

SMS Cost-Model Demonstration

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Questions & Answers

- What is the SMS operation profile in some years?
- What is the total man effort per annum?
- How is this human effort distributed?
- What are direct/hidden SMS costs?

How are we doing it?

The model is actually a set of equations

BUT

It can be automated ...

Next demonstration of cost calculations of one SMS
procedure

SMS Cost-Model Principles

- Two cost cards per procedure:
 - Implementation
 - Operation
- Four cost components in each card:
 - Human effort
 - Training
 - Infrastructure and equipment
 - Non-effort elements
- Procedure broken down into steps
- Steps decomposed by activities (actions)

Note: Equipment cost calculated adhering to strict accounting principles

Human effort

Procedure Implementation

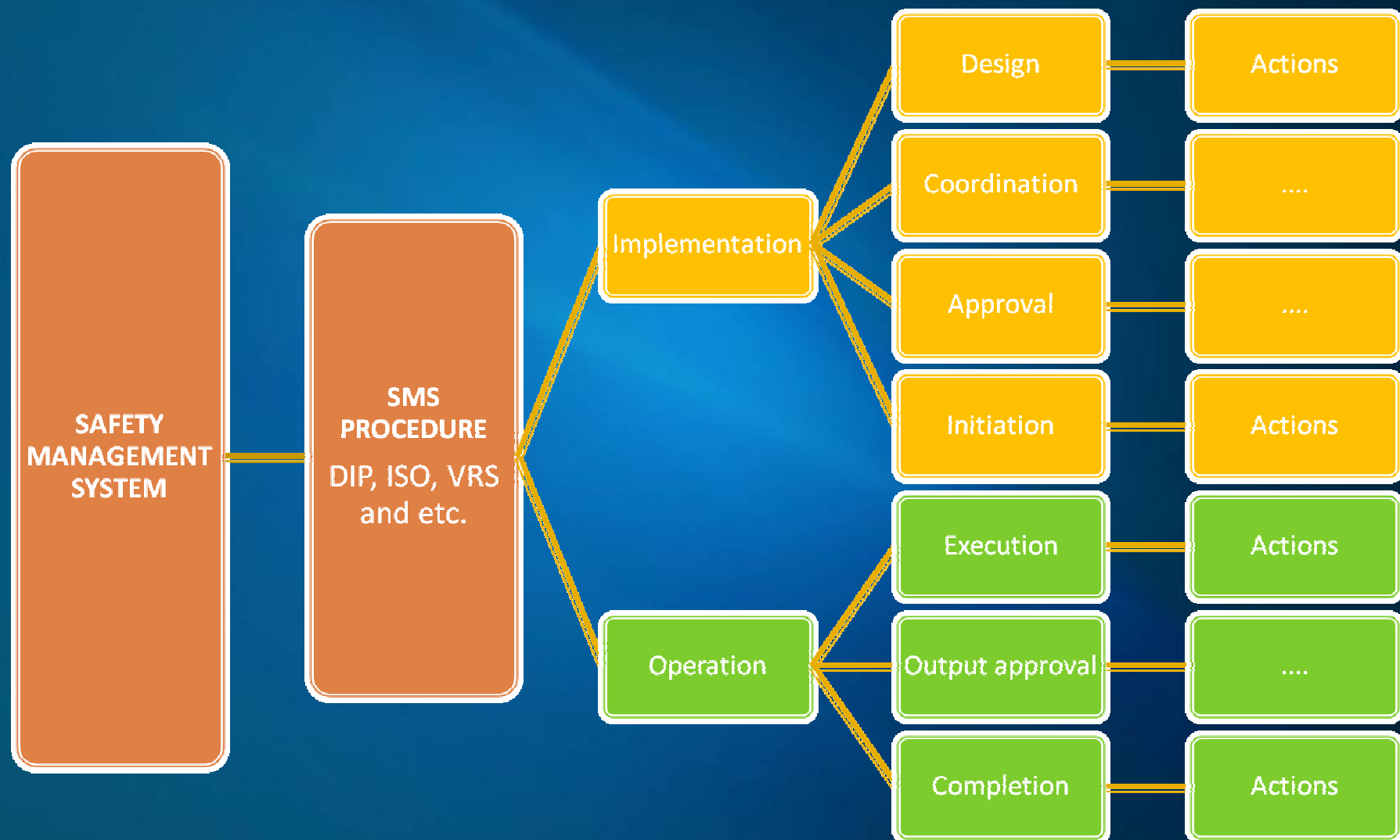
- Procedure Design
- Procedure Coordination
- Procedure Approval
- Procedure Initiation

