

The impactful TTO

Activities and best practices from Luleå, Sweden

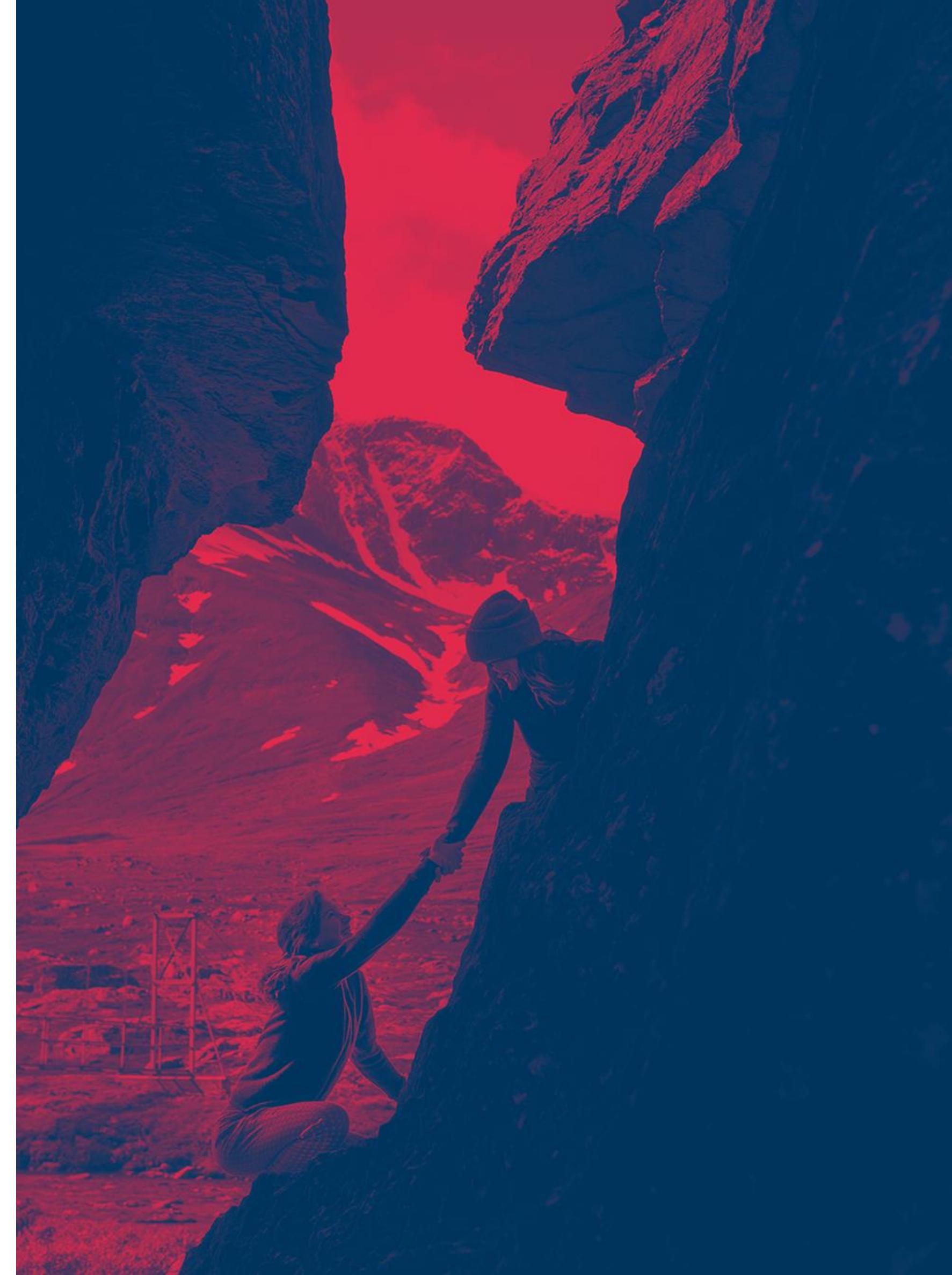
Alexander Bergström

Johanna Vesterberg

May 2022

AGENDA

- About us and LTU Business
- How we generate a consistent inflow of ideas
- The benefit of working with early ideas
- Innovation Due Diligence
- Examples from our daily work



This is us!

Alexander Bergström



Johanna Vesterberg



We work as Management consultants at LTU Business

- Primarily work with strategy and innovation management
- Work with different industries:
 - Mining and mineral exploration
 - Space
 - Green energy
 - Tourism
 - ...
- Working with different kinds of organizations:
 - University
 - Start-ups
 - SME
 - Large companies
 - Public and private



Who are you?

- Name
- Role
- Organization

LTU Business

LTU Business is the **tech transfer office** (TTO) of Luleå University of Technology (LTU)

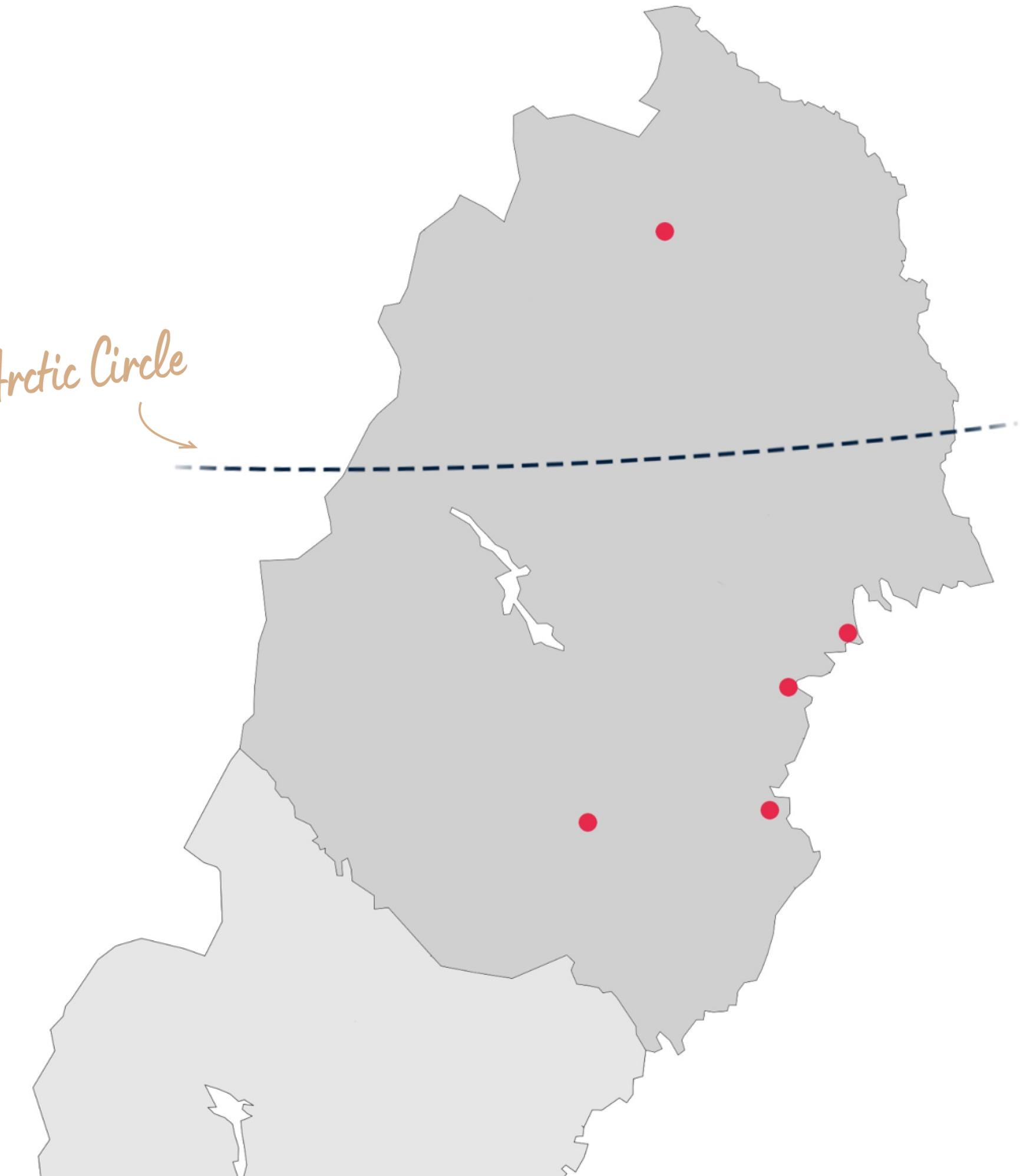
- but also, the largest **business development company** in northern Scandinavia - specializing in **Innovation Management**

Fully owned by Luleå University of Technology

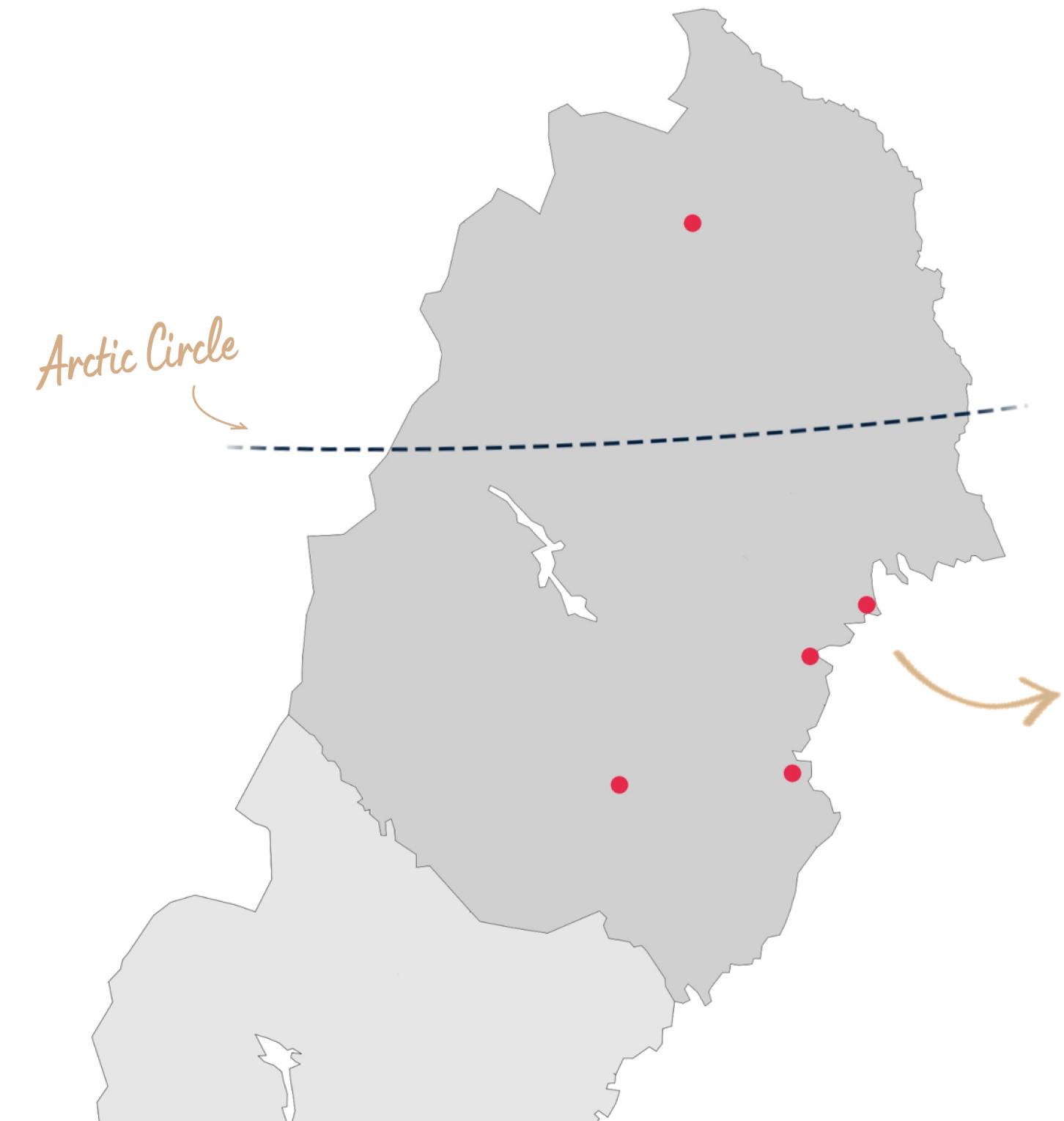
Non-profit organization

Some figures:

