INTRACOM TELECOM

Technology Shaping the Future

OUTSOURCING SERVICES

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About myself

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- Section Manager in Intracom Telecom, Software Design Center - Thessaloniki Branch
- There are ~120 Telecom Software Engineers at the site of Thessaloniki
- Operations management experience ~16 years in Telecommunication software development: 2G/3G/4G, Virtualization & Cloud, SDN/NFV, 5G
- Electrical engineering in Aristotle University of Thessaloniki
- Master in Information Systems, University of Macedonia
- Married with two kids

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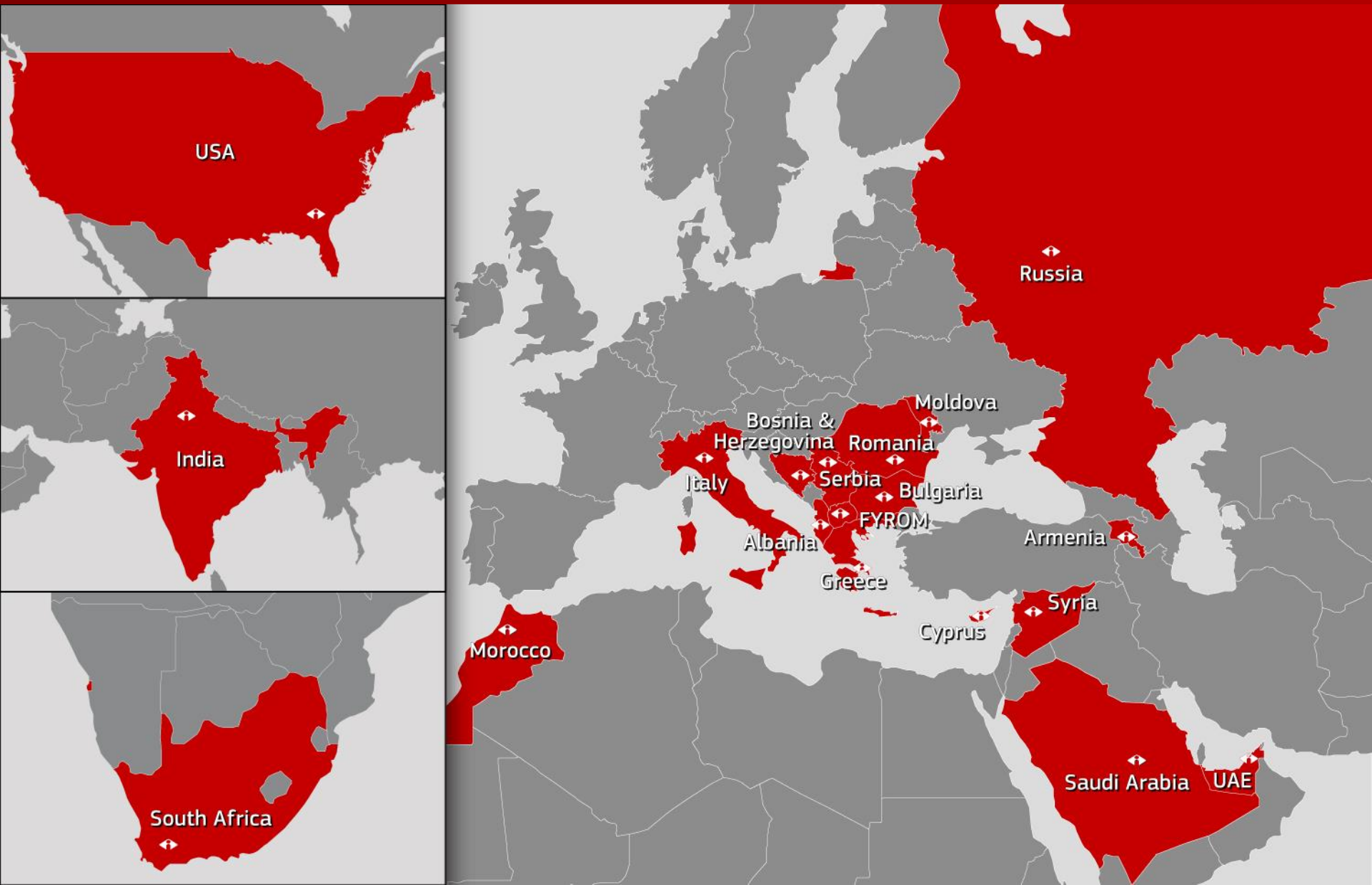
Intracom Telecom at a Glance

- A global telecommunication systems and solutions vendor
- Over 35 years experience in the telecoms market
- Exports to Over 70 Countries
- Over 1,900 employees worldwide
- Advanced R&D and Production facilities

- Core Offerings:
  - Wireless Access & Transmission
  - Telco Software Solutions
  - ICT Services & Solutions
  - Renewable & Energy Management Solutions
  - eHealth Services

International Presence



R&D Consultancy Services, Facts in Brief

- Business focus : R&D outsourcing services for Real Time Telecommunication Networks
- R&D Consultancy services are also known as *Software Design Center* - Established early 1989
- As of 1992 and up to now a major contributor to the evolution of Mobile Core products and services for one of the largest vendors in the world
- Achieved the status of Preferred Supplier
- Number of FTE's : ~400

Services Portfolio

Software Development

Technical investigations & System evolution studies
Proof of concepts
Solution & Architecture Design
Solution implementation, Integration and Verification
Software assembly and CPI library production
Updates and upgrades of Software releases

Market Customizations

End Customer Consulting and support during requirement phases
Implementation verification and packaging of e2e Customized Solutions
Quick Turnaround Times
On site verification and Deployment Support

Verification

Test Management, Test Design and Documentation
Low level Protocols and Interfaces Verification
Feature and Configuration Testing
End to End Test and Test Automation
Node & Network System Testing,
Integration and Troubleshooting

