

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

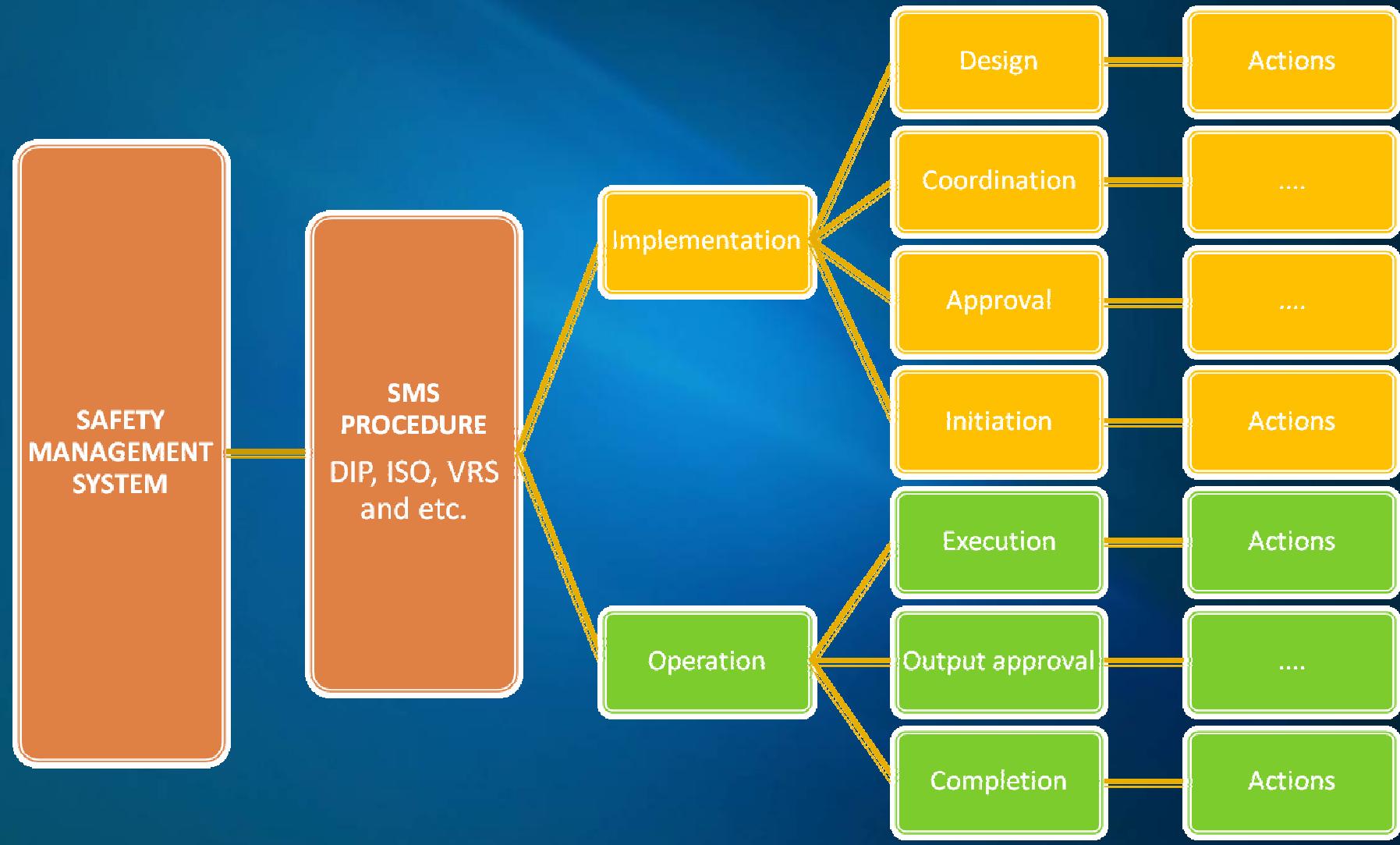
- Procedure Design
- Procedure Coordination
- Procedure Approval
- Procedure Initiation

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
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SMS Cost Model

Human effort – screen shot

Human Effort

	Internal						External
	SAF [mandays]	OPS [mandays]	ENG [mandays]	MAN [mandays]	ANC [mandays]	ADM [mandays]	
<i>Procedure Design</i>							
Review applicable regulatory requirements	1	5					3
Review guidance material and available best practices	2	7					3

