BUSINESS TAMPERE

EU Bootcamp
13.02.2024

EU-hankkeisiin osallistumisen edut ja haasteet - kokemuksia EU-projekteista hankepartnerin roolissa

Marko Elo

PIRKANMAA
COUNCIL OF TAMPERE REGION

innokaupungit

Euroopan unionin osarahoittama

CROSSCONTROL INTRO

crosscontrol

PROVIDING TECHNOLOGIES THAT MAKE MACHINES SMARTER, SAFER AND MORE PRODUCTIVE

CENTROMOTION™
Advancing Actuation and Control Solutions

SUPPLYING LEADING OFF-HIGHWAY EQUIPMENT OEMS AND SYSTEM SUPPLIERS GLOBALLY

Agriculture and Forestry

John Deere · Krone · alö · Ploeger · Kuhn · Rauch · Grimme

Construction Equipment

Caterpillar · Ditch Witch · CNH Industrial · Haulotte Group · Zoomlion

Cargo and Material Handling

Toyota Material Handling · Kalmar · Hyva · Konecranes Lifting Businesses · Bromma

Mining and Minerals

Epiroc · Sandvik · Hexagon · metso minerals

Marine and Off-shore

Rolls-Royce · Wärtsilä · Caterpillar · MAN · MacGregor

Rail Transportation

Bombardier Transportation

WIDE PORTFOLIO OF DISPLAYS & ON-BOARD COMPUTING PRODUCTS

ARM-based Display Computers

CCpilot VI
- 3.5" display
- iMX6 Solo

CCpilot VC
- 5" display
- iMX5

CCpilot VA
- 7" display
- iMX5

CCpilot V700
- 7" display
- iMX8

CCpilot V1000
- 10" display
- iMX8

CCpilot V1200
- 12" display
- iMX8

CCpilot VS
- 12" display
- iMX6 Quad

Intel-based Display Computers

CCpilot X900
- 9" display
- Intel ATOM Quad

CCpilot X1400
- 14" display
- Intel i5 Quad

Vehicle Computers & ECUs

CrossFire
- I/O controller

CrossCore
- Vehicle computer
- Intel ATOM

OPEN SOFTWARE PLATFORM & COMPONENTS FOR WIDE SPECTRUM OF SOLUTIONS

Software Application Tools

UX Designer

Data Engine

Fieldbus Access

CODESYS

Qt

MATLAB

HTML

Protocols & Communications

ISOBUS

Automotive Ethernet

CANopen

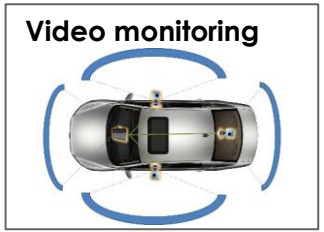
VNC

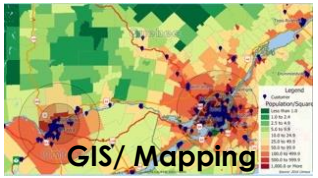
OPC UA

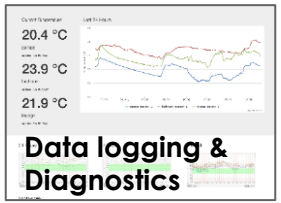
Core system

yocto PROJECT

docker







crosscontrol
making machines smarter, safer and more productive

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Three stories from EU projects

CRAFTERS

CRAFTERS - ConstRaint and Application driven Framework for Tailoring Embedded Real-time Systems
2012-2015

Embedded **many-core systems**: marketable lead applications driving ecosystem development and benchmarking on the fields of **industrial applications**, intelligent transport systems, video and image processing, and wireless communications. Key challenges include guaranteeing secure, safe, reliable, and timely operation, back-annotation based forward system governance, tool-tool, **tool-middleware, and middleware-hardware exchange interfaces**, and energy management with minimal run-time overhead.