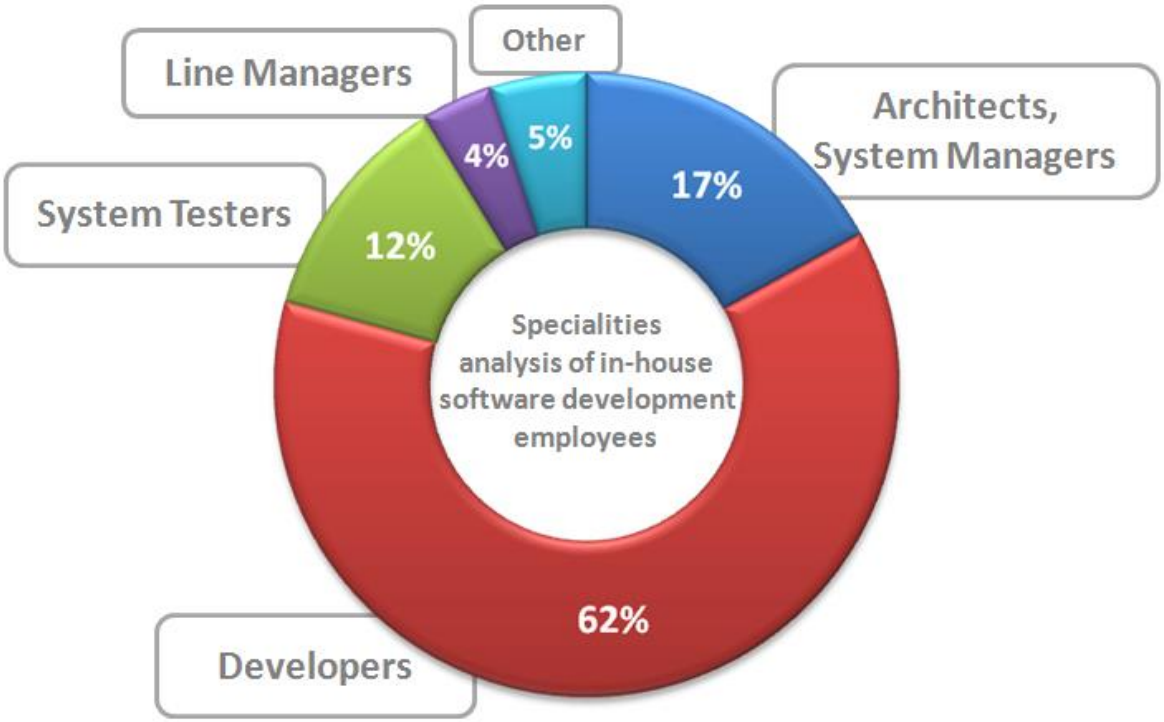
Management Capabilities

Efficient Networking with technical and business stakeholders
Agile scaling for Large and Complex Projects
Deployment of Scrum and Kanban
Provisioning of Agile Training and Coaching

Support & Maintenance

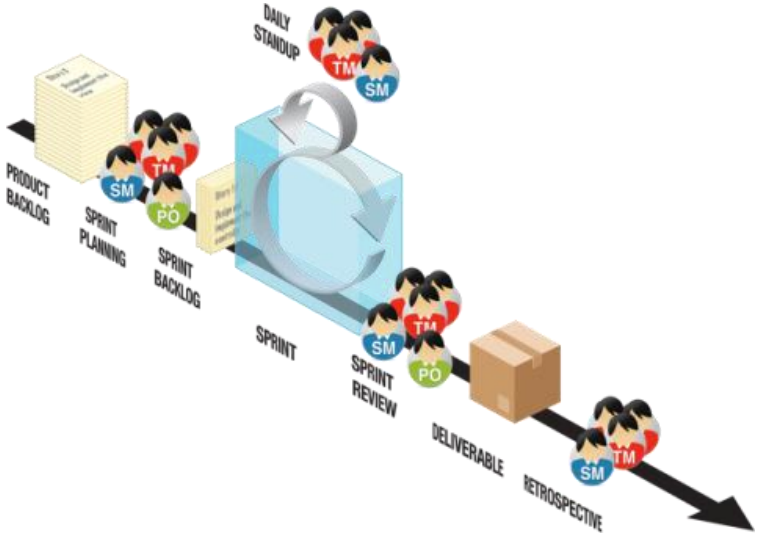
Product Introduction , Deployment &Support
Tier 2 Level Organization
Technical Management and Escalation Handling
Network Level Troubleshooting
End Customer Support (On site , 24h/7d)

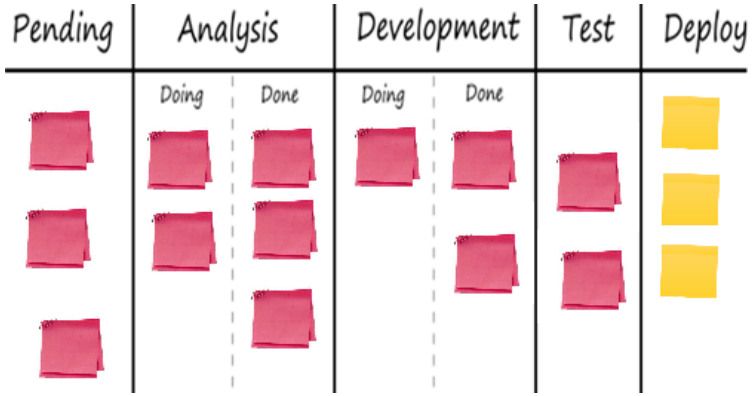
Our People, Our Most Valuable Asset



Full deployment of Agile and Lean values

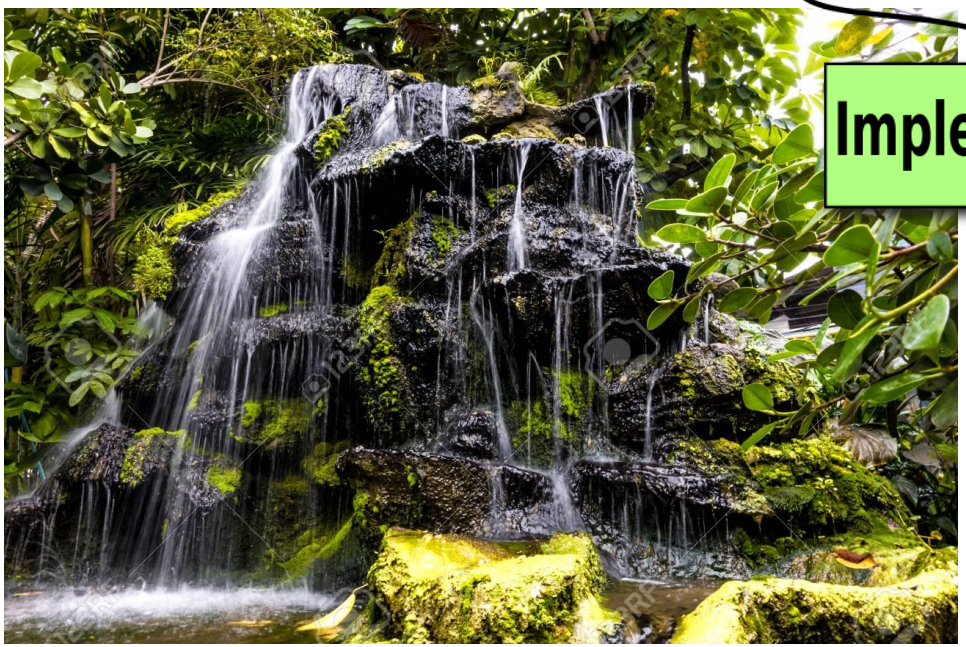
- Cross functional, self organized teams following the Agile Framework
- Scrum and Kanban methods in use
- Working Communities of Practice for Teams, Coaches, Product Owners
- Software Craftsmanship and Agile Coaching
- Investing on the Continuous adaptation of the Agile Framework to our actual needs and challenges, through an Agile Transformation program





