



Business Case Software

~A brief description~

**CHAOUKI MUSTAPHA, Economist,
International Civil Aviation Organization**

**Workshop on the Development of Business Case
for the Implementation of CNS/ATM Systems
(Lima, 10 – 14 November 2008)**



Outline

- What is it ?
- Main functions
- Main components
- Strengths and weaknesses
- Summary



What is it ?

- The CNS/ATM Database and Financial Analysis Computer System (DFACS)
 - an **analytical** and interactive software,
 - including a **database** component.



Main function

- Enables air navigation service providers and airspace users to **build**, **evaluate** and **compare** alternative **options or scenarios** for the implementation of CNS/ATM systems



Other functions

- **Maintain databases:**
 - **Geographical locations**
 - **Air navigation services equipment**
 - **Airspace users fleet and avionics**



Main components

➤ Database

- **Geographical data**
 - Regions reference
 - States reference
 - Locations reference
- **Air Navigation Services Equipment**
 - Conventional Technology Equipment reference
 - New Technology Equipment reference
 - Equipment database by location
- **Airspace users**
 - Aircraft types
 - Avionics



Main components

➤ Scenarios

- Scenario manager
 - Scenario creation
 - Copy of a scenario
- Scenario Analysis
 - Profitability
 - Cash flows
- Scenario Comparison
 - Summary table



Scenario building

- Homogeneous Area
- Conventional technology equipment types
- Scenario parameters
- Conventional technology equipment decisions
- New technology equipment decisions
- Fleet forecast
- Aircraft movements forecast
- Avionics equipage process
- Additional costs

Scenario Name:

Flight Hours Forecasts	Aircraft Equippage Decision Process	Aircraft Equippage Profile	Flight Efficiency Rates	ANSP additional costs	Airspace users additional costs
Homogeneous Area	Conventional Technology Equipment Types	ANSP Parameters	ANSP Conventional Technology Decision Process	ANSP New Technology Decision Process	Aircraft Fleet Forecasts

Save
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Africa Asia Pacific Caribbean and South America Europe Middle East North America	> < >> <<	
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Areas Under The Control Of The Pale: Bahrain Iran (Islamic Republic of) Iraq Israel Jordan Kuwait Lebanon Qatar Saudi Arabia Syrian Arab Republic United Arab Emirates Yemen	<input type="text" value=">"/> < >> <<	Oman
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Scenario Name:

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Homogeneous Area	Conventional Technology Equipment Types	ANSP Parameters	ANSP Conventional Technology Decision Process	ANSP New Technology Decision Process	Aircraft Fleet Forecasts

Save
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Communication
Navigation
Surveillance

>
<
>>
<<

MSSR
PSR

>
<
>>
<<

DVOR
ILS CAT II
VHF VOICE/DATA
VOR



Scenario Name:

Flight Hours Forecasts	Aircraft Equippage Decision Process	Aircraft Equippage Profile	Flight Efficiency Rates	ANSP additional costs	Airspace users additional costs
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Analysis Period

Start of Analysis Period: 1 /01/06

End of Analysis Period: 1 /01/25

Cost Recovery

Start of Cost Recovery Period: 1 /01/15

End of Cost Recovery Period: 1 /01/25

Discount Rate (%): 10

Profit Margin (%): 10

CNS/ATM Operational Dates

Equipment Category	Operational Date
▶ Communication	1/01/15
Navigation	1/01/15
Surveillance	1/01/15

ANSP Equipment Decommissioning cost

Consider decommissioning cost

Other parameters

Transition Period (Years): 10

Default Installation Date: 1 /01/95

Default Life Cycle (Years): 10

Max. Stretching Period: 10

Max. Refurbishment Period: 10

Year switching Month: 6

ANSP Equipment Residual Values

Consider residual value at the end of the transition period to CNS/ATM

Consider residual value of conv. tech. at end of the analysis period

Consider residual value of new tech. at the end of the analysis period

Default Parameters

Scenario Name:

Flight Hours Forecasts	Aircraft Equippage Decision Process	Aircraft Equippage Profile	Flight Efficiency Rates	ANSP additional costs	Airspace users additional costs
Homogeneous Area	Conventional Technology Equipment Types	ANSP Parameters	ANSP Conventional Technology Decision Process	ANSP New Technology Decision Process	Aircraft Fleet Forecasts

Save
Cancel

Total Number: 6

Location	ICAO Location Indicator	Type of Equipment	Installation Date	Option
▶ MUSCAT/SEEB INTL.	OOMS	VOR	1/01/93	Keep until the end of the transition period
MUSCAT/SEEB INTL.	OOMS	VHF VOICE/DATA	1/01/86	Replace at the end of each life cycle
MUSCAT/SEEB INTL.	OOMS	ILS CAT II	1/01/93	Do not include in the analysis
MUSCAT/SEEB INTL.	OOMS	PSR	1/01/95	Do not replace at the end of life cycle
MUSCAT/SEEB INTL.	OOMS	MSSR	1/01/95	Do not include in the analysis
MUSCAT/SEEB INTL.	OOMS	DVOR	1/01/85	Do not include in the analysis



Scenario Name:

Flight Hours Forecasts	Aircraft Equippage Decision Process	Aircraft Equippage Profile	Flight Efficiency Rates	ANSP additional costs	Airspace users additional costs
Homogeneous Area	Conventional Technology Equipment Types	ANSP Parameters	ANSP Conventional Technology Decision Process	AISPP New Technology Decision Process	Aircraft Fleet Forecasts

Save
Cancel

	Location	Equipment	Installation Date
▶	00IZ - IZKI		
*	00JN - JARF NORTH		
	00KB - KHASAB		
	00LK - LEKHWAIR		
	00MA - MASIRAH		
	00MM - MUSCAT FIR		
	00MS - MUSCAT/SEEB INTL		
	00MX - MARMUL		
	00NZ - NIZWA		

Scenario Name:

Flight Hours Forecasts	Aircraft Equippage Decision Process	Aircraft Equippage Profile	Flight Efficiency Rates	ANSP additional costs	Airspace users additional costs
Homogeneous Area	Conventional Technology Equipment Types	ANSP Parameters	ANSP Conventional Technology Decision Process	ANSP New Technology Decision Process	Aircraft Fleet Forecasts

Save
Cancel

Aircraft type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
A320	56	57	59	61	63	64	66	68	70	73	75	77
A310	50	51	53	54	56	58	59	61	63	65	67	69
C130	23	24	25	25	26	27	28	29	29	30	31	32
A340	21	21	22	23	23	24	25	26	26	27	28	29
K35R	6	6	6	6	7	7	7	7	8	8	8	9
B-757	6	6	6	6	6	7	7	7	7	7	8	8
IL18	6	6	6	6	6	6	7	7	7	7	7	8
C17	4	5	5	5	5	5	5	5	6	6	6	7
AN12	4	4	4	4	5	5	5	5	5	5	5	6
AN24	4	4	4	4	5	5	5	5	5	5	5	6
SH7	4	4	4	4	4	5	5	5	5	5	5	6
T154	4	4	4	4	4	4	5	5	5	5	5	6
BA11	3	3	3	3	3	3	3	3	4	4	4	5
IL76	2	2	3	3	3	3	3	3	3	3	3	4
GLF4	2	2	2	3	3	3	3	3	3	3	3	4
C135	2	2	2	2	2	2	2	3	3	3	3	4
P3	2	2	2	2	2	2	2	2	3	3	3	4
UH1	2	2	2	2	2	2	2	2	2	2	2	3
NIM	2	2	2	2	2	2	2	2	2	2	2	3
B707	2	2	2	2	2	2	2	2	2	2	2	3
OTHERS	27	28	28	29	29	30	30	31	32	32	33	34

Clear forecast grid Add aircraft type

Scenario Name:

Homogeneous Area	Conventional Technology Equipment Types	ANSP Parameters	ANSP Conventional Technology Decision Process	ANSP New Technology Decision Process	Aircraft Fleet Forecasts
Flight Hours Forecasts	Aircraft Equippage Decision Process	Aircraft Equippage Profile	Flight Efficiency Rates	ANSP additional costs	Airspace users additional costs