Review existing in house

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

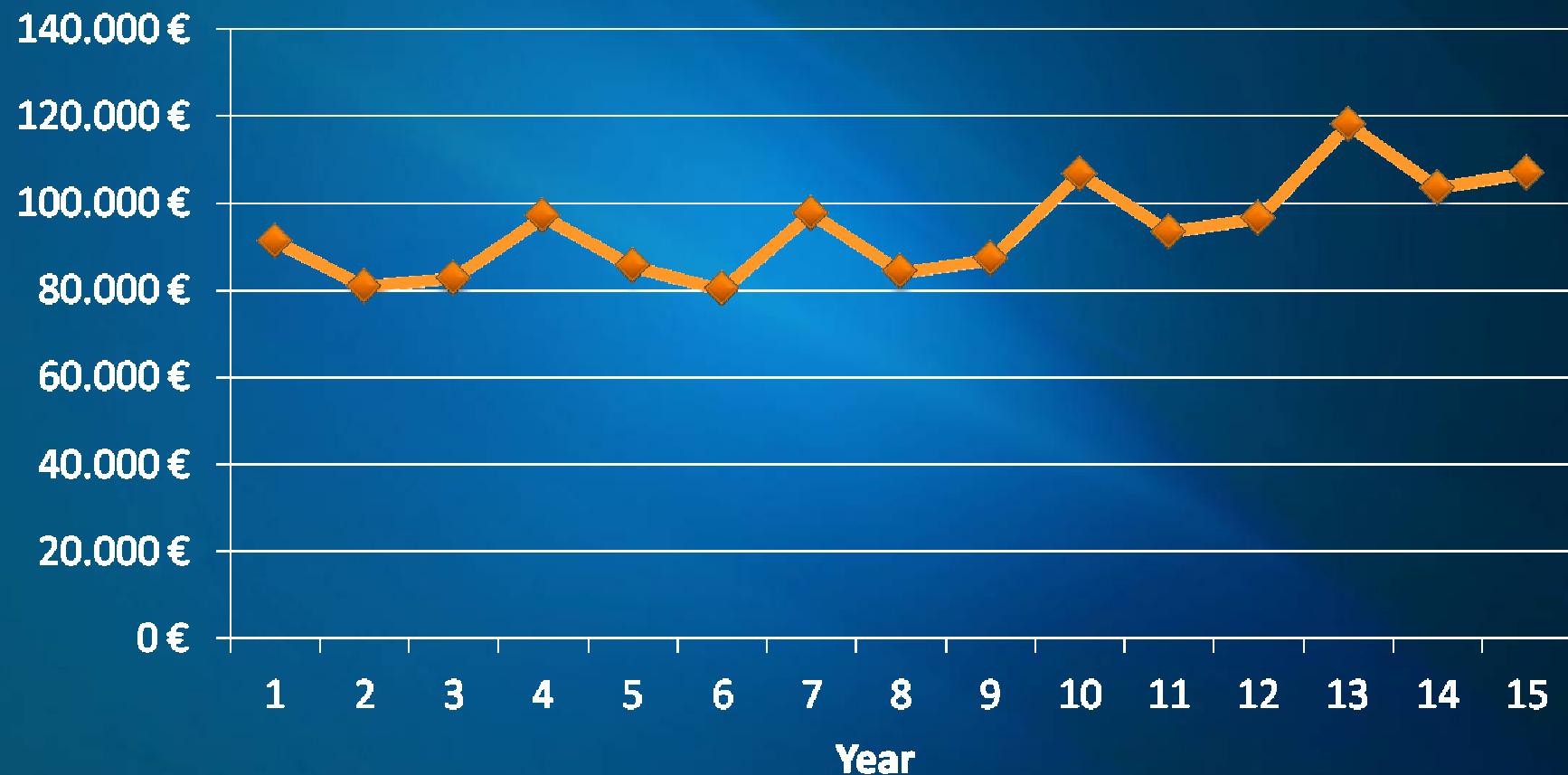
- Input data
 - Single prise
 - Quantity
 - Frequency per year
- Output data
 - Total cost

