Introduction of New Ways of Working driven by Measurements

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Operational Development and quality

ABOUT ERICSSON

Global presence and customer relationships

- A unique position: 134 years – 140 countries
- Never left a market – never left a customer
- Innovation for customer growth and profitability
- Around 85.000 employees worldwide
- NS 2009: 206,5 BSEK

Dedicated to customer success

BACKGROUND

- Measurements were in used for a long time driving continuous improvements.
- Measurements covered mainly the project development cycles and the product performance in the field.
- Measurements for some of the front-end activities, like customers satisfaction, responsiveness, understanding customer requirements and needs; as well as financial also drove continuous improvements.
- BUT, after the telecom crisis in the early 2000's, the convergence of Telecom and IS/IT worlds, the merging of suppliers, and the appearance of new players there was a need to focus on more radical improvements leading to introduction of new ways of working.

OUR CHALLENGES

Technology shift out in the market.

We are leaders in the current technology and face a big challenge for maintaining this leadership with the new technology shift.

Need to launch the first release quicker to drive technology and market and be perceived as the technology leaders in new architecture.

Fierce competition with traditional telecom competitors and new players from IS/IT.

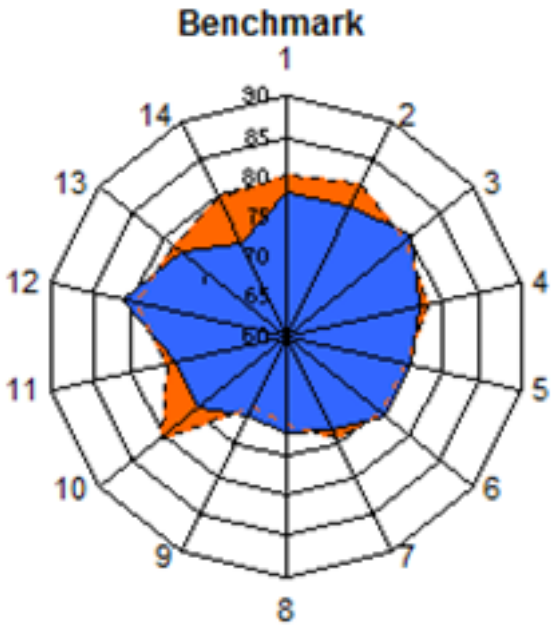
We must be perceived as flexible in R&D.

We have to be more responsive to customers and market demands

KEY Measurements

- Time To Market
- Time To Customer
- Project Lead Time
- Project Delivery Precision
- Project Cost Precision
- Effort estimates accuracy
- Risk Management efficiency
- Productivity
- Fault Slip Through
- Fault Density
- Cost of Poor Quality
- Test Progress
- In Service Performance
- Customer Complaints

Customer Satisfaction Survey



included questions

1. **Proactivity**
2. **Responsiveness**
3. Understand your business situation and needs
4. Determine your requirements
5. **Design solutions to increase your future business**
6. Address your business requirements adequately in the proposals you receive
7. **Lead times meet your requirements**
8. Advance notification given of problems/delays
9. Projects are completed on time
10. **Ease of putting the system into operation**
11. Ease of operating and maintaining the system
12. **Quality of network performance**
13. Quality of software upgrades
14. **Quality of support services**

Conclusions

We need to:

- adapt our ways of working in order to be flexible to achieve customer needs quicker.
- increase development efficiency e2e by
  - Simplifying and optimizing Node Development
  - Ensuring right Solution approach with minimum cost
  - Faster product deployment
- shorten Time To Market and Time to Customer
- reduce Time To Cash in order to finance the introduction of new technology.
- definitely, be successful with the first release.