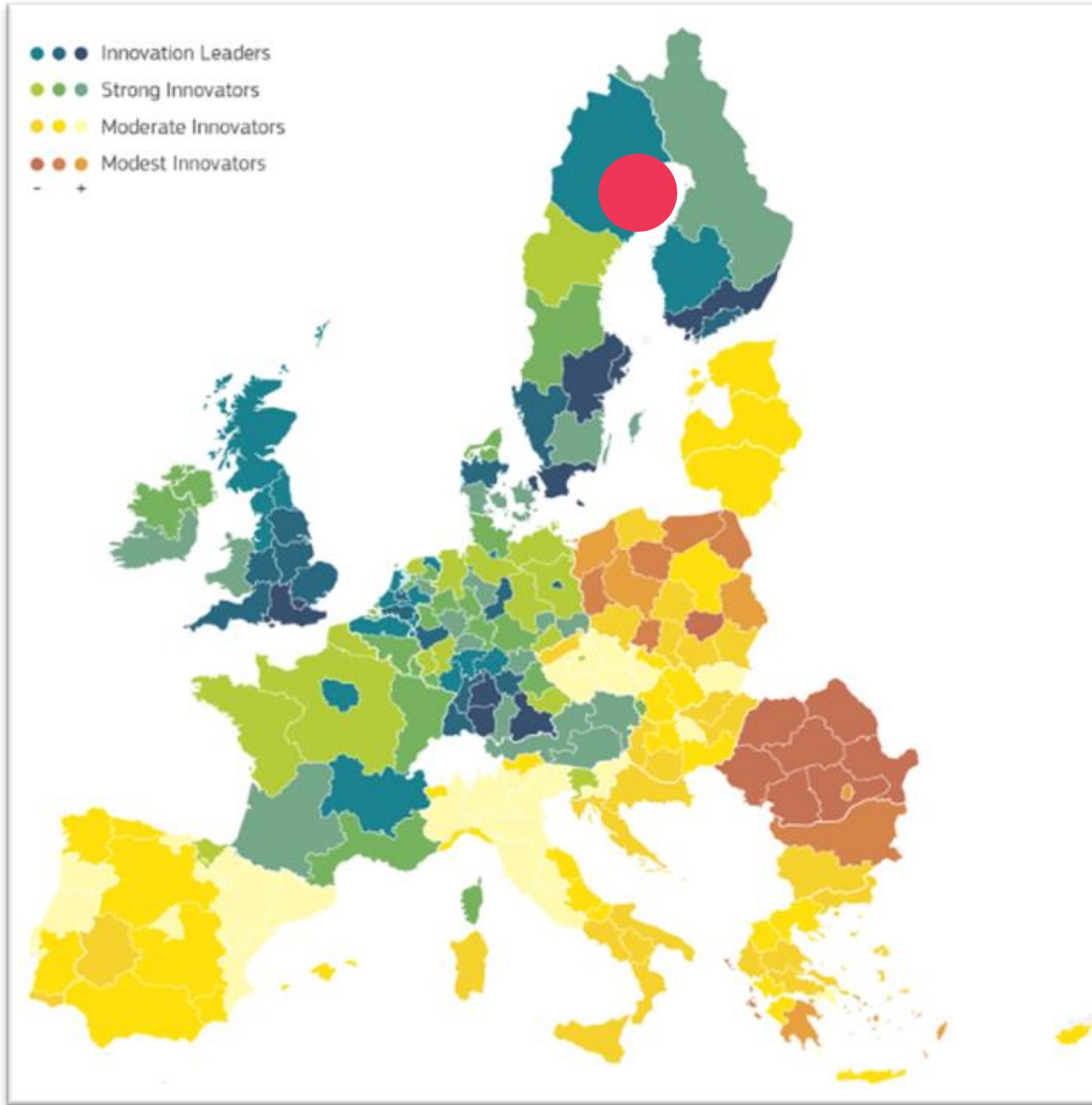
- Participates in 28 EIT RM projects
- Test and validate >200 ideas p.a. from LTU + 150 ideas from SMEs
- Participates in 7 test-site projects, and multiple national/international innovation projects within mining, energy, space, and Big Data
- Consults larger companies and organizations in Innovation strategy
- Appr. 40 consultants work at LTU Business



We live in the north!



Northern Sweden – a unique innovation hub



We're operating in an innovation Hot-Spot!

- **Sweden ranks #1 in European Innovation Scoreboard**
- **Sweden is highly successful in creating startups (per capita)**
 - Key start-up cities: Stockholm, Gothenburg, Malmö, Luleå, Linköping
 - Stockholm has the second-largest concentration of billion-dollar new companies (unicorns) per capita in the world
- **1,100 billion SEK is currently being invested in Northern Sweden** 2585 billion CZK
 - Renewable energy
 - CO2-free iron
 - CO2-free steel
 - Large scale battery production and recycling
 - Large scale mine-waste extraction of REE
 - Mainland Europe's first spaceport
 - ...

Our mission - and role in the innovation ecosystem

Our overall aim is to **support collaborations between academia and society**, with a focus on the business sector as well as the public sector in northern Sweden and Europe.

LTU Business has the **role of transforming new research and innovations to products and services in the commercial marketplace**, developing commercialization strategies and verifying market potential.

What is your role in the innovation ecosystem?

What are the challenges?

We are striving for involvement early in the process

Our involvement consists mainly of:

Projects

- Writing project applications
- Discussions and workshops regarding ideas with industry partners – *long before large investments are made*
- Connecting industry and academia to network
- ...

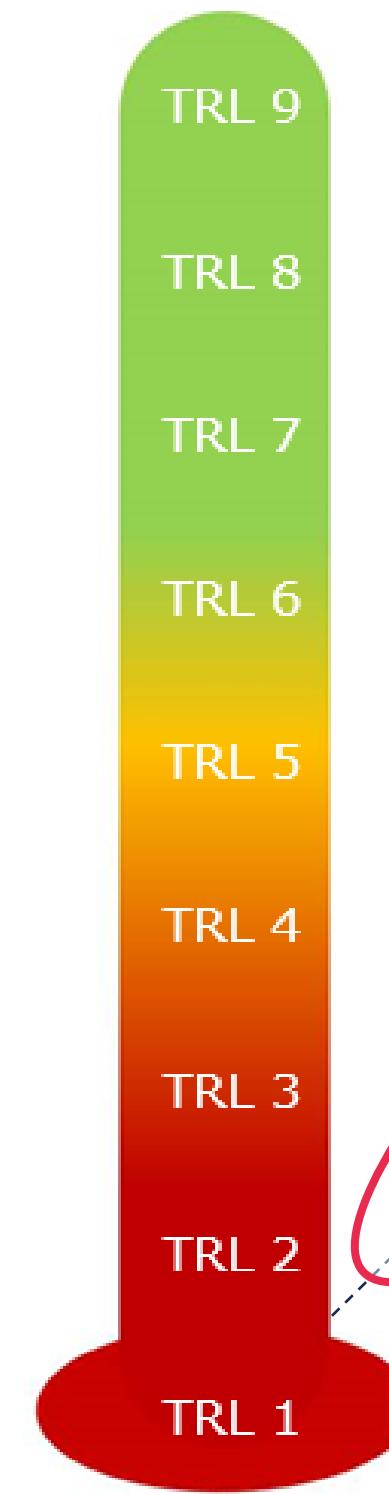
Participating in education

- Aiding PhD:s and students with idea generation
- We are a part of several courses at the university
- ...

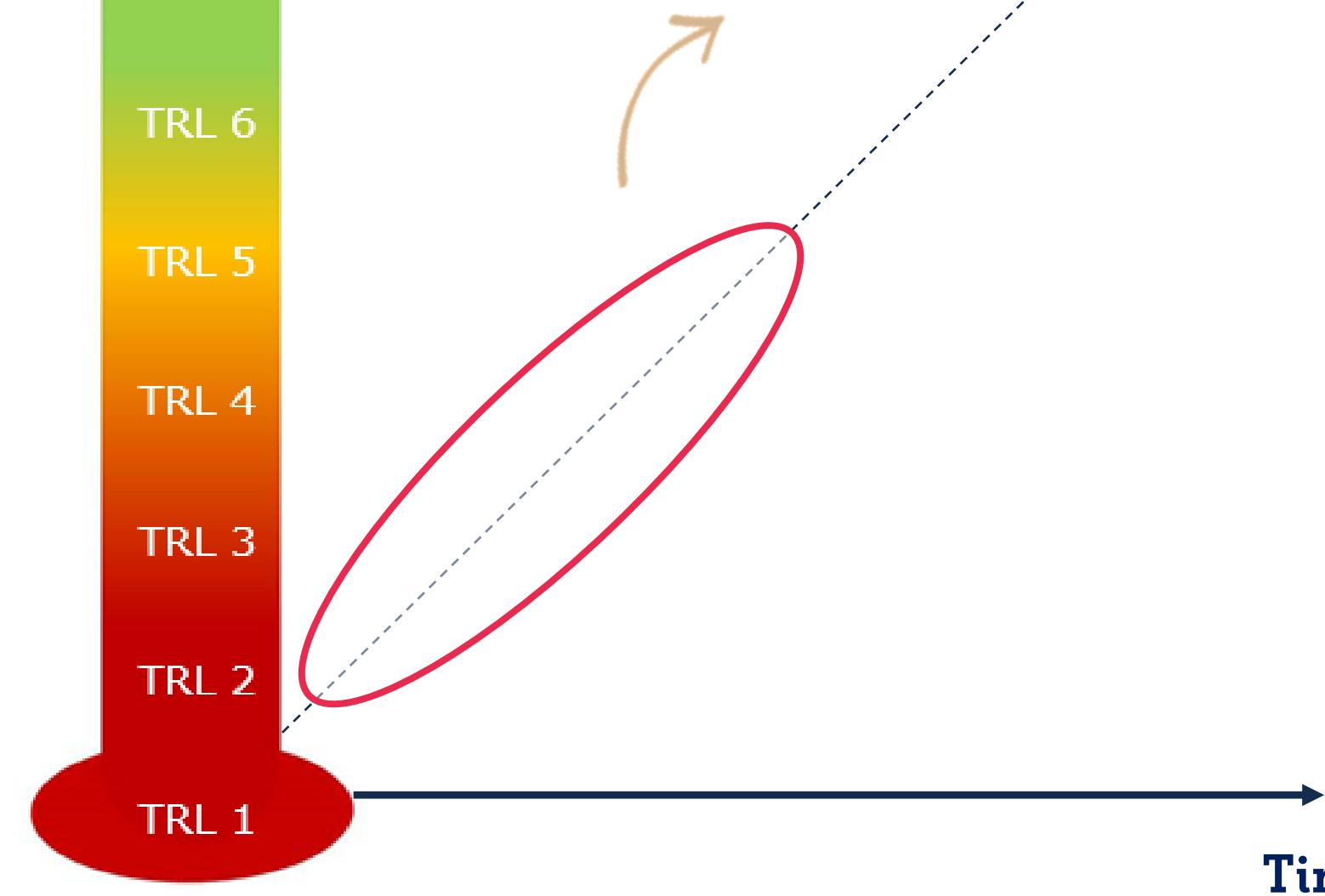
Consultation services

- We provide individual consultation for students, PhD:s and researchers at the university (academic side)
- We coach innovation managers, R&D staff and entrepreneurs in innovation management (industry side)
- ...