Save
Cancel

Aircraft Type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	20
B-737-4	32992	33981	35000	36051	37132	38245	39395	40576	41792	43045	44339	45
B-757	4152	4277	4405	4539	4675	4813	4957	5108	5260	5419	5580	57
DC-9-50	1888	1947	2004	2064	2125	2189	2256	2323	2392	2464	2539	26
A-300-600	23496	24203	24928	25676	26445	27237	28056	28899	29764	30659	31579	32
B-767-3/ER	30917	31844	32800	33784	34797	35843	36916	38024	39165	40340	41549	42
B-777	34290	35317	36379	37469	38595	39752	40944	42172	43437	44740	46083	47
B-727-2	1512	1556	1604	1652	1701	1752	1804	1859	1915	1972	2032	20
DC-10-4	6308	6496	6692	6892	7100	7312	7532	7757	7989	8229	10476	87
MD-11	6941	7149	7364	7587	7813	8048	8288	8539	8795	9059	9331	96
B-747-4	58731	60492	62308	64176	66101	68084	70128	72232	74397	76629	78931	81
OTHERS	19765	20160	20564	20976	21395	21821	22260	22704	23157	23621	24093	24
A330	49659	51146	52683	54261	55891	57565	59293	61072	62904	64792	66733	68
A320	40603	41820	43075	44365	45699	47068	48480	49936	51435	52976	54565	56
A310	36221	37309	38428	39581	40768	41992	43252	44549	45885	47261	48680	50
C130	16957	17467	17989	18531	19085	19659	20248	20856	21483	22125	22789	23
A340	15195	15651	16117	16603	17100	17613	18141	18685	19245	19824	20419	21
K35R	4340	4469	4604	4741	4884	5032	5181	5339	5499	5661	5832	60
IL18	4059	4180	4304	4435	4565	4704	4845	4989	5140	5293	5453	56
C17	3189	3285	3384	3485	3589	3699	3808	3923	4040	4163	4285	44
AN12	2965	3053	3147	3240	3339	3437	3540	3645	3756	3868	3984	41
AN24	2955	3043	3133	3228	3324	3424	3525	3632	3741	3853	3971	40
SH7	2900	2988	3076	3171	3264	3363	3464	3568	3675	3784	3899	40



Scenario Name:

Homogeneous Area	Conventional Technology Equipment Types	ANSP Parameters	ANSP Conventional Technology Decision Process	ANSP New Technology Decision Process	Aircraft Fleet Forecasts
Flight Hours Forecasts	Aircraft Equipage Decision Process	Aircraft Equipage Profile	Flight Efficiency Rates	ANSP additional costs	Airspace users additional costs

Save
Cancel

Start of Equipage Date

End of Equipage Date

Aircraft Type	Avionic Equipment	Maximum # of a/c equipped each year	Efficiency Rate
B-737-4	Package 1	7	7
DC-9-50	Package 1	0	0
A300-600	Package 1	3	7
B-767-3/ER	Package 1	3	7
B-777	Package 1	5	7
B-727-2	Package 1	1	7
DC-10-4	Package 1	2	7
MD-11	Package 1	3	7
B-747-4	Package 1	10	7
ATR-42	Package 1	2	7
A330	Package 1	6	7
A320	Package 1	10	7
A310	Package 1	5	7
C130	Package 1	2	7
A340	Package 1	4	7
K35R	Package 1	1	7
B-757	Package 1	1	7
IL18	Package 1	2	7
C17	Package 1	2	7
AN12	Package 1	1	7
AN24	Package 1	1	7
SH7	Package 1	2	7
T154	Package 1	1	7

Delete equipage dec.