Requirements for the new way of working

Principles used:

- Customer driven development
- Early feedback
- Well defined early phases
- Always on-going development
- Continuous integration
- Design decoupled from release

Expected outcome:

- Increased flexibility
- Improved quality
- Improved predictability
- Reduction of TTM and Features' lead-time
- Quicker answer to customer needs
- Higher Feature hit rate
- Lowered cost
- Reduce Time To Cash

THE SOLUTION:
Streamline-Agile development

STREAMLINE – AGILE DEVELOPMENT

is a strategy for product and project life cycles.

This means that:

- Product management has a sliding window to decide upon content for the next release.
- R&D develops features in a never-ending stream of iterations.
- The release is done separately with continuous integration of features in the Last System Version (LSV) which is always shippable.
- The deliveries are handled by rollout and delivery projects with flexible content and timing.

Traditional contra Streamline - AGILE Development

"Traditional" development	Streamline Development
› Requirements are selected and negotiated together before TG1/TG2 (Feasibility Study)	› Continuous stream of requirements selected based on Customer Value, Technical Risk, Dependencies and Development Capacity
› One large development project per release	› Several small agile development projects, approx 3 months development
› Late integration and testing	› Continuous integration of features into main track (LSV)
› Release project included in development project	› Release projects decoupled from development projects
› Changing requirements (CR's) are inevitable	› The iterative nature of Streamline Development requirement selection enables adaptability and flexibility – thus requirements should not change after development projects are started

"An ocean of requirements"

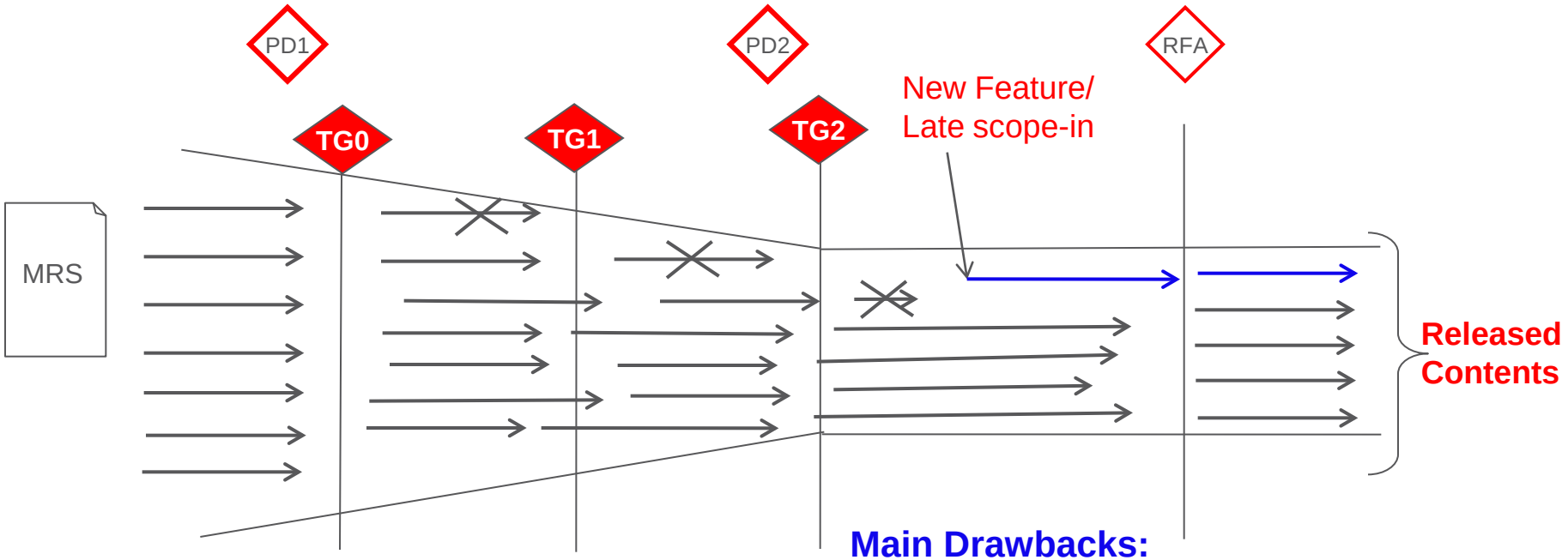
"A controlled stream of requirements"