Technology Readiness Level



We want to be involved at an early stage



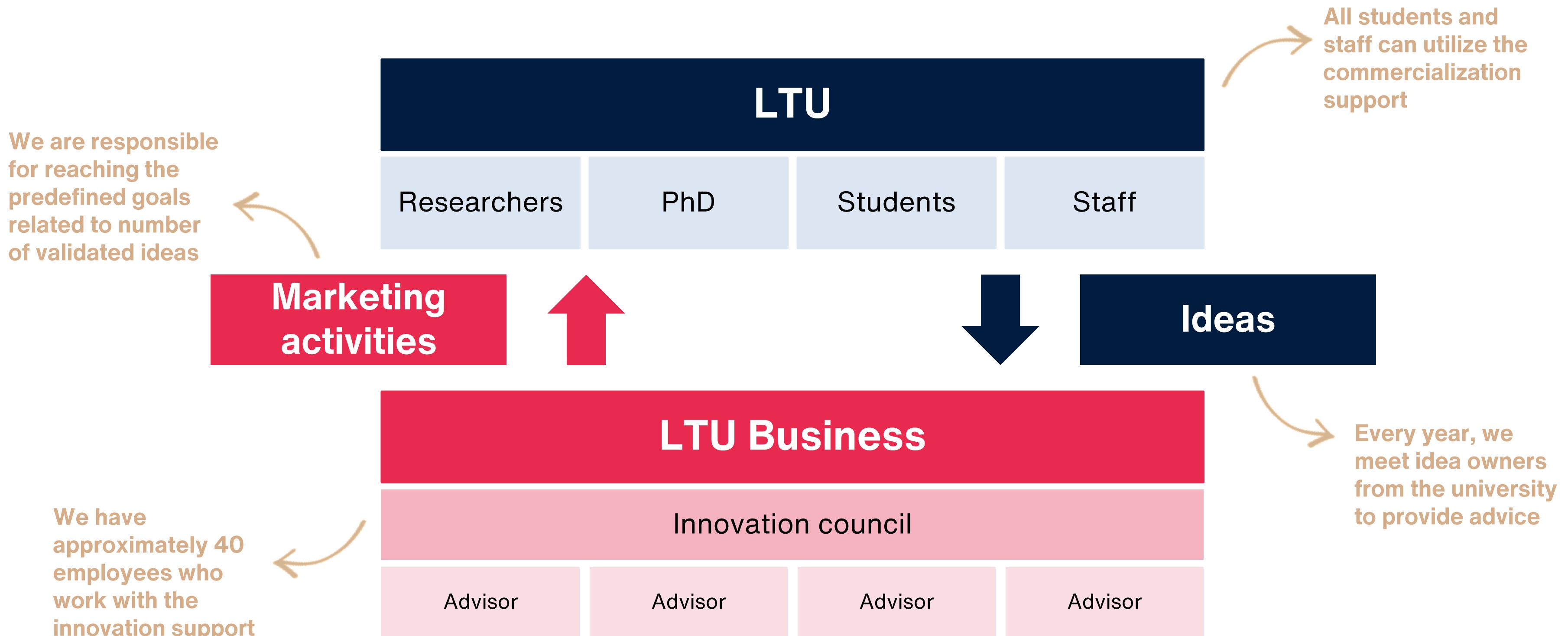
Time

**How mature are
the ideas and
innovations you
work with?**



We offer to consultation to everyone at LTU

- Resulting in new startups, patents, licenses, etc.



We at LTU Business are responsible to ensure a continuous inflow of ideas from the university



Networking



Information



Events

Our overall learnings



It can't be forced – you need incentives to get it going – e.g., funding for projects for researchers or strong merits for students



Adapt to different target groups – even within some programs there are differences



It HAS to be relevant and real – both for companies and researchers, otherwise it won't last



Try to offer something a bit different than what exists on campus – e.g., "after workshop" where senior professors are invited to discuss specific areas in a very different setting



Show success stories – use examples to demonstrate the value generated

Our overall approach and strategy

- Create relevancy and capture champions early



Work actively to ensure supply and demand match – e.g., understand the market demands to affect research



Keep engagement relevant – segmentation is needed to align incentives and activities



Capture them early on – We want to be there when the academic career starts



Construct solid programs and give it time – Cultures don't change fast so don't give up right away



Leverage and build external networks – Impact research by bringing industry closer

Overall learnings and success criteria we strive for

Our overall learnings



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Try to offer something a bit different than what exists on campus – e.g., “after workshop” where senior professors are invited to discuss specific areas in a very different setting

- Also breaking siloes between research areas



It takes time

Success criteria

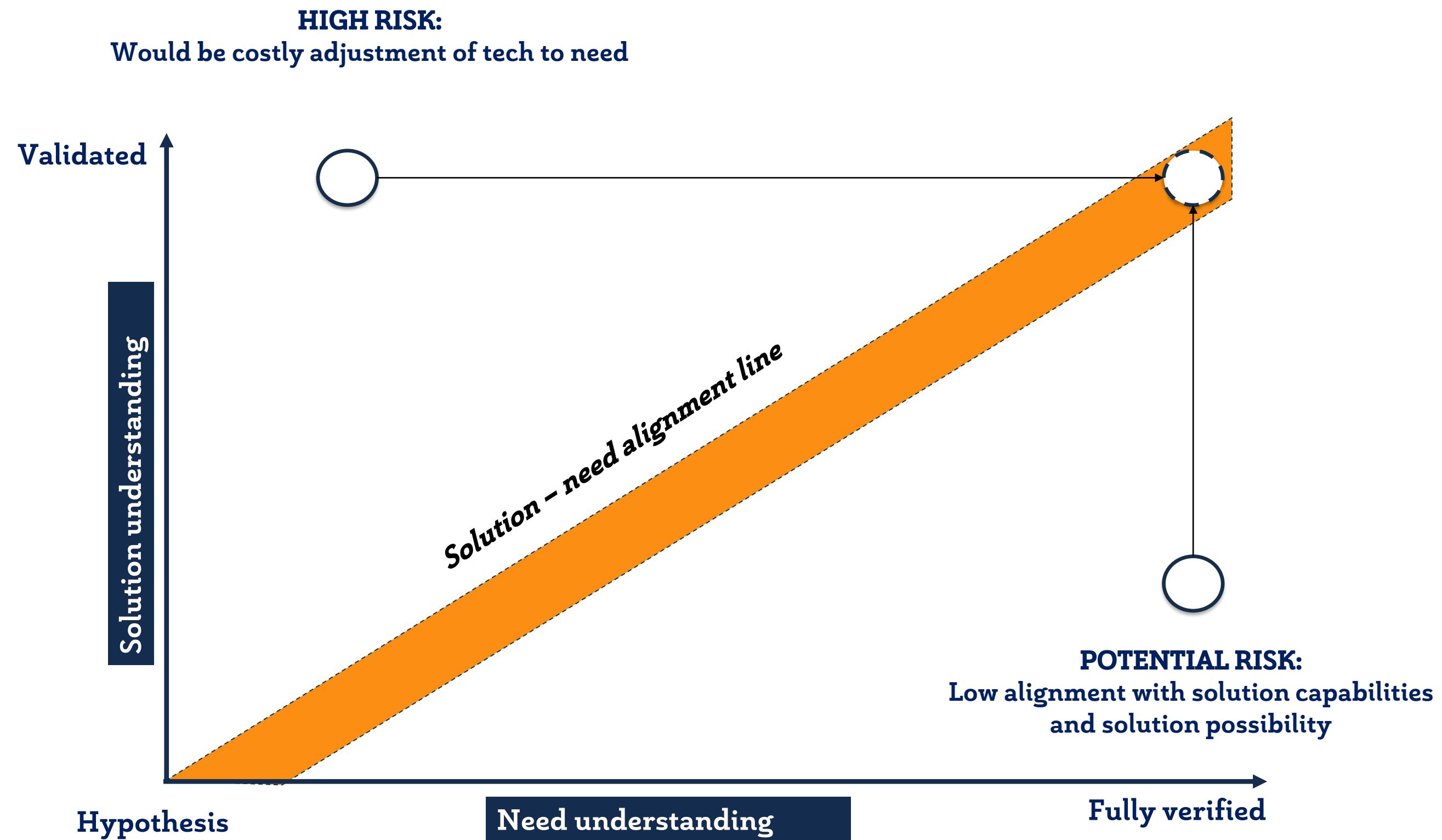
Internal TTO – University success criteria:

1. We have a segmentation method in place that we are using?
2. We can capture and address all target groups?
3. Activities we do are relevant [e.g., subjects and output matter]
4. Activities are aligned with incentives for target groups?
5. We have a way of measuring client satisfaction?

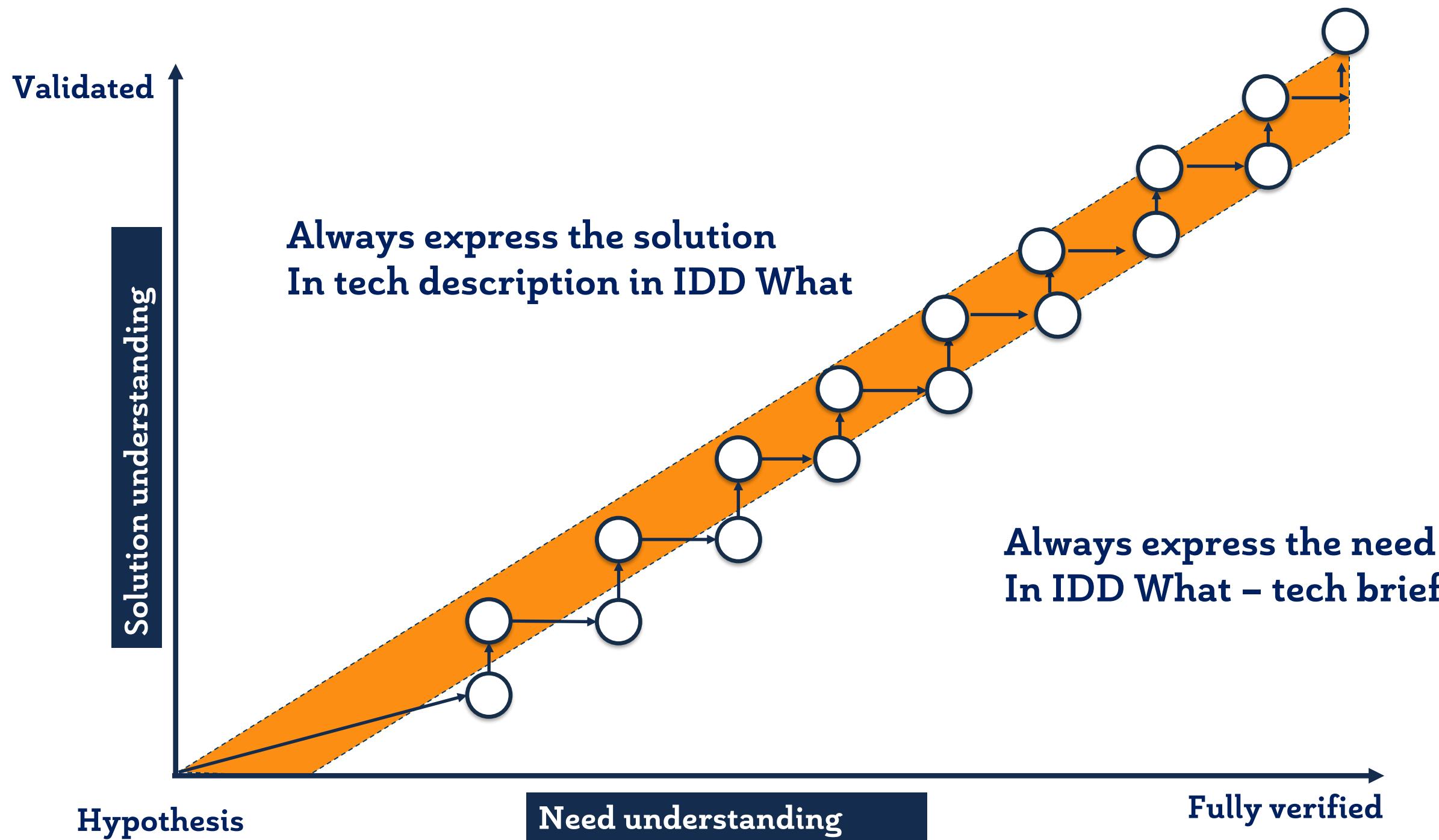
External TTO – Industry success criteria:

1. Large regional network of industry/market partners
2. Large national/international network of industry/market partners
3. We have ongoing activities with multiple industry/market partners?
4. They see a real value of the exchange with academia?

Understanding market need at an early stage ...