Questions & Answers

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Operational profile

Operation profile for 15 years



Human effort per implementation

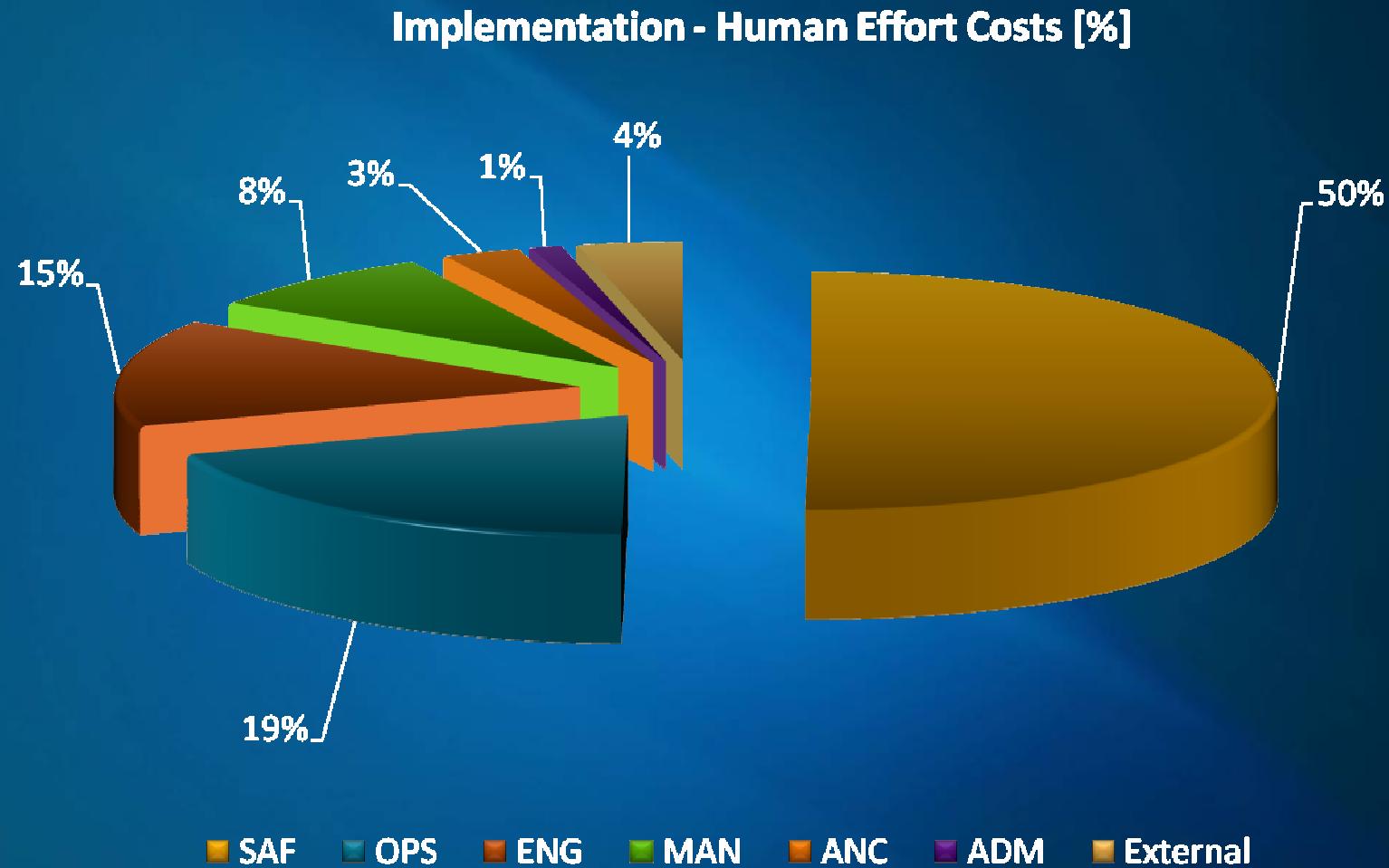
Human Effort for Development and Implementation of SMS							
Procedure Action	Internal						External
	SAF	OPS	ENG	MAN	ANC	ADM	
	[total mandays]	[total amount]					
1-Design	41	0	0	0	0	0	
2-Coordination	12	20	20	0	0	0	
3-Approval	2	0	0	1.25	0	0	
4-Initiation	39	20	20	12	10	5	
Grand Total Human Effort	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]						
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 €