Human effort

Procedure Operation

- Procedure Execution
- Procedure Output Approval
- Procedure Completion

Human effort structure



SMS Cost Model

Input / Output

- Model Input
 - Global variables
 - Implementation cost card (ISO-I)
 - Operation cost card (ISO-O)
- Model Output (results)
 - Human effort costs
 - Training costs
 - Infrastructure & equipment costs
 - Non-effort elements costs

SMS Cost Model

Global variables

- Global variables
 - Daily rates
 - SAF
 - OPS, ENG
 - MAN, ANC, ADM
 - Internal & External Trainers or support
 - Inflation
 - Weighted average cost of capital
 - Annual effort cost increase

Human effort matrix

Human effort assignment matrix					
SAF	OPS	ENG	MAN	ANC	ADM
[safety]	[operations]	[engineering]	[management]	[ancillary]	[administration]
Expert	Expert	Expert CNS	Top management (incl. directors)	MET	Procurement
Specialist	ATCO in OPS	COM	Line management	AIS	Accounting
	ATFM/ASM	NAV		SAR	HR
	Assistant	SUR		Instructor	
	OPS support (non-ATCOs)	IT			
	Trainee	Electro			
	Instructor	Instructor			

SMS Cost Model

Global variables – screen shot

Daily Rates

Role	Rate	Overhead Rate
SAF - daily rate	220.00 €	20.00%
OPS- daily rate	200.00 €	20.00%
ENG - daily rate	150.00 €	20.00%
MAN - daily rate	260.00 €	20.00%
ANC - daily rate	110.00 €	20.00%
ADM - daily rate	90.00 €	20.00%
Internal Trainer - daily rate	220.00 €	20.00%
External Trainer- daily rate	500.00 €	N/A
External Human Effort - daily rate	300.00 €	N/A

Global Variables

Variable	Value
Annual effort cost increase	3.50%
Inflation	3.00%
WACC - weighted average cost of capital	5.00%

SMS cost model - Human effort assignment matrix

SAF	OPS	ENG	MAN	ANC	ADM
[safety]	[operations]	[engineering]	[management]	[ancillary]	[administration]
Expert	Expert	Expert CNS	Top management (incl. directors)	MET	Procurement
Specialist	ATCO in OPS	COM	Line management	AIS	Accounting
	ATFM/ASM	NAV		SAR	HR
	Assistant	SUR		Instructor	
	OPS support (non-ATCOs)	IT			
	Trainee	Electro			
	Instructor	Instructor			

SMS Cost Model

Human effort – screen shot

Human Effort

Procedure Design

Review applicable regulatory requirements

1

5

3

Review guidance material and available best practices

2

7

3

Review existing is house

Internal						External
SAF [mandays]	OPS [mandays]	ENG [mandays]	MAN [mandays]	ANC [mandays]	ADM [mandays]	[mandays] [amount]

SMS Cost Model

Training

- Input data
 - Training courses
 - Training infrastructure and equipment
e.g. SOE, venue
 - Training missions
 - Training non-effort elements
e.g. training materials
- Output
 - Total training cost

SMS Cost Model

Infrastructure & Equipment

- Input data
 - Gross balance value
 - Expecting operating life
 - % for SMS purposes
- Output data
 - Cost (depreciation and interest) for the whole operating life

Note: Example on request.