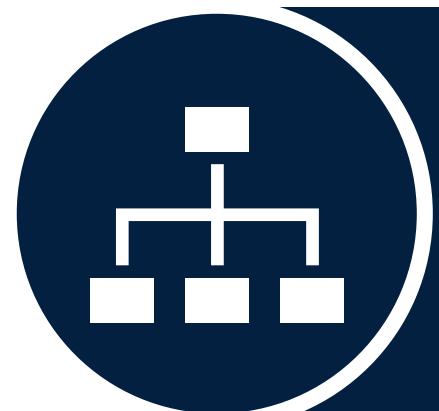
Incremental process mitigates risk: Let the need guide the process



We use our methodology
Innovation Due Diligence
to validate the market potential

What is Innovation Due Diligence?

- Also called IDD



It is a structured methodology, which is used to map market potential of ideas and innovation at an early stage



The methodology has been developed by LTU Business with support from Vinnova and Swedish Mining Innovation



The methodology IDD is free to use through a so called Creative Commons-licens (www.innovationduediligence.com)



It can be used when:

- Writing proposals for projects
- Analysing market potential and developing commercialization strategies in projects
- Prioritizing and managing a portfolio of innovations
- Evaluating risk and potential for investments

It is commonly used by our consultants, as well as by organizations and companies which we have educated

The methodology was designed based on common mistakes which has been observed during the

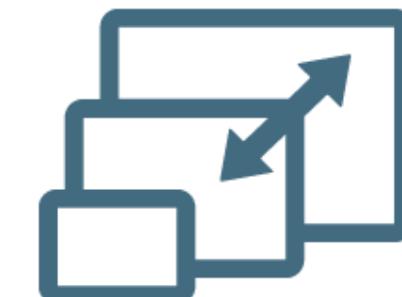
Not knowing the **benefits** valued by customers – but investing money in development anyway



Not analyzing **competitor** games, solutions or trends – going blindfolded into war



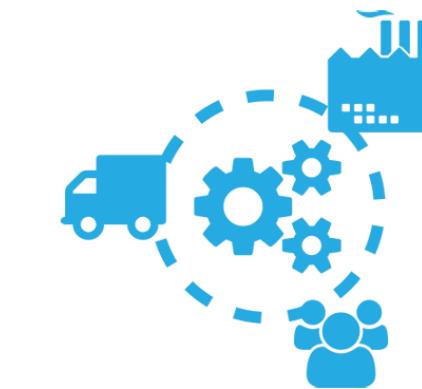
Not understanding your **market's size** and dynamics – The cake might be smaller than you think



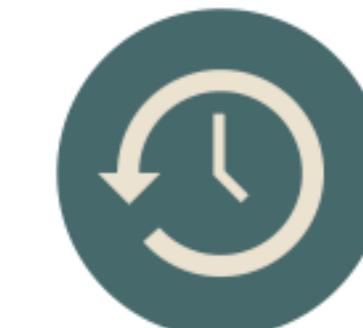
Missing the key **requirements** to be an eligible choice – some things are hygiene factors



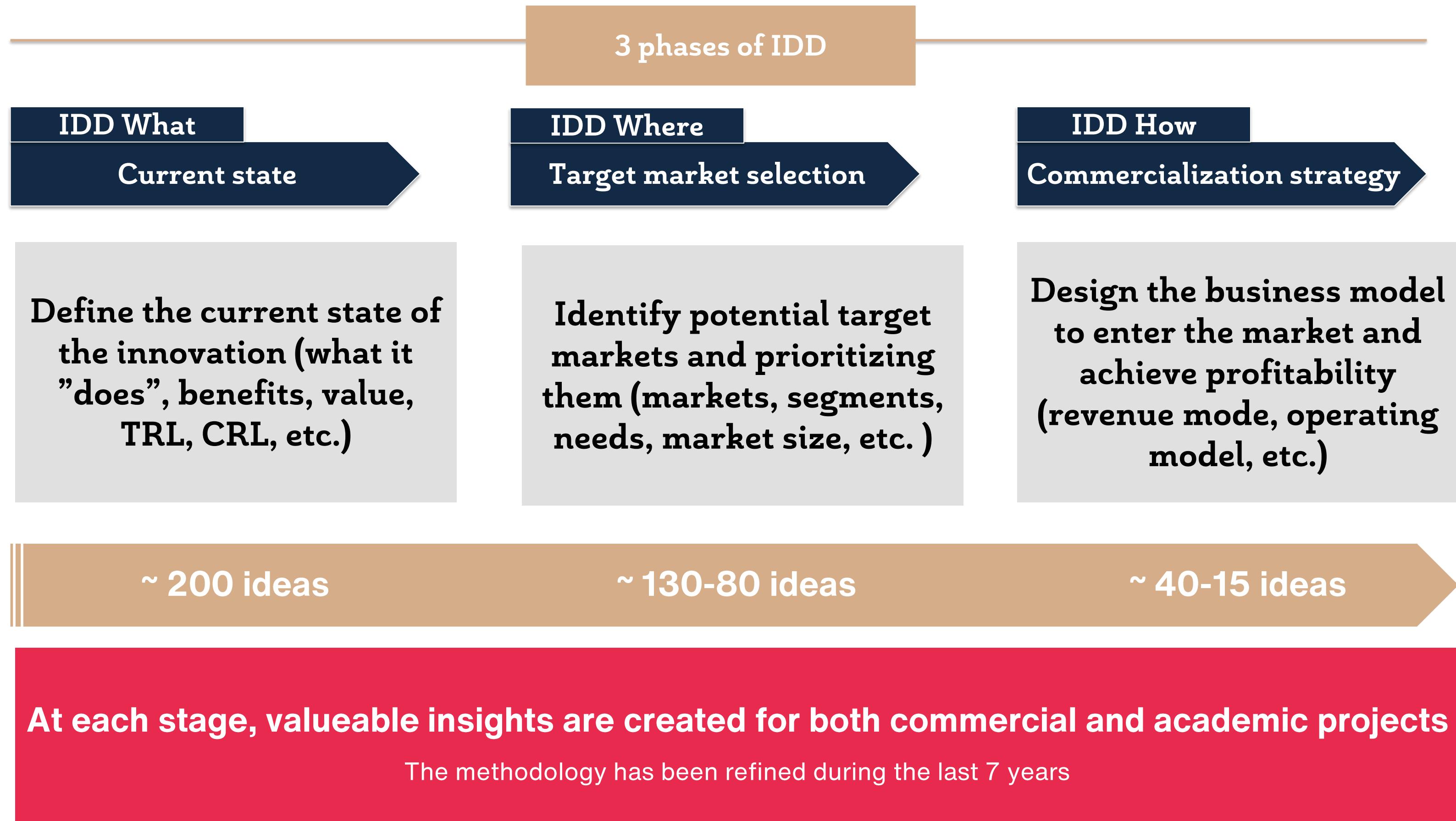
Not understanding the **value chain** – having a great product but no means to reach the market



Over-developing – market changes while you invest money in 'the perfect solution'



The IDD process consists of the phases



IDD What

- Create a good understanding of the innovation

IDD What

- Short and communicative description of the innovation
- The benefits of innovation (features, benefits and value)
- Previous validation (tests of innovation)
- Identified requirements (laws, functions, etc.)
- Developmental stage (TRL, CRL)
- IP protection
- The team
- Competitive situation

IDD0 – Current State Template

Case #	Title																				
Need (optional) Describe which need the idea/technology fulfills or which problem it solves. Figure/Image Include a figure that quickly and simply explains the idea. E.g., a drawing of the solution/architecture or value chain where the solution is contextualized. Provide a short text description with images.																					
Description Provide a short (< 50 words), clear and concise description of what the idea is and what it does (not how). Make it understandable for a person without specific domain knowledge. State the most important aspects, especially those that set the idea apart from existing or alternative solutions.																					
Benefits This is where the unique benefits of the solution are explained. Benefits need to be compelling, credible and relevant to a potential user. Use terminology that is relevant for users. If possible, state quantitative and qualitative benefits. A reader should understand how the solution increase revenues, decrease costs or otherwise be of value to an organization, a user or society.																					
The table is optional <small>Features = properties and functions of the solution [speed, size capacity etc] Benefits = the benefits that the features bring to users Values = the values created by benefits</small> <table border="1"> <thead> <tr> <th>Feature</th> <th>Benefit</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Feature	Benefit	Value																	
Feature	Benefit	Value																			
Validation (optional) Provide evidence that your innovation does what you say it does. Independent 3rd party validation by a recognized industry testing or certification organization is best, although an organization utilizing accepted industry testing regimen and standards is acceptable.																					
Development status What stage of the development process are you in? Do you have prototypes? Timeline for development? Describe status of the solution in terms of its readiness regarding: <ul style="list-style-type: none"> • Customer Readiness level: Its readiness to be utilized by a customer • Technology readiness level: Development status of the solution <table border="1"> <thead> <tr> <th>TRL</th> <th>CRL</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>3</td> </tr> </tbody> </table>		TRL	CRL	5	3																
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5	3																				
IP Protection <ul style="list-style-type: none"> • List any patents in progress or held • Include any additional relevant IP information 																					
Team (optional) Describe the different roles and competences within the team. Who is the champion? Can be excluded for products or technologies.																					
Competition Who are your competitors and what are they offering? List advantages of your innovation versus its primary competitors or competing solutions. These advantages should be objective and whenever possible, measurable. Don't exaggerate – if the prospect were to say "prove it", you better be able to demonstrate your technology does what you say it does, AND your competitor cannot demonstrate results that exceed what you claim THEY are capable of. To add credibility, consider including advantages competing solutions have over yours. Doing so causes readers to place more authority in your claims.																					
<table border="1"> <thead> <tr> <th></th> <th>Competitor advantages</th> <th>Competitor disadvantages</th> <th>Your advantage</th> </tr> </thead> <tbody> <tr> <td>Regular salt</td> <td>can be used as a preservative</td> <td>mainly sodium, health risks</td> <td>No sodium</td> </tr> <tr> <td>No sodium Salts (potassium)</td> <td>On the market</td> <td>Bitter or metallic after taste</td> <td>No bitter metallic after taste</td> </tr> <tr> <td>Low sodium salts</td> <td>Limited reduction of the sodium content</td> <td></td> <td>No sodium</td> </tr> <tr> <td>Herb and spice blends</td> <td>All-natural, no sodium</td> <td>Many different tastes</td> <td>Salty taste</td> </tr> </tbody> </table>			Competitor advantages	Competitor disadvantages	Your advantage	Regular salt	can be used as a preservative	mainly sodium, health risks	No sodium	No sodium Salts (potassium)	On the market	Bitter or metallic after taste	No bitter metallic after taste	Low sodium salts	Limited reduction of the sodium content		No sodium	Herb and spice blends	All-natural, no sodium	Many different tastes	Salty taste
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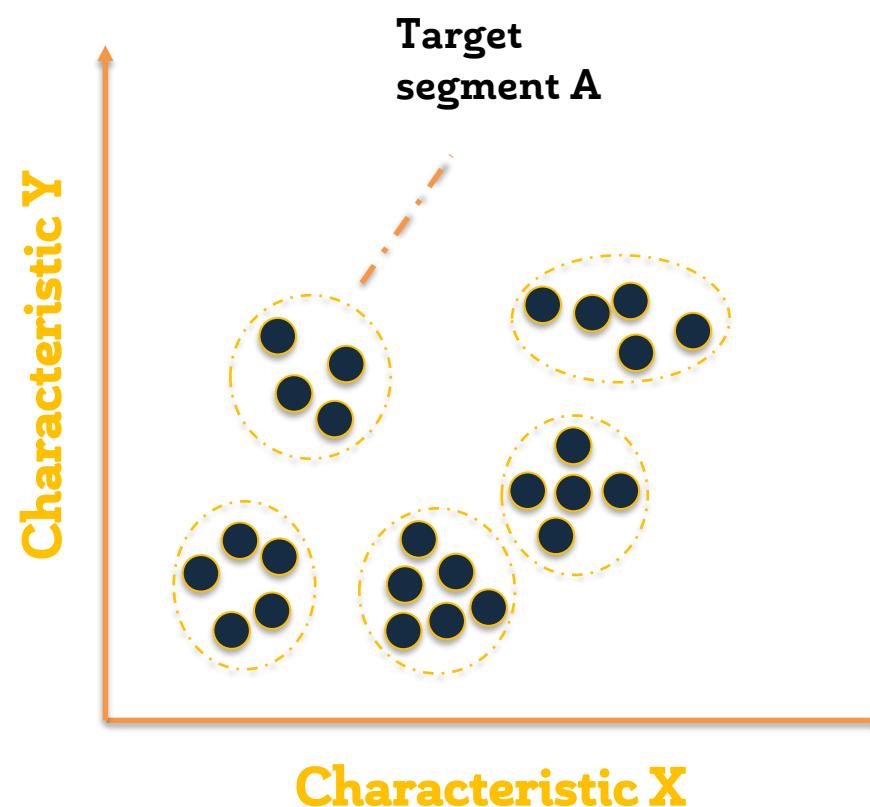
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IDD Where