Transition to Agile Framework of a Large Scale Software Development organization

Pre-Agile Era



Requirements → Product requirements document

Design → Software architecture

Implementation → Software

Verification

Maintenance

A need to change … emerged

Improve TTM

Cope with Delayed deliveries

Improve Planning accuracy

Reduce the Uncertainty

Improve Quality

Improve Customer Satisfaction

A need to change emerged for the whole organization

First-time-right

First-time-Right was a Quality-moto for many years, and still is…

A complex and demanding product

real-time system

top quality

zero down time

System Integrity

Adherence to standards

robustness

stability

high availability

scalability

upgradeability

maintainability

redundancy

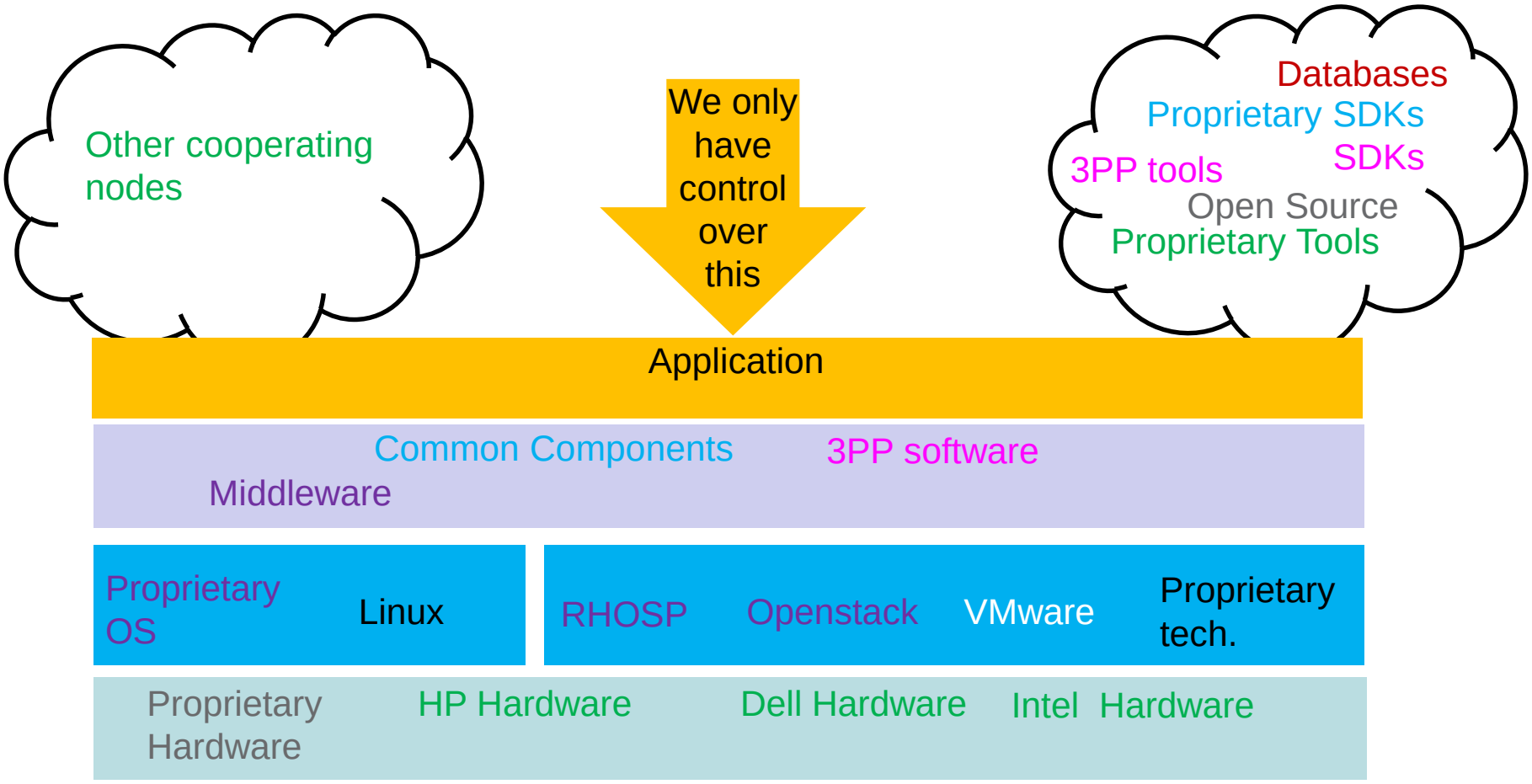
Customer Documentation

Product Documentation

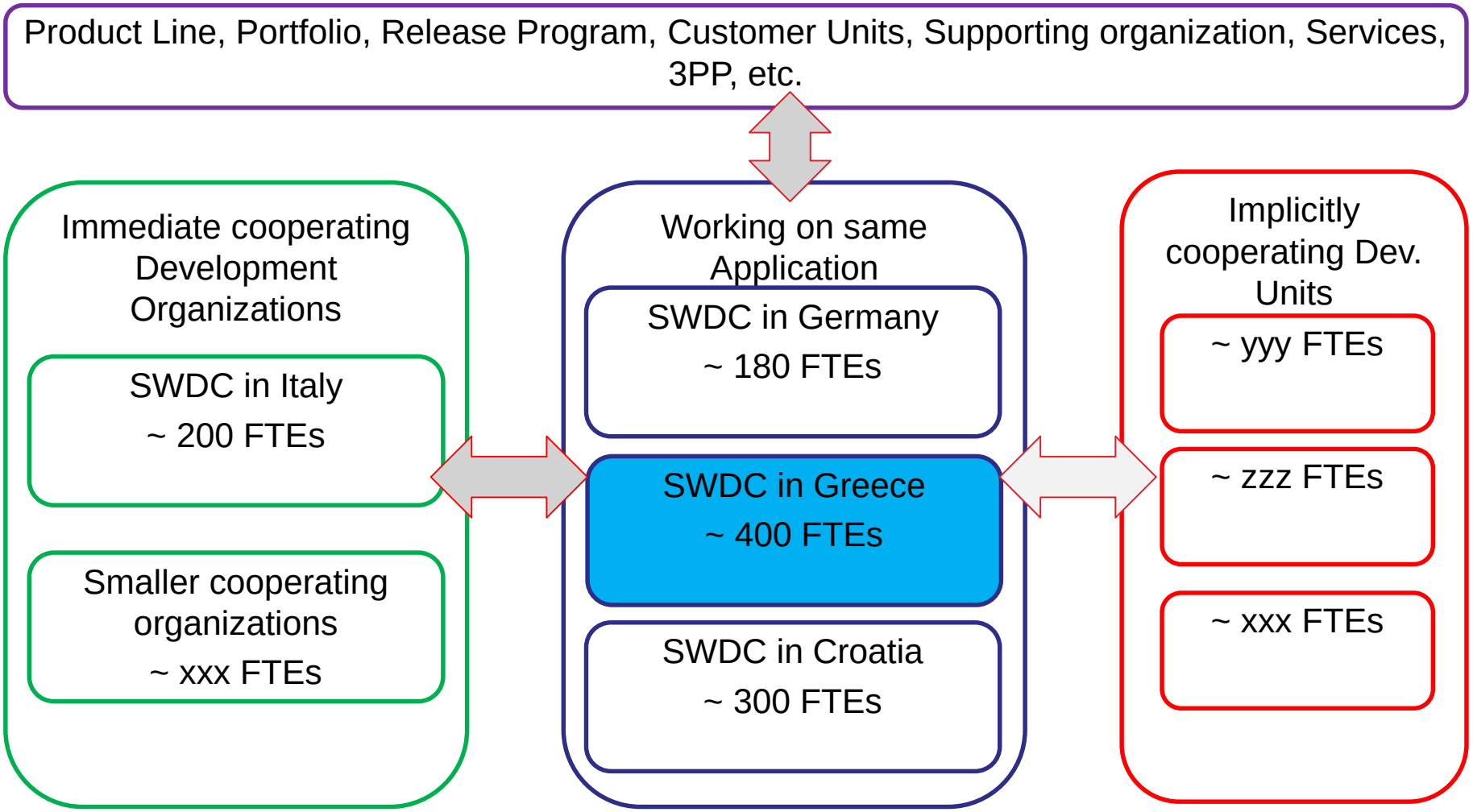
future proof

Technical Dependencies on other products

- There are strong dependencies on other products, tools, organizations
- Not always are synced with our ways of working and/or product lifecycle

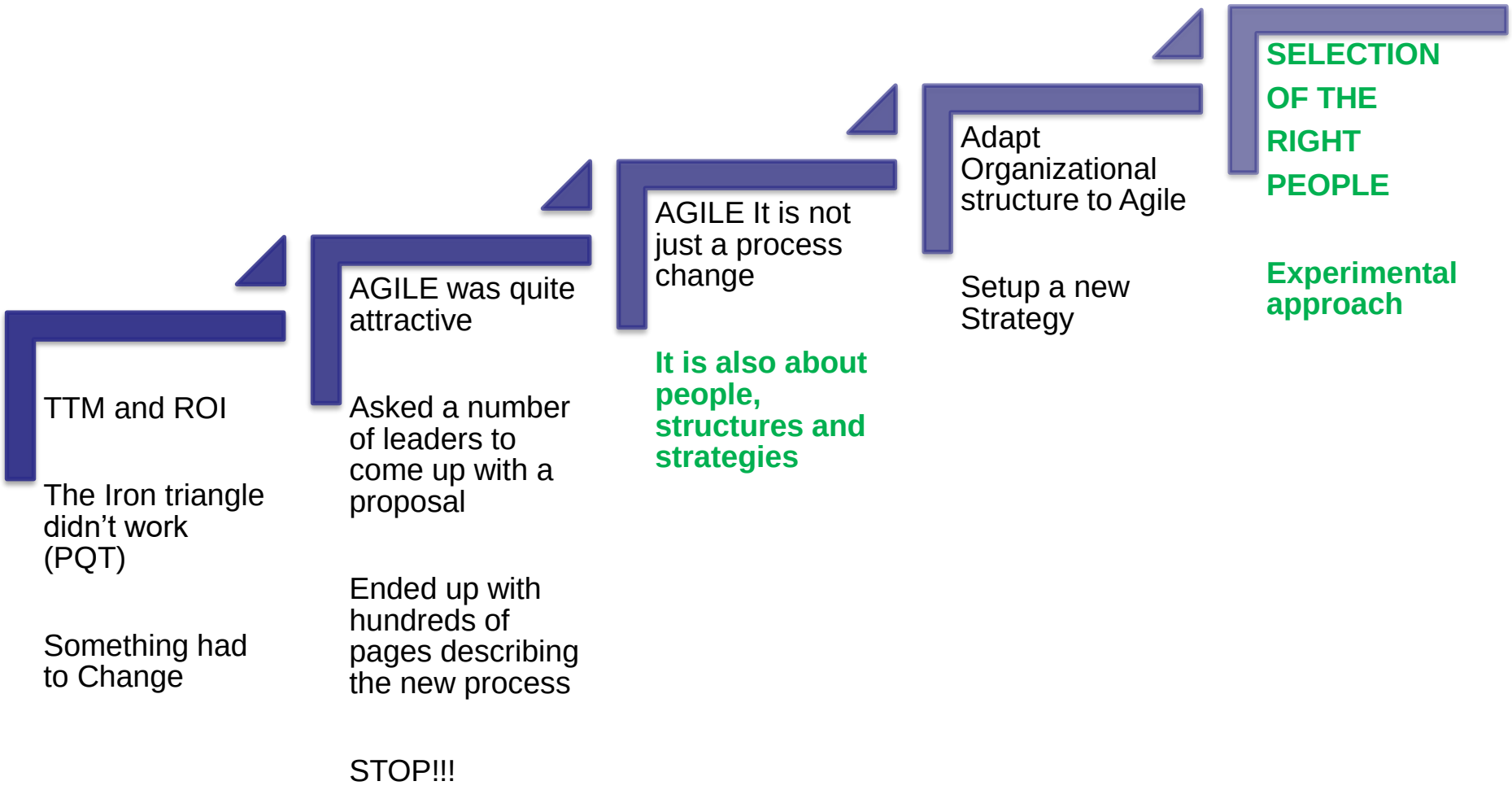


Multiple organizations interacting



MANAGING THE CHANGE

Stairway to change



AGILE IS MINDSET

“Agile is mindset" and if you can’t grow that mindset, you will not succeed, but just get stuck in a changing processes”