Scenario Name:

Homogeneous Area	Conventional Technology Equipment Types	ANSP Parameters	ANSP Conventional Technology Decision Process	ANSP New Technology Decision Process	Aircraft Fleet Forecasts
Flight Hours Forecasts	Aircraft Equippage Decision Process	Aircraft Equippage Profile	Flight Efficiency Rates	AHSP additional costs	Airspace users additional costs

Save

Cancel

Cost Type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Other	0	5000	7000	5000	6000	5000	6000	7000	0	0	0	0

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Clear cost grid

Add cost line



Analysis output

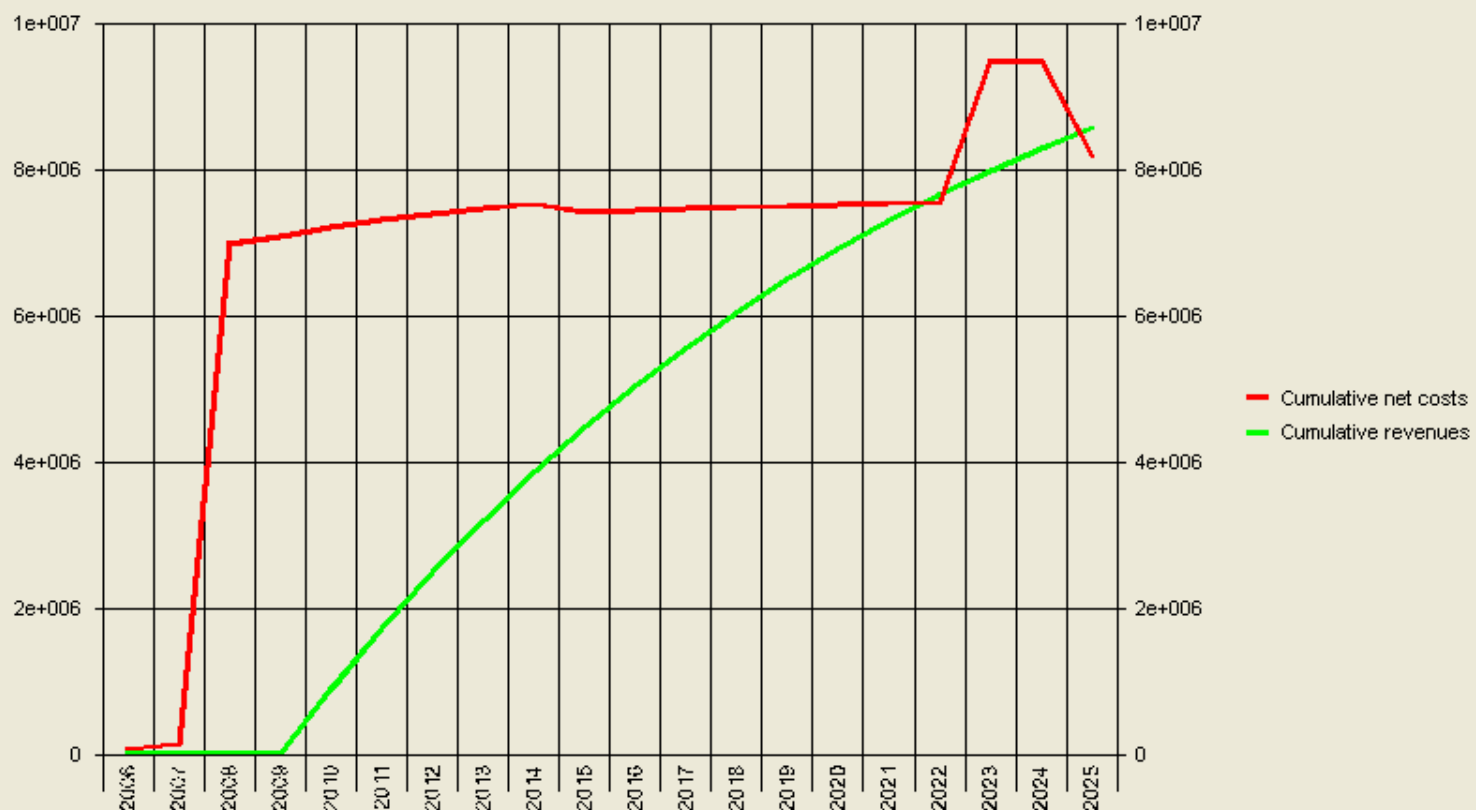
- **Summary analysis output values**
 - Present values of costs, revenues
 - Average annual amount of user charges
 - Cost recovery year
- **Costs:**
 - by State,
 - by location,
 - by equipment type,
 - by specific equipment
- **Cost recovery charts for ANSP & airspace users**