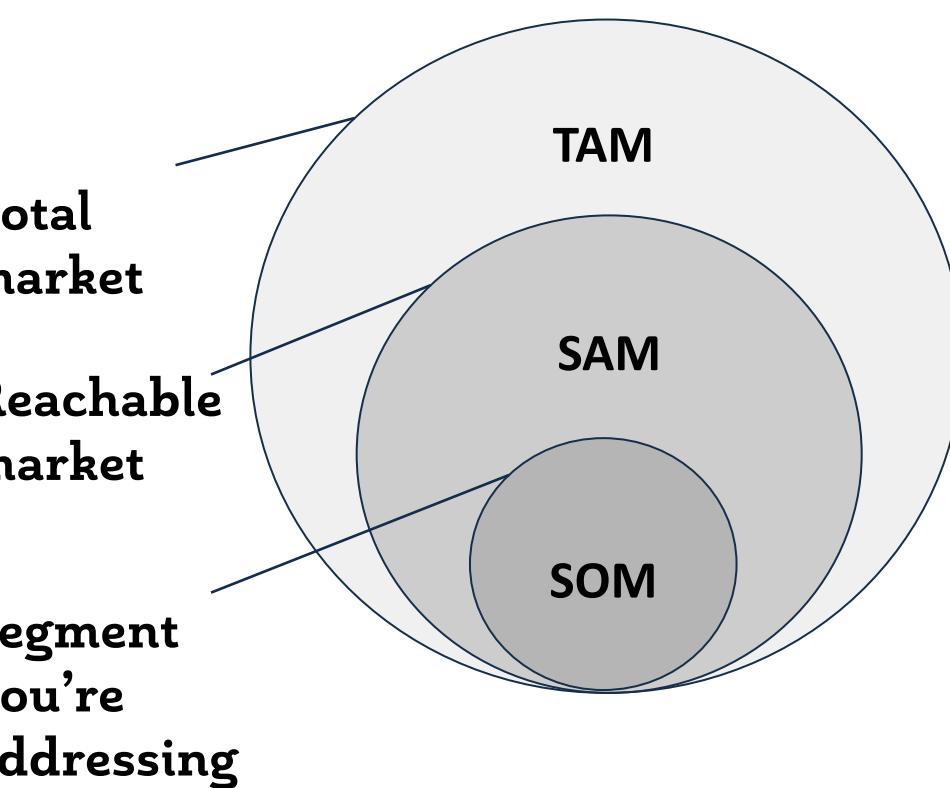
- Understand the need, market and market size

- Identify which market/customer segments are of interest
- Create hypothesis regarding the need

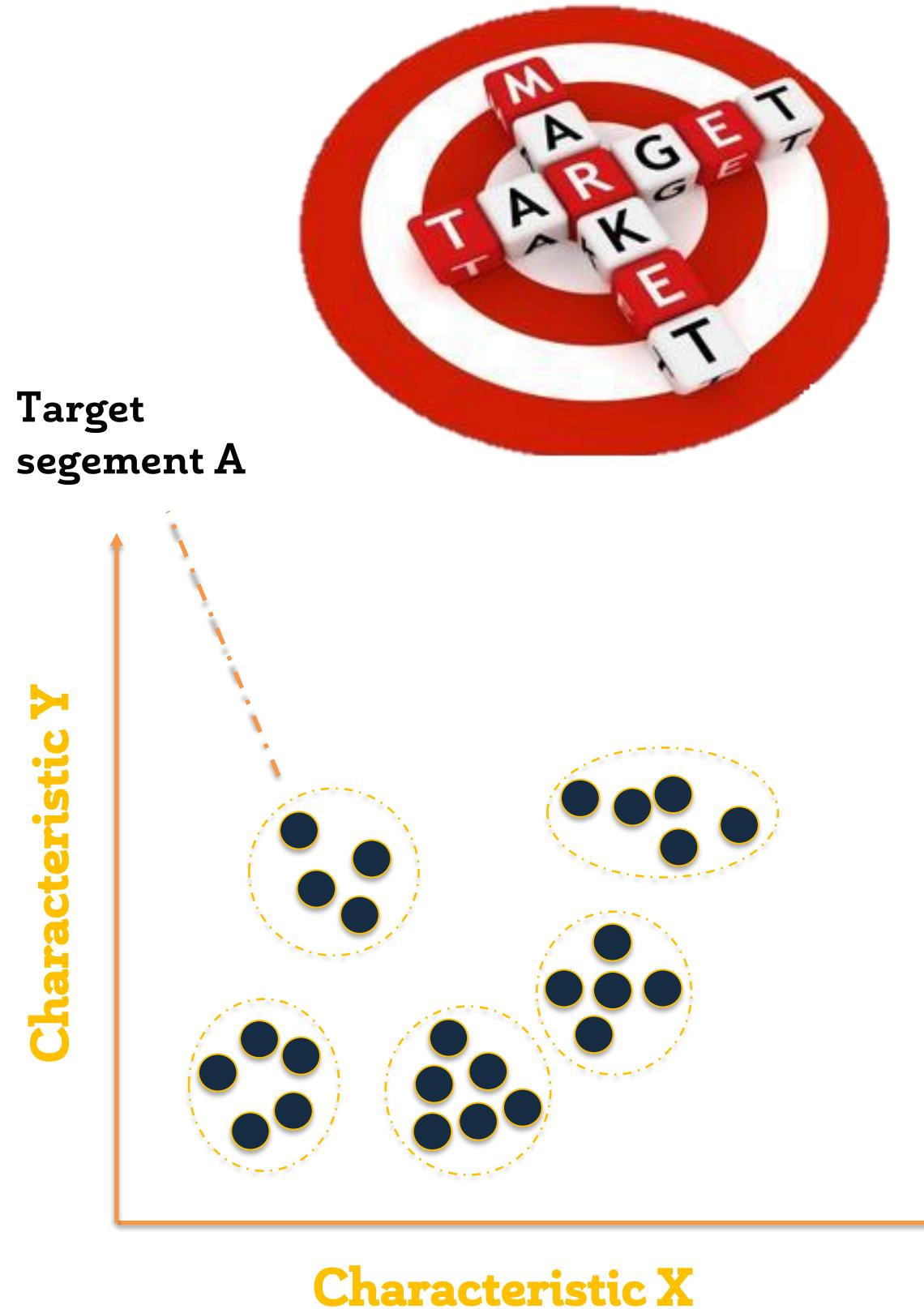


- Validate each/prioritized markets through primary and secondary data collection**
- Need
 - Requirements
 - Challenges
 - Potential
 - ...

Estimate market size to evaluate market potential and determine which market(s) is most attractive



What is a target market?



A target market are a cluster or group of individuals or organizations that have some similar features and are/can categorized into target segments.

The categorization process is subjective. The target market can be categorized on example:

- Industry
- Sector
- Use area
- Value chain
- Demographic
- Geographic
- Psychographics
- Behavioral
- Contextual & Situational

Understanding the market need on different levels

Understanding the problem and need: on 3 levels

The nature of the problem: understand the process in which the problem occurs, when does the problem occurs, which persons/functions/processes are affected by the problem? How do you currently handle the problem?

The depth/value of the problem: What are the implications of the problem? What costs, operational losses or other inefficiencies does it cause? Is it a often reoccurring problem causing small losses or is it seldom causing big losses? If it's not a thought of problem: How big would the improvement potential be?

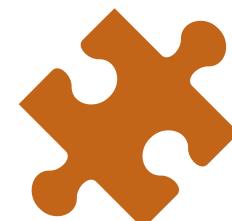
The width/spread of the problem: How common is this problem? Is it something felt only by a specific company or person, or is it industry-wide? – This will provide a first view on the tentative market size

Solution fit

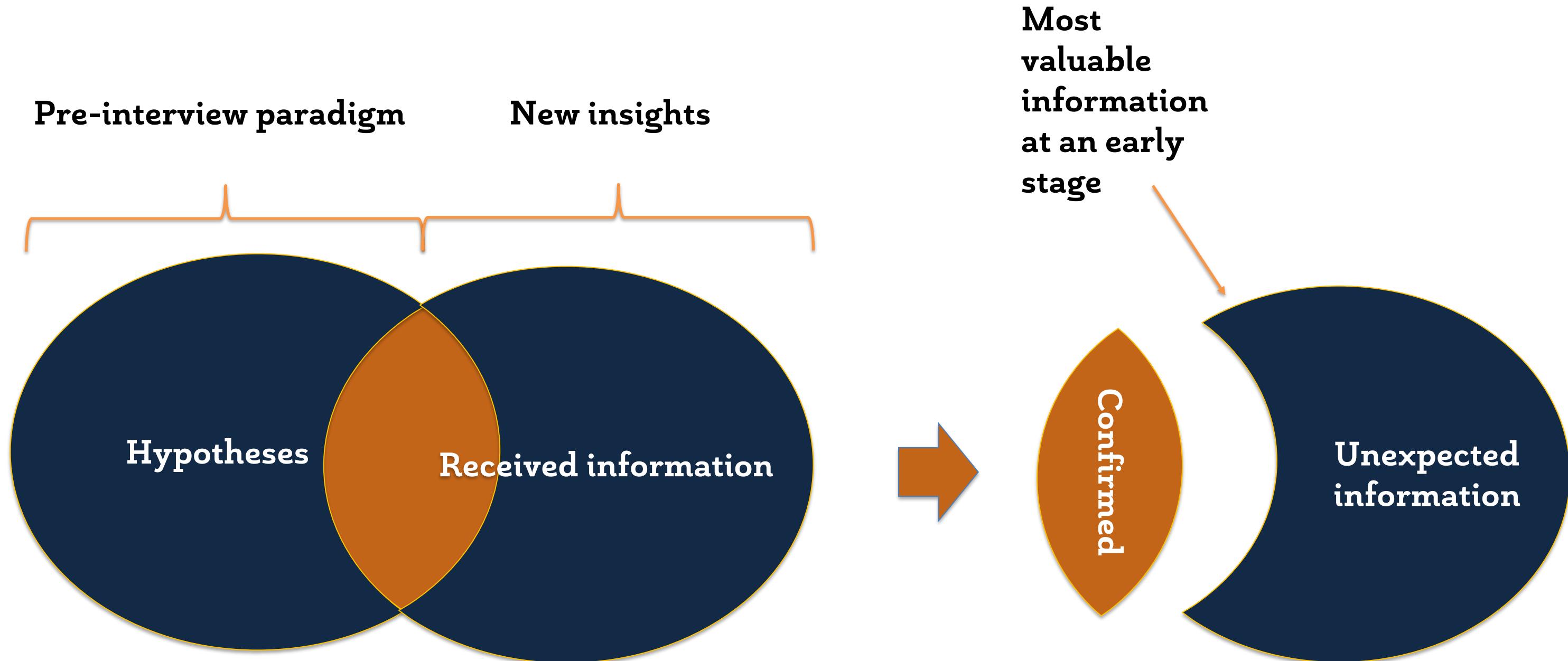
Can the innovation's benefits solve the problem? How is it better/worse than how the problem is currently handled?

Initial challenges/opportunities

Are there any key requirements? Changes in trends, operations or technology that affects the innovations potential?

