

From hours to output: Applying NPR 5333 and FSM in the mission-critical Schiphol case

replacing the beating heart of Schiphol (CiSS): Schiphol’s largest operational IT transformation to date



Introduction



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Richard Sweer

- Senior project manager/director and metric consultant
- PRINCE2, AgilePM, MSP, IPMA-B and IPMA-A certified
- ISO/IEC 24570:2018 Nesma function points certified
- Co-author of ISO/IEC 25986:2026 Easy Functional Sizing
- >35 years in custom software development
- >30 years measuring software performance
- Member of IPMA
- Member of Nesma, Nesma counting practice and examination board
- Member of NEN[1] Software and System engineering committee
- Initiator and a key architect of NEN NPR 5333

[1] NEN – Netherlands Standardization Institute (Dutch equivalent of ISO)



Agenda

The assignment and the impact

Output-based steering: NEN[1)] NPR 5333 & ISO/IEC 25986:2026

[1] NEN – Netherlands Standardization Institute (Dutch equivalent of ISO)

Our assignment

The goal: replace CiSS like-for-like
- The digital heart of Schiphol
- 600,000 lines of code
- More than 65 integrations with applications inside and outside Schiphol
- Very limited documentation
- Processes approximately 800,000 messages per day

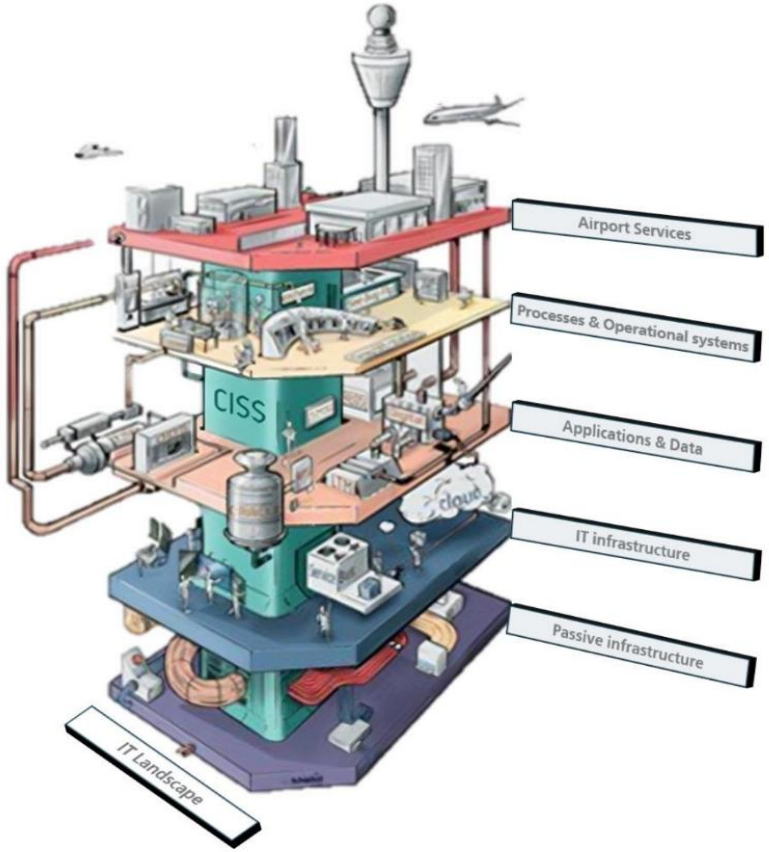
Two guiding principles
- Migrate first, then innovate
- Input and output remain unchanged

Scale
- Schiphol's largest IT project to date
- Must comply with the Dutch Aviation Act process which has a budget tolerance of only 5%

Delivery Model
- Output-based contract
- Nearshoring from Kaunas, Lithuania

Central Information System Schiphol (CiSS)

Project working name: **Airport Operational Database (AODB)**
Project name: **NextGen AODB (NG AODB)**



When things go wrong …

- Flight planning
- Gate planning
- Check-in
- Baggage handling
- Aircraft stand planning
- Passenger information
- Ground handlers
- Security

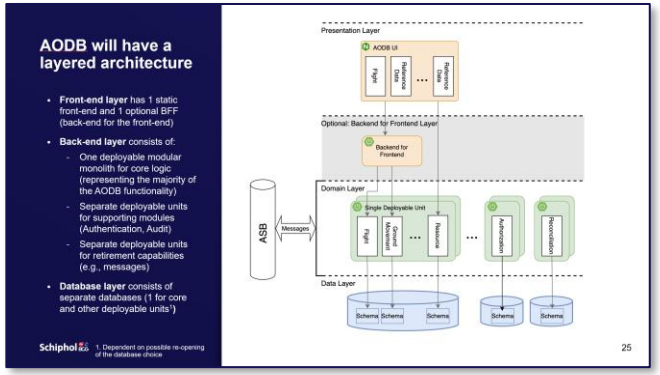


Output-based contracting | The role of FSM and its impact on planning, build & testing of custom software

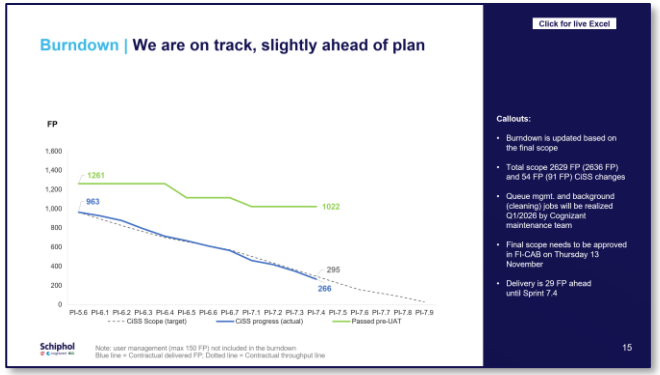
Activity	2023				2024				2025				2026				2027			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Handover																	Go-live	Handover		
Transition													Transition							
Build					Build & Test															
Plan		Planning																		