SMS Cost Model

Non effort elements

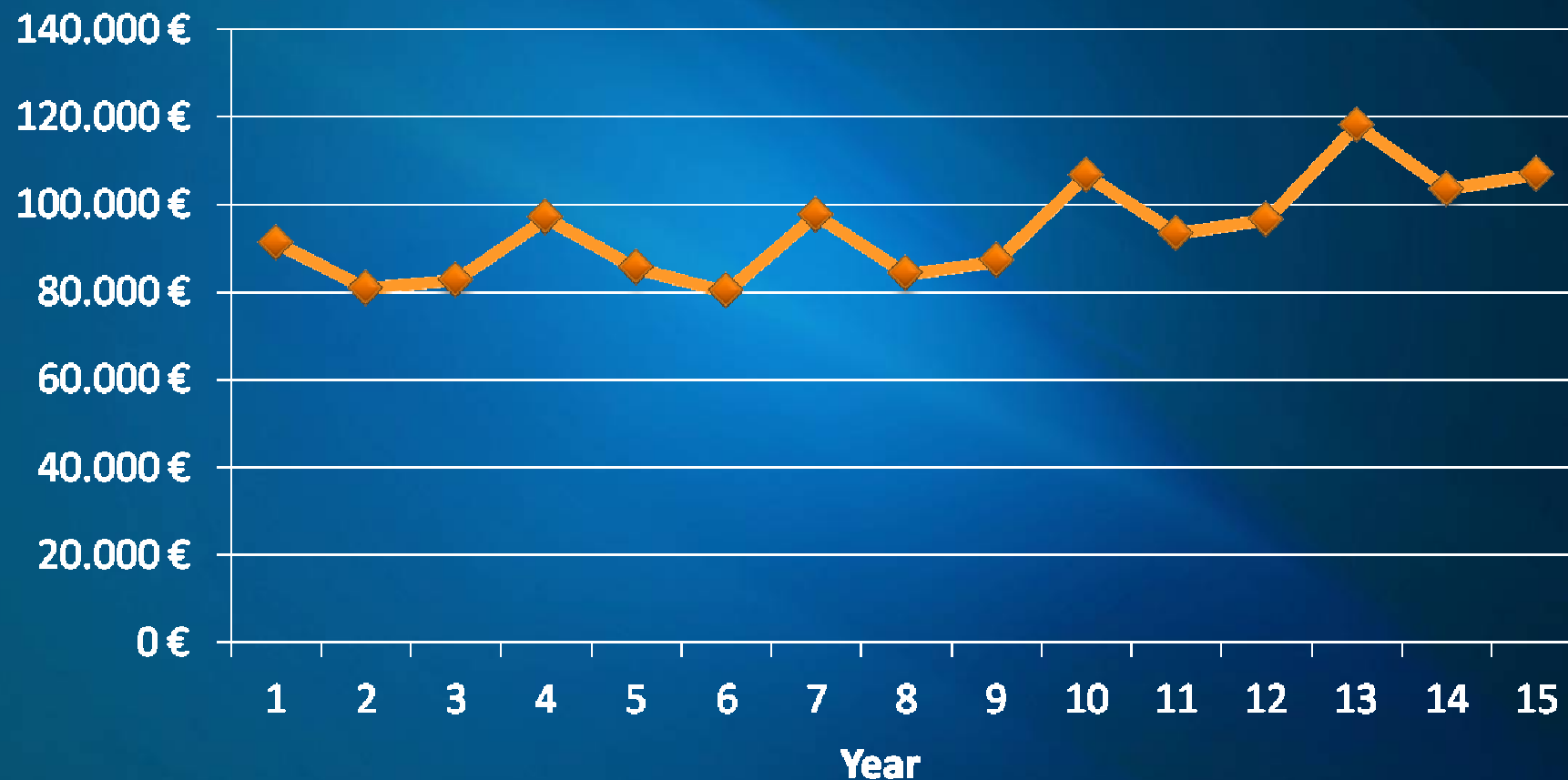
- Input data
 - Single prise
 - Quantity
 - Frequency per year
- Output data
 - Total cost

Questions & Answers

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- What is the total man effort per annum?
- How is this human effort distributed?
- What are direct/hidden SMS costs?

Operational profile

Operation profile for 15 years



Human effort per implementation

Human Effort for Development and Implementation of SMS

Procedure Action	Internal						External
	SAF	OPS	ENG	MAN	ANC	ADM	
	[total mandays]	[total mandays]	[total mandays]	[total mandays]	[total mandays]	[total mandays]	[total amount]
1-Design	41	0	0	0	0	0	
2-Coordination	12	20	20	0	0	0	
3-Approval	2	0	0	1.25	0	0	
4-Initiation	39	20	20	12	10	5	
Grand Total Human Effort	94	40	40	13.25	10	5	
R-Average Rate [per day]	220 €	200 €	150 €	260 €	110 €	90 €	
OH-Overhead [%]	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	
Rate for estimations	264.00 €	240.00 €	180.00 €	312.00 €	132.00 €	108.00 €	
Total Human Effort Costs	24 816 €	9 600 €	7 200 €	4 134 €	1 320 €	540 €	1 800 €