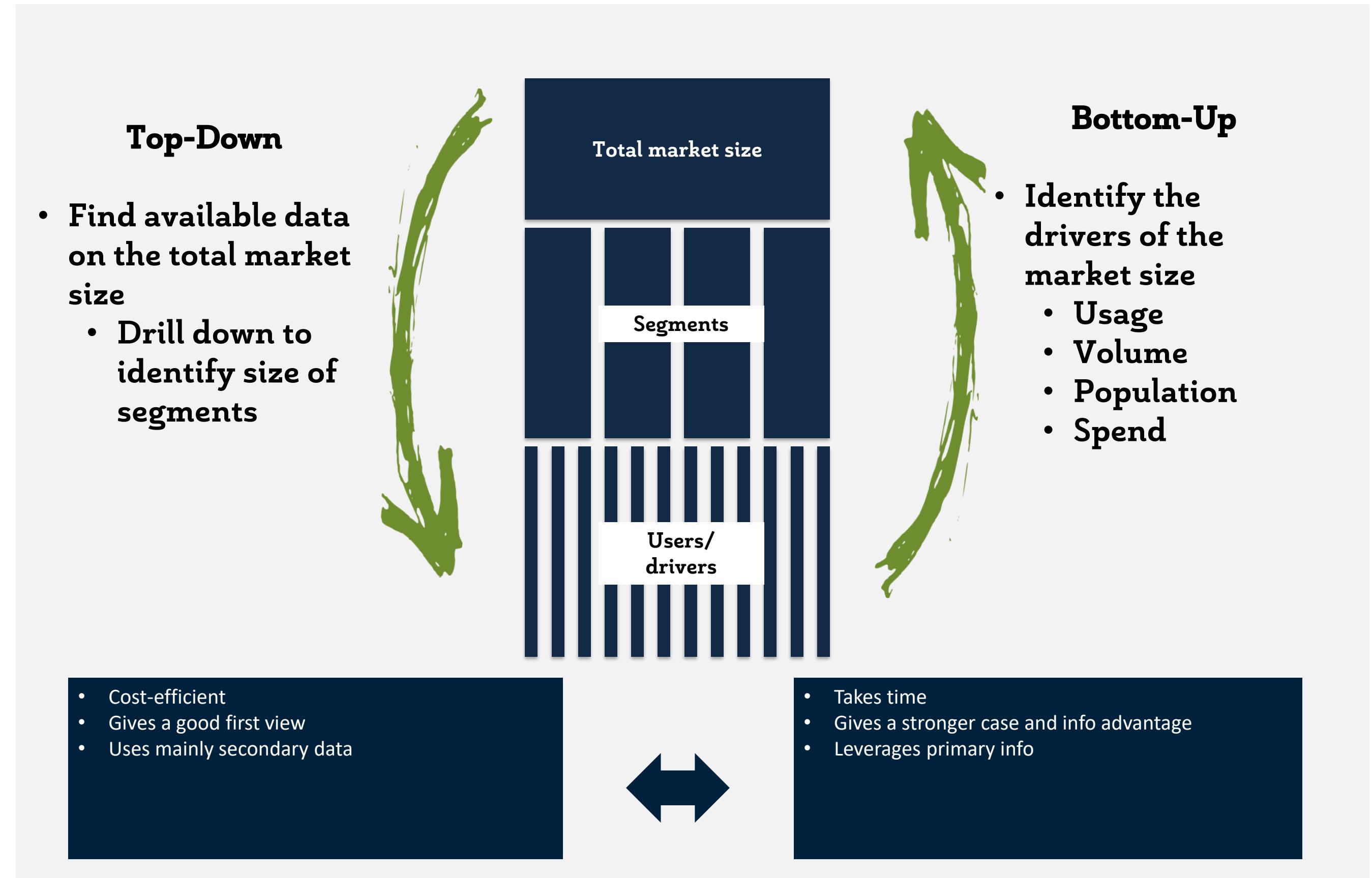
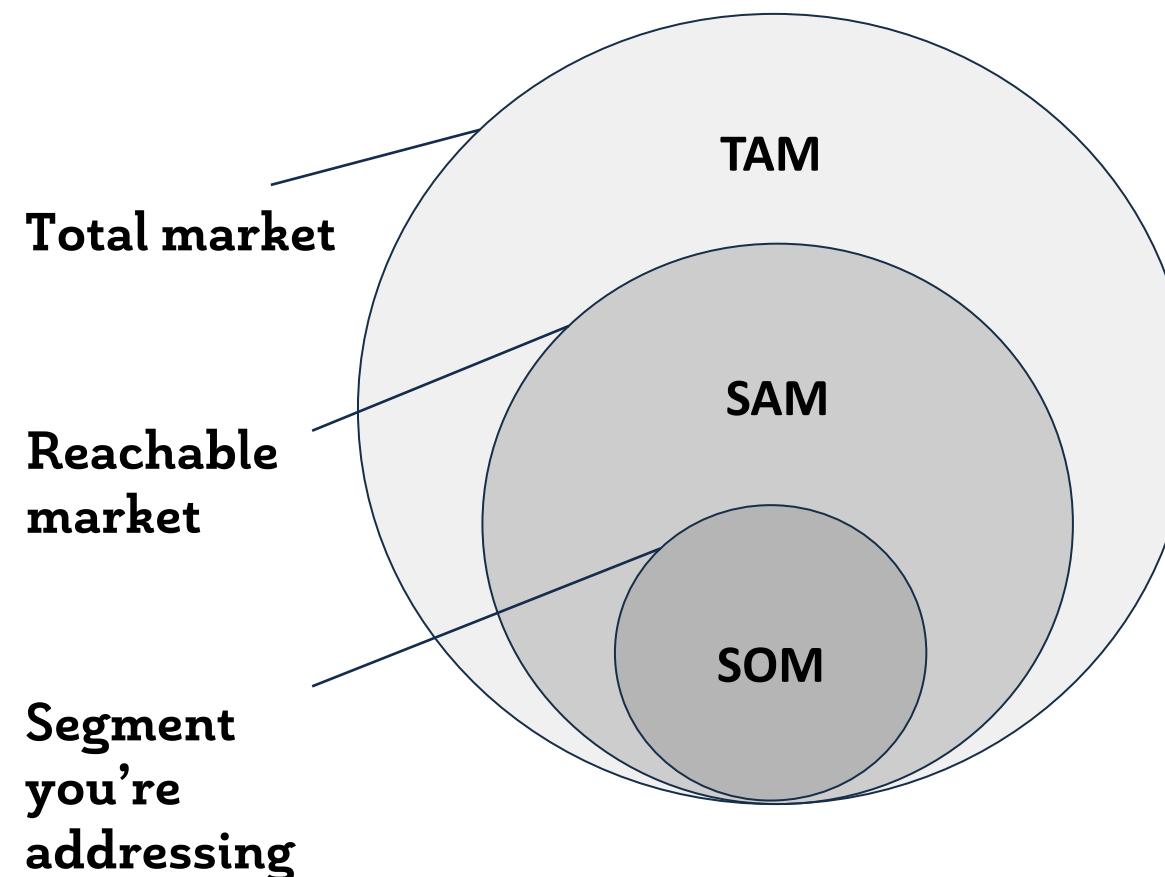


What is the purpose?



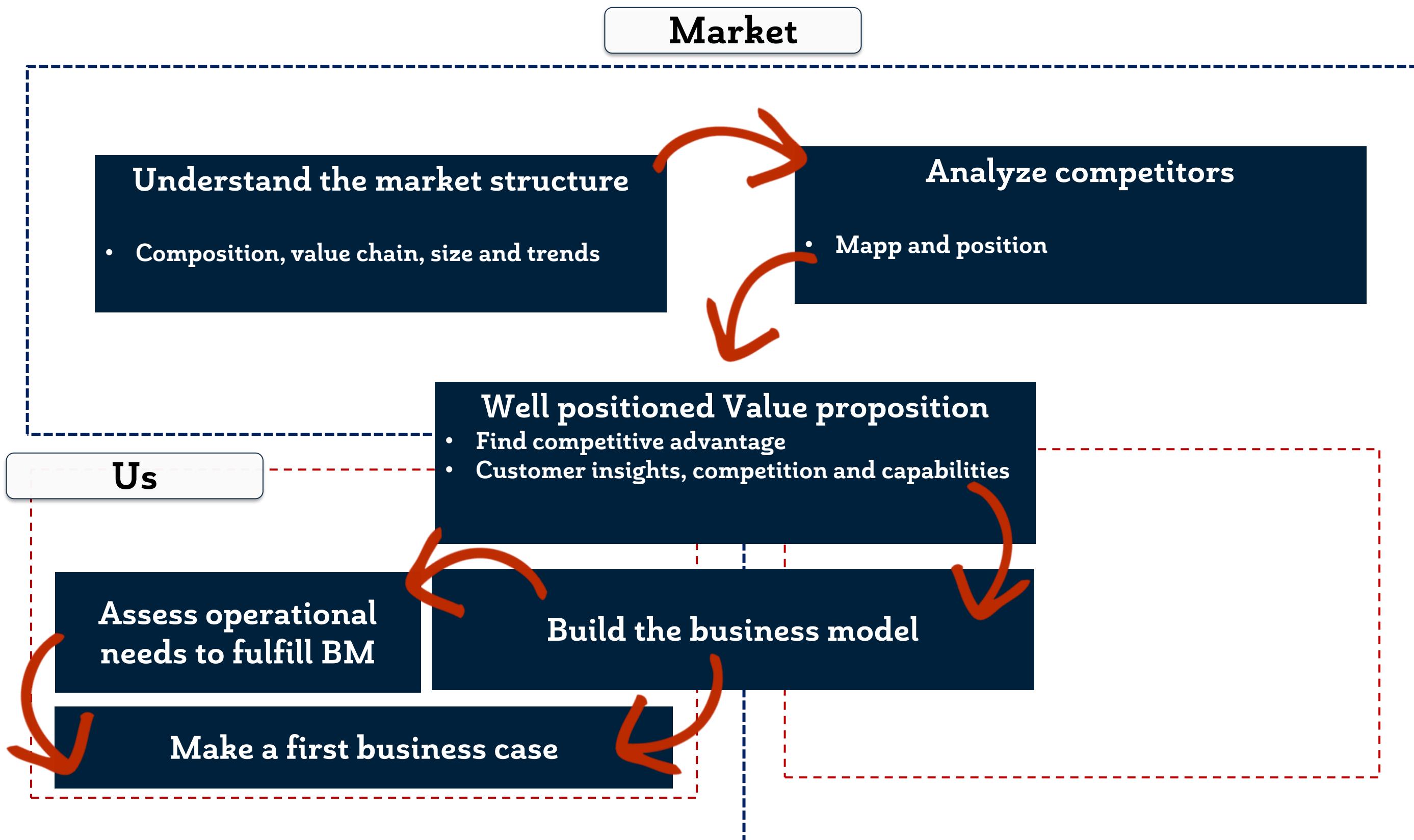
We want to know if our hypothesized paradigms are the same as the real market paradigm