- 26 partners, coordinator Technoconsult ApS (Denmark)
- Main partners Infineon Technologies AG, Tampere University (TTY), Thales Italy
- Finnish consortium: Tampere University, Mobisoft, CrossControl

Tulokset

+ wide and ambitious research component: safety + realtime + many-core
+ safety & non-safety application co-existence

- RIA-project with outcomes in early TRL
- viable learning experience, but no path for productization

PRODUCTIVE4.0

Productive4.0 - Electronics and ICT as enabler for digital industry and optimized supply chain management covering the entire product lifecycle
2017-2020

https://productive40.eu

Scope: Digitalization (Industry 4.0), distributed systems, industrial use cases, IoT, Arrowhead framework (open, IoT-platform with academic background)

- Partners: Total 109, 19 countries (EU + associated countries), 65% industrial
- Coordinator: Infineon Technologies AG
- Finnish consortium: VTT, Tampere University, Konecranes, Metso Outotec, Wapice, CrossControl

Productive 4.0

\+ use cases
\+ IoT-platform development, applications

\- Arrowhead IoT framework has gained very limited footprint in real applications

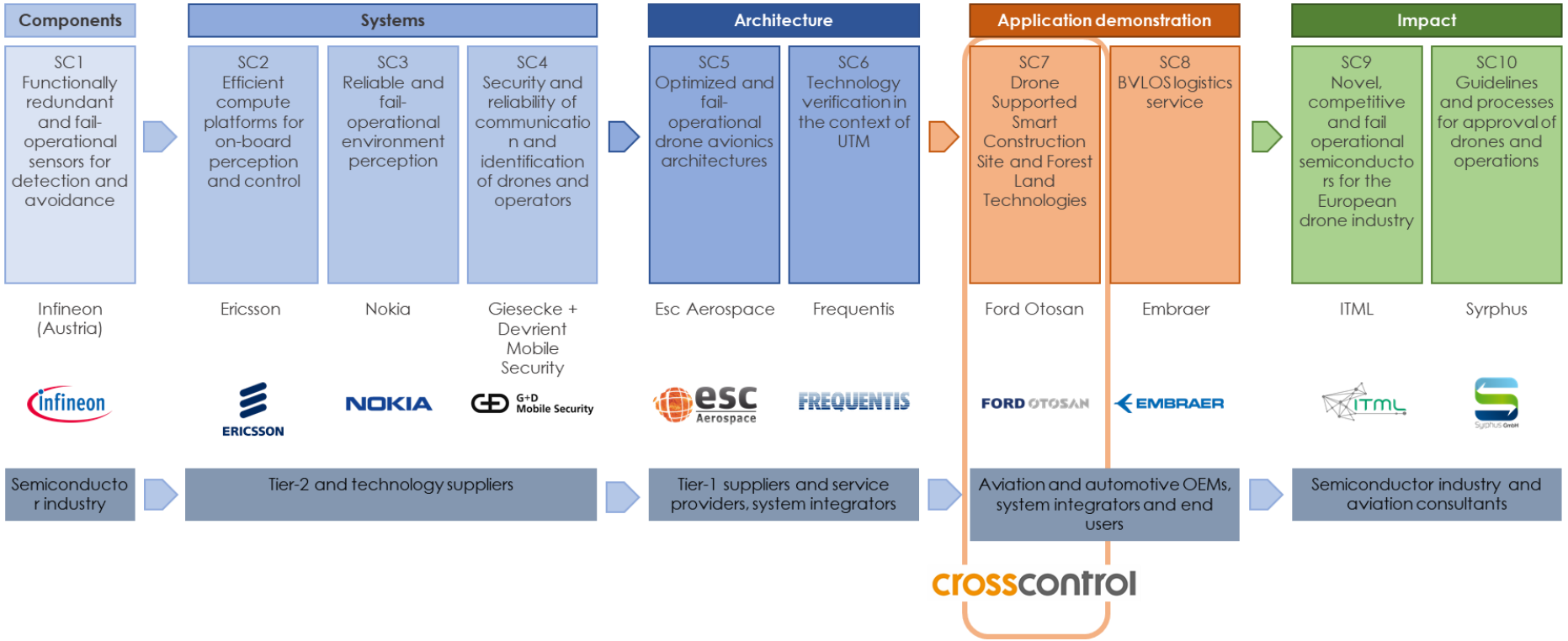
ADACORSA

ADACORSA - Airborne data collection on resilient system architectures
2020-2023
Vision: Provide European technology to render **drones** as a safe and efficient component of the mobility mix, with differentiated, safe and reliable capabilities in extended **beyond visual line of sight** (BVLOS) operations.

