



EXECUTIVE DIPLOMA IN TECHNOLOGY MANAGEMENT

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**SCIENTIA ET
PRATIQUE**



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TECHNOLOGY & FINANCE**

INTRODUCTION & COURSE PLAN

1. Course for CIO, CTO, IT Managers and Managers of other domains who want to understand IT management key problems
2. We will consider 5 practical topics
 - Technology Planning
 - in-House vs Outsource vs Out-staff work
 - Vendors and Contractors Management
 - Platform-oriented vs Product-oriented vs Tech oriented teams
 - Case: Lean 6 Sigma at Technology Management

1. TECHNOLOGY PLANNING

1. Company Strategy / Products Roadmap 3 Y
2. Vendors Platforms Roadmap Plan
(Core Software, CRM, Digital Platforms, cloud services) / Industry Analysis
3. Startups Scouting / Open innovations
4. Product / Service / Platform Model shift
= uberization / booking
5. Baas / Saas = your business as service
6. Strategic Merge & Acquisition
= cheaper buy vendor than buy solution
7. inHouse vs Purchasing
8. Scalability



IT strategy and Tech roadmap linked to business activities = calculated ROI for each activity / calculated allocated ROI for platforms and infrastructure.

2. IN-HOUSE VS OUTSOURCE VS OUT-STAFF WORK

1. IT Expertise / Business Expertise
2. Are you tech-based business?
Is IT your core expertise?
3. Motivation
4. Cost of overtime work
5. Know-how / Commercial Secret
6. Cost efficiency



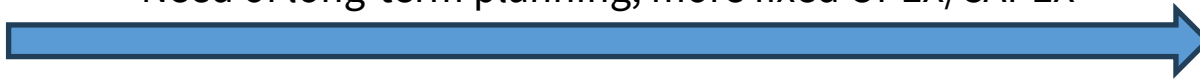
At any option you need to build united closely working teams.