Planning

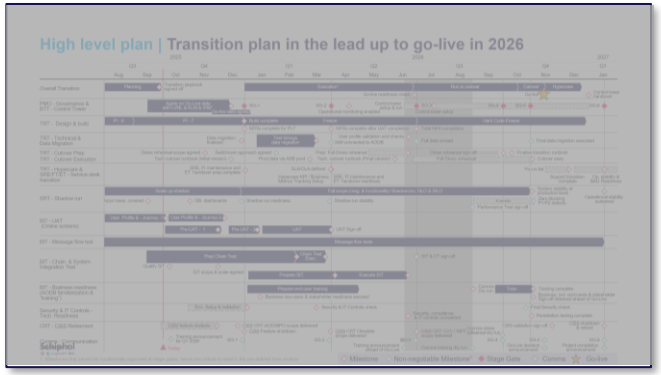




Build & Test



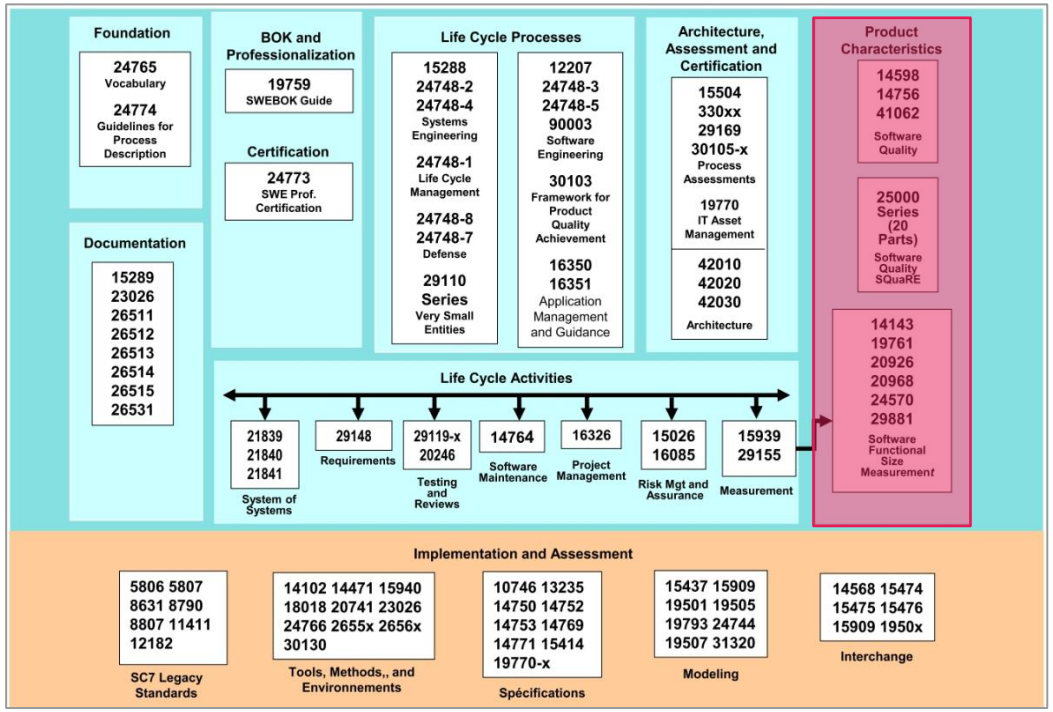
Transition



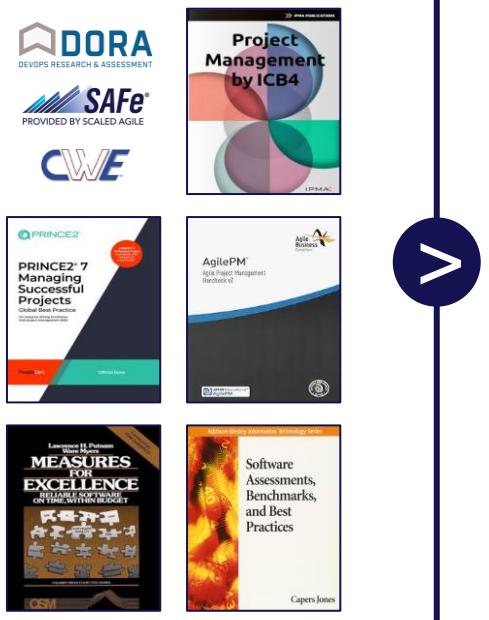
NEN NPR 5333 | Finidy from pioneer to a NEN standard for output-based software development in 30 years

JTC1/SC7 Software and System engineering

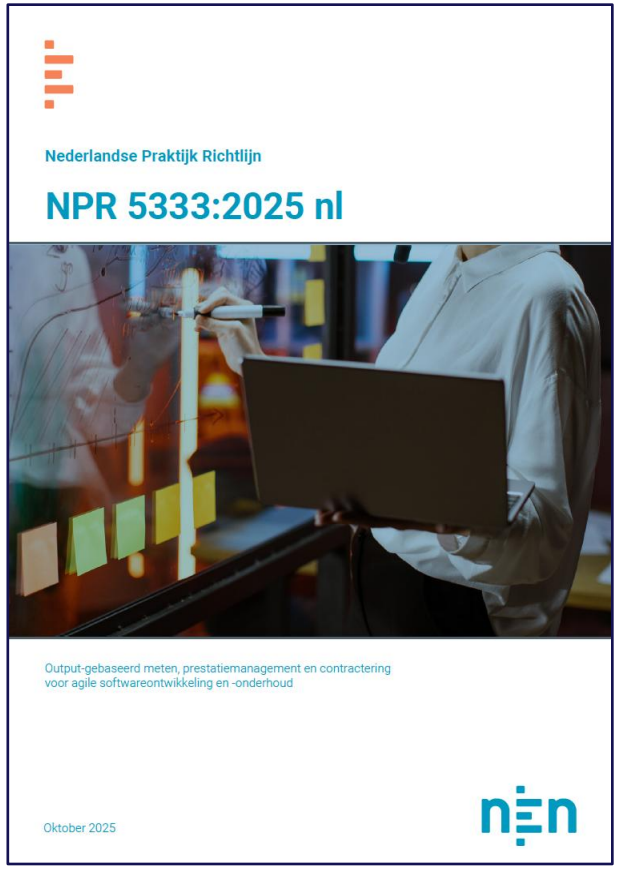
(>150 published ISO standards)



Source - https://committee.iso.org/sites/jtc1sc7/home/projects/overview.html



Download at NEN Connect

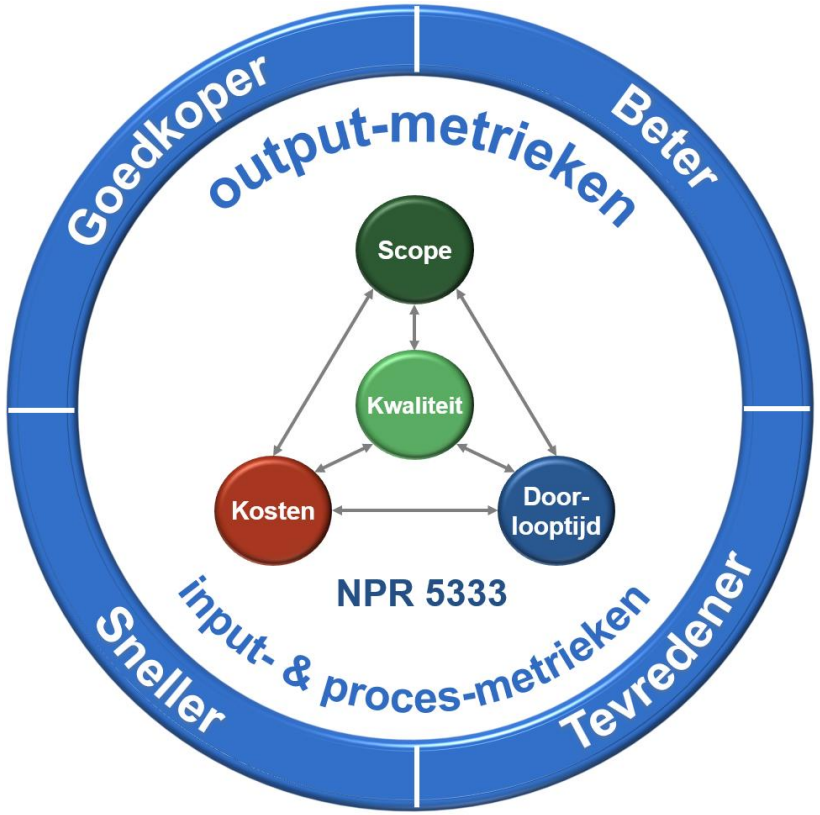


The 17 key metrics - use each metric, or explicitly explain why you don't.

ID	Metric	Based on	Category
1	Delivery speed (function points per period)	ISO 24570 & ISO 25986	Faster
2	Velocity (story points delivered per iteration)	SAFe® & Flow metrics	Faster
3	Load (story points promised per iteration)	SAFe® & Flow metrics	Faster
4	Flow predictability (realized/promised x 100 %)	SAFe® & Flow metrics	Faster
5	Hourly rate		Cheaper
6	Output rate (price per unit of output)	ISO 24570 & ISO 25986	Cheaper
7	Maintainability	ISO 25010 & ISO 5055	Better
8	Efficiency	ISO 25010 & ISO 5055	Better
9	Reliability	ISO 25010 & ISO 5055	Better
10	Security	ISO 25010 & ISO 5055	Better
11	Functional suitability (CWE product metrics)	ISO 25010 & ISO 5055	Better
12	Functional suitability (test metrics)	ISO 25023	Better
13	Mean time between failures	DORA en ISO 25023	Better
14	Mean time to repair/resolve	DORA en ISO 25023	Better
15	General team satisfaction	ISO 25022	Happier
16	General satisfaction with the collaboration	ISO 25022	Happier
17	General usage satisfaction	ISO 25022	Happier