Where we were

PD Product Decision

TG Project Decision

Traditional way of working

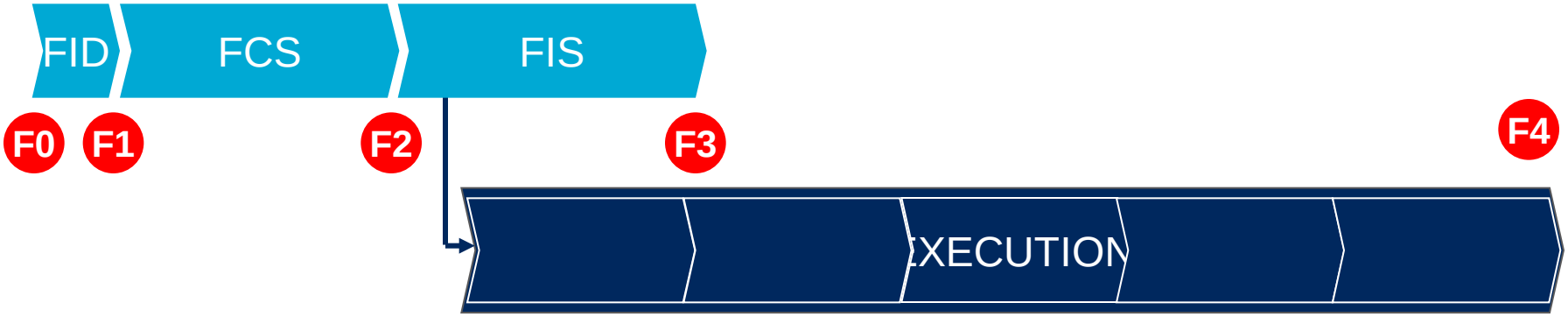


Main Drawbacks:
- Waste produced
- Lack of flexibility
- Late problems difficult to solve