Outsource

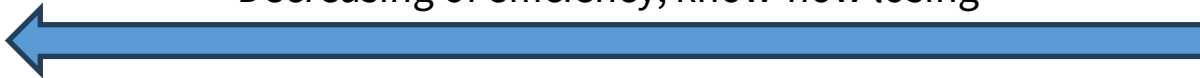
Out-staff

In-House

Need of long-term planning, more fixed OPEX/CAPEX



Decreasing of efficiency, know-how losing



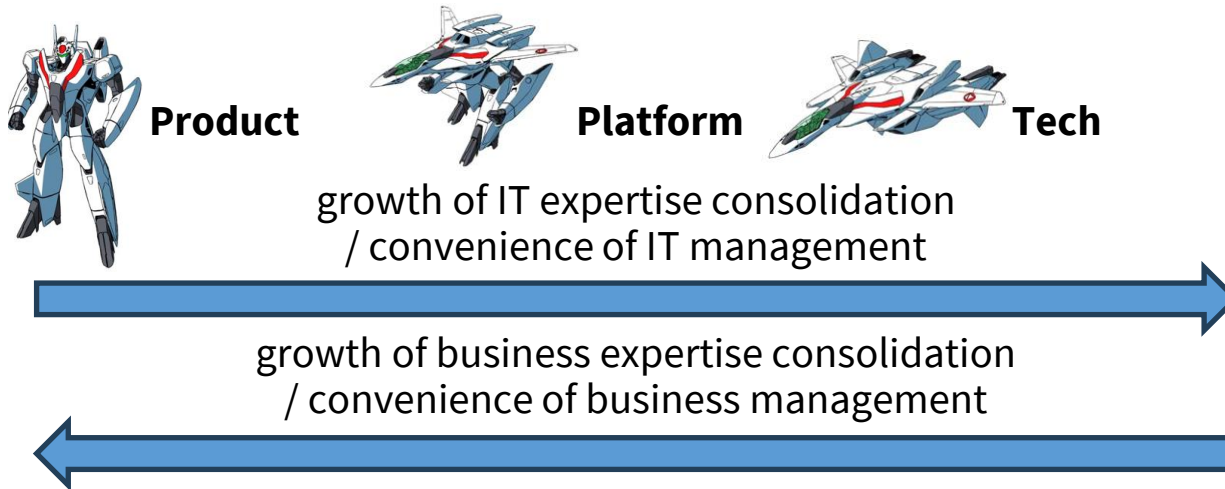
3. VENDORS AND CONTRACTORS MANAGEMENT

1. Planning
its cheaper to plan long-term work
2. Switching between outsource-outstaff
3. Purchasing of share at company
4. Purchasing of source codes
5. Procurement Management
6. Use demo / gift projects
7. Ask about additional benefits
(for example extra licenses, products)
8. Have back-up vendors and contractors
9. Don't create a technology zoo



4. PLATFORM VS PRODUCT VS TECH-ORIENTED TEAMS

1. Closer to business or to tech core?
2. Tech / System Analysis Chapter Leaders as link
3. Pro go to business:
 - Client-centric approach
 - Focus to business case
4. Pro go to tech:
 - Faster and cheaper development
 - Better alignment of IT practices



V. CASE: LEAN 6 SIGMA AT TECHNOLOGY MANAGEMENT

8 TYPES OF WASTES AT SOFTWARE DEVELOPMENT

Type of Waste Canonical	Type of Wastes at Software Development	Description / Specific problems
Overproduction	1. Development of features that users don't need, 2. Overproduction of task at backlog	1. Needs to support useless functionality 2. Obsolescence of tasks (and BRD)
Waiting	Waiting / Delays	Waiting between stages
Transportation	Task switching	Needs to delete useless code. Risk of conflicts of code for new task and code from not finished and not tested task.
Inventory	Incomplete / Partial work done	Conflicts between code of different tasks.
Over/Incorrect Processing	Rework due to poor preparation of requirements	Rework, retesting, due to lack of clear business and system requirements
Unnecessary Movement	Excess communication due to lack of requirements formalization	Lack of detailed requirements leads to excess communication, subjectivity in interpretation, difficultness at testing.
Defects	Software Errors	Inoperability or wrong functionality
Unused employee creativity	Short deadline / lack of time for task doesn't allow to improve quality of requirements or realization	Generating the volume not a quality of functionality

V. CASE: LEAN 6 SIGMA AT TECHNOLOGY MANAGEMENT

Product Development Errors

= Did we create a correct product?

Equal to waste: Overproduction, Over/Incorrect Processing

- Development of features that users don't need
- Rework due to poor preparation of requirements

Technical Error

= Is our functionality working correctly?

Equal to waste: Defects

- Inoperability
- Wrong functionality

Product Development and Technical errors have different nature but common causes.

But what if technical errors meet to errors at product development stage?