https://adacorsa.eu/

- 50 partners
- Coordinator: Infineon Technologies AG
- Finnish consortium: Tampere University, Nokia, CrossControl
- CrossControl was responsible of leading one task: construction and forestry use cases, 8 partners

ADACORSA, PROJECT MATRIX



ADACORSA, SMART FORESTRY USE CASE

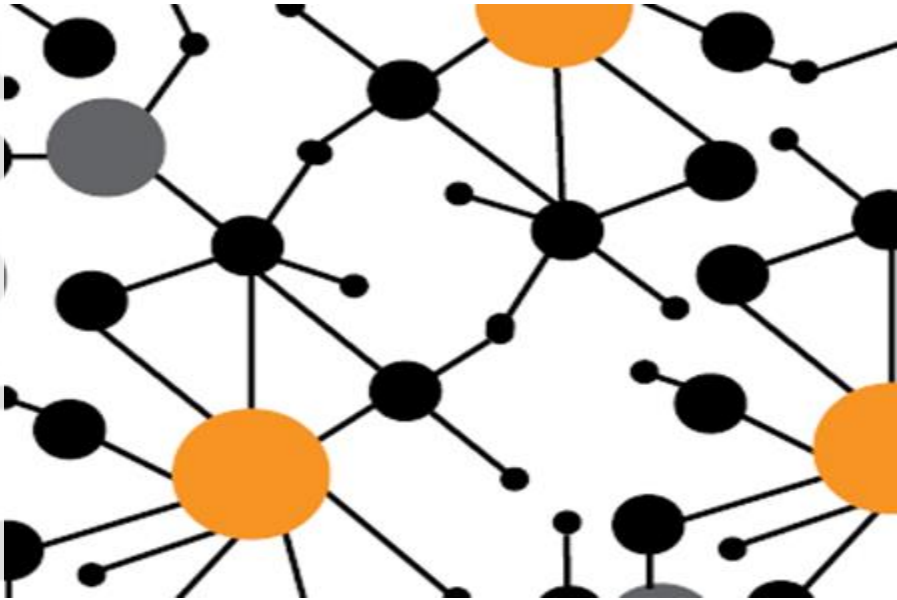
- Data feed (camera, LiDAR, other sensors) collected by the drone
  - Over the canopy: tree heights, locations
  - Terrestrial flight below the canopy: log width, species
- Drone and onboard computing by Avular (NLD)
- Algorithms by Katam (SWE) and University of Lund (SWE)
- Post-flight analysis at the edge computing platform by CrossControl
- Moving the analysis from cloud to the AI-powered edge at the field

\+ AI platform and tool chain development
\+ successful smart forestry pilot, workflow involved by several partners

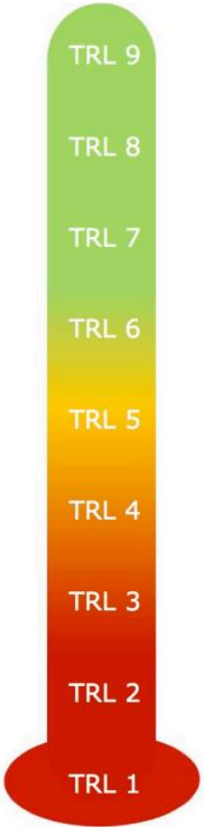
\- as sometimes typical in co-creation projects, one partner dropped off mid-project, impacting the task we were leading

EU PROJECTS

GOOD PRACTICES AND LESSONS LEARNED



FOR BACKGROUND: TRL AND CRL STAGES



TRL 9:	Actual Technology system proven in operational environment
TRL 8:	Actual Technology system completed and qualified through test and demonstration
TRL 7:	Technology prototype demonstration in an operational environment
TRL 6:	Technology demonstration in a relevant environment
TRL 5:	Technology validation in relevant environment
TRL 4:	Technology validation in laboratory
TRL 3:	Analytical and experimental proof-of-concept of critical function and/or characteristics
TRL 2:	Technology concept and/or application formulated
TRL 1:	Basic principles observed