Advantage:
- Less risky at TG2 decision

MRS: Main Requirement Specification

Streamline-Agile with Feature Decision Model



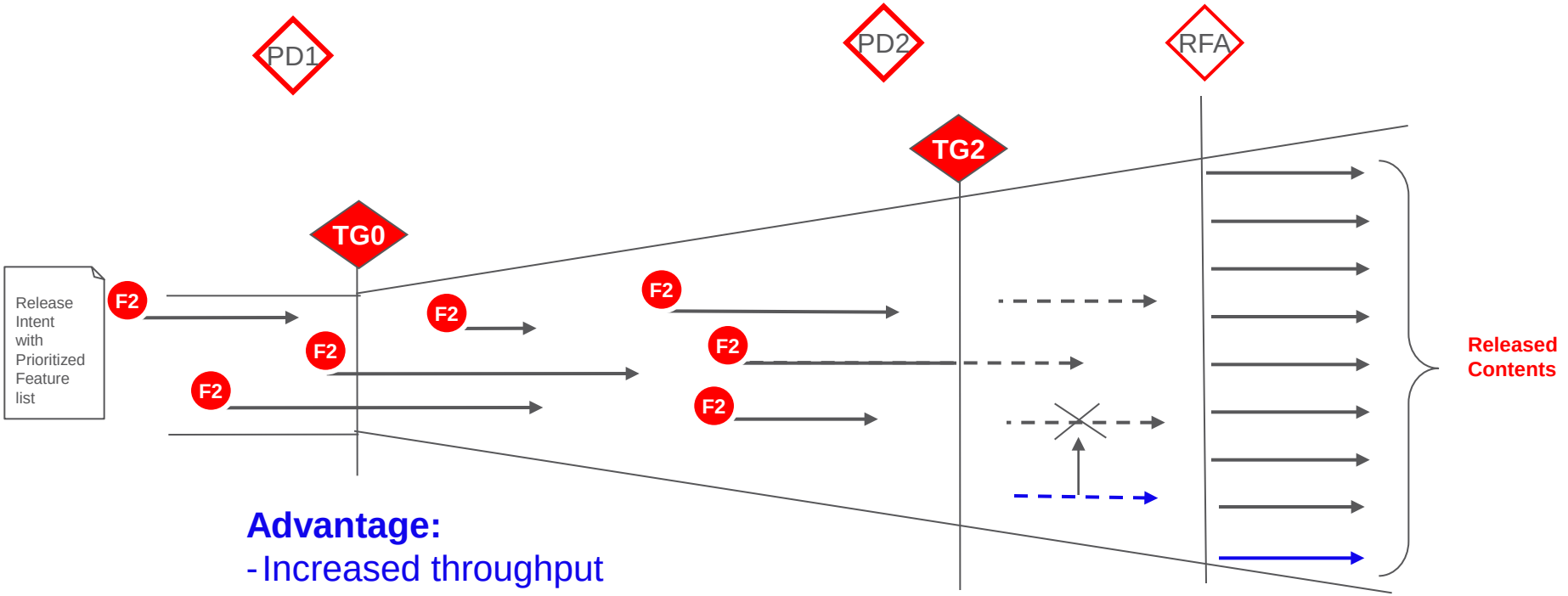
- **F0 – Identification GO**
  - Summary of technical scope, very rough cost and business aspects
- **F1 – Concept GO**
  - Feature Conceptual Study (FCS) comprising general technical investigation, requirements, high level modeling, high level cost including distribution over system areas, I&V impacts
- **F2 – Feature GO**
  - Start of implementation: Feature Implementation Study (FIS), covering system architecture, implementation description, test scope and detailed cost/resource needs.
  - Iteratively implementation and integration test of increments is started (EXE)
- **F3 – Feature COMMIT**
  - XFT commits to a delivery date for the feature.
- **F4 – Feature IMPLEMENTED**
  - Feature is implemented and integrated.
  - It can now be delivered to the market via a release project.

where we WANTED to go: Reverse Funnel

PD Product Decision

TG Project Decision

Streamline-Agile way of working



Advantage:

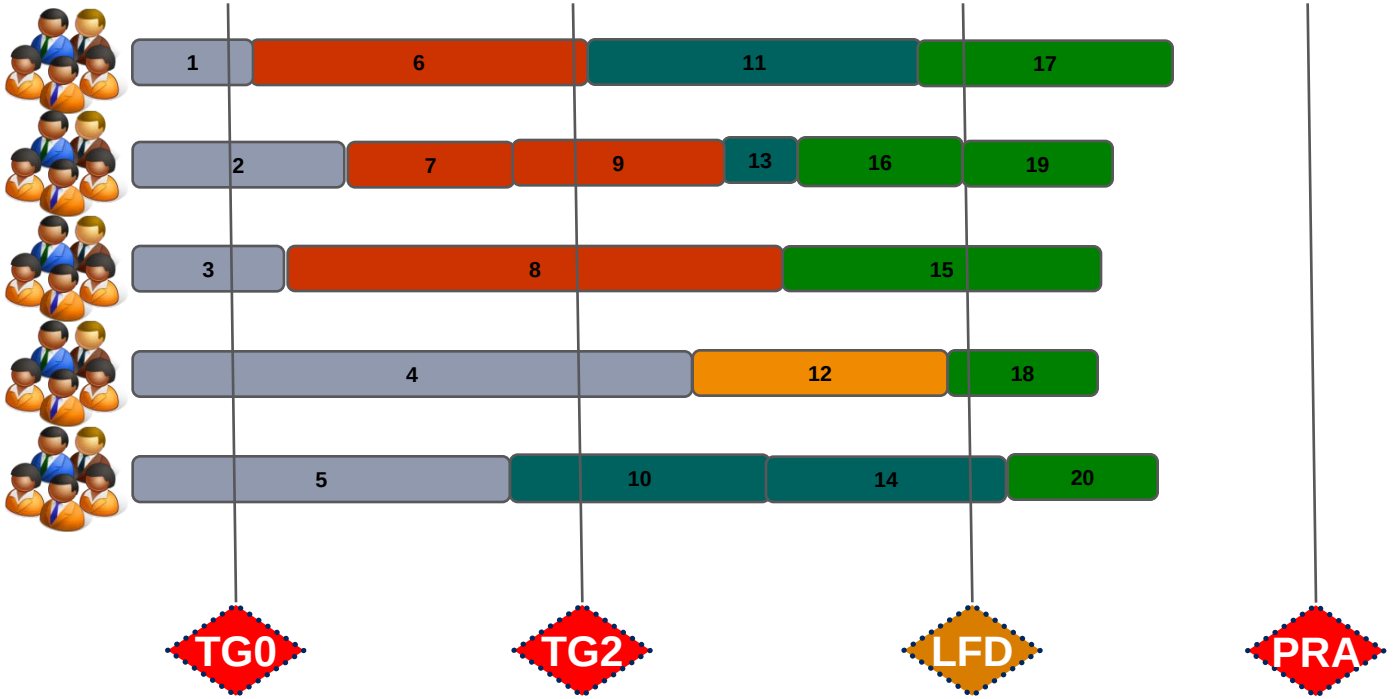
- Increased throughput
- Reduced waste
- Higher Flexibility