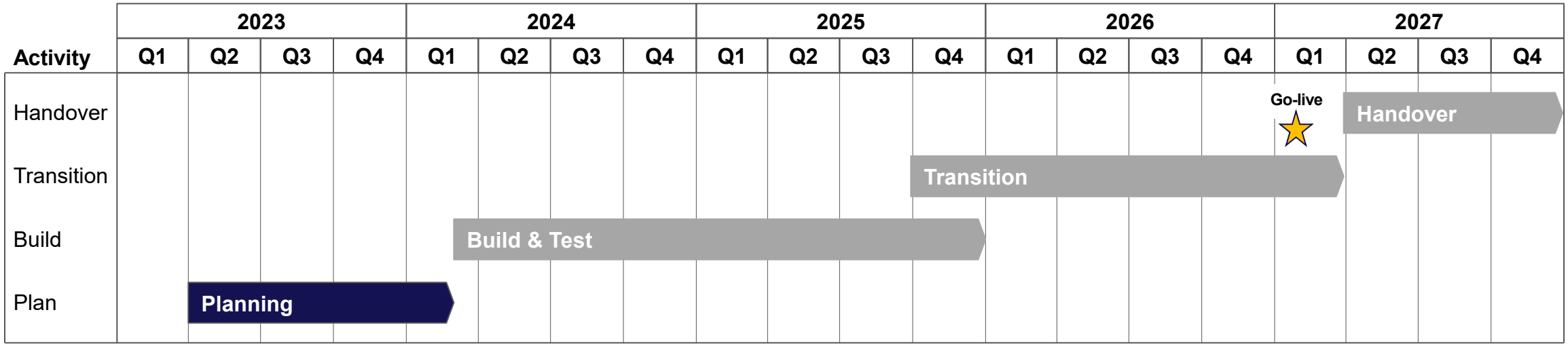
5.2.4 – table 2

Control over scope, time, quality, and cost leads to better software, delivered faster



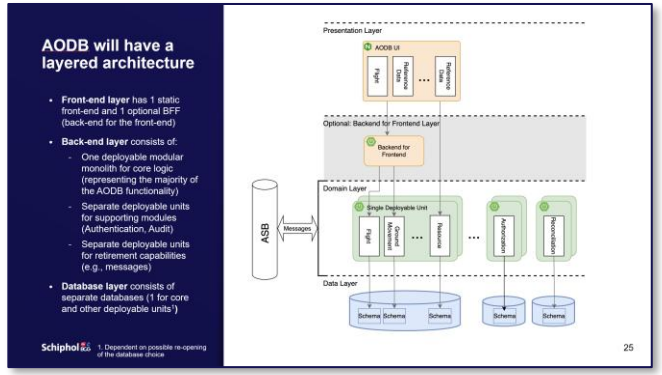
5.2.4 – figure 3

Planning | Control over execution through a strong baseline plan

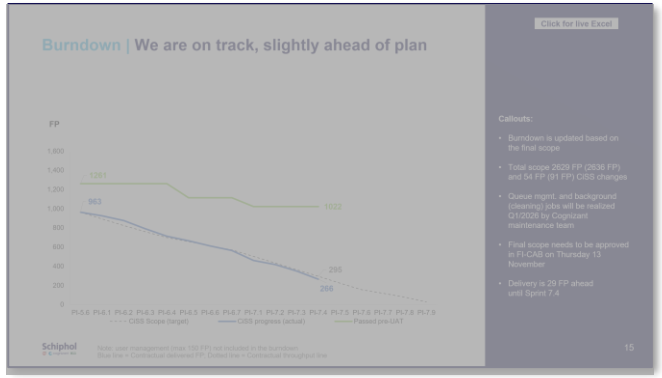


Planning

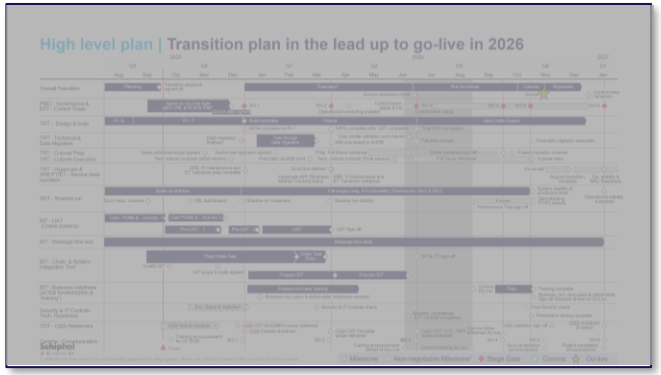




Build & Test



Transition



Planning | Output-based: higher productivity delivers quality software faster and creates a win-win for client and supplier

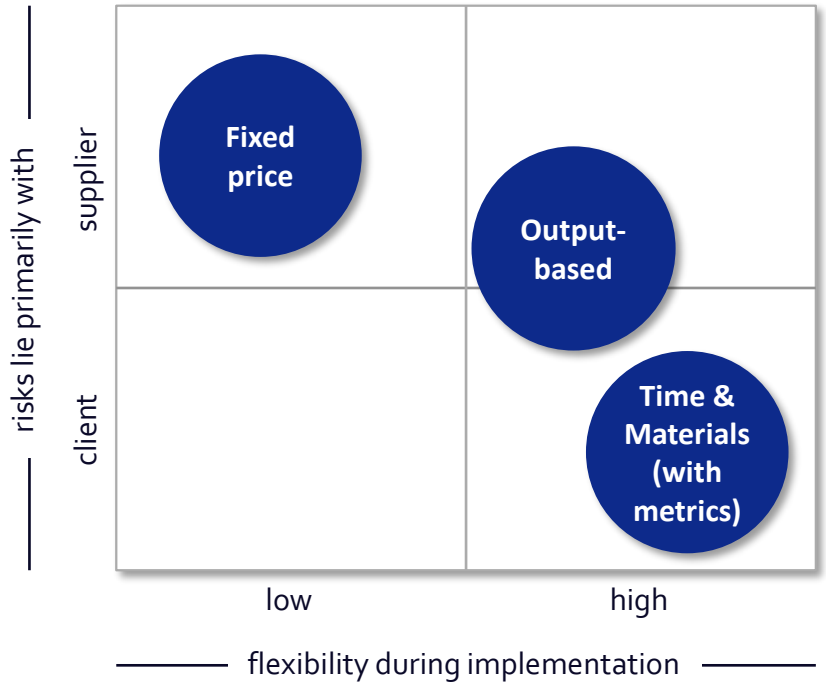
Scope of NEN NPR 5333

Time & Material	T&M with metrics	Output-based	Outcome based
Definition A **Time & Material contract** pays for time and materials used by the supplier.	**Time & Material with metrics** contract pays for time and materials used, when software meets metrics (incl. quality).	An **output-based** contract pays for **what** functionality is delivered when software meets metrics (key: quality), not **how**.	An **outcome-based** contract pays only when predefined business objectives are achieved.
Supplier incentive Maximize hours and rates	**Supplier incentive** Maximize hours and rates	**Supplier incentive** Optimize quality & productivity (output) for cost	**Supplier incentive** Optimize outcome for cost
Client risk No control over devil's triangle	**Client risk** Devil's triangle: scope, duration and costs	**Client risk** Devil's triangle: only scope	**Client risk** Scope, strategic relevance, measurability of chosen outcome and cause & effect

low — Maturity of Client and (internal) Supplier, risk of (internal) Supplier and Business value — high

high — Risk of Client regarding quality, duration, costs and happiness of business users — low

Planning | Output-based contracts, the freedom to adapt, and the discipline to deliver



9.2.1 – figure 7

Freedom to change, discipline to deliver:

- Output-based contracting combines high delivery flexibility with balanced risk allocation.
- Risk is shared where it can be managed best: quality and productivity at the supplier, scope and priorities at the client.
- Business value flows faster when output, not effort, drives the contract.
- Productivity improvements benefit both parties, not just the supplier.
- Output-based contracting rewards throughput instead of hours.