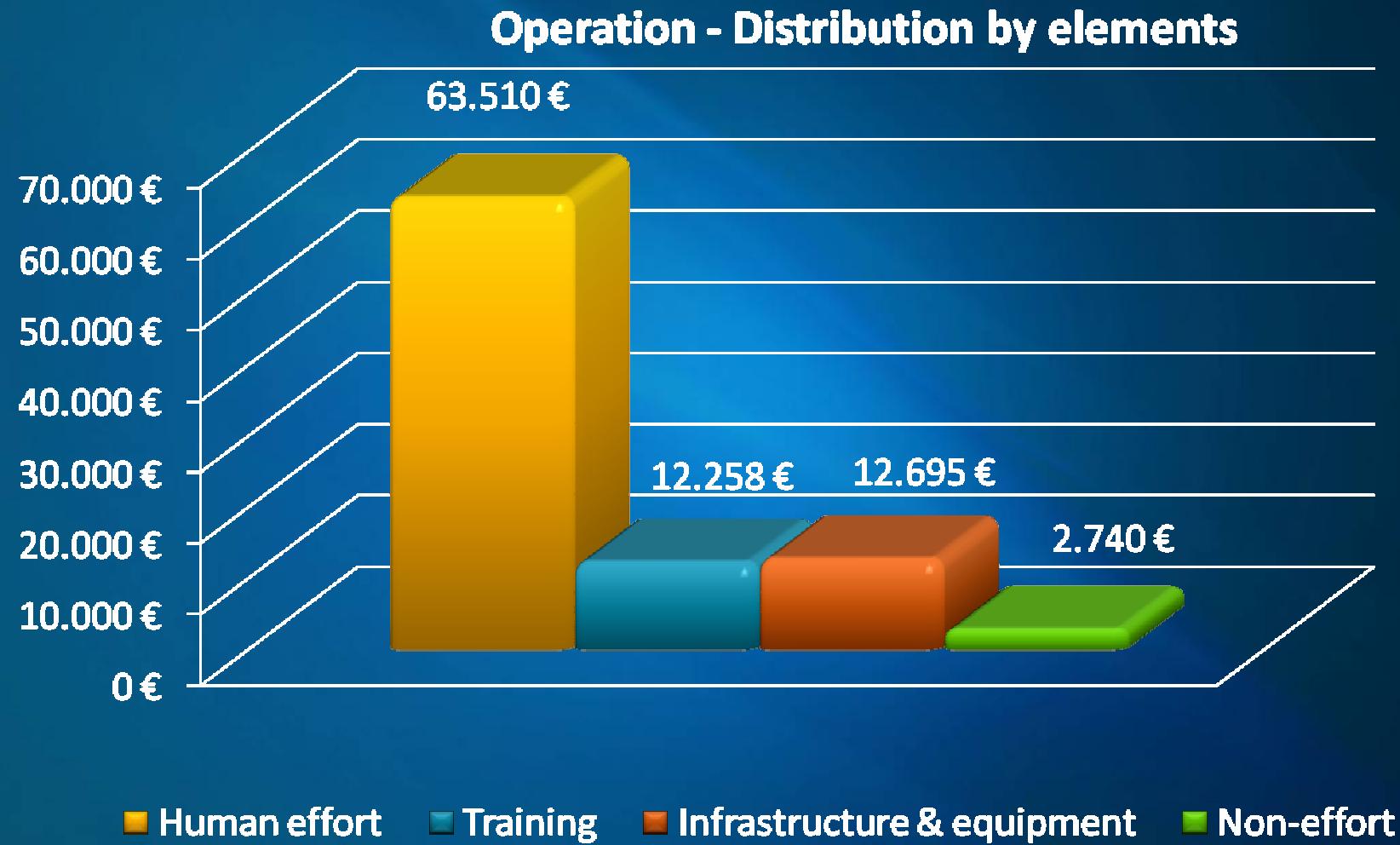
Human effort distribution per staff



Direct – Hidden – Variable costs

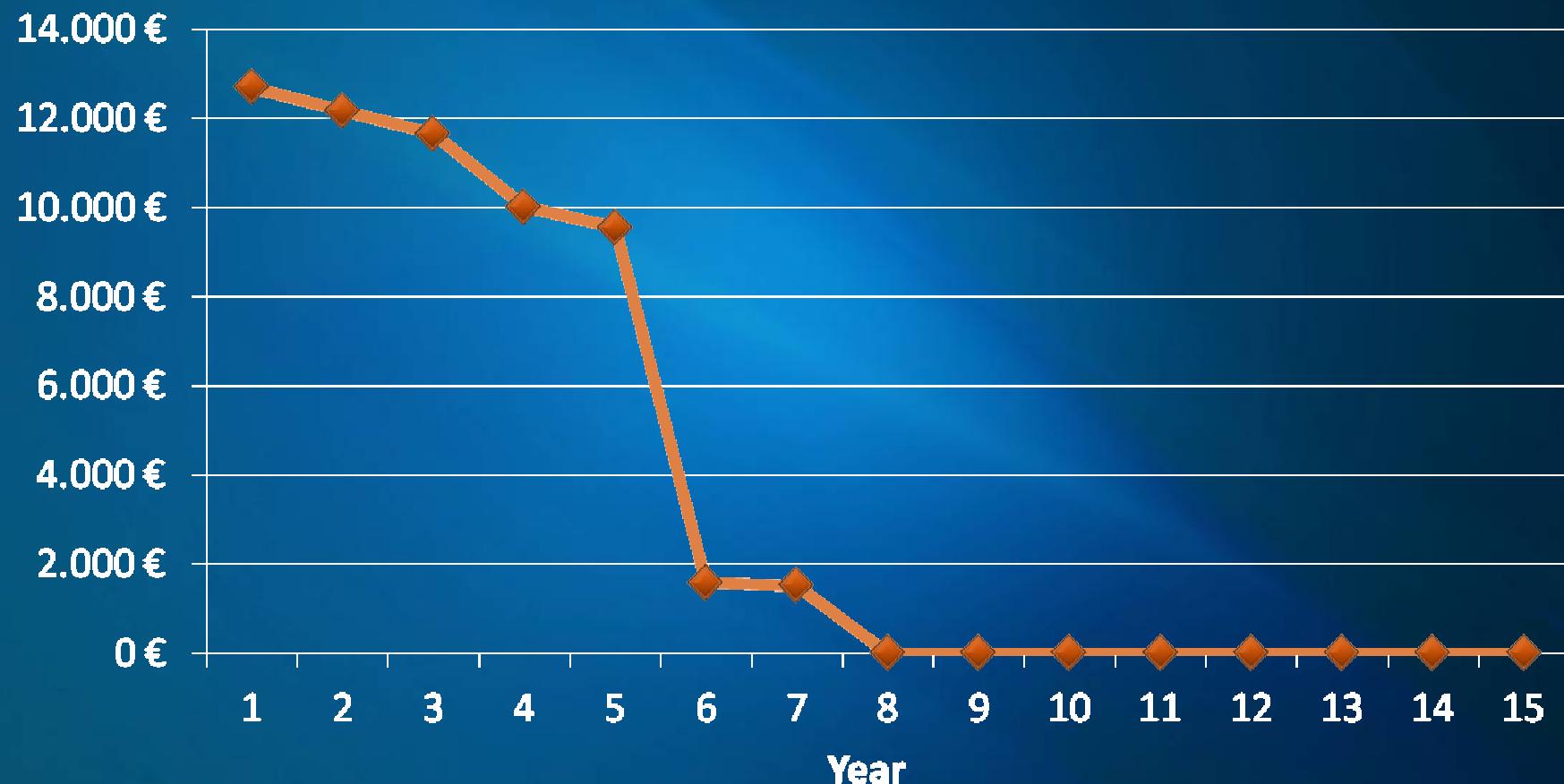
- Direct costs
 - SAF effort
- Hidden (indirect) costs
 - Communication to and familiarisation of concerned staff
 - Involvement of OPS/ENG/ANC staff in SMS related activities
 - Venue costs
 - Overhead costs
- Variable costs

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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