CRL 9:	Widespread product sales
CRL 8:	First products sold
CRL 7:	Customers in extended product testing and/or first test sales
CRL 6:	Benefits of the product confirmed through partnerships and/or first customer testing
CRL 5:	Established interest for product and relations with target customers
CRL 4:	Confirmed problem/needs from several customers and/or users
CRL 3:	First market feedback established
CRL 2:	Identified specific needs in market
CRL 1:	Hypothesizing on possible needs in market

KOKEMUKSIA EU-KONSORTIOHANKKEISTA - VALMISTELU

- Hankeaihioiden löytäminen:
  - Tutkimuksen kotimaiset veturit: VTT, yliopistot
  - Oman segmentin EU-projektien avainpartnerit
  - Business Finlandin ja Business Tampereen tarjoamat EU-rahoitusneuvontapalvelut
  - Brokerage-tilaisuudet
  - LinkedIn-ryhmät
- Projektiaihiosta konsortion kokoamiseen, hakemusprosessiin ja projektin alkuun saattaa kulua jopa 1 vuosi, varsinkin jos ohjelmassa on kaksivaiheinen haku
  - Jos hanke kestää 3 vuotta, odotukset markkinahorisonttiin pitää huomioida
  - Aikaisin mukaan valmisteluun → parhaat mahdollisuudet vaikuttaa projektin sisältöön
- Konsortiosopimuksen (PCA) teko ottaa aikansa, projekti usein käynnistyy ennen PCA:n valmistumista
- Hankkeissa saattaa olla kymmeniä partnereita. Yhteistyö keskittyy kuitenkin työpakettien ja taskien sisällä tyypillisesti n. 4-8 partnerin osaprojekteihin; tämä pätee jo projektisuunnitelman kirjoittamisvaiheessa
  - Työpakettien ja taskien vetovastuuta usein tarjolla enemmän kuin halukkaita; mitä suurempi budjetti, sitä enemmän vastuunottoa partnerilta odotetaan
- Alihankinnan sisällyttäminen budjettiin on yleensä mahdollista, pienemmille yrityksille yksi tapa osallistua onkin alihankkijana; alihankintabudjetin painottaminen PK-sektorille on projektille yleensä meriitti. ”Best value for money” osoitettava.
- Jos hanke ei saa rahoitusta, konsortio saattaa jatkaa valmistelua yhdessä ja yrittää uudelleen; jos projektisuunnitelma ei olennaisesti muutu, uutuusarvo tietysti laskee

KOKEMUKSIA EU-KONSORTIOHANKKEISTA – VALMISTELU

- PK-yritysten merkittävä osuus konsortiossa on yleensä eduksi
  - kaikkien partnerien roolien pitää olla tasapainossa budjettiin nähden, ja olennaisia hankkeen toteuttamiseksi; ei siis esim. ’kiintiö-SME’-yritystä mukaan, jollei konkreettista roolia
- State-of-the-art pitää esittää selkeästi, jotta hankkeen ’beyond the SotA’ erottuu
- Disseminaatiosuunnitelma mieluummin haastava (KPI:t!) kuin liian geneerinen
- Projektin jälkeisiin exploitation planeihin pitää kiinnittää huomiota, tavoitteet määriteltyjä. Quantify!

