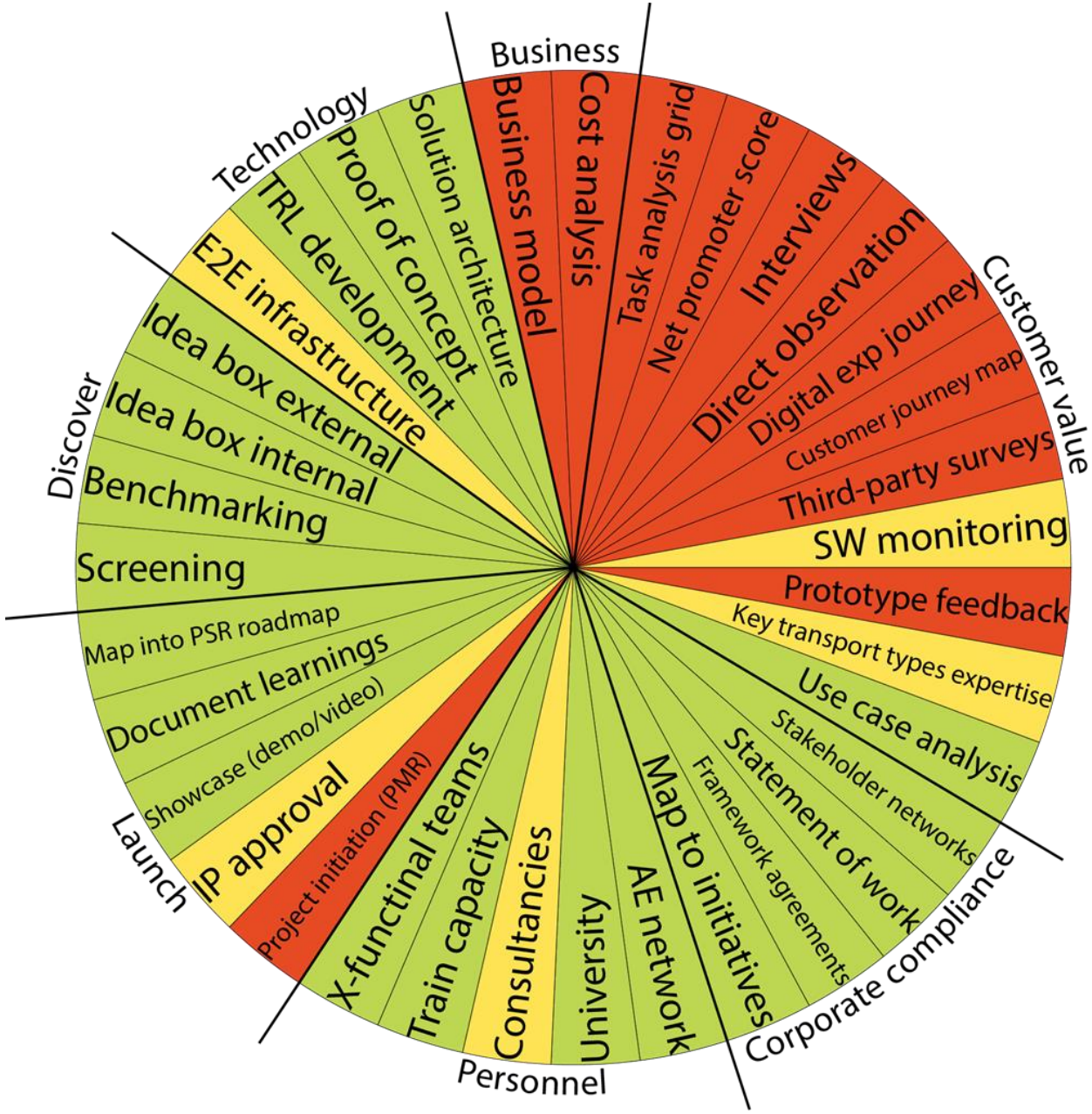
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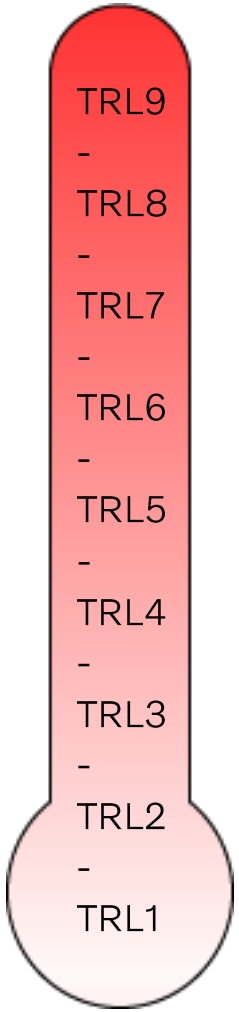