Original cover of the PID

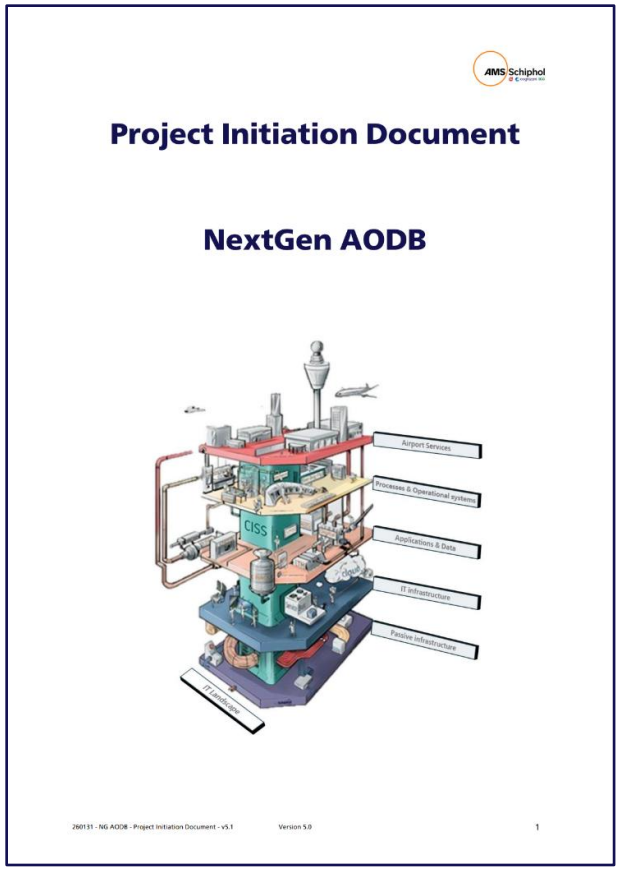
The PID: not the project manager's plan, but <u>our</u> shared plan for success

Output contracting based on NEN NPR 5333

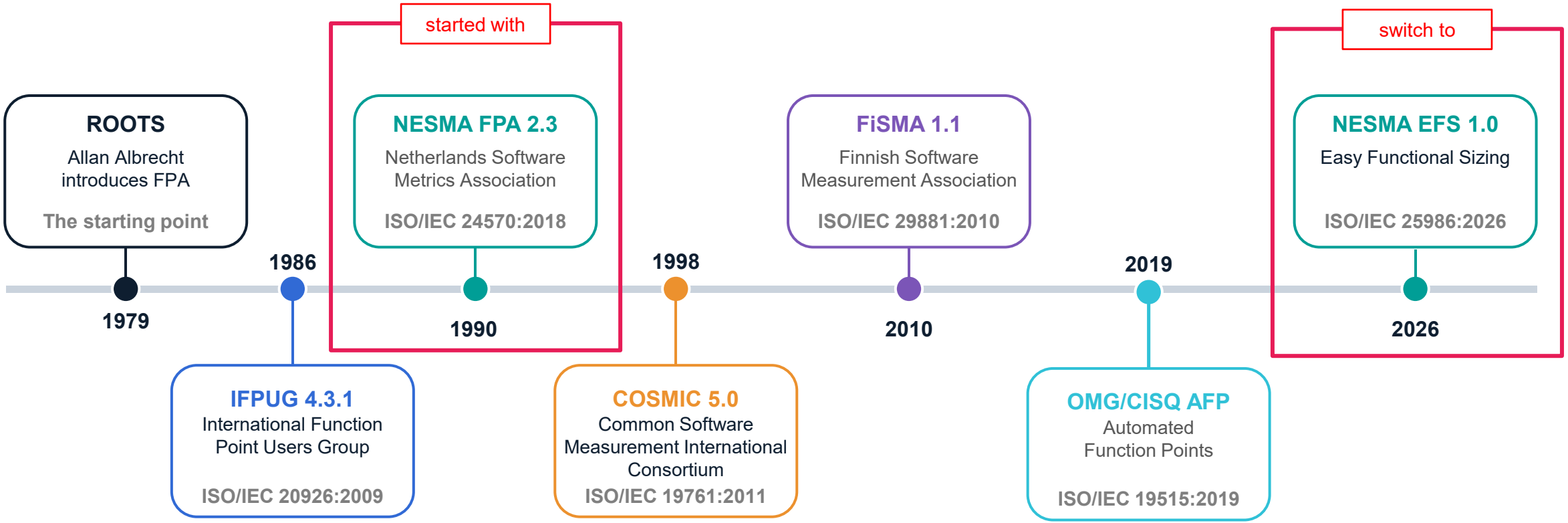
1. Products to be delivered
2. Quality of the products to be delivered
3. Target values for the metrics

– specific for output-based –

1. Function Points to be delivered per quarter
2. Price per Function Point
3. What is included in the price per Function Point and what is not



Functional Size Measurement | In nearly five decades six ISO/IEC standards



Output-based delivery uses an objective measure of scope: Function Points …

Process	Function	Details	Module	Type	#Func.	FP
Outgoing invoices	**Print generated invoices**		Invoicing	EO	1	5
Cancel booked invoice	**Cancel booked invoice**		Invoicing	EI	1	4
Cancel booked invoice	**Cancel booked invoice**	**and reopen invoice**	Invoicing	EI	1	4
Accruals	**List box accrual types**	**Multi select variant**	Accounting	EO	1	5
Accruals	**Approve accrual calculation**	**Show search result**	Accounting	EO	1	5
Accruals	**Approve accrual calculation**	**Edit, delete, delete all**	Accounting	EI	3	12
Booking period	**Booking periods**	**Show search result**	Accounting	EO	1	5
Booking period	**Booking periods**	**Edit exposure indicator**	Accounting	EI	1	4
Booking period	**Booking periods**	**Build RPS exposure**	Accounting	EI	1	4
Silo transfers	**Out of silo transfer**	**Show search result**	Stock	EO	1	5
Silo transfers	**Out of silo transfer**	**Used in transfer**	Stock	EO	1	5
Silo transfers	**Storage unit**	**Show search result**	Stock	EO	1	5
Data model invoice	**Invoice header**		Invoicing	ILF	1	7
Data model invoice	**Invoice documents**		Invoicing	ILF	1	7
Data model invoice	**Invoice payment**		Invoicing	ILF	1	7
Data model invoice			Invoicing	ILF	1	7

… but not every Function Point requires the same effort to deliver

Cost drivers that determine the price per Function Point:

1. Size
2. Composition and number of Agile teams
3. Technologies within the IT stack
4. NPR core metrics and, where required, additional metrics (including target values)
5. Functional Size Measurement method used (Nesma, IFPUG, COSMIC, …)
6. Size measurement of the product, project, or both
7. Minimum number of Function Points delivered per period
8. System products to be delivered
9. Quality and acceptance criteria
10. Complexity of the business and its processes
11. Non-functional requirements (e.g. cybersecurity, IT controls, performance, RTO, …)
12. Architecture

Subset of original Function Point counting of CiSS
At the start, NG AODB comprised approximately 900 elementary functions, totaling around 2,636 Function Points (FP)

Planning | Control over functionality, shared understanding across Business and IT