Scenario Name: Oman_Illustration

Scenario Details
Done

- ANS Conv. Tech. Costs
- ANS New Tech. Costs
- ANS Conv. Tech. Cost Chart
- ANS New Tech. Costs Chart
- Analysis Output Values
- Costs by State (ANSP)
- Costs by equipment category
- ANS Cost Details
- Airspace Users Cost Recovery Chart
- Airspace Users Cost Chart
- Airspace Users Benefit Details
- Airspace Users Benefits Chart
- Avionics Costs by a/c type and by avionic
- Hours Growth Chart
- Avionics Costs Details
- Avionics Costs by cost category

ANS Cost Recovery Chart



Scenario Name:

Scenario Details
Done

Airspace Users Cost Recovery Chart
 Avionics Costs by a/c type and by avionic
 ANS Cost Recovery Chart
 ANS Conv. Tech. Costs
 Analysis Output Values
 Airspace Users Cost Chart
 Hours Growth Chart
 ANS New Tech. Costs
 Costs by State (ANSP)
 Airspace Users Benefit Details
 Avionics Costs Details
 ANS Conv. Tech. Cost Chart
 Costs by equipment category
 Airspace Users Benefits Chart
 Avionics Costs by cost category
 ANS New Tech. Costs Chart
 ANS Cost Details

Conventional Technology cost details							
State	Location	ICAO LocDesig	Equipment	Technical Option/Decision	Installation Date	2006	2007
Oman	MUSCAT/SEEB INTL.	OOMS	VOR	Keep until the end of the tr	1/01/93	0	0
Oman	MUSCAT/SEEB INTL.	OOMS	VHF VOICE/DATA	Keep until the end of the tr	1/01/86	750	7
Oman	MUSCAT/SEEB INTL.	OOMS	ILS CAT II	Keep until the end of the tr	1/01/93	75000	7
Oman	MUSCAT/SEEB INTL.	OOMS	PSR	Keep until the end of the tr	1/01/95	2000	2
Oman	MUSCAT/SEEB INTL.	OOMS	MSSR	Keep until the end of the tr	1/01/95	1000	1
Oman	MUSCAT/SEEB INTL.	OOMS	DVOR	Keep until the end of the tr	1/01/85	0	0
▶ Total						78750	7