Hendrik Esser, Ericsson Management – Leading the Agile change

Managing Complexity

- An experimental approach: Probe-sense-respond
  - This helped to cope with dynamically emerging phenomena and changes
- Started from the problems we wanted to solve
  - Agile is not the goal but it might offer some solutions
- Change of Mindset
  - Leaders were first
  - Built own agile masters and used them in our local transition program
  - Encouraged people to be actively driving the change
  - Reflect and improve

THE JOURNEY

Started up in 2010 - Experimenting

Venue …GREECE

- Selection of champions
- Setup a Pilot
- Train the trainers
- Train the teams
- Cascade competence and framework to a few more teams

External consultant company called Agile42

- The company helped substantially to establish the right mindset
- Helped a lot in training the trainers and the teams
- Made clear the simplicity of the manifesto and encouraged us to get out of the cumbersome legacy way of thinking and micromanagement
- Did not continue after the pilot

Certified our Scrum Masters

- We certified all our Scrum Masters
- We have chosen PSM (scrum.org)
  - Advertise this to our customers
  - Not so much of a direct-value adding certification to the company
  - Rather an individual attribute.
  - However it keeps the moral of Scrum Masters high and boosts their interest for evolving themselves

Agile transformation program

- Establishment of an Agile transformation program with champions as drivers
- Keep things going in a consistent manner
  - Coaches' training, teams' training, safeguard the values of agile, apply new ways of working etc.
  - Continuous people engagement (i.e. Agile days, Coaching Networks, Rewarding Best practices etc.)
  - Continuous team development
  - Assessment - evaluation and improvement (retrospectives, subjective evaluation, feedback loops etc.)

SCALING AGILE

TAKE AWAYS

Scaling Agile …with figures

The Scale of scaled Agile

- The magnitude of the scale on feature development level:
  - 7-10 teams had to work on the same feature (project)
  - Each team consist of 6-7 FTEs
  - 1 PDO per two teams
  - 1 Scrum master per two teams

- The scale on Product Release level
  - 3-4 features had to coexist in the same release of the application
  - Some more teams working on underlying layers of the product
  - The release had to synchronize with other releases of depended nodes

Scaling Agile – take aways

Good practices in Scaling Agile

- Strong chief PDO
- Common sprint planning ceremonies between the teams
- Common daily stand up with all teams
- Close cooperation between the teams - the management - and stakeholders i.e. a meeting where teams meet management regularly to discuss the constraints of the projects and priorities

The myth of collocation

- Collocation of teams working on same project is –of course- nice to have.
- However, engaging the right teams (even if geographically distributed) is more important and has much higher benefits than choosing collocated teams of inferior attributes
- Cross-organization cooperation in Scaled Agile is very common
  - Geographical distribution of teams is usually inevitable.
  - This is a more complex process and needs time.
  - Creating bonds between organizations by rotating people, syncing WoWs and frameworks, swapping responsibilities, are some of the actions that can help overcome physical and logical distance

Enablers on Agile framework level

- **Establishing a consistent Agile transformation program**
  - A step-by-step strategy on how to transform the organization
  - Long term vision: move from “doing Agile” to “being Agile”
  - Coaching the coaches
  - Training the teams - Good knowledge of agile framework
  - Continues teams’ development – striving to build high performing teams

Enablers on coaching level

Selection of the right persons to drive the change

- Enthusiasts (can be of any age)
- Natural team players
- Open minded people
- Self driven people
- People with natural leadership skills

Coaching the Coaches to:

- Challenge teams and encourage them to take things forward (not sitting back)
- **Strive for building high performing teams**
- Give time to the team to form

Note: One needs to be careful that coaches don't create tasks, just to make themselves busy (Cobra effect).

Enablers on team level

Build real Cross functional teams

- A legacy organization carries the load of function specialization (silos)
- In Agile, people need to acquire flexibility. As a rule of the thumb, the team needs to have a goal: 40% of members being able to conduct studies, 60% able for doing design and 60% able to do verification
- Collocation of team members belonging to the same team is vital. Use of open spaces seems to work better

Evolve all needed skills on the team

- Soft skills i.e. presentation skills, communication, collaboration, time management etc.
- Stakeholders management
- Planning skills
- Risk management
- self competence management
- a.s.o

Mindset of Ownership

- Reinforce ownership of the deliverables
- If not correctly handled some deliverables can be endangered i.e. documentation, test suites etc.

Enablers on organizational level

Efficient Retrospectives on all levels

- Probably the most important activity and needs to run on team level, organizational level, PDO level etc.
- Retrospectives usually suffer from poor follow up
- Settings actions and implementing them is key

The role of operations managers

- Serving the teams
- Let-go mindset → **Need to empower the teams**
- Steering instead of driving

  Note:

  - Letting things work completely automatically …will NOT work
  - Rather : challenging / suggesting / facilitating
  - Micromanaging things will gradually REMOVE the ownership from the teams

Learnings

- **Comfort zone and job security (especially the legacy part of the organization)**
  - Management that saw Agile as a threat for their positions
  - Technical experts and key persons that felt they would become less important
  - Simple Engineers that acted with skepticism (natural behavior)
- **Organizational structures (Silos)**
  - The legacy organization was divided in groups of Technology experts, designers, testers, verification engineers etc.
  - Most difficult was to break the silos that were relying on individuals
  - Teams initially left alone (Team is responsible for everything)
- **Management's appetite for fast results and quantification of benefits**
  - Pressure for figures
  - Pressure for fast adaptation of the whole organization using a copy-paste approach
- **Misinterpretation of the Agile Manifesto about "working software over comprehensive documentation"**
  - Good Documentation is an integral part of a well working application. Especially the customer documentation
- **Confined information – the organization needs to have the full picture of the "field"**