Drawback:

- Riskier decision at TG2

How it works

Development



Release

Release Committed	1,2,3,4,5	1,2,3,4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10, 11,12,13,16
• Commercial Core	6,7,8,9		
• Candidates	10,11,12,13,16	11,12,13,16	-
• Out	14,15,17,18,19,20	14,15,17,18,19,20	14,15,17,18,19,20

STREAM LINE-AGILE PROCESS CORNERSTONES

WE ENSURE WE TIMELY INVEST INTO THE RIGHT THINGS	Features are prioritized based on customer/market needs, business case.
WE PRODUCE FUNCTIONALITY IN THE MOST EFFICIENT WAY	Features development is done based on priority and capability using Agile methods.
WE ENSURE QUICK RETURN ON INVESTMENTS	Development of features is faster and the delivery time to customer is shortened.
WE TRUST IN TEAMS AND PEOPLE	Cross Functional Teams (XFT) are responsible from requirements up to delivery to LSV with continuous learning and lean thinking in mind.

How to demonstrate we have achieved the expected outcome?

Let's define the information needs first !!

We ensure that we timely invest into the right things

- How long does it take until we adopt changes in the market needs with new products / solutions?
- Are we developing the right features?
- How effective is our tender process?
- How is our product portfolio affected by innovations?
- What is the probability that our investments become profitable?
- Are we responsive and innovative enough to customers needs?
- How do customers rate us compare to other vendors?
- How satisfied are our customers with Quality?
- Are we technology leaders?
- How do we compare with competitors?
- How do we protect our intellectual property?
- Are we achieving the targeted market share?
- How innovative are we?

Most relevant questions in green

We produce functionality in the most efficient way

How much in average cost a feature development? Is it increasing/decreasing?

How is the average cost of our projects developing?

How good are we when repairing faults or upgrading to new version?

How much is our productivity increasing?

How much budget do we spent in maintenance?

How quickly can we incorporate new and changing requirements?

Where do we produce waste?

How much rework do we produce?

What is our capability to shorten our lead time?

How stable is our roadmap?

What is our capability to fulfill our time commitments?

To what extent can we (and others) rely on our estimations for cost, effort, delivery date, lead time?

What ISP do we have?

How many long term outages do we see?

Are there sufficient qualified people to fulfill our commitments?

How good is our e2e performance regarding complaints from customers?