Innovation Tools

- Categotized into
  - Discover
  - Technology
  - Business
  - Customer Value
  - Corporate Compilance
  - Personnel
  - Launch



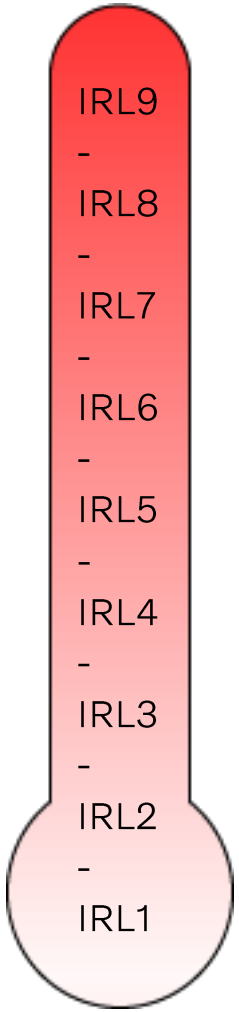
Technology Readiness Level (TRL)



TRL9	System proven through successful mission operations
-	-
TRL8	System completed and qualified through test and demonstration
-	-
TRL7	System prototype demonstration in an operational product/process environment
-	-
TRL6	System model or prototype demonstration in a relevant product/process environment (platform, machine, vehicle)
-	-
TRL5	Component and/or breadboard validation in a relevant environment
-	-
TRL4	Component and/or breadboard validation in a laboratory environment
-	-
TRL3	Analytical and experimental critical function and/or characteristic proof of concept
-	-
TRL2	Technology concept and / or application formulated
-	-
TRL1	Basic principles observed and reported

Source: https://en.wikipedia.org/wiki/Technology_readiness_level

Investment Readiness Level (IRL)



IRL9	Identify and Validate Metrics That Matter
-	-
IRL8	Validate Value Delivery (Left side of Canvas)
-	-
IRL7	Prototype High-Fidelity Min. Viable Product
-	-
IRL6	Validate Revenue Model (Right side of Canvas)
-	-
IRL5	Validate Product / Market Fit
-	-
IRL4	Prototype Low-Fidelity Min. Viable Product
-	-
IRL3	Validation Problem / Solution
-	-
IRL2	Market Size / Competitive Analysis
-	-
IRL1	Frame Hypotheses / Complete First-Pass Business Model Canvas

Source: https://steveblank.com/2014/07/01/how-investors-make-better-decisions-the-investment-readiness-level/