KOKEMUKSIA EU-KONSORTIOHANKKEISTA – PROJEKTIN AIKANA JA LOPUKSI

- Olennaista: johdon tuki projektille koko projektin ajan
  - joskus yrityksen toiminnassa voi tulla nopeita muutoksia, ja projektin aihepiiri ei olekaan enää yrityksen ytimessä → kriittinen arvio olisiko syytä jättäytyä projektista kesken pois
- Projektin scopeen ja budjetin kustannuslajeihin voi tehdä muutoksia projektin aikana järkevissä rajoissa (amendment-menettely)
- Suurissa yhteishankkeissa usein ulkoistettu projektihallinto, joka laskuttaa partnereita kunkin budjettiosuuden suhteessa
- Taskin vetäminen vaatii aikaa ja sisältää myös sellaisten asioiden ohjaamista, jotka eivät välttämättä ole itselle prioriteetti
- EU-hankkeen raportointi (tekninen eteneminen, talous) ei juuri poikkea Business Finland –projektista
  - EU:lle raportointisykli yleensä vuoden välein
  - työpakettien ja taskien vetäjillä on jonkin verran lisävastuita teknisessä raportoinnissa
- Tilintarkastajan auditointi vaaditaan loppuraportin yhteydessä jos EU:n rahoitusosuus ylittää 300 000€
  - jos projektille saatu myös Business Finland –rahoitusta (esim. ECSEL/KDT-ohjelmat), auditointi tarvitaan aina
- aikakriittinen kehitystyö ei keskimäärin sovi hyvin yhteen EU-projektien kanssa
  - poikkeuksia on, mm. EIC Accelerator, EIT:n ohjelmat

How Kalmar summarized it…

Why EU Projects?

- Money for research, innovation and development to accept the business risk
- Opportunity to find, co-work, co-develop with the best academic and industry expertise
- Opportunity to collaborate with our customers, solving their problems together
- Contribute to future industry business environment including standards and regulations
- Opportunity to validate the product or solution to market fit phases
- Build international R&I networks, value chains and commercial channels
- Get access to find top notch IP such as knowhow, access to corporate data lakes and test facilities

KALMAR

Must have

1. Strategy fit
2. Roadmap fit
3. Resources guaranteed
4. Strong use case
5. Realistic plan (budget & schedule)
6. Good consortium
7. Top management support

KALMAR

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BEFORE THE PROJECT

...

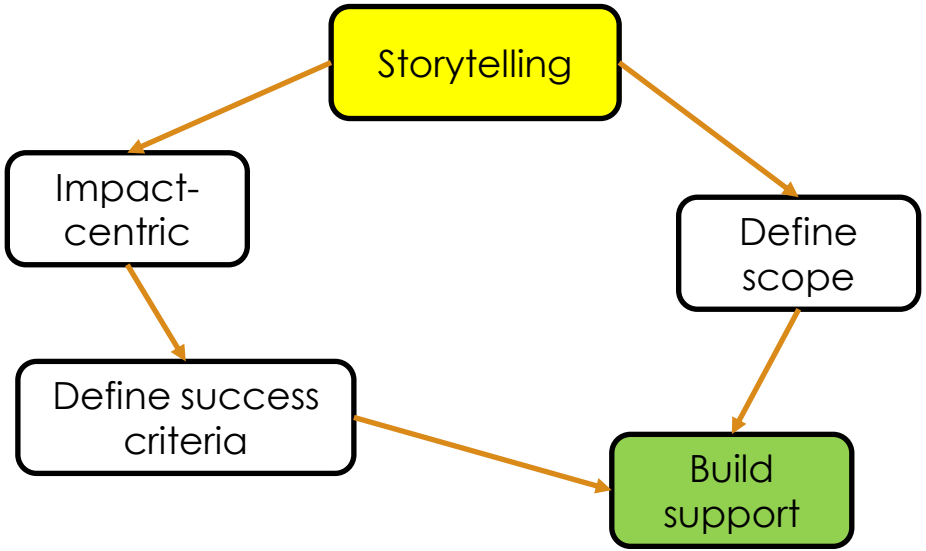
YOU HAVE AN IDEA, WHAT NEXT?