Most relevant questions in green

We ensure quick return on investments

What is our capability to fulfill our time commitments?

How profitable is our portfolio?

What is our capability to shorten our lead time?

How quickly can we incorporate new and changing requirements?

What net sales can we expect in near future?

How long does it take until we adopt changes in the market needs with new products / solutions?

Are we responsive and innovative enough to customers needs?

How satisfied are our customers with Quality?

How do customers rate us compare to other vendors?

How do we compare with competitors?

Most relevant questions in green

We trust in teams and people

How much is our team productivity increasing?

Are there sufficient qualified people to fulfill our commitments?

How empowered our people feel themselves?

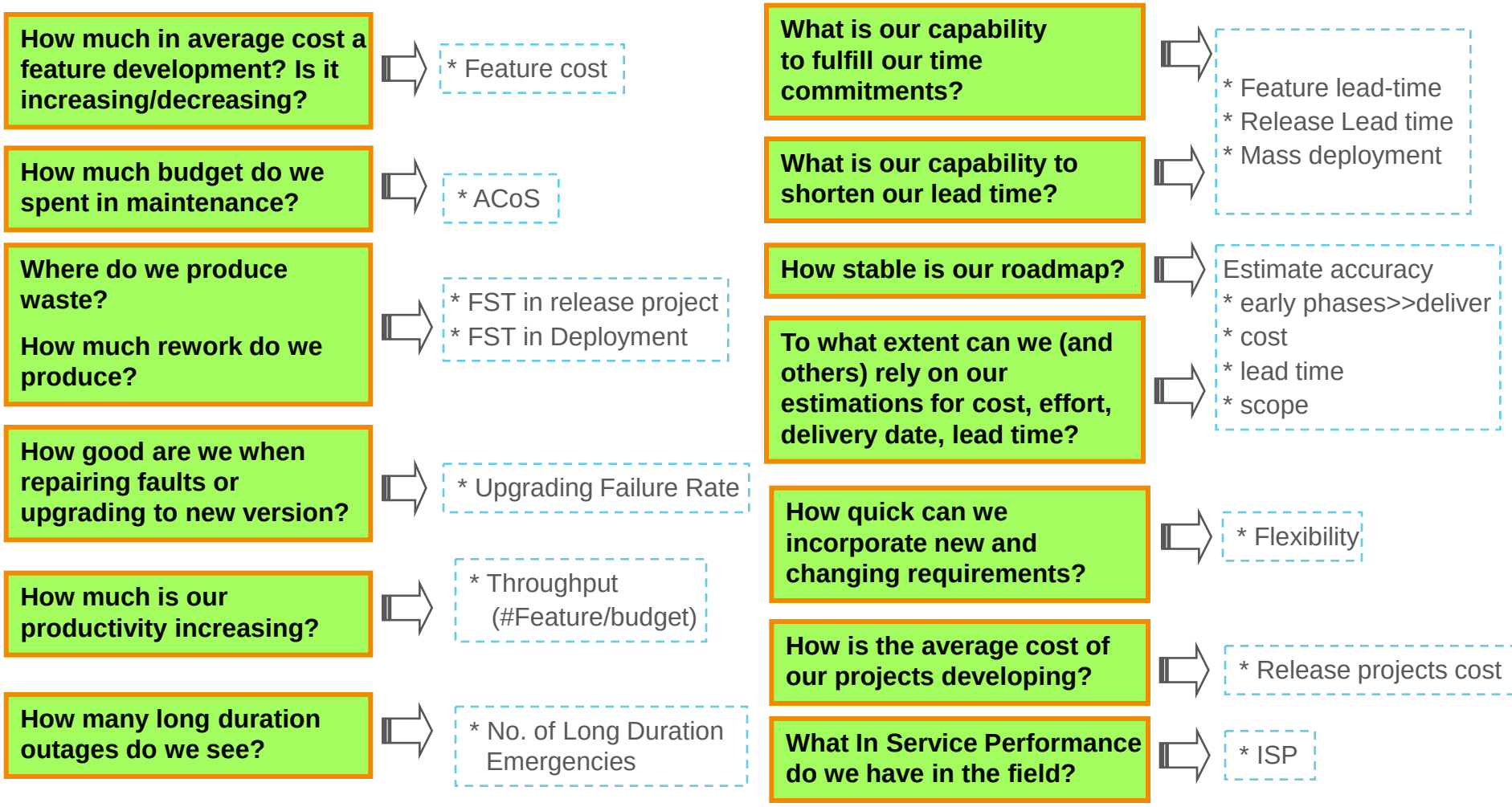
How innovative is our environment?