Cost of an Etalon Task = X

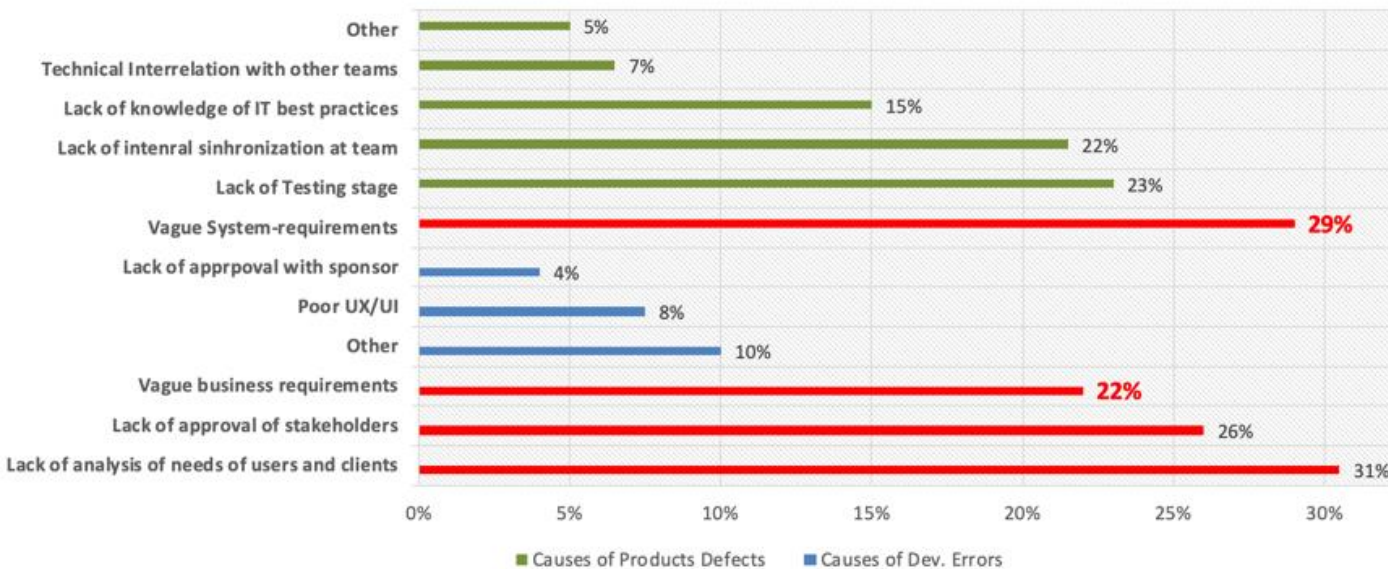
$X * \% \text{ (probability of prod. errors)} * \% \text{ (probability of technical errors)} = X * 72,5\% * 74,6\% = \mathbf{184,9\% X}$



V. CASE: LEAN 6 SIGMA AT TECHNOLOGY MANAGEMENT

If we stack results of the main categories of errors both for product and software development processes we again able to see strong impact from stages linked to business and system analysis for quality of the overall process.

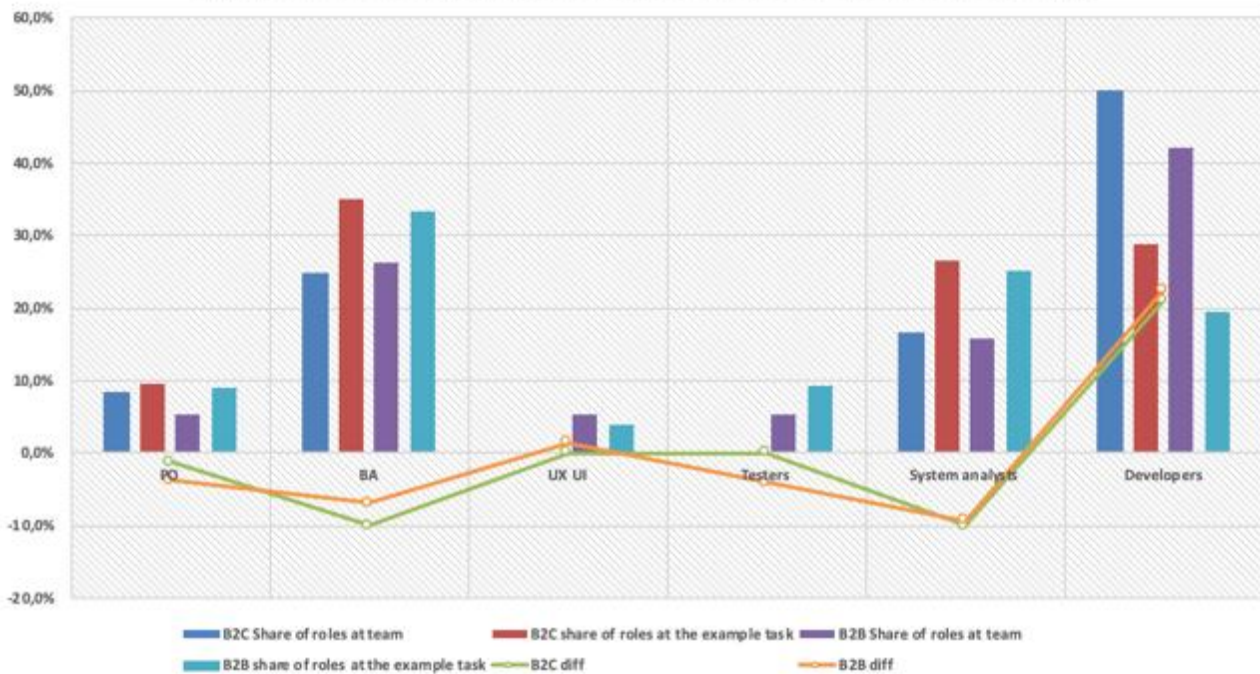
Main Causes both for Dev. Errors and Prod. Defects