Clarifying and formalizing your idea

ONE-PAGER

- Project Charter tai ”One-pager”
- Inspiroiva tarina, ytimekäs esitys siitä mitä yritykselläsi on T&K-agendalla ja mitä voisit tuoda johonkin yhteishankkeeseen
- Mielellään julkinen, jaettavissa oleva, jos etsit sopivaa yhteishanketta ja keskustelet konsortioiden kanssa
  - ”ice-breaker”, pääsylippu keskusteluihin potentiaalisten partnereiden ja konsortioiden kanssa
- Samalla työkalu yritykselle sisäisesti oman projektiportfolion ja -roadmapin suunnittelussa

- Hankeohjelmasta riippumatta, samat asiat pitää jossain muodossa tuoda esiin proposalissa



One-pager template

Contacts	
Initiative launch by:	
Project Sponsor:	
Date last edited:	

Needs, Requirements, Drivers	
Customer	
Market/ Trends	
Competition	
Internal	

Business Opportunity	
Goals & Benefits	

Strategic alignment	Score 1…5, comment	Financial reward	Score 1…5, comment
Competitive advantage	Score 1…5, comment	Timing	Score 1…5, comment
Market attractiveness	Score 1…5, comment	Level of disruption	Score 1…5, comment
Technical feasibility	Score 1…5, comment	Other?	Score 1…5, comment

Scope of the initiative	
Scope of work	
Assumptions, dependencies	
Outcome, deliverables	

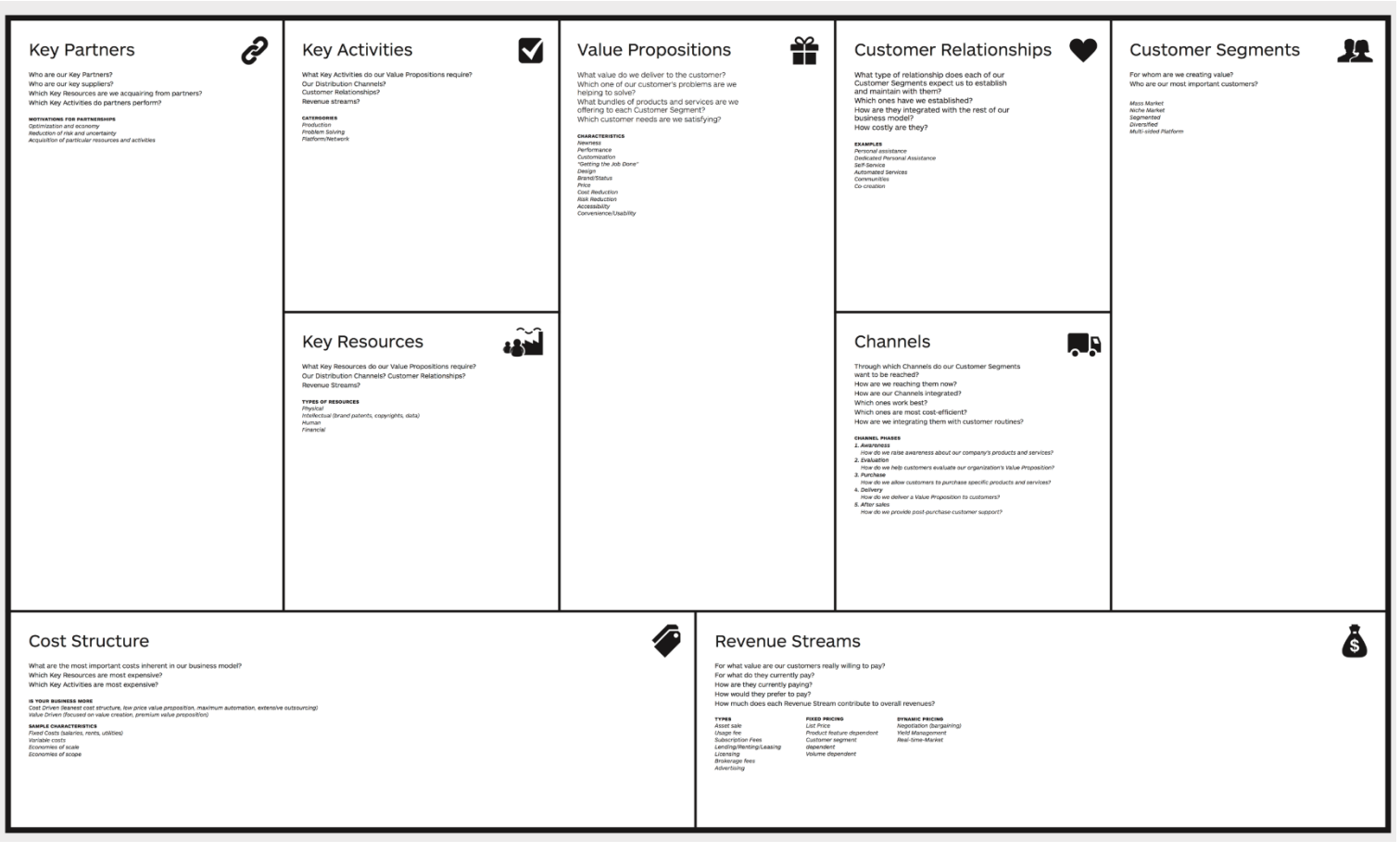
Funding Estimations (order of magnitude)	
Internal labor hours	
External services, other spending	
CapEx	