Learnings

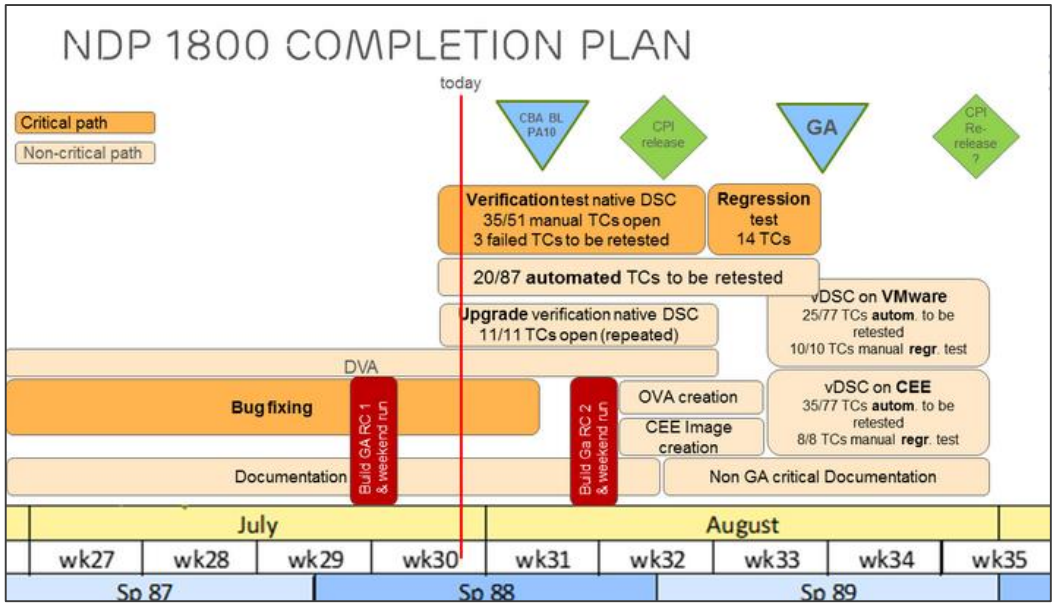
- **The pyramid of decision making and escalation management can be a problem if too large (the shorter the better)**
  - The size of the organization can be a hinderer
    - Lost responsibilities between chairs
    - Disconnection of teams from management expectations and sometimes the customer. A customer driven organization cannot have a large pyramid of decision making etc.
- **Putting everything on the teams**
  - Teams can not handle everything as there are human limits
- **Lost in Agile theory**
  - Doing Agile …just for the shake of Agile
  - Staying on a Theoretical mood – overlooking actions
- **Leadership can sometimes be dominant**
  - *Article Ref: The dark side of Charisma*

Quality and Agreed Practices

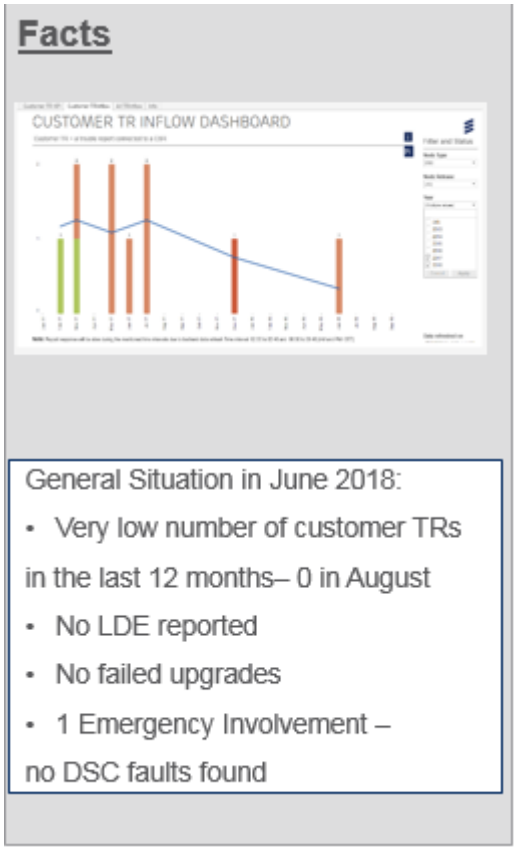
Measuring trends

Strategy

The basic guideline is that we are focusing on **measuring trends**. Evaluation of a trend will show if we are continuously improving and whether the taken measures are showing the desired effect.



Radiator



Quality Definition of Done

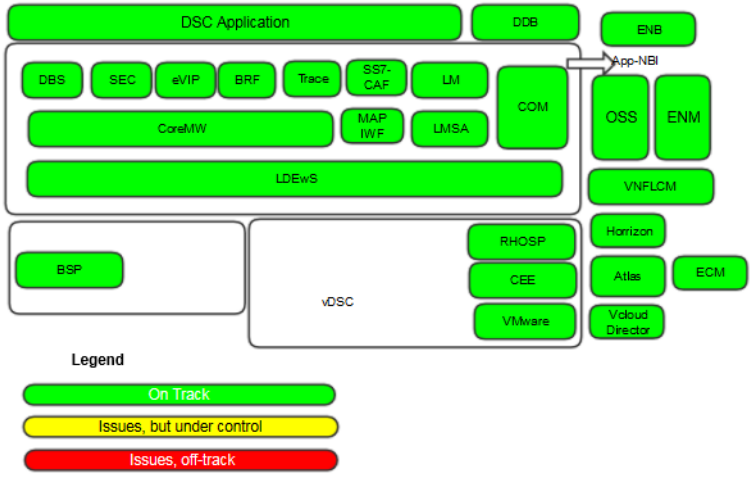
Stone Tablets

1. No class A and B faults at GA
2. The release performs equal or better than previous release
3. Verification completed in due time before GA
4. The release/product shows robust upgradeability
5. New features tested and proven in Customer Networks

Release Assessment

- Overview - Key Dates and Status
- Release Burn-down
- **Quality Status**
- **Status of 'non-green' elements 04 Sep 2018 1.10**
- **NDP Check-list**
- Release Assessment - Summary

Quality status



Assessment check-list contains criteria about

- Product Quality
- Release procedure
- Documentation
- Configuration Management
- Production readiness
- Security Alert

Own defined Quality Indicators

- Quality ranking on Components (a subjective Expert ranking based on test results and bugs)
- Bug Tracker Trend (The Created vs Resolved Bug curve shows the trend of our Bug creation- and resolution rate)
- TR Trend
- Continuous Integration
- Customer Support Requests (CSR) Trend
- Test Scope Status
- Subjective Expert Feedback on Code Quality
- No Compiler Warnings