V. CASE: LEAN 6 SIGMA AT TECHNOLOGY MANAGEMENT

If we share an average workload at each stage and available roles and resources, we are able to see shortage of resources of Business Analysts and System Analysts, testers.

Difference between shares of roles at workload and roles at teams

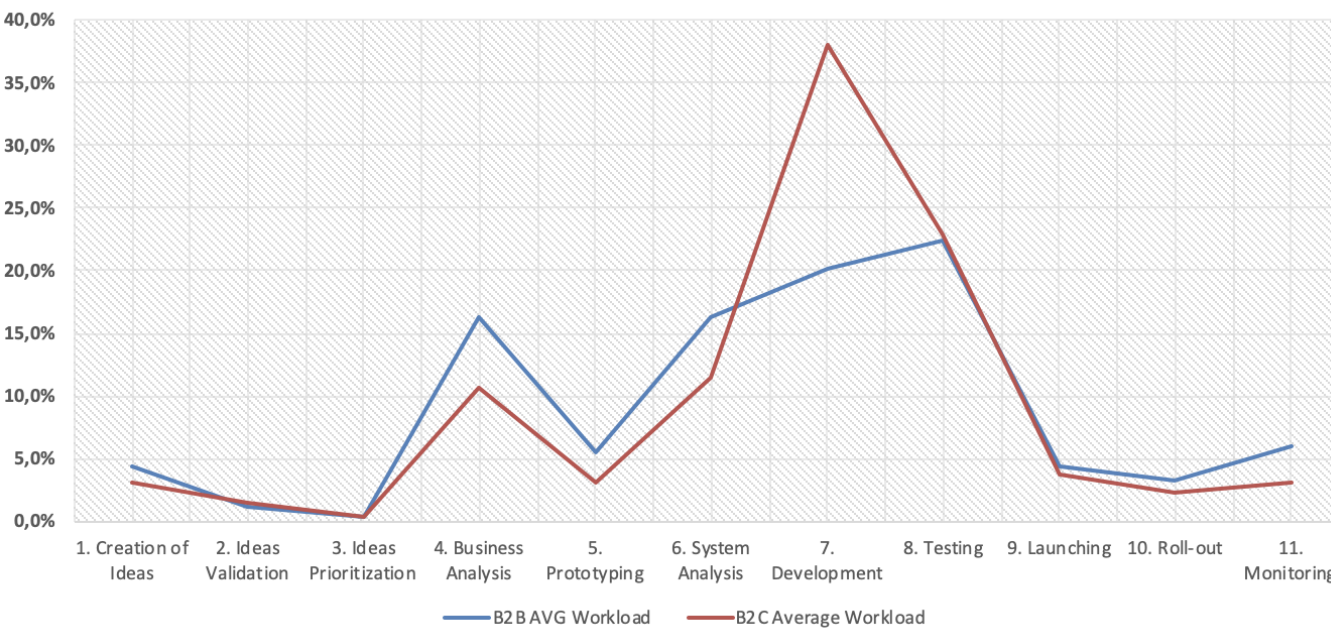


V. CASE: LEAN 6 SIGMA AT TECHNOLOGY MANAGEMENT

As we can see 13% of extra work at stage of business analysis and research of users and clients expectations saves 18% of development cost.

