IF WE™ take traveling to new heights, how far can we go?

Space destinations for all
– a dream our software could bring to life.

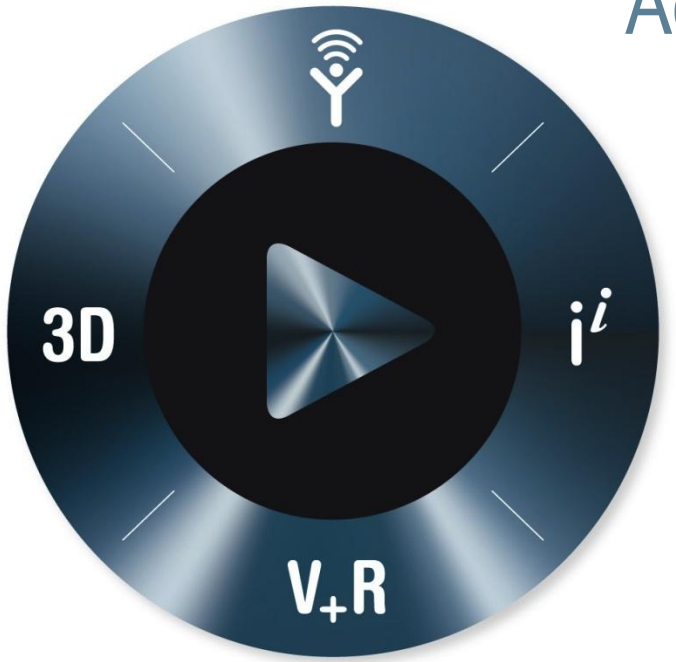
It takes a special kind of compass to explore the world's future possibilities. Innovative companies use our **3D**EXPERIENCE software platform to understand the present and navigate the future.

Find out more: **3DS.COM/AEROSPACE**

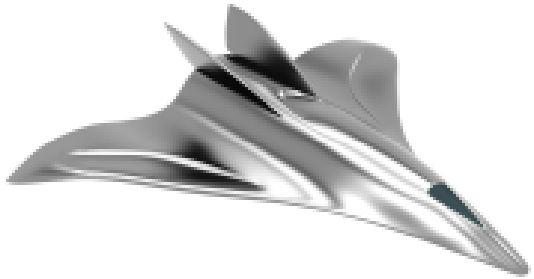
DASSAULT SYSTEMES | **IF WE** ask the right questions we can change the world.

Aerospace & Defense Strategy

Dassault Systèmes



3DEXPERIENCE

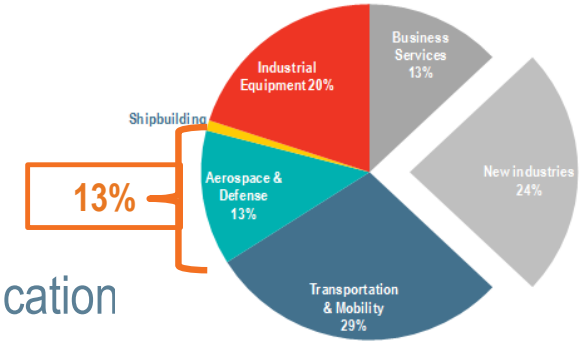


Michel TELLIER
Vice President
Aerospace & Defense

DASSAULT SYSTEMES | IF WE ask the right questions we can change the world.

Dassault Systèmes at a Glance

% Software End-User Revenue



- At the heart of **product innovation** in **12 industries**
- Targeting **~$32bn market**
- **~170,000** customers, with **+20,000** in 2012
- Dynamic **eco-system** (software, sales, research, education
- Serving **~140 countries**
- 2002-12 average **revenue** growth up **~14%** *
- 2002-12 average **headcount** growth up **~ 10%**
- **Long-term strategy** – Investments in **R&D** (~4,500 engineers) – Stable **shareholders**

* Non-IFRS, in USD

From 3D-Design to **3D**EXPERIENCE

30 years of success stories in Aerospace & Defense programs

Renaissance of Growth

From 2.5 B Passengers in 2011

to **16** B Passengers in 2050

33 500 New Planes worth $4T

over next **20** years

Space Access Demand Exploding ..... at Affordable Cost

More Than **1,200 Satellites** To Be Launched
Over The **Next 10 Years**

- **+ 80** Satellites for **4** Constellations
- **x100** growth in mobile communications in the **next 5 years**
- **x2** growth in Planetary sciences over **next 5 Years**

Aggressive competition on launchers and satellites price : **- 30%** by 2014

DASSAULT SYSTEMES | IF WE ask the right questions we can change the world.