Technology Readiness Level

System test, launch & operations

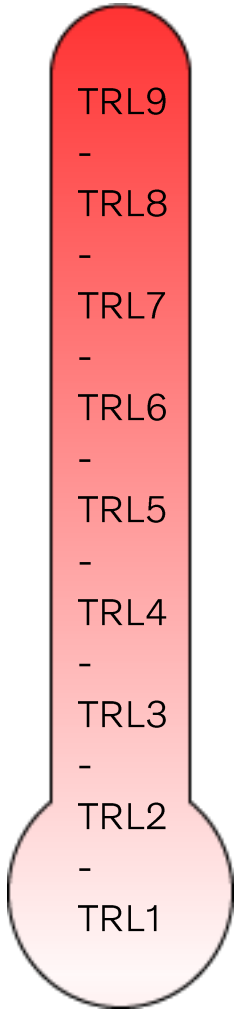
System/subsystem development

Technology demonstration

Technology development

Research to prove feasibility

Basic technology research



+

Investment Readiness Level

Metrics that matter

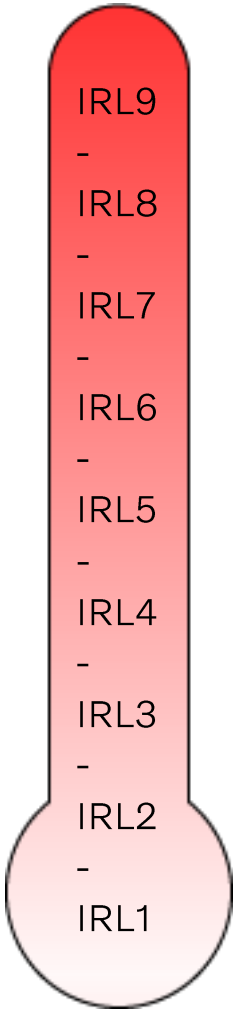
Validate left side of canvas

Validate right side of canvas

Product / market fit

Problem / solution fit

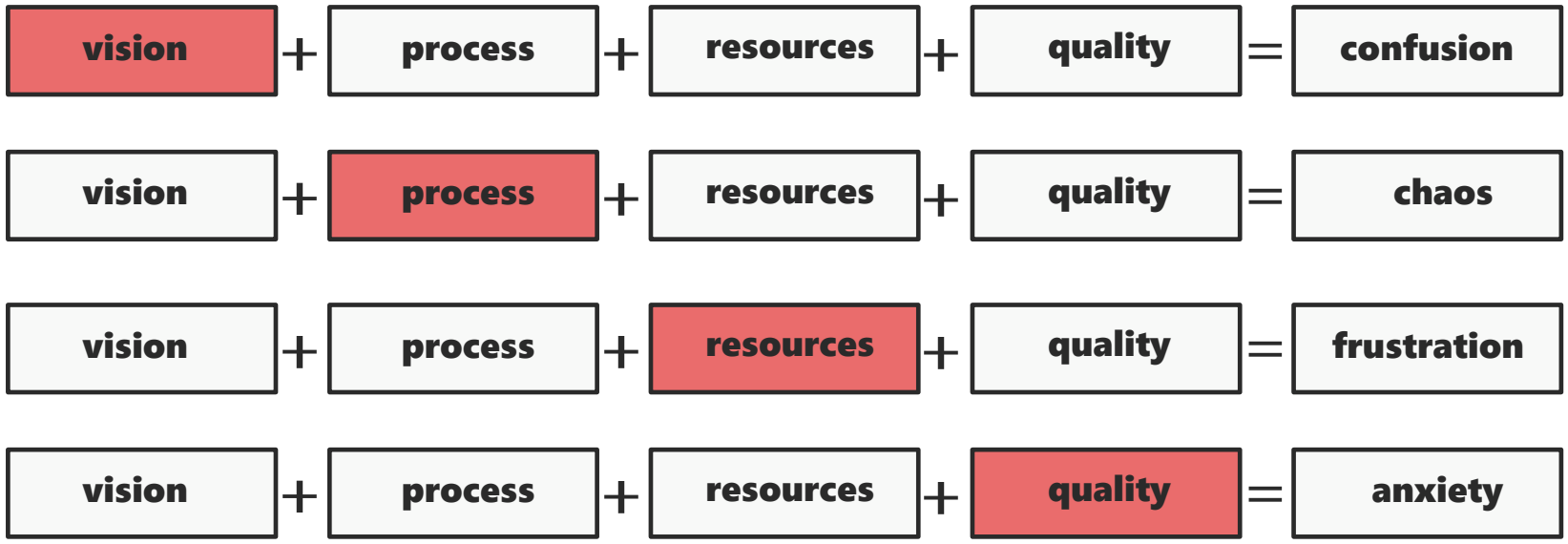
Hypothesis



Sucessful Change Requires a Few Things



Typically Something is Missing



The three types of Innovation

TYPE	DESCRIPTION	IMPORTANCE
Managements & Work Organizations	The use of human resources	Enhances a better work environment, therefore creates better internal culture
Processes & Workflows	The methods of achieving tasks	Increases productivity, therefore lowers cost
Products & Services	Creating tangible goods or offerings for internal / external use	Opens up new markets and leads to consumer interaction, therefore helps with societal problem solving

Source: https://www.johndukelogan.com/blog/what-are-the-3-types-of-innovation

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Hackathons

Hackathon is a kind of contest with rewards, where IT enthusiasts create micro projects and software prototypes. Hackathon endures **24 through 48 hours non-stop**. Organizers provide **equipment, place and pizza**. Participants bring their brains and enthusiasm. Hackathons usually help to increase creativity and motivation of self-organizing teams

The Challenges

Hacking is creative problem solving. A hackathon challenge defines a particular challenge or issue of importance. The challenge should address a situation, state, or event which meets a real need and inspire new and creative thinking

It´s responsibility of the organizers to ensure that the challenges proposed for the hackathon align to our company´s short- and long-term strategies





Main Incentives

Exemplify culture of collaboration across departments

Stimulate IP creation & innovation culture

Exposure and solving real-life challenges in key strategical areas

Generate a backlog of ideas with potential business value



Main Incentives

Accelerates innovation

Fastrack ideas to implementation

Diversity drives innovation

Trust is an accelerator and an essential element of innovation

Stakeholders

It´s important to engage stakeholders that are ready to invest in the backlog of ideas that will result from every hackathon. The ultimate result is to make some of the ideas become part of our solutions offering