Assessing market size can be done in a number of ways – based on 2 approaches

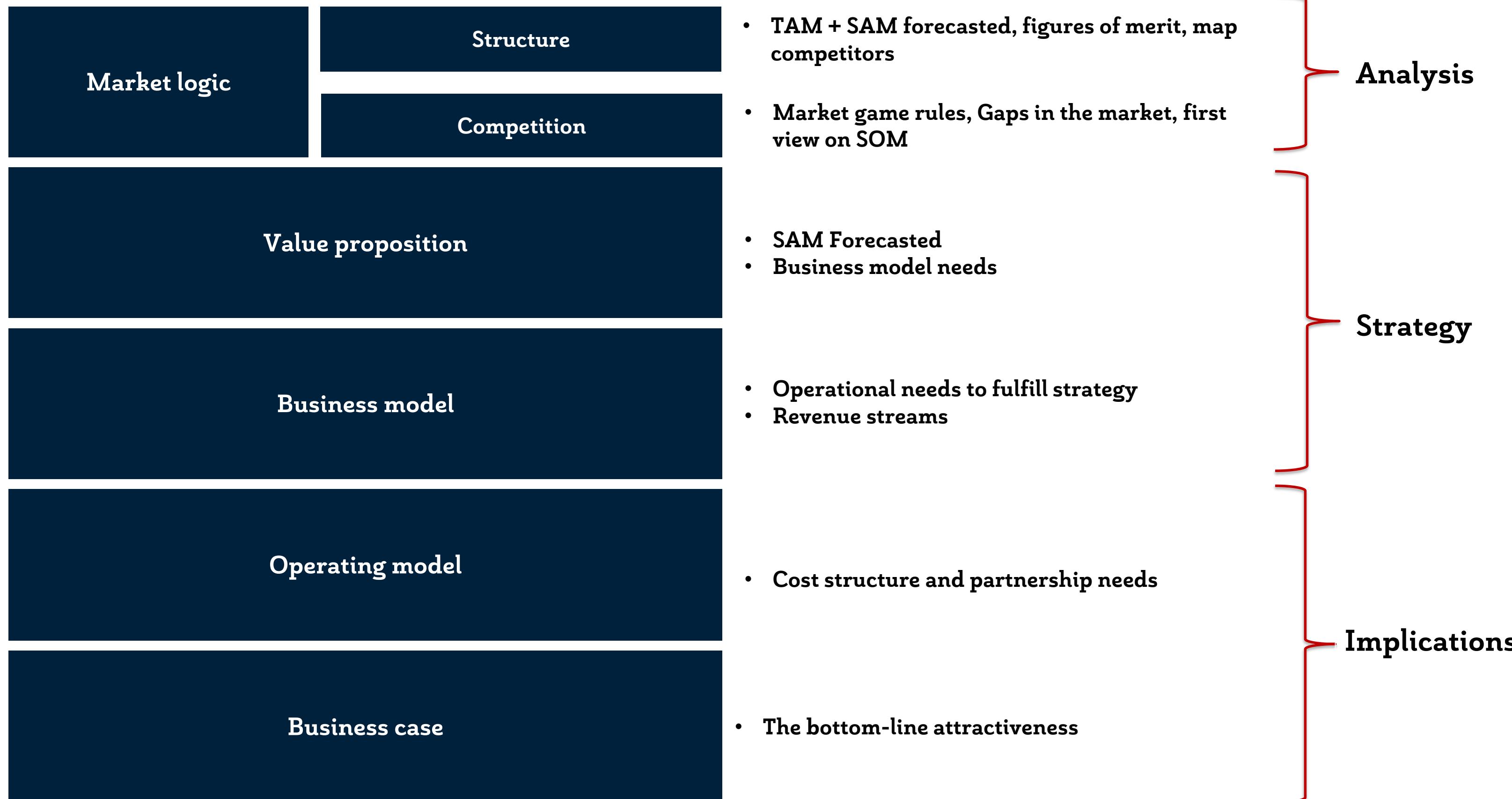


IDD How

- Identify market position and design attractive business model



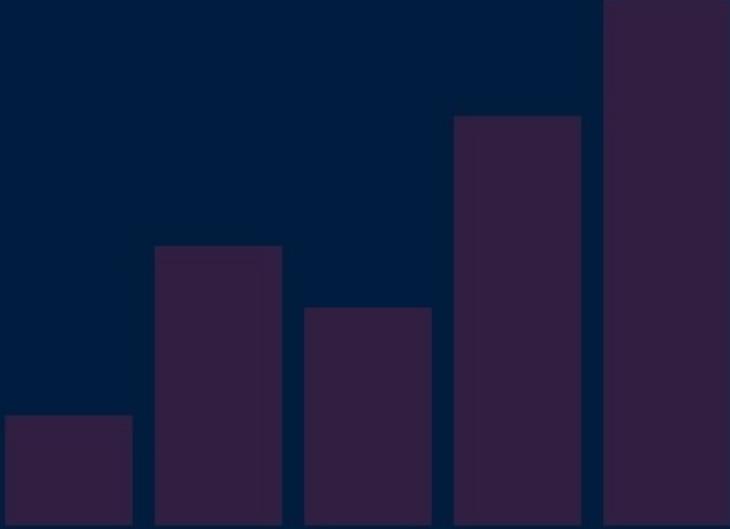
There are key outputs created in every step



**How do you
validate
market need
and potential?**



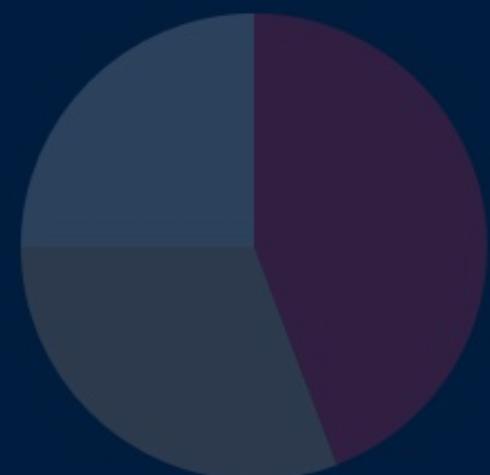
Partnerships for the goals



Founders of
Innovation Due Diligence®

300

New ideas validated every year



45% regional development projects
30% Parent company projects
25% commercial projects

Sustainable cities and communities

Latitude 66 Mentorship
Growth Academy
IDD Academy
Turistanläggningars
Form & Funktion



Industry, innovation
and infrastructure

Let's take a closer look at
some of our cases!



1100 000

euros for regional development initiatives

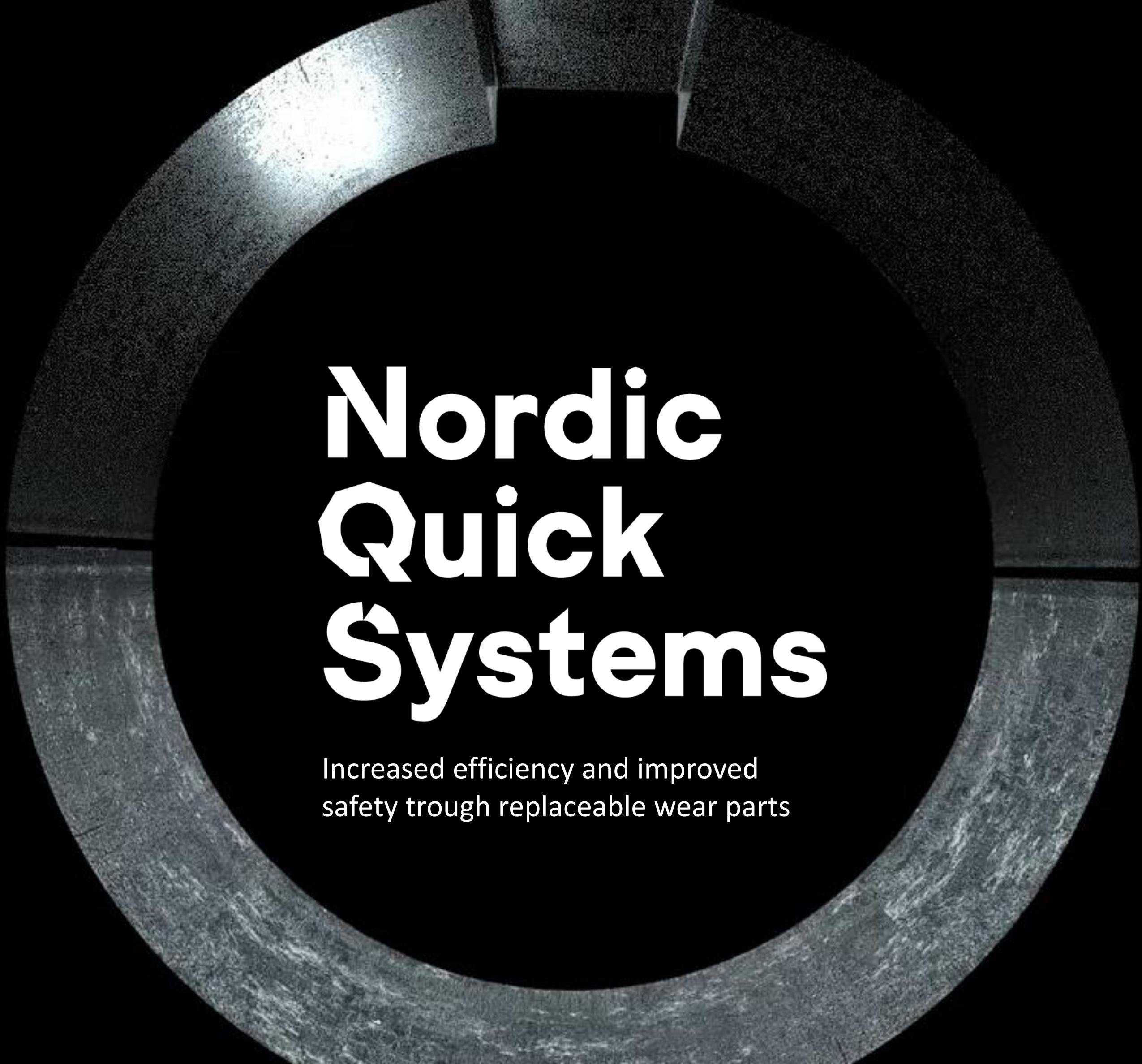
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Located in five northern Sweden
innovation hubs. Our HQ is in Luleå.

40

hearts and heads

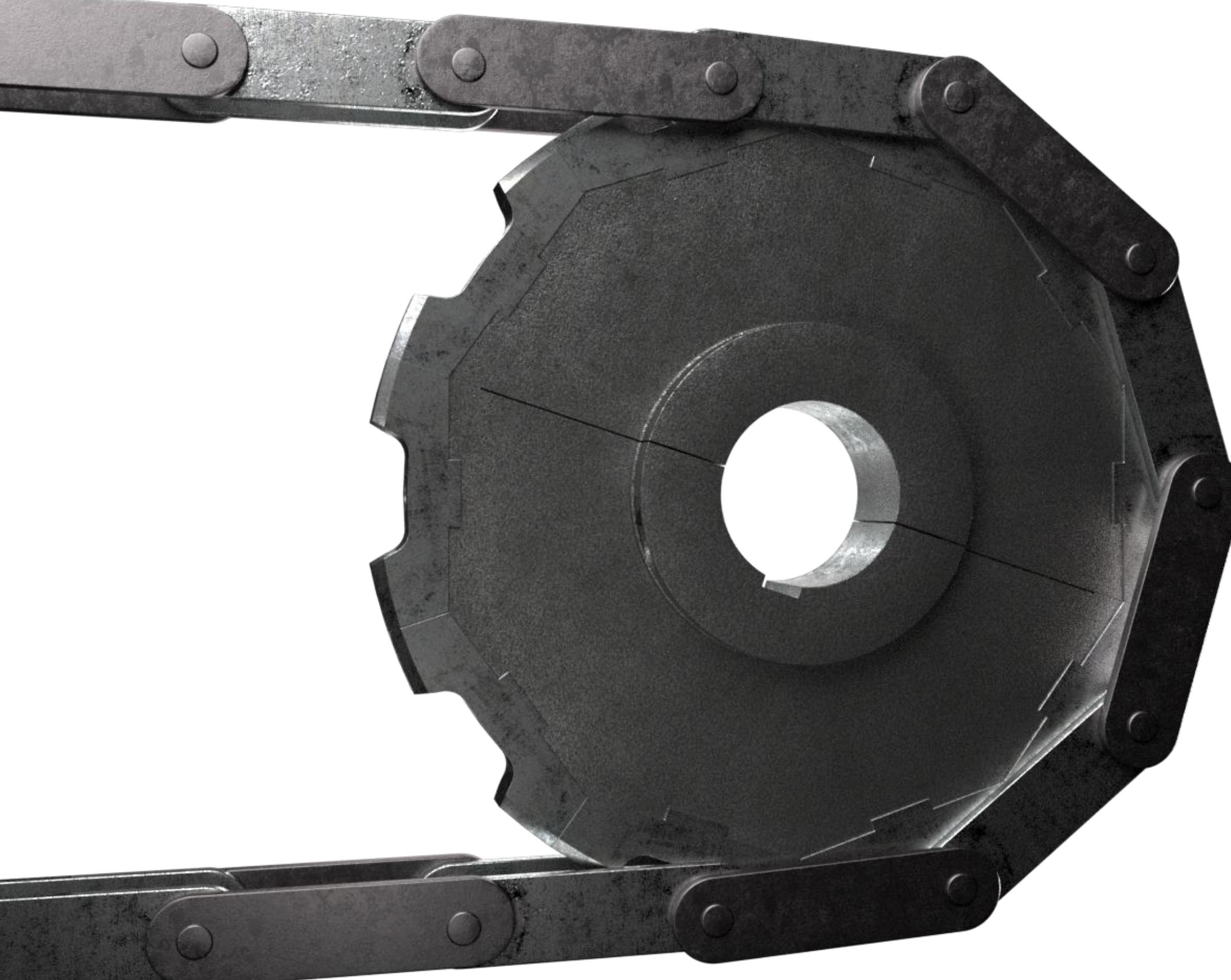




Nordic Quick Systems

Increased efficiency and improved
safety through replaceable wear parts

We have supported NQS on their commercial journey



It started with an idea - 2018

- Inventor and founder of NQS came to us with an idea that potentially could revolutionize the industry of wear parts
- Our consultants assisted the inventor with market validation, strategy, and business development through our IDD-method
- Through our network, we connected the inventor with a research organization to assist the inventor with technical feasibility and validation