If we take to account cases where cost of 1 developer higher than cost of 1 business analyst, we get one more strong point for efficiency improvement.

Difference of shares of stages for workload



PROPOSED SOLUTIONS FOR INCREASING OF EFFICIENCY LEVEL

Linked Causes of Wastes	Countermeasures
Lack of approval of stakeholders	<ol style="list-style-type: none"> 1. Usage of Poka-yoke (check-lists for interviews) 2. Formalization of approval process (formal deadlines and scope of responsible persons) 3. Usage of more effective ways for approval (less text more prototypes and process maps) 4. More active feedback usage at process of development 5. Including of stakeholders to working groups
Lack of analysis of needs of users and clients	<ol style="list-style-type: none"> 1. Less experts opinions, more data driven decisions 2. Usage of customer-development practices (deep interviews, feedback collecting) 3. Usage of technical tools for analysis (f.e. clicks monitoring) 4. Usage of beta stages with loyal users
Vague business requirements	<ol style="list-style-type: none"> 1. Usage of Poka-yoke (check-lists for analysis) 2. Increasing of usage of prototyping 3. Usage of special analysis frameworks (f.e. user stories) 4. Additional learning of business analysts for required data for system analysis and development stage
Vague system requirements	<ol style="list-style-type: none"> 1. Usage of Poka-yoke (check-lists for analysis) 2. Usage of required analysis frameworks (for example process maps, data maps) 3. Including of system analysts to stage of customer development

+ formalized expectations and roles descriptions for each participants

PROPOSALS FOR IMPROVING OF TIME TO MARKET SPEED

Stages of Process	Type of wastes	Countermeasures
System Analysis + Development	Waiting	<ol style="list-style-type: none">1. Setting of deadlines for time of answer and approval2. Setting of prioritization between analysis of new tasks and answering for questions for existing tasks3. Usage of more effective notification of start of waiting and arrival of the answer
	Excess Communications	<ol style="list-style-type: none">1. Implementation of set of improvement for business and system analysis (setting of requirement format of documents, usage of prototypes and mock-ups, usage of schemas, preparing of data and process maps)2. Usage of more effective tools for collaboration



Tools implementation at Product Development Stages: Stage 1: Creation and validation of Ideas

Stage Check-List:

0. Do we have an idea or we need to create an one?:

- ☐ yes, go through check-list
- ☐ no, let's create it based on data

1. Requirements of our Strategy

- ☐ decreasing of the cost of process
- ☐ increasing of sales
- ☐ increasing of cross-sale level
- ☐ increasing of clients satisfaction
- ☐ decreasing or risk level

2. Do we have an existent data

- ☐ if yes, let's analyze
- ☐ if no, is it possible to collect it?

3. Do we have users feedback

- ☐ if yes, let's analyze
- ☐ if no, is it possible to collect it?

4. Filling of template

- ☐ cost
- ☐ benefit
- ☐ auditory of users
- ☐ Is approval of stakeholders required?
- ☐ short name
- ☐ description

Linked Wastes:

1. Overproduction

Development of features that users don't need

2. Unnecessary movement

Excess communication due to lack of requirements formalization.

3. Unused employee creativity

It's not required to ask developers and testers propose ideas, but it improves overall team's spirit and motivation.

Also we had unused clients and partners creativity.

Implemented Tools:

1. Required Quantitative (f.e. funnel metrics) and Qualitative (f.e. clicks monitoring) Data Analysis

Allow to decrease impact of experts' biases

2. Deep interviews and Feedback analysis

Is it important for our users? Do we have they preferences?

3. Strategy driven approach

Which goal we try to achieve?

4. Stage Check-list

Usage of check-list allow us not to miss important details

5. Template usage

- Preliminary expectations (cost, benefit) allow us to understand is our idea important. We set minimum buy-back period of 2 years as a threshold
- Required fields allow to avoid unnecessary communications.