ID	Elementary function/process	FPA type	FPA	Price	PI-Sprint	Build Status	Approved
[1.1.1.1]	[1.1.1.1] - Online | Arrivals | Find | Overview Arrivals Today - EO	EO	5	High price	PI-4.4	3 - UAT completed	27-01-25
[1.1.1.11]	[1.1.1.11] - Online | Arrivals | Find | Delete Arrival - EI	EI	4	High price	PI-5.3	3 - UAT completed	28-04-25
[1.1.1.12]	[1.1.1.12] - Online | Arrivals | Find | Cancel Flight (rmks = CAN) - EI	EI (DELETE)	4	High price	PI-4.6	3 - UAT completed	25/02/25
[1.1.1.13.1]	[1.1.1.13.1] - Online | Arrivals | Find | Magnifier Nextmv | View associated Departure - EO	EO (To be deleted)	5	High price	PI-7.2	2 - Build completed	25/02/25
[1.1.1.14.1]	[1.1.1.14.1] - Online | Arrivals | Find | Flight Admin | View Arrival Administration Data - EO	EO	5	High price	PI-5.5	3 - UAT completed	21-05-25
[1.2.1.15.3]	[1.2.1.15.3] - Online | Departures | Find | Status update Departures | ASRT present => RDY - EI	EI (DELETE)	4	High price	PI-4.6	3 - UAT completed	25/02/25
[1.4.1.2]	[1.4.1.2] - Online | References | Aircraft Registration | View details Aircraft Registration - EO	EO	5	Low price	PI-1.4	3 - UAT completed	05-09-24
[1.4.12.1]	[1.4.12.1] - Online | References | Country | Find and list Country - EO	EO	5	Low price	PI-1.5	3 - UAT completed	05-09-24
[1.4.12.2]	[1.4.12.2] - Online | References | Country | New Country - EI	EI	4	Low price	PI-4.6	3 - UAT completed	25/02/25
[1.4.12.3]	[1.4.12.3] - Online | References | Country | View details Country - EO	EO	5	Low price	PI-1.5	3 - UAT completed	05-09-24
[1.1.1.14.2]	[1.1.1.14.2] - Online | Arrivals | Find | Flight Admin | Update Arrival Administration Data - EI	EI	4	High price	PI-5.5	3 - UAT completed	21-05-25
[1.1.1.16.2]	[1.1.1.16.2] - Online | Arrivals | Find | Status changes Arrival | ALDT present => TAX - EI	EI (DELETE)	4	High price	PI-4.6	3 - UAT completed	25/02/25
[1.1.1.16.4]	[1.1.1.16.4] - Online | Arrivals | Find | Status changes Arrival | CDM flight state SCH or RTN and ELDT present with (pric	EI (DELETE)	4	High price	PI-4.6	3 - UAT completed	25/02/25
[1.12.3.2]	[1.12.3.2] - Online | Fuse Admin | Bulk Movements | Start Amove Bulk - send data - EO	EO	5	High price	PI-6.5	3 - UAT completed	11-08-25
[1.12.4.1]	[1.12.4.1] - Online | Fuse Admin | Bulk I-comps | Start Bulk Icomps - send data - EO	EO	5	High price	PI-7.7	2 - Build completed	16-12-25
[1.12.4.2]	[1.12.4.2] - Online | Fuse Admin | Bulk I-comps | Dropdown interfaces movements (already counted) - EO	EO	0	High price	PI-7.7	2 - Build completed	16-12-25
[1.2.1.1]	[1.2.1.1] - Online | Departures | Find | Overview Departures Today - EO	EO	5	High price	PI-4.5	3 - UAT completed	02-10-25
[1.2.7.1]	[1.2.7.1] - Online | Departures | Chk-In All | check-In all FLights - EI	EI	4	High price	PI-3.4	3 - UAT completed	04-11-24
[1.3.1.1]	[1.3.1.1] - Online | Movements | Find | Find and List Aircraft Movements - EO	EO	5	High price	PI-6.2	3 - UAT completed	25-06-25
[1.3.1.2]	[1.3.1.2] - Online | Movements | Find | View details Aircraft Movement - EQ	EO	5	High price	PI-6.2	3 - UAT completed	25-06-25
[1.3.2.1]	[1.3.2.1] - Online | Movements | New | New Aircraft Movement - EI	EI	4	High price	PI-6.4	3 - UAT completed	28-07-25
[1.3.2.2]	[1.3.2.2] - Online | Movements | New | Request Aircraft Movement (Tow list (AODB)) - EI	EI	4	High price	PI-6.4	3 - UAT completed	28-07-25
[1.3.3.1]	[1.3.3.1] - Online | Movements | Update Acreg | Update Registration Of Movements And Flights - EI	EI	4	High price	PI-6.2	3 - UAT completed	25-06-25
[2.1.24.1.2]	[2.1.24.1.2] - Interfaces | Incoming messages | CiSS Swissport | Timetable | Update Timetable - EI	EI	4	High price	PI-2.3	3 - UAT completed	14-10-24
[2.1.24.3.1]	[2.1.24.3.1] - Interfaces | Incoming messages | CiSS Swissport | Information | TT Delete - EI	EI (DELETE)	4	High price	PI-3.6	2 - Build completed	28-11-24
[2.1.24.4.1]	[2.1.24.4.1] - Interfaces | Incoming messages | CISS Swissport | Bulk request | Register Bulk request Flt - EI	EI (To be deleted)	4	High price	PI-7.3	2 - Build completed	28-11-24
[2.1.27.2.1]	[2.1.27.2.1] - Interfaces | Incoming messages | CiSS Viggo w | Timetable | Create Timetable - EI	EI (DELETE)	4	High price	PI-2.3	2 - Build completed	14-10-24
[2.1.27.2.2]	[2.1.27.2.2] - Interfaces | Incoming messages | CiSS Viggo w | Timetable | Update Timetable - EI	EI (DELETE)	4	High price	PI-2.3	2 - Build completed	14-10-24
[2.1.27.2.3]	[2.1.27.2.3] - Interfaces | Incoming messages | CiSS Viggo w | Timetable | Delete Timetable - EI	EI	4	High price	PI-2.3	3 - UAT completed	14-10-24
[2.1.27.3.1]	[2.1.27.3.1] - Interfaces | Incoming messages | CISS Viggo vv | Modifications | Update data - EI	EI (DELETE)	4	High price	PI-4.4	2 - Build completed	27-01-25
[2.1.35.2.1]	[2.1.35.2.1] - Interfaces | Incoming messages | FIDS-CISS (DMC) | Modifications | Update data - EI	EI (DELETE)	4	High price	PI-4.6	2 - Build completed	25/02/25

Original from the PID

Planning | What is included in the price per Function Point and what is not?

Which deliverables are included in the price per Function Point?

Table 7.2.1: System deliverables with owner

ID	System Deliverables	Description	Incl. in FP price	Owner	Body to sign-off
AODB-01	Domain REST services	RESTful services source code for domain layer providing domain-specific functionality facilitating seamless communication between AODB components.	Yes	Technical Realization Team	TA
AODB-02	Frontend as SPA	Source code for the frontend as Single Package Application (SPA). It can be packaged and deployed into dedicated AODB module.	Yes	Technical Realization Team	TA
AODB-03	AODB Infrastructure as Code (IaC)	Infrastructure as Code (IaC) for OpenShift cluster automates deployment, configuration, and management, ensuring consistency, scalability and ease of provisioning environments.	No	Technical Realization Team	TA
AODB-04	Delivery pipelines	Delivery pipelines automate software deployment processes, orchestrating code integration, testing, and release stages, ensuring continuous delivery, reliability, and efficiency throughout the development and transition lifecycle.	No	Technical Realization Team	TA
AODB-05	DevSecOps Flow	DevSecOps Flow outlines the integrated development, security, and operations processes applied at AODB to ensure secure and efficient software delivery.	No	Technical Realization Team	TA
AODB-06	Release notes	Release Notes provide a summary of changes, enhancements, and bug fixes included in a release. They serve as a communication tool for stakeholders and users to understand what's new in AODB.	Yes	Technical Realization Team	TA

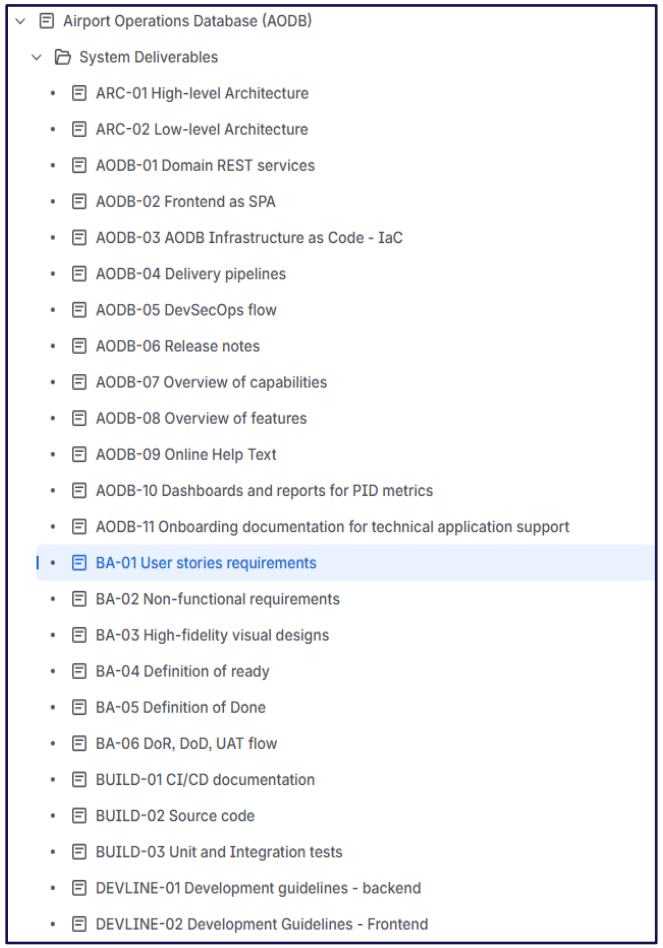
Which activities are included in the price per Function Point?