8

52 new defense programs in operation today

61% of US defense programs suffered major delays while cost overruns averaged **26%** (source GAO)

Homeland Security is valued at **$2.6T**

2X Defense Business

DASSAULT SYSTEMES | IF WE ask the right questions we can change the world.

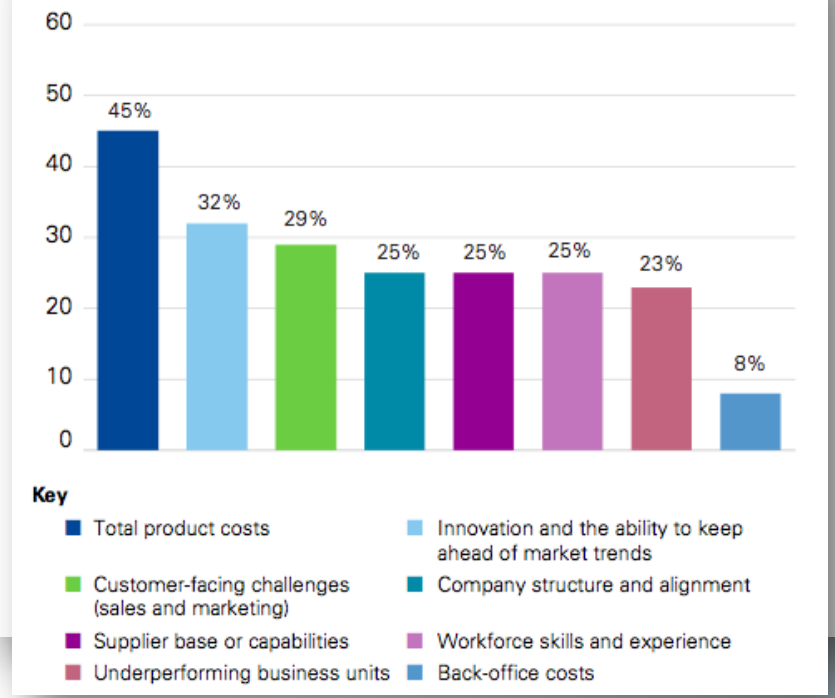
DASSAULT SYSTEMES

Priorities in Aerospace & Defense

Areas of increased spending over the next year

Competitive advantage in today's marketplace

Constraints to achieving a competitive advantage



Amongst **TOP 4** investment priorities

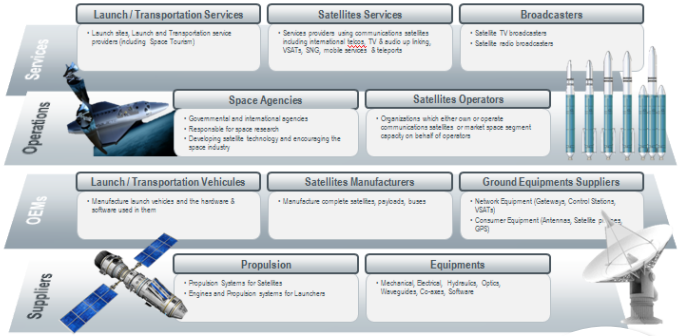
- **New Products & Services**
- **R&D**
- **Process & Tools**

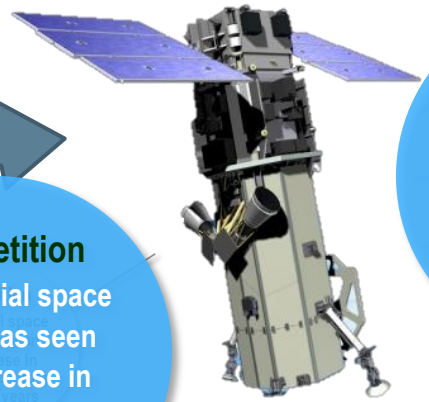
Competitive Advantage driven by **INNOVATION** in Products & Services

Competitive risk mitigated by **LEAN OPERATIONS** & **ANTICIPATING** new trends

Source: KPMG A&D Market Survey

Space Segmentation & Priorities





Zero Fault

Any system or component failure may result in total loss of asset (Satellite or

Functional Integration

Ensure effective integration of all functions, systems and subsystems

communications integrity with the asset equate to loss of asset

Competition

Commercial space Sector has seen 10X increase in Viable competition In past 10 years