Commercial Estimations (if applicable)	
EAU:	
Revenue potential	
Estimated SOP:	

Review Conclusion	
Type of Development	
Decision	
Next action	

Defining your scope

BUSINESS MODEL CANVAS



Defining your scope

SWOT

	Strengths	Weaknesses
Opportunities	*Opportunity-Strength strategies (use strengths to take advantage of opportunities)*	*Opportunity-Weakness strategies (overcome weaknesses by taking advantage of opportunities)*
Threats	*Threat-Strength strategies (use strengths to avoid threats)*	*Opportunity-Strength strategies (minimize weaknesses to avoid threats)*

Defining your scope

RISK ANALYSIS

#	Description	Severity (low/mid/high)	Probability (low/mid/high)	Mitigation plan
1	Fail in material selection in plant areas where chlorides concentration is very high, causing corrosion problems. (Technical)	Mid	Mid	Integration partner XX carried out a study with the research partner YY and concluded that Titanium based equipment was necessary in specific areas to prevent this corrosion, so these materials will be used already in the construction phase.
2	Lower sales prices caused by volatility of raw materials markets. (Market)	High	Low	Adjust the financial model with the latest information when necessary to quantify the impact. Cover cash flow by funding from ZZ.
3	…			

- Think of all aspects of risks: technology, financing, market, regulation, legal, IP
- Be specific and quantify where you can

  - Example: reference to definitions by MIL-STD-882D
  - Use you own industry standard if available and applicable

Description	Category	Environmental, Safety, and Health Result Criteria
Catastrophic	I	Could result in death, permanent total disability, loss exceeding $1M, or irreversible severe environmental damage that violates law or regulation.
Critical	II	Could result in permanent partial disability, injuries or occupational illness that may result in hospitalization of at least three personnel, loss exceeding $200K but less than $1M, or reversible environmental damage causing a violation of law or regulation.
Marginal	III	Could result in injury or occupational illness resulting in one or more lost work days(s), loss exceeding $10K but less than $200K, or mitigatible environmental damage without violation of law or regulation where restoration activities can be accomplished.
Negligible	IV	Could result in injury or illness not resulting in a lost workday, loss exceeding $2K but less than $10K, or minimal environmental damage not violating law or regulation.

Defining your scope

POTENTIAL BARRIERS

- Similar to the risk register, consider potential barriers for market entry
  - and how to mitigate or make a workaround
- A barrier is something that already exists, while a risk may or may not realize

- What kind of barriers could you be facing?
  - Technology
  - Commercial
  - Market structure or dynamics
  - Standards, regulatory and legal
  - IP