Table 10.1.1: Activities included or excluded in price per function point

ID	Activities	Incl. in FP price	Owner
AC-01	Delivery management of TRT (incl. management of scrum/agile rituals)	Yes	Technical Realization Team
AC-02	Development & testing up to UAT environment	Yes	Technical Realization Team
AC-03	Investigation, analysis, validation and resolution of defects within 8 weeks of quality gate 2	Yes	Technical Realization Team
AC-04	Investigation, analysis, validation and resolution of defects after 8 weeks of quality gate 2	No	Technical Realization Team
AC-05	Deployment up to UAT environment	Yes	Technical Realization Team
AC-06	Deployment to production/shadow environment (NB: promotion to release environment done by RSG)	No	Technical Realization Team
AC-07	Development of release pipelines (NB: done by Platform team)	No	Technical Realization Team
AC-08	Design, implementation, monitoring and maintenance support of infrastructure and environments (NB: done by Platform team)	No	Technical Realization Team
AC-09	Technology or tooling infrastructure changes after start of implementation	No	Technical Realization Team
AC-10	Support technology stack upgrades	No	Technical Realization Team
AC-11	Technology evaluations and comparison matrices efforts	No	Technical Realization Team
AC-12	Performance tracking tool design support and metrics creation for NFR monitoring	No	Technical Realization Team
AC-13	Chain testing (i.e. testing of downstream and upstream applications with AODB system)	No	Technical Realization Team
AC-13	UAT communication, resource availability and attendance	No	Business Implementation Team
AC-14	Development of UAT test cases and test data	No	Business Implementation Team
AC-15	Management of issue ticket backlog (following UAT)	No	Business Implementation Team
AC-16	Preparation, planning and execution of UAT sessions	No	Business

Original from the PID (Confluence)

Planning | Clear output requires a clear definition of the system deliverables



PRINCE2 – product description template 2017

Identifier	**BA-01**
Title	User stories requirements
Purpose	The purpose of this deliverable is to document and articulate user stories and requirements that will serve as a foundation for the development and implementation of the project. This document aims to clearly define the functionalities, features, and constraints that the system must adhere in order to meet the needs of the stakeholders.
Composition	The deliverable will be composed of: 1. User story 2. Description 3. Deviations from current AODB (CiSS) 4. Acceptance criteria 5. Testing notes 6. Designs (if applicable) 7. Key data fields URL - A sample user story is recorded here: User Story template [Draft] - Concept AODB - Confluence (atlassian.net)
Derivation	This deliverable will be derived from 1. Extensive stakeholder engagement, including user interviews, workshops, and analysis of existing documentation. 2. Reverse engineering of the existing code base (CiSS) 3. Alignment to business objectives: Understanding the overarching goals and objectives of the project as outlined in the project initiation documentation. 4. Regulatory Requirements: Compliance with any EASA regulations, or industry standards that may impact the system's design and functionality. 5. Transition & operational considerations: Any items related to the technology stack & consideration for enabling transition & business operations
Format and Presentation	URL - Azure Devops - User Story template [Draft] - Concept AODB - Confluence (atlassian.net)
Quality	
Quality Criteria:	The quality criteria for the User Stories and Requirements deliverable will be covered & measured in the following sections: Coverage: - Ensure coverage of all requirements related to the user story and alignment to meet the DoR (definition of ready)(Definition of Ready [DRAFT] - Concept AODB - Confluence (atlassian.net)) Clarity: The user story is documented in plain language and wherever possible acronyms will be avoided. Completeness: Every user story and requirement will be meticulously documented, aiming to capture the accepted system behavior, as defined by the Definition of Done (DoD). Traceability: Establishing a clear traceability matrix to link each requirement back to the originating user story and its associated stakeholder input & existing system behavior Validity: Validating the accuracy and relevance of each user story and requirement through stakeholder reviews
Quality Tolerances:	Coverage: 100% coverage of all identified user stories and requirements. Completeness: 100% completion of acceptance criteria for each user story. Traceability: 100% traceability between requirements and corresponding user stories. Validity: Agreement among stakeholders in validation sessions.
Quality Method:	SME Workshops: Engaging the PO & Schiphol SME to gather inputs, review & validate user stories Peer Reviews: Engaging team members in peer reviews to evaluate the clarity, completeness, and validity of the deliverable. Prototyping: Creating prototypes or mock-ups to visualize user stories, enabling stakeholders to provide tangible feedback on requirements.
Quality Skills Required:	Business Analysis skills
Quality Responsibilities:	Technical Realization Team

Original from the PID

Planning | What you agree on must be continuously measurable, over 30 metrics that we continuously monitor

Table 8.3.1: Overview of the Better, Cheaper, Faster and Happier improvement metrics

ID	Metric	Target	Unit of Measure	When to measure	Comments
Better Metrics					
B-01	Static code analysis	A		DoD	SonarQube or TIOBE
B-02	Backend code and branch coverage	>80	%	DoD	File exclusion rules will be applied (to ignore not relevant scope)
B-03	Frontend code and branch coverage	>80	%	DoD	File exclusion rules will be applied (to ignore not relevant scope)
B-04	Mutation test coverage backend (killed mutants)	>80	%	DoR	File exclusion rules will be applied (to ignore not relevant scope - same scope applicable as to unit testing)
B-05	Mutation test coverage frontend (killed mutants)	>80	%	DoR	File exclusion rules will be applied (to ignore not relevant scope - same scope applicable as to unit testing)
B-06	Technical Debt ratio (how much technical debt work we have maximum)	<2	Sprints	yes	
B-07	MTBF for defects priority 1 in production and shadowrun environment	360	days	n.a.	
B-08	MTBF for defects priority 2 in production and shadowrun environment	160	days	n.a.	
B-09	MTBF for defects priority 3 in production and shadowrun environment	decide by PO	days	n.a.	
B-10	MTBF for defects priority 4 in production and shadowrun environment	decide by PO	days	n.a.	
B-11	MTBF for defects priority 1 in acceptance	360	days	n.a.	
B-12	MTBF for defects priority 2 in acceptance	160	days	n.a.	

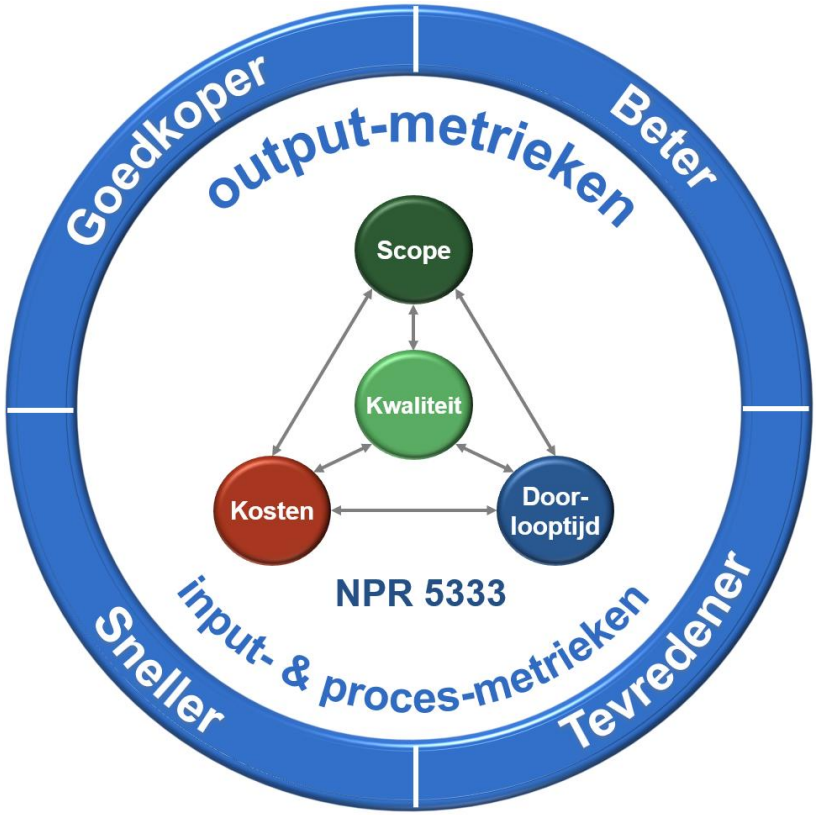
Original from the PID

Planning | Proactive back-to-green plan after two consecutive “red” or “amber” sprints