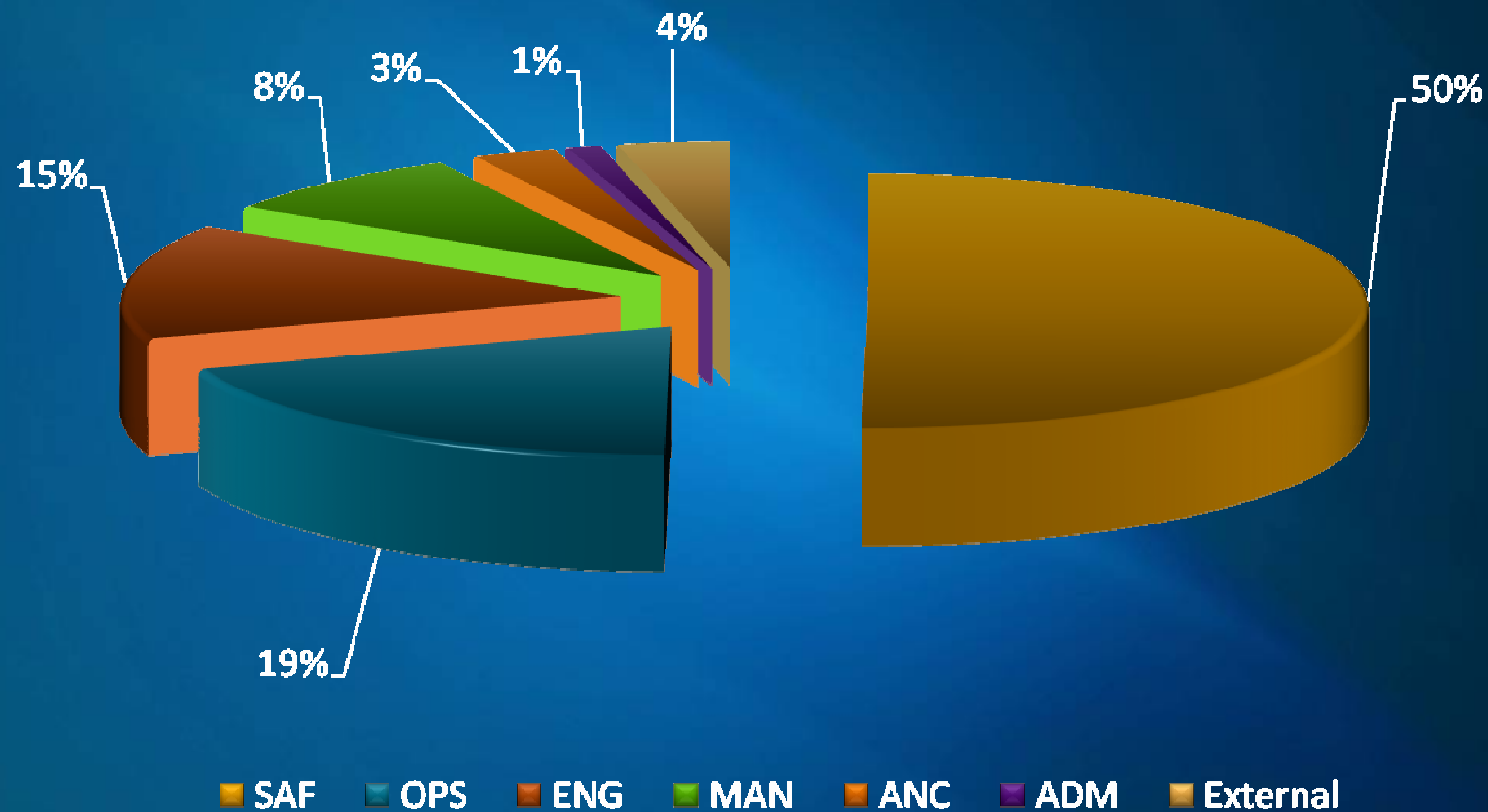
Human effort for operation

Human Effort for Maintenance and day-to-day Operation of SMS

Procedure Action	Internal						External
	SAF	OPS	ENG	MAN	ANC	ADM	
	[total mandays]	[total mandays]	[total mandays]	[total mandays]	[total mandays]	[total mandays]	[total amount]
5-Execution	10.625	0.5	0.25	3	0.25	0	
6-Output approval	0	0	0	2	0	0	
7-Completion	1.5	2	2	1	1	1	
Grand Total Human Effort	121.25	25.00	22.50	60.00	12.50	10.00	
R-Average Rate [per day]	220 €	200 €	150 €	260 €	110 €	90 €	
OH-Overhead [%]	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	
Rate for estimations	264.00 €	240.00 €	180.00 €	312.00 €	132.00 €	108.00 €	
Total Human Effort Costs	32 010 €	6 000 €	4 050 €	18 720 €	1 650 €	1 080 €	0 €