6. Users Club

We ask loyal external and internal users join our users club for ability to discuss ideas and be involved to beta-test of new functionality. Also including of internal stakeholders to Users club decreases risk of rejecting at approval stage.

Indicator	AS IS	TO BE	PRO	CONS
Cost of stage (average, m/h)	X		Self-checking and a better formalization decrease time spending at next stages	1. Implemented tools <u>required of spending of additional time</u> 2. It's not obviously for team, why their need to spend additional time
Impact to total wastes				
Impact to total Time-to-Market				
Impact to total cost				

Calculations fields

Tools implementation at Product Development Stages: Stage 3: Business Analysis and Prototyping

Stage Check-List:

0. Usage of Template

- ☐ Fill all required fields, especially - changed systems
- group of processes (sales, service, credit conveyor)
- new/changed functionality

1. CJM or Process Map

- ☐ If new process include/change more than 3 step of process and more than 2 points of decision usage of CJM or process map is mandatory
- ☐ All steps of process need to be described
- ☐ If process map contains more than 2 participants – it's mandatory to use BPMN notation.

2. Matrix of Approval

- ☐ Use matrix of approval for checking of new functionality with stakeholders

3. Requirements for mock-up

- ☐ Visual effects
- If it required to use any special visual effects – please provide link or short video to sites with the same functionality

- ☐ Elements of control
- Please highlight elements of control and show different conditions

- ☐ Web / Mobile
- Please check how proposed page looks at web and mobile versions.

- ☐ Colors
- In case of usage of new types of colors – please provide codes of colors

- ☐ Alignment with BRD
- In case of change of functionality please check it with author of BRD doc.

Linked Wastes:

1. Over/Incorrect Processing

Rework due to poor preparation of requirements.

2. Unnecessary movement

Excess communication due to lack of requirements formalization.

Implemented Tools:

1. Templates and User-Stories / Mock-Ups Usage

Usage of templates (f.e. BRD - Business Requirements Document) allows to analyst remember about all important points of analysis, and to user of document – easier navigate through it.

2. CJM and Process Map Usage

Preparing of Client Journey Map and Process Map (for example in BPMN notation) allows to easier understand a process and interrelationship between it parts.

3. Matrix of Approvals

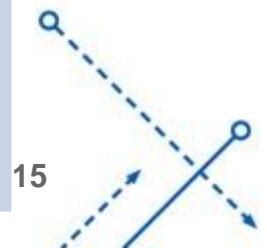
If we change several fields of process we need to approve it with stakeholders.

4. Stage check-list usage / Deadlines settings

Usage of check-list as a part of template allow to remember about important details and deadlines. Feedback of System analysts and developers used for templates preparing.

Indicator	AS IS	TO BE	PRO	CONS
Cost of stage (average, m/h)	X		- Decrease of excess communications at next steps - It's easier for analysts to remember about important details	- Analysts resistant to new rules due to increase of level of their work. - Necessity of training for analysts for usage of mock-ups tools (f.e. figma).
Impact to total wastes				
Impact to total Time-to-Market				
Impact to total cost				

Calculations fields



Tools implementation at Product Development Stages: Stage 4: System Analysis

Stage Check-List:

0. Data Model

- ☐ Description of changes and integration for fields
- ☐ Integration map

1. Functional map

- ☐ Extended description of systems deviation

2. System map

- ☐ Description of required for use system elements (plugins, services,..) and changes linked to it

3. Preliminary settings

- ☐ Our system (Dynamics CRM) allow to system analysts create part of new process steps and system objects without development

4. Interrelationship analysis

- ☐ Analysis of common usage of system elements between different teams.

Linked Wastes:

1. Over/Incorrect Processing

Rework due to poor preparation of requirements.

2. Unnecessary movement

Excess communication due to lack of requirements formalization.

3. Inventory

Incomplete / Partial work done.