Category	Metric	DoD	Green	Orange	Red	Unit	Remark
Happier	Happiness score business		>=4	>=3	<3	1-5 – 5 is the best	
	Happiness score IT (scrum team)		>=4	>=3	<3	1-5 – 5 is the best	
Better	Static code quality	Yes	A	B	<C	Range A-F – A is the best	
	Front-end Back-end code coverage	Yes	>=90%	<75%	<60%	Percentage coverage	
	Mutation test coverage	Yes	>=90%	<75%	<60%	Percentage coverage	
	Technical Debt	Yes	=<2	=<3	>3	Amount of required sprints	
	Defect Density Severity 1-2 during UAT		<0.15	>0.15	>0.2	Defects per function point	
	Open defects in production	Yes	<0.2	>0.2	>0.4	Defects per FP	
	MTBF Severity 1 UAT		>360	<360	<180	Days	
	MTBF Severity 2 UAT		>90	<90	<30	Days	
Faster	MTTR Severity 1 UAT		=<1 hours	>1 hours	>2 hours	Hours (office)	
	MTTR Severity 2 UAT		=<6 hours	>6 hours	>10 hours	Hours (office)	
	Minimum work in stock (sprints)	Yes	3	2	1	Sprints per team	
	Flow predictability of Story Points		>=80%	<80%	<50%	Story points committed/realized	
	Amount of Function Points delivered	Yes				Target is separate burndown	No target
Cheaper	Hours per FP					Hours	No target
	Amount of Virtual Function Points delivered					Hours on non-FP * points/productivity	No target
	Ratio of virtual FP versus delivered FP						No target

Table is original from the PID

Planning | Control aspects: what you agree on must be continuously measurable



5.2.4 – figure 3

Table 8.2.1: Overview of the dashboards for the users, IT and project control

Category	#	Subject of dashboard	What to monitor of devil's triangle
Progress and quality for the users	1	Progress expressed in business functionality/Function Points	Duration & Scope
	2	Functional scope (in Function Points) of the project	Scope
	3	Productivity expressed in business functionality/Function Points	Costs & Duration
	4	Satisfaction	Quality
	5	Mean Time Between Failures and Mean Time To Repair	Quality
	6	Defect Density per priority	Quality
IT (Technical Quality)	7	Quality of static source code	Quality
	8	Shortcomings and technical debt	Quality
	9	Implementation of test scenarios per capability	Quality
	10	Quality of test cases (mutation testing)	Quality
Cost and effort control	11	Hours (Budget, Actual, ETC, EAC and VAC[9])	Time
	12	Costs (Budget, Actual, ETC, EAC and VAC)	Costs

Planning | Contracting for output, managing for value

Number of Function Points the supplier must deliver per month

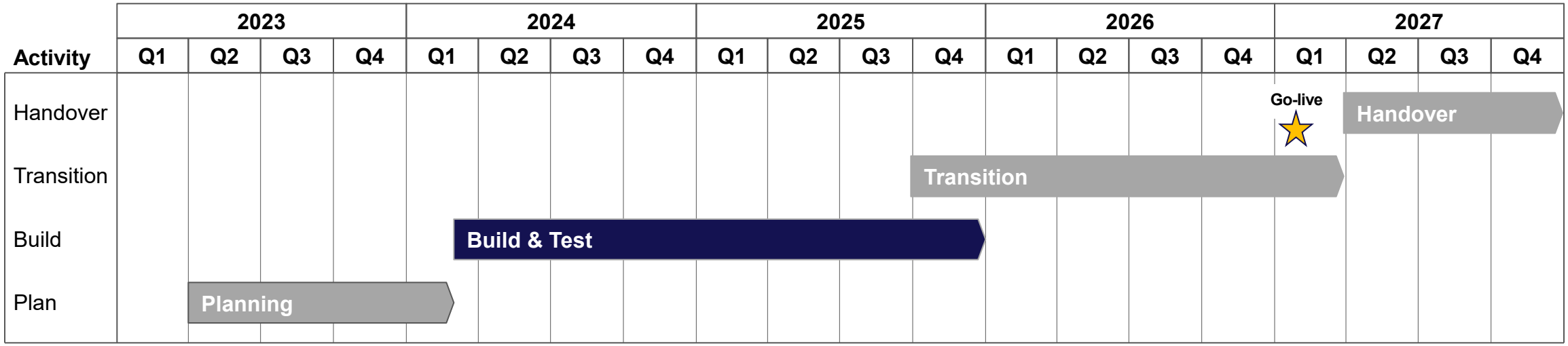
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
	2024										2025												
	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
FP per month according to contrat	0	0	42	84	84	126	76	76	126	136	136	123	133	139	148	148	148	138	126	126	138	138	138	107	2636
Countdown of FP	2636	2636	2594	2510	2426	2300	2224	2148	2022	1886	1750	1627	1494	1355	1207	1059	911	773	647	521	383	245	107	0	

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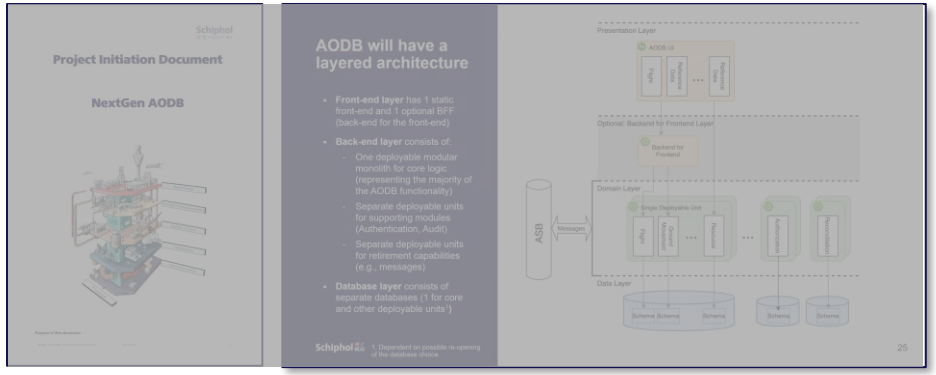
	PI-1			PI-2			PI-3			PI-4			PI-5			PI-6			PI-7			
Start and end FP per PI	2636		2426	2426		2148	2148		1750	1750		1355	1355		911	911		521	521			0
FP per PI	210			278			398			395			444			390			521			

FP per sprint	2-1	2363		3-1	2085		4-1	1689		5-1	1281	74	6-1	842	69	7-1	475					
	2-2	2300		3-2	2022		4-2	1627		5-2	1207	74	6-2	773	69	7-2	429					
	2-3	2262		3-3	1954		4-3	1583		5-3	1133	74	6-3	710	63	7-3	383					
	2-4	2224		3-4	1886		4-4	1538		5-4	1059	74	6-4	647	63	7-4	314					
	2-5	2198,67		3-5	1818		4-5	1494		5-5	985	74	6-5	605	42	7-5	245					
	2-6	2173,33		3-6	1750		4-6	1425		5-6	911	74	6-6	563	42	7-6	176					
	2.7	2148					4-7	1355					6-7	521	42	7-7	107					
																7-8	53,5					
																7-9	0					

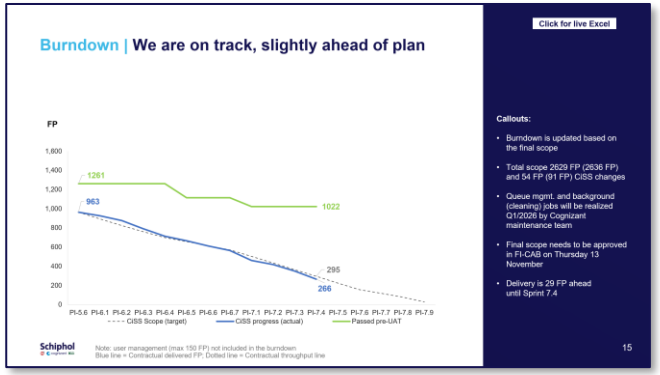
Planning | Control over execution through a strong baseline plan