Human effort distribution per staff

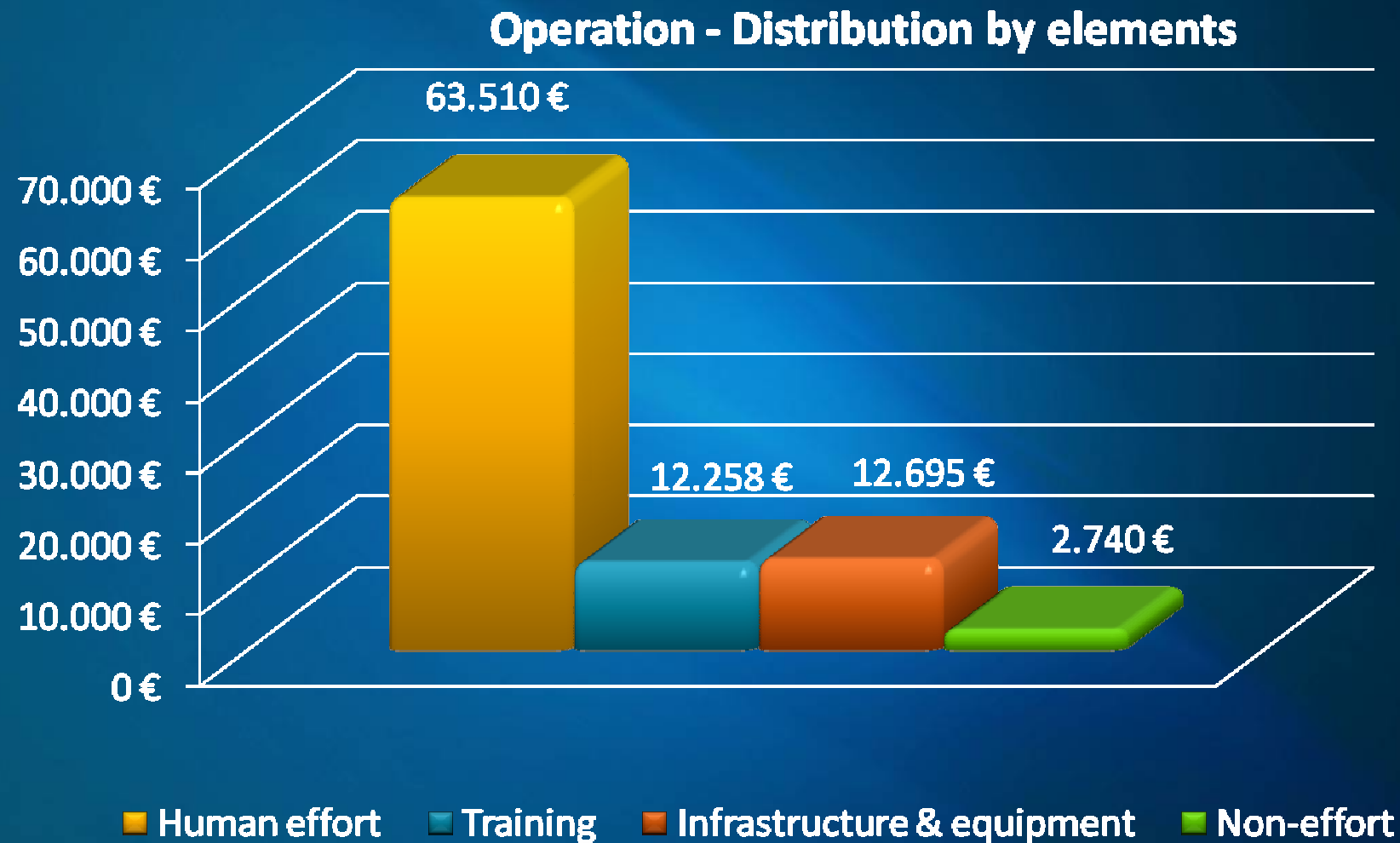
Implementation - Human Effort Costs [%]