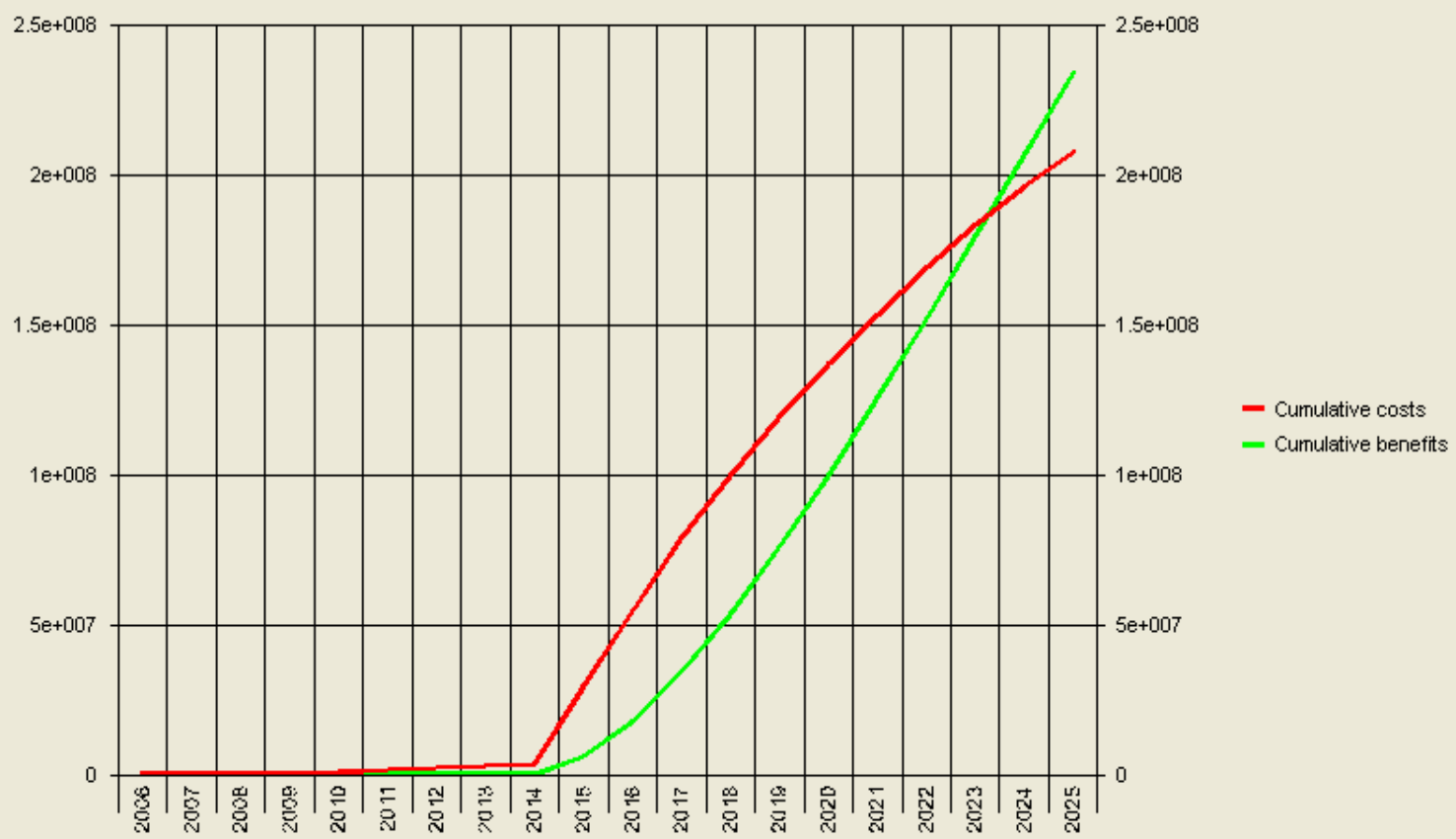
New Technology cost details							
State	Location	ICAO LocDesig	Equipment	Installation Date	2006	2007	2008
Oman	MUSCAT/SEEB INTL.	OOMS	AMHS	1/01/08	0	0	500
Oman	MUSCAT/SEEB INTL.	OOMS	AMSS Voice/Data	1/01/08	0	0	655
Oman	MUSCAT/SEEB INTL.	OOMS	GBAS	1/01/08	0	0	860
Oman	MUSCAT/SEEB INTL.	OOMS	SBAS-Ref	1/01/08	0	0	255
Oman	MUSCAT/SEEB INTL.	OOMS	SBAS-Mst	1/01/08	0	0	307
Oman	MUSCAT/SEEB INTL.	OOMS	ADS-B	1/01/08	0	0	395
Oman	MUSCAT/SEEB INTL.	OOMS	ADS-C (Workstations)	1/01/08	0	0	260
▶ Total					0	0	773

Scenario Name: Oman_Illustration9

- Avionics Costs by a/c type and by avionic
- Airspace Users Cost Chart
- Airspace Users Benefit Details
- Airspace Users Benefits Chart
- ANS Cost Recovery Chart
- Hours Growth Chart
- Avionics Costs Details
- Avionics Costs by cost category
- ANS Conv. Tech. Costs
- ANS New Tech. Costs
- ANS Conv. Tech. Cost Chart
- ANS New Tech. Costs Chart
- Analysis Output Values
- Costs by State (ANSP)
- Costs by equipment category
- ANS Cost Details

Scenario Details
Done

Airspace Users Cost Recovery Chart





Strengths and weaknesses

- **Analysis covers ANSP and airspace users**
- **Scenario decisions for each individual equipment**
- **Average amount of user charges**
- **Detailed costs**
- **Reference costs are generic**
- **Flight efficiency benefits an input**
- **Multinational facility/service**



SUMMARY

- Flexible
- Interactive
- Open
- Evolutionary