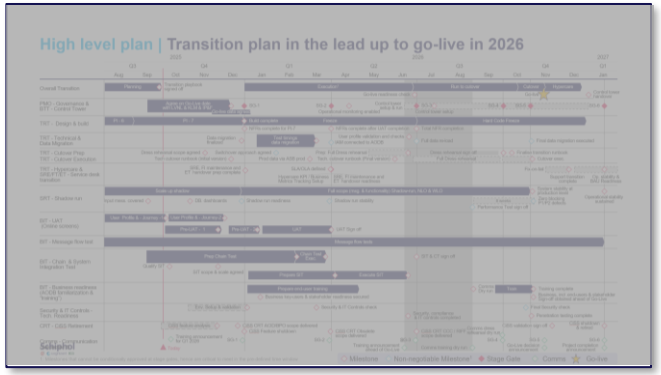
Planning



Build & Test

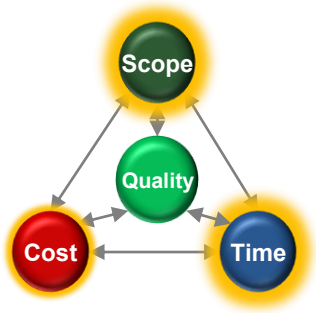


Transition

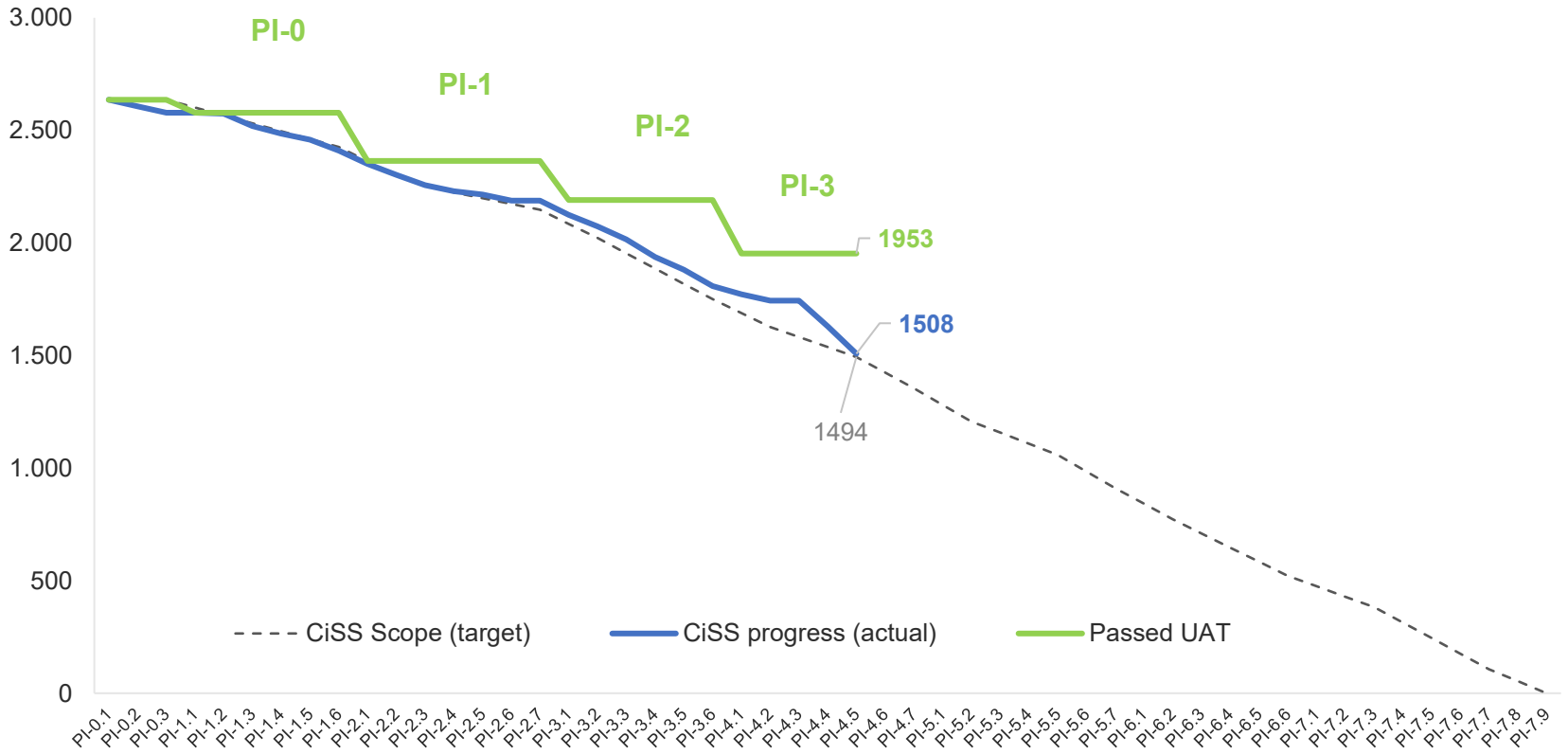


Original from the (Exec) Steerco

Build & Test | Delivered 1,128 FP of the CiSS scope (43%)



Function Points



Callouts:

- [illegible]
- [illegible]
- [illegible]
- [illegible]

Blue line = Built CiSS FP + "Deleted" CiSS FP (FP of CiSS covered by realized FP); Dotted line = Contractual throughput line

Burndown - Context

Delivery metrics | Four measures provide context on burndown quality



Measures	Goal	What we need to see	Value	Sub-metric	Sub-value
FP creep Contract: throughput and costs	The new AODB should not contain more function points than CiSS	AODB FP scope **is smaller than or equal to** CiSS FP scope	[illegible]	[illegible]	[illegible]
Feature creep Obsolete or Move to other application back in scope	The new AODB should not contain more features than original baseline of CiSS	AODB number of features **is smaller than or equal to** CiSS features	[illegible]	[illegible]	[illegible]
First time right Quality	Function points should ideally not be developed twice, e.g., due to quality issues	Product function points (delivered) **is smaller than or equal to** Project function points (in the final product)	[illegible]	[illegible]	[illegible]
Transparent productivity Time	Elementary functions that are complex should not be delivered at the end, to ensure a "fair" view of productivity	The average complexity of delivered FP is **larger than or equal to** the average CiSS FP complexity	[illegible]	[illegible]	[illegible]

Values	On target	Issues/Below Target	Risk	No target	Limited data

Original from the (Exec) Steerco

Build & Test | Overview of Sprint PI-4



Category	Metric	Unit	S 4.1	S 4.2	S 4.3	S 4.4	S 4.5	S 4.6	S 4.7
Happier	Happiness score business	1-5 (from S 2.3)							
	Happiness score IT (scrum team and PO)	1-5 (from S 2.3)							
Better	Static code quality	Range A-F – A is the best							
	Front-end Back-end code coverage	Percentage coverage							
	Mutation test coverage (backend/frontend)	Percentage coverage							
	Technical Debt	Amount of required sprints							
	Defect Density Severity 1-2 during UAT in software	Defects per function point							
	Defect Density Severity 3 during UAT in software	Defects per function point							
	Open and Closed defects for UAT	Amount							
	Open and closed defects for Shadowrun	Amount							
Faster	Minimum work in stock (sprints)	Sprints per team							
	Story points to be validated by Schiphol (sprints)	Story points per team							
	Flow predictability of Story Points	Story points committed/realized							
	Flow predictability of Product Backlog Items	Story points committed/realized							
	Amount of Function Points delivered (incl. creep)	Function Points							
	Amount of functional product backlog items to validate (DoR)	Number of backlog items							
	Amount of functional product backlog items to validate (DoD)	Number of backlog items							
	Amount of technical product backlog items to validate	Number of backlog items							
Cheaper	Hours per FP bucket 1 (cheaper)	Hours							
	Hours per FP bucket 2 (expensive)	Hours							
	Amount of Virtual Function Points delivered	Hours on non-FP /productivity							
	Ratio of virtual function points versus function points	Ratio							

Metrics	Measured	Not measured

Values	On target	Below target	Issues	No target	Limited data



Thank you for your attention.

Any questions?

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