Implemented Tools:

1. Wiki for log of used modules and changes

Allow to different teams understand common changes

2. Data Maps

If system requirements document (SRD) contains changes or integration more than 5 fields.

3. Templates and check-list for analysis

Usage of templates for providing of analysis of different systems.
Usage of required deadlines and priorities for analysis.

4. Additional learning

Alignment of knowledge base between analysts (sql, databases, basic principles of development) for their ability to prepare more useful for developers technical requirements.

Indicator	AS IS	TO BE	PRO	CONS
Cost of stage (average, m/h)	X		Decrease of wastes at further steps	Necessity of additional training for analysts
Impact to total wastes				
Impact to total Time-to-Market				
Impact to total cost				

Calculations fields

Analysis of the Project's results

Key Insights:

- Real workload shifting was dramatically higher than planned
- Primary cost was decreased only at 1,43%. It's was too low for teams perception as a justification of changes.
- Total wastes (causes for rework) were decreased twice! It's allow to decrease total cost of work more than at 6,87% and decrease TTM from 21-22 days to 19 days!

Decreasing of wastes was more efficient than general decreasing of usual cost of each task... It seems obvious after calculation of results, but it was not perceived at separated stages. It's a reason why support of management is important and why wide looking is mandatory.



To Be			1. Creation and validation of Ideas	2. Ideas Prioritization			3. Business Analysis and Prototyping	4. System Analysis	5. Development	6. Testing	7. Launching	8. Roll-out	9. Monitoring	Total wastes (sum at stages + overall for all stages)	Total + Weighted Rework
B2C															
Cost (M/H)			9	0,5			24	21	38	17	5	3	7	124,5	132,5801
PO			3	0,5			4	1	0	1	2	1	2		
BA			4	0			14	5	2	10	3	2	4		
UX/UI			0	0			0	0	0	0	0	0	0		
Test.			0,5	0			0	1	0	0	0	0	0		
SA			1	0			6	10	8	4	0	0	1		
Devel.			0,5	0			0	4	28	2	0	0	0		
Wastes Creation (%)			1,90%				1,10%	0,70%	0,35%	1,34%				6,49%	8,08
Time to Market (days)			1,5	0,5			3	3	4	3	1	1	1		18
B2B															
Cost (M/H)			14,5	0,5			48	37	29	29	8	6	14	186	196,3602
PO			4	0,5			6	1	0	1	2	2	4		
BA			7	0			22	10	2	6	6	4	8		
UX/UI			0,5	0			8	1	0	0	0	0	0		
Test.			0,5	0			0	1	1	12	0	0	0		
SA			2	0			12	18	6	6	0	0	2		
Devel.			0,5	0			0	6	20	4	0	0	0		
Wastes Creation (%)			0,40%				2,14%	1,30%	0,24%	0,19%				5,57%	10,36
Time to Market (days)			2	0,5			4	4	3	3	1	1	2		20,5
Cost (Average)			11,75	0,5			36	29	33,5	23	6,5	4,5	10,5	155,25	164,4701
Wastes			1,15%				1,62%	1,00%	0,30%	0,77%				6,03%	
Time to Market			1,8	0,5			3,5	3,5	3,5	3,0	1,0	1,0	1,5	19,25	
Resulted Workload Shifting			46,88%	0,00%			24,14%	28,89%	-22,99%	-35,21%	0,00%	0,00%	40,00%	-1,43%	-6,87%
Wastes (Change)			-2,03%	0,00%			-2,26%	-1,30%	-0,09%	-0,49%	0,00%	0,00%	0,00%		-50,53%
Time to Market (Change)			-12,50%	-50,00%			0,00%	0,00%	-36,36%	0,00%	0,00%	0,00%	0,00%		-12,50%
Planned Workload Shifting (Change)			3%				7%	5%	-6%	-12%			-2%		

Goal of the Project	% of fulfillment
	-5%
	-6,87%
	-50,53%
	-10%
	-12,50%

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