How well are we leading people to deliver high performance?

Most relevant questions in green

From information needs to kpi

› We produce functionality in the most efficient way



RESULTS obtained in the pilot project

Expected outcome:	Results:
Increased flexibility	› Scope-in of requirements in project was done based on priorities. › Any time a team is free we assigned them the most prioritized requirement/feature in the list.
Improved quality	› XFTs have more control of all development phases, any needed competence is in the same team with less handovers. With Agile the quality improved because the teams can solve issues at every iteration.
Improved predictability	› Cost estimation accuracy improved (usually actual cost is bit lower than estimated costs) with characterization of three sub-processes. › Delivery precision needs to improve. Variation needs to be further studied, especially on the light of the good cost precision.
Reduction of TTM and Features' lead-time	› TTM is flexible cause we always have a LSV shippable at any time. › Lead time to develop a feature (from F2 to F4) is 3-4 months (12 – 17 weeks).
Lowered cost	› The new process has increased productivity and has reduced the CoPQ. Results are even much better when inputs for the XFT are stable.
Quicker answer to customer needs	› Scope of the release project can change easier than before showing the new WoW is much adapted to quickly respond to customers needs.
Reduce Time To Cash	› Delivery to customers is done earlier, the contents of any release is more focused on satisfying customers' needs and more business driven.

PRODUCTIVITY

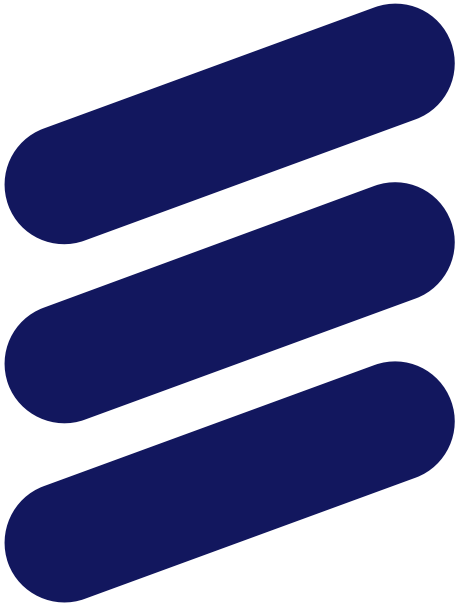
› Productivity with Streamline-Agile (S-A) is slightly better than in previous traditional way of working

Project	Productivity Cost/NCSCS	Throughput Cost per feature
Release N	2,42	5,16
Release N+1	2,52	5,41
Release N+2	2,49	5,38
Release N+3	2,53	5,54
Average	2,49	5,37
Release S-A	2,21	4,41
Improvement	11%	17%

ABBREVIATIONS

- ACoS Adjustment Cost of Sales
- CoPQ Cost of Poor Quality
- e2e End to End
- FCS Feature Conceptual Study
- FID Feature IDentification
- FIS Feature Implementation Study
- FST Fault Slip Through
- ISP In Service Performance
- LSV Latest System Version
- MRS Main Requirement Specification
- PDx Product Decision
- TGx Toll Gate
- TTC Time to Customer/Cash
- TTM Time To Market
- XFT Cross Functional Team
- WoW Way of Working

QUESTIONs



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