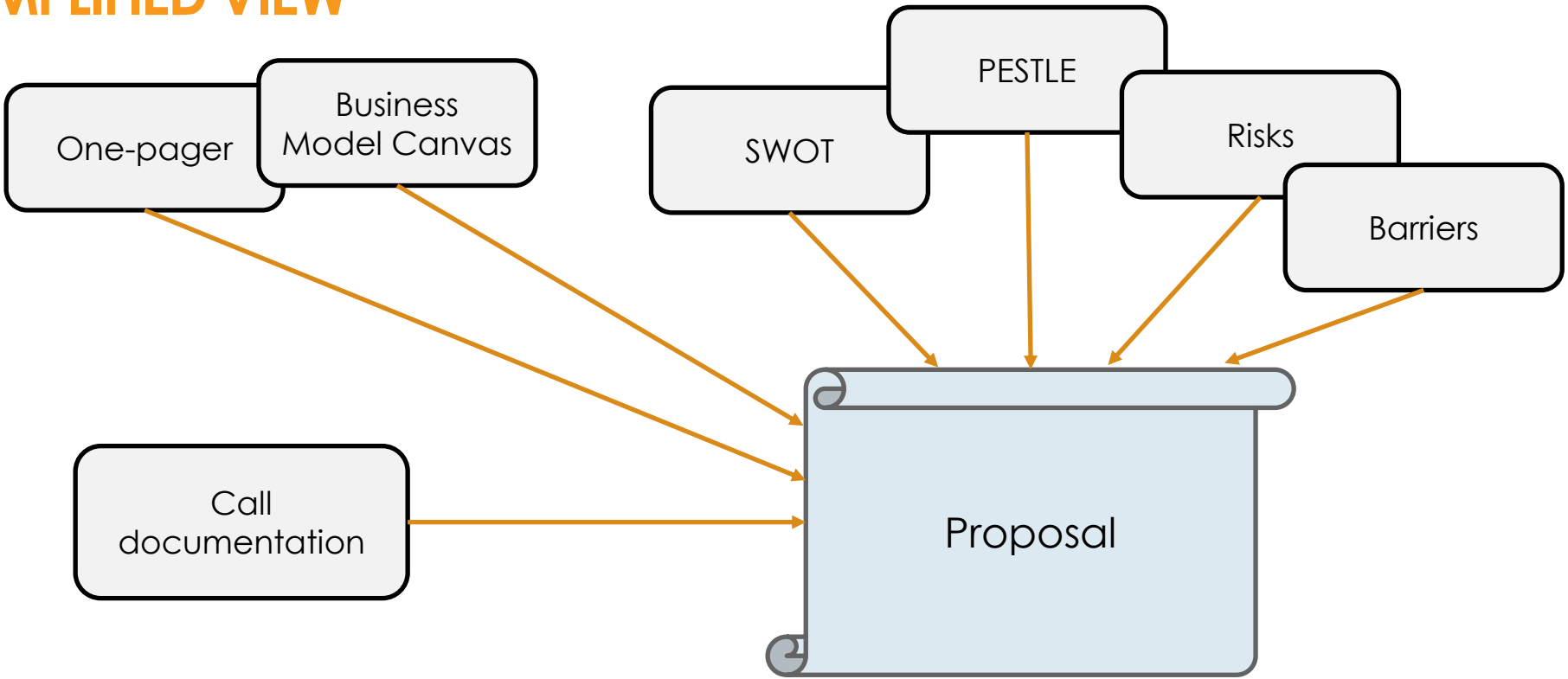
#	Description	Mitigation or workaround plan
1	Virtual process chain for simulation of the complete physics of the manufacturing process does not exist at the moment. (Technical)	The complete process will be separated into smaller steps with mechanical, thermal and electromagnetic solvers. A virtual process chain will be established that combines smaller and more resource-efficient simulations, by mapping of relevant process data, like, residual stresses, strains, temperature etc.
2	Some markets have a fragmented supply chain. For example, in [country XXX], vendors such as ZZ and YY supply the larger manufacturers directly, bypassing distributors. (Market)	The direct supply appears to be restricted to the very large manufacturers. We may need to form relationships with manufacturers as well as distributors. However, there is still significant business going through the distribution channel.
3	…	

Defining your scope

PESTLE

- A framework to look outside the organization to hypothesize what may happen in future and what should be further explored
- Helps understand the context for change, and is most effective when used in association with a SWOT analysis to understand opportunities and threats
- Potentially applicable in today's theme, especially with energy transformation and EU regulations (Green Deal) in mind

BRINGING THE HOMEWORK ALL TOGETHER – A VERY SIMPLIFIED VIEW

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