Agreed Practices between the teams

Agreed practices on team level

- **All Team work Agreements**
  - Coding Guidelines C++
  - Severity Level for Logging
  - Git (Workflow, Eclipse, ...)
  - Storage Space
  - Software Areas
- **User Story Definition of Done (U-DoD)**
  - Code fulfill our Code Quality Criteria (agreements followed)
  - Potential (system, documentation, scope or test) limitations are agreed with the PdO and documented in the US
  - Relevant documentation updated or created
  - Before closing, and while working on a US or a BUG, all findings, agreements, decisions, solutions, links, etc. that are relevant to know for all teams, are added as comment to it.
  - If parts of the new functionality can be unit tested, new unit test cases have been designed
  - CI suites updated with relevant new TC and the existing impacted TC are updated, all TC run.
  - The DSC software is compiled on a merged local master branch once before pushing the changes to master.
  - Regression test is performed by running the TCs before push to master on your own branch.
  - Monitoring the CI 1-2 days after pushing to master is mandatory.
- **Code Quality SoS**
- **…and many more good things happening**

ASSESSMENT OF ACHIEVEMENTS

McKinsey feedback

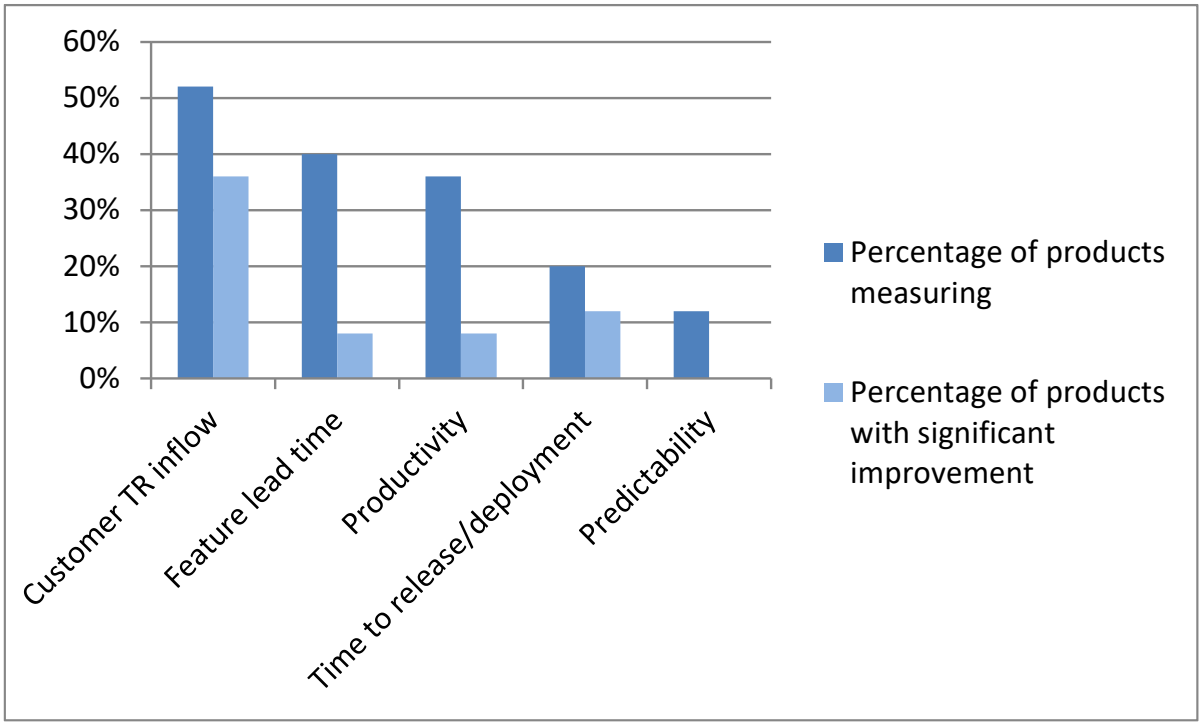
McKinsey

- Six years after the adoption of Scrum, McKinsey was asked to answer the question:

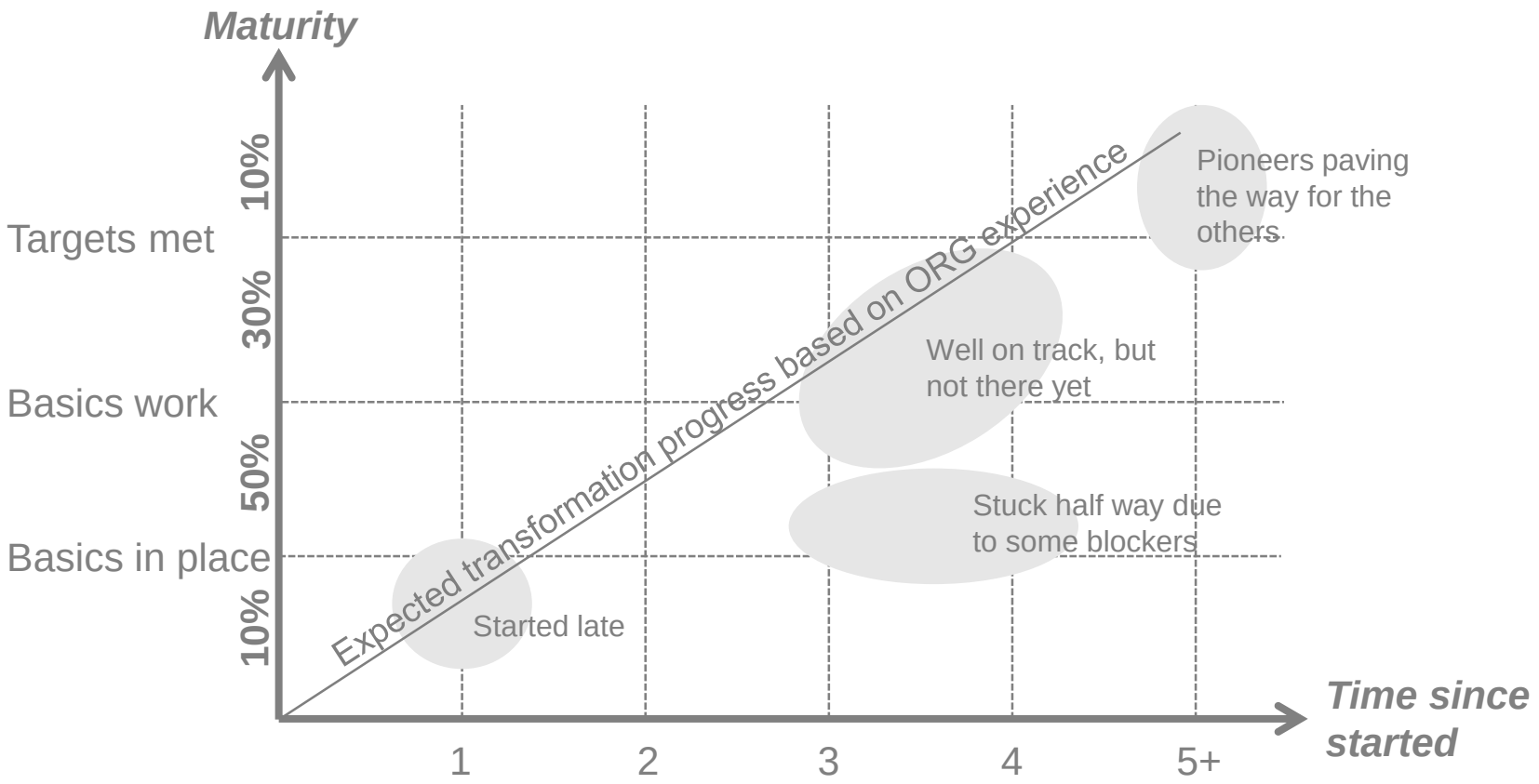
“Do we have a competitive product development?”