Hackathon #3

PARTICIPANTS FEEDBACK

"Thanks for giving me the **opportunity to meet some new colleagues**! I've learned a lot about potential areas for self-improvement"

PARTICIPANTS FEEDBACK

"Possibility to try something different to the normal everyday tasks. Learn new things outside my usual work scope. That **cultivates innovative thinking**"

PARTICIPANTS FEEDBACK

"Great way to inspire creativity and interesting real-life use cases to explore. **Focused problem solving,** concepts were inspiring they helped me literally **find my passion**"

Activities Calendar



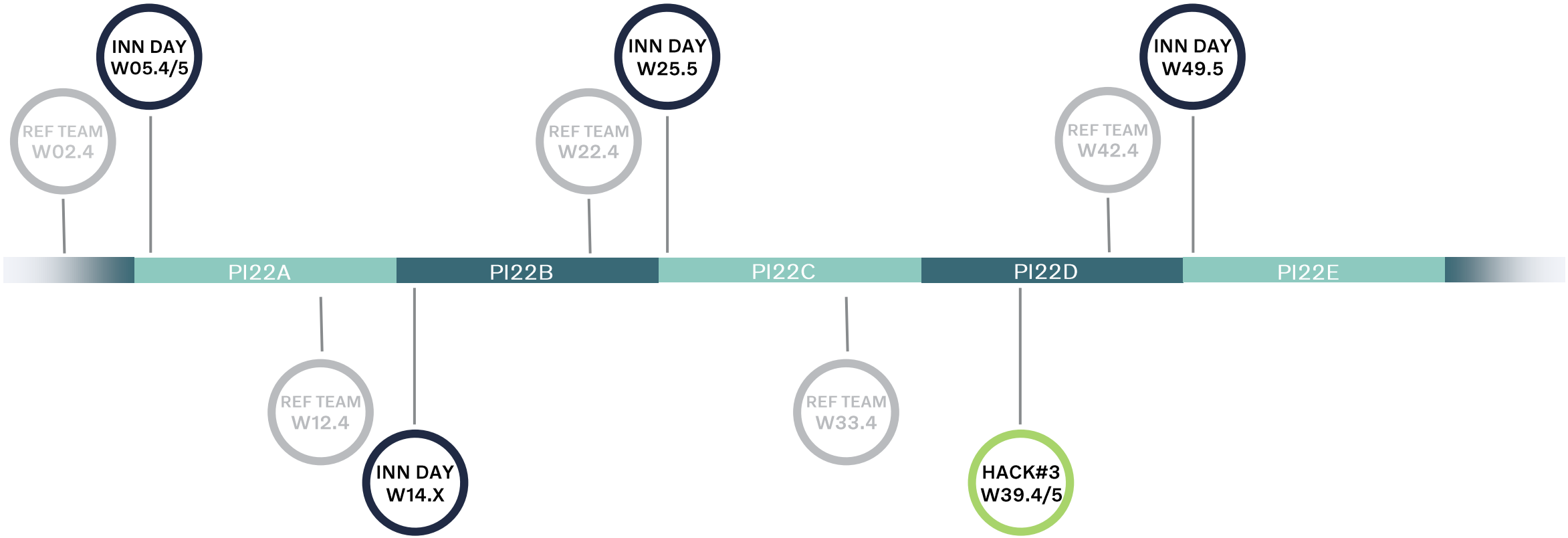
Innovation Days

One dedicated full day for innovation per PI



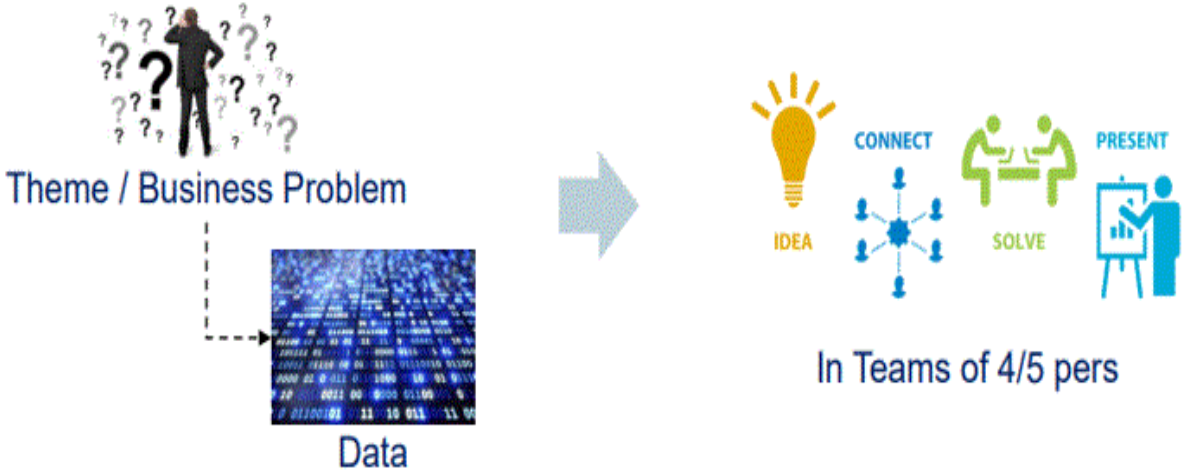
Hackathon

Real-life challenges to be solved in a 2-days competition



Analython