Direct – Hidden – Variable costs

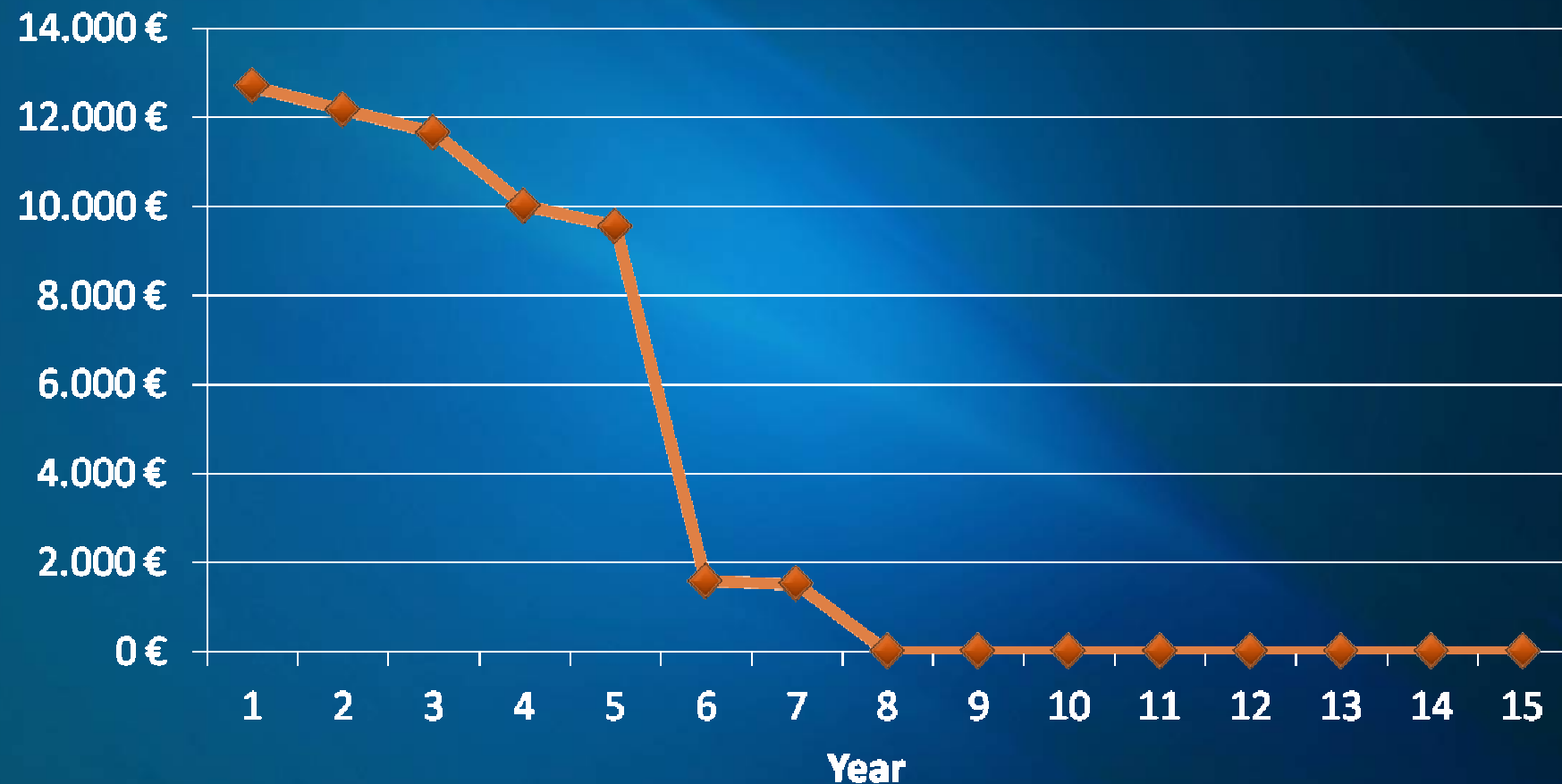
- Direct costs
 - SAF effort
- Hidden (indirect) costs
 - Communication to and familiarisation of concerned staff
 - Involvement of OPS/ENG/ANC staff in SMS related activities
 - Venue costs
 - Overhead costs
- Variable costs

Distribution by cost elements



Infrastructure & equipment profile

Infrastructure and Equipment for 15 years



Financial crisis

- How much costs me each particular activity?
- May I optimise SMS procedure in terms of effort/cost?
- May I plan manpower for my SMS?
- Can I make a plan for some years ahead?

Thank you!



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