From idea to startup - 2020

- The company was founded in 2019 and by 2020 it had grown to a turnover of ~0,55 MEUR
- NQS signed up for our *summer program*, where students for our university aided them with market research and export strategy to scale their sales

From startup to scaleup - 2022

- We aided NQS with an *investment memo* and the process of acquiring more capital to scale production, new inventions, sales, and export
- Today, NQS predicts a turnover of 3,76 MEUR for the next FY



FIELD
ROBOTIX



**Reach the unreachable
with autonomous drones**



We have supported *FieldRobotix* from an early stage



Idea arose during SIMS project at LTU – 2017 - 2020

- Researchers from LTU participated in a research project focusing on autonomy, Sustainable Intelligence Mining (SIMS)

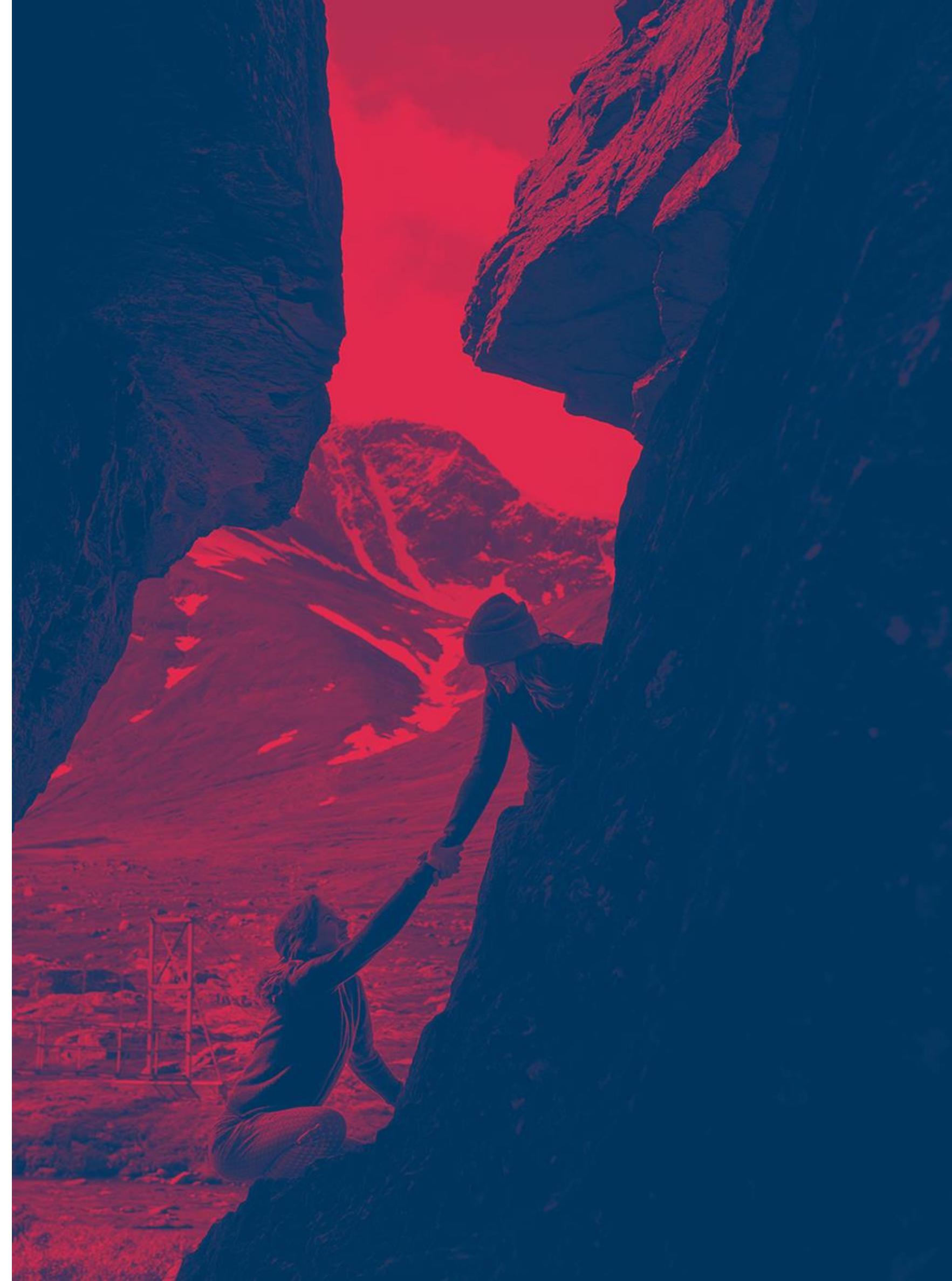
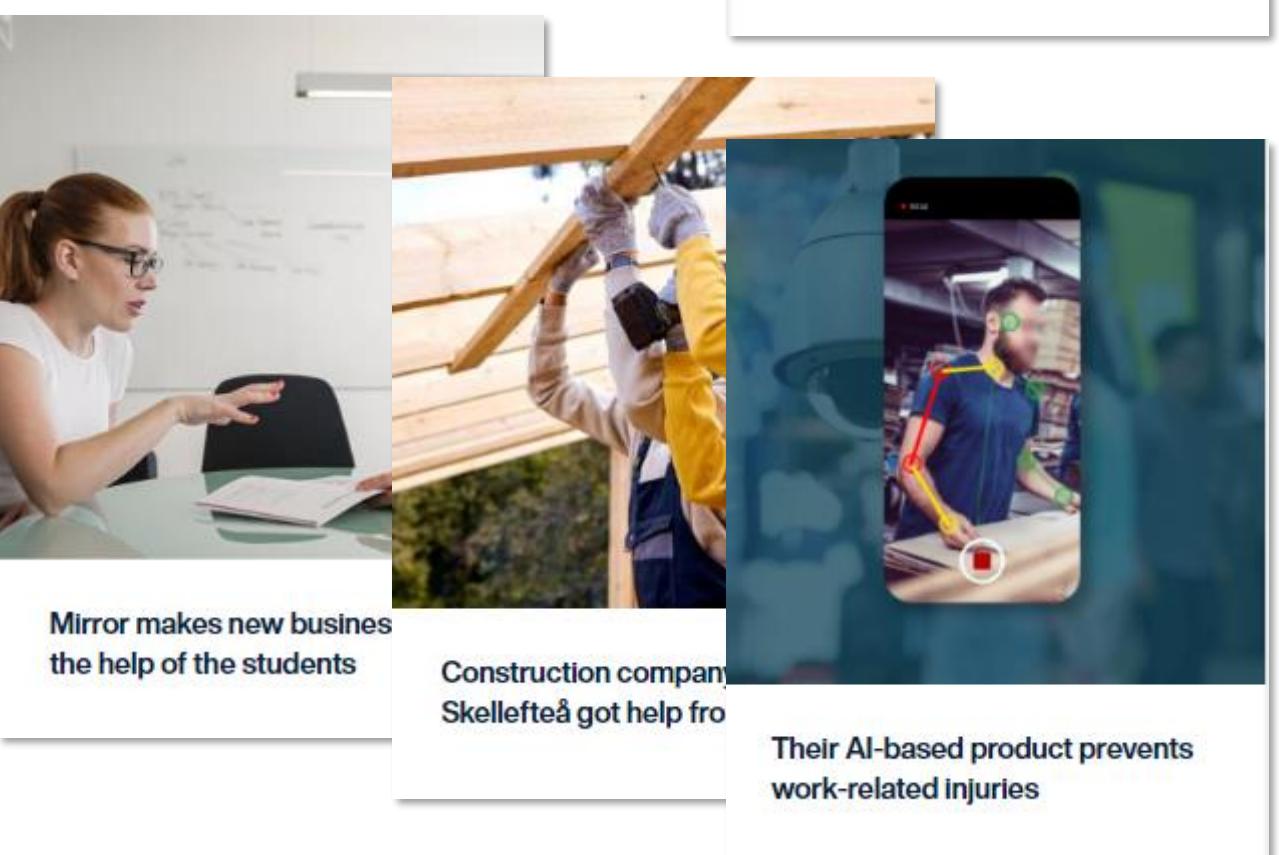
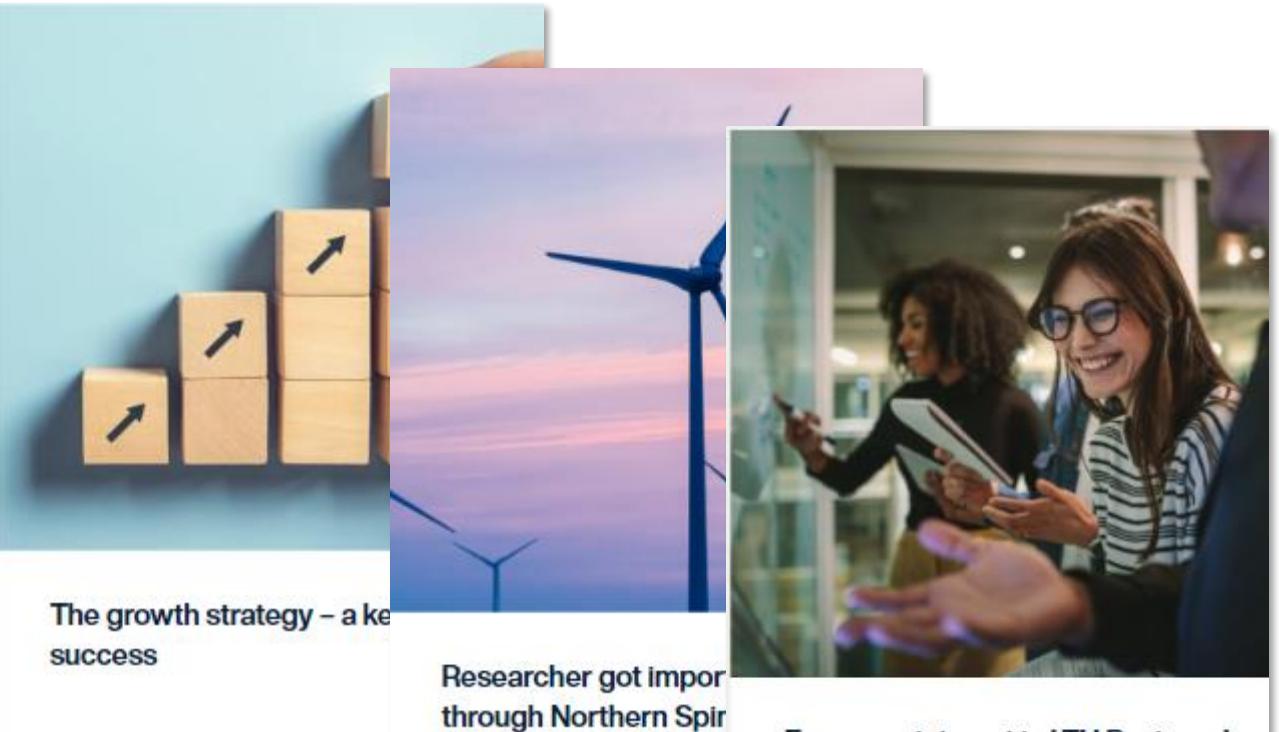
From idea to startup - 2020

- In 2020, FieldRobotiX became a spinoff from the project and the company offers fully autonomous drones for accurate and reliable data capturing
- Our consultants assisted the inventor with market validation, strategy, and business development through our IDD-method
- FieldRobotiX was accepted to Arctic Business Incubator

From Sweden to USA - 2022

- FieldRobotiX got accepted into the Nordic Innovation House in Silicon Valley

If you're interested, we have a lot of cases on our website!



**What could you do
to increase
commercialization?**



Thank you!