- A friendly team competition in which colleagues with diverse backgrounds collaborate intensively during a short time to solve a data-driven business problem, to create usable analytics outputs and to present it to their peers.



Hyper Island - HackSprint

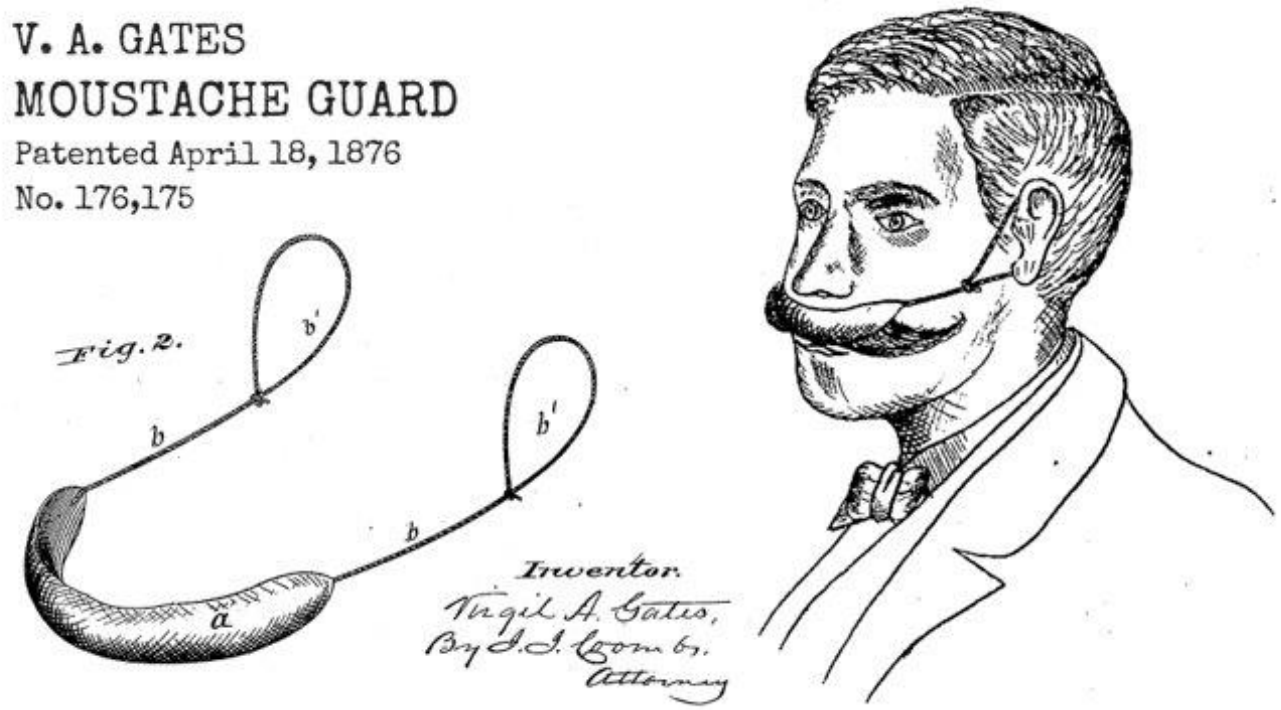
Similar activity hosted by VGCS - Innovation Lab, located in Sweden and Silicon Valley.



Final Slide - Motivation

INNOVATION IS NOT BIG,

rather it is a small step above something BIG, perhaps.



Topic Roadmaps

Volvo

Innovation Organization

What Innovation representatives do?

Innovation Phases

Innovation Frameworks

Innovation Tools

Activities & Events

Q&A






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WE SHAPE THE WORLD
we want to live in

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