- McKinsey confirmed what was measured internally

Significant improvement (>50%) compared with pre-agile



McKinsey



Basics in place:	Pull from backlog, XFTs and short feedback loops established
Basics work:	Significant (>50%) improvement can be shown for at least one post GA parameter
Targets med:	program targets met (effectiveness excluded until measurement is in place)

Effects on the organization (McKinsey report)

	Long term target	*Status*
Productivity (Features / man hour)	100% higher	**17% higher**
Quality (Customer TRs)	50% less	**14% less**
Lead time (E2E feature lead time)	50% shorter	*Measurement in place, measurement started in Jan, 18% of the products show > 5% improvement*
Effectiveness (Feature deployment)	higher	*Measurement being established. Trial ongoing in the PeM program.*

McKinsey Summary

Large improvements by lean & agile, well in line with the program targets, i.e. double productivity and half the lead time

The transformation is making our product development a competitive advantage, only 4% of the companies in the benchmark performs better in all 3 aspects: productivity, quality and lead time

The way we scale lean and agile works well, i.e. makes us very fast, still being productive

Our current way to estimate productivity (features per man hours) comes with severe limitations. It is applicable for a minority of our nodes and for trends on aggregated level

McKinsey comes with recommendations for improvements on:

1. Predictability in hitting the release needs improvement
2. Our way to measure productivity needs improvement
3. The organization should establish a systematic performance management based on a balanced set of metrics

The organization responds to the recommendations according to:

1. The lean and agile core program will work on this one
2. We will work with McKinsey, using their database as a lab for improving our own productivity metric
3. We will work with McKinsey in 2 pilots, 1 per BU , on systematic performance mgmt

In addition we will make the Numetrics tool available for use where PDUs want to create a better understanding of their performance

RESULTS TODAY

- 100% of Software Releases on time since the change
- 50% Less defects found at customer after Release
- Better decisions through significantly improved interactions (collaboration culture)

CLOSING

Certification on corporate level

- The company has established and maintains certifications for
  - Quality Management System **ISO** 9001:2015
  - Environmental Management System according to ISO 14001:2015
  - Information Security Management System ISO 27001:2013
  - Occupational Health and Safety Management System according to the OHSAS 18001:2007
  - Business Continuity Management System in accordance with ISO 22301:2012

Software Design Center certification

Being a supplier our certification strategy is mainly driven by our customer's requirements. The most recent ones:

- Scrum Master certification
- Verification engineers: ISTQB
- VMware certification, CCNA a.s.o.

- In the past, our customer applied :
  - 6-sigma model for Quality and this was abandoned all of a sudden
  - the CMM model for some years and we also had to adhere
    - The model seized in 2003/2004
  - We are not in position to know why our customer stopped CMM and 6-sigma

Reflections

- As an observer:
  - Our main customer is hesitant to invest in process assessment models - Could it be that the benefits from such activities are not so evident?
    - The recent experience with McKinsey was good at the level of confirming what was known. Deriving suggestions and post-benefits are not yet visible to the majority of the organization
  - Models that are targeting the management layer, they have a difficulty to reach the core of the development organization.
  - Process goes hand in hand with people. Whenever we talked about process assessment models, we sensed that the developers were disconnected
    - It is very likely that management has a big share for not succeeding in engaging people.
    - Another reason is that measurements are then connected to management bonus and this creates wrong behaviors. Figures are killing improvement
  - When it comes to improvement, we noticed that heavy process for triggering improvement will not work. Instead bare minimum works better and is well engaging teams i.e. light risk assessment, retrospectives, daily follow up, simple target setting
  - The way we assess our progress in the Agile journey is quite subjective. It is evident that a more organized and structured model like Spice would help in setting up more sustainable measurements on a longer term

Reflections

So where is the interest:

- → **Keyword: High performing teams.**
  - The production cell is the team (not individuals)
  - The trend is to invest on frameworks that will help the teams reach performance excellence
  - But of course, Novelty works well the first time and it usually doesn't last too long. Moreover, you cannot copy novelty.
  - It is better to invest on people's mindset, behaviors, soft skills, encourage own initiatives and driver-ship.
  - The challenge for models like Spice is probably the "how to engage the teams"
- **Flexible, autonomous, small-sized organizational structures ← OUR NEW OBJECTIVE**
  - The trend is to setup small sized autonomous organizations (<99 engineers with thin management layer).
  - **Faster decision making** ← HOW TO
    - Empowerment of the team is a prerequisite and this means that the team has to be closer to the customer and the stakeholders
    - Thin decision making layer (a few brave men and women)
  - Management is strongly interested in the outcome of process related communities, forums, blogs etc. i.e. Agile forums, blogs for decoding the success of startups, new frameworks, WoWs, automation, Continuous-X a.s.o
- **The journey will continue …**Soon, we expect significant changes towards more lean organizational structures…

thank you

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