Defense Segmentation & Priorities

Homeland Security

Anticipating and preventing threats from emerging

Budgets ↓

Decrease in spending, need more flexible capability and acquisition speed

Budgets ↑

In emerging countries, increase in spending, need for better pooling "Smart Defense"

Battlefield Integration

Improved integration across western "Alliance" members

"Smart Defense"

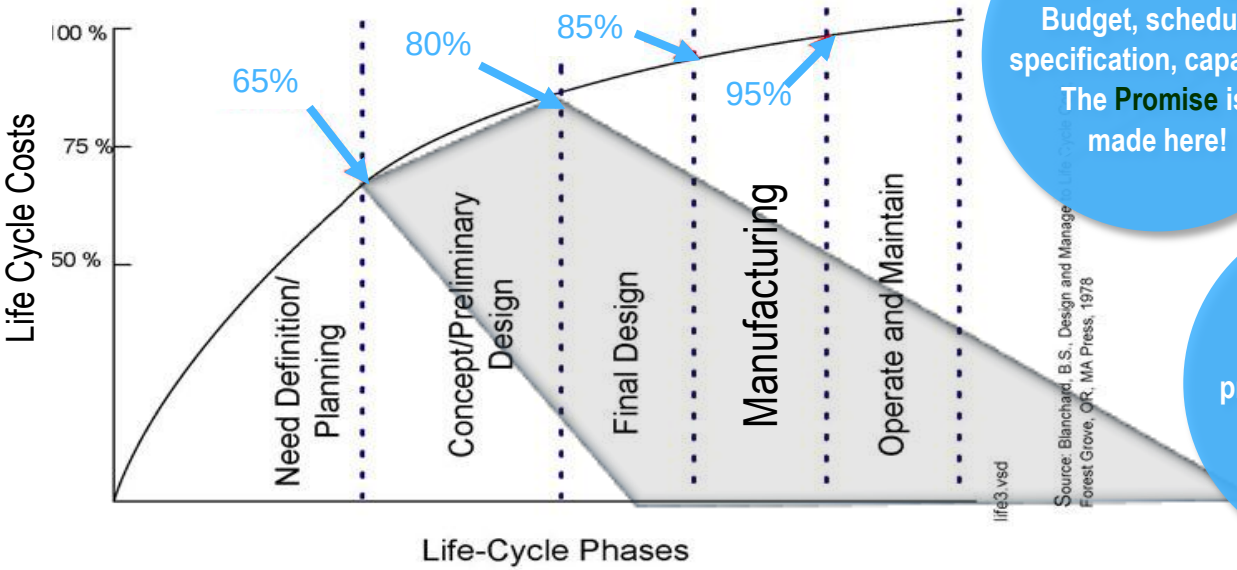
Cyber Defense

Asymmetric infrastructure attacks and "Information Warfare"

Program Integrity

Delivering programs on schedule, on target and on budget

Conceptual Design is the best opportunity to address these **Challenges**!



Program Integrity
Budget, schedule, specification, capability
The **Promise** is made here!

Functional Integration
Behavior & Technology is selected & optimized
Architecture is defined here!

Competition
This is when programs & contracts are
Won or Lost

Aerospace & Defense

Winning Program

3DEXPERIENCE Solution

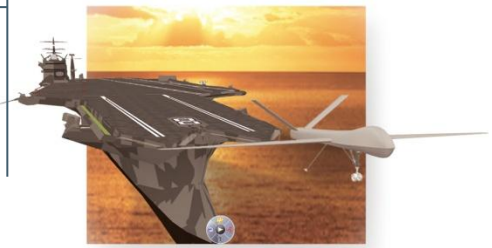
DASSAULT SYSTEMES

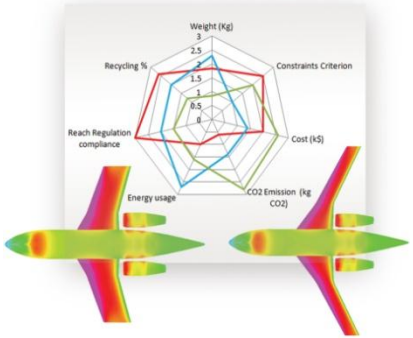
Winning Program

Configure the Right Concept, Know How to Deliver It

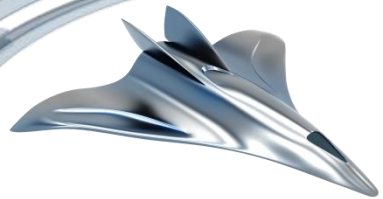
Production
Trade-Studies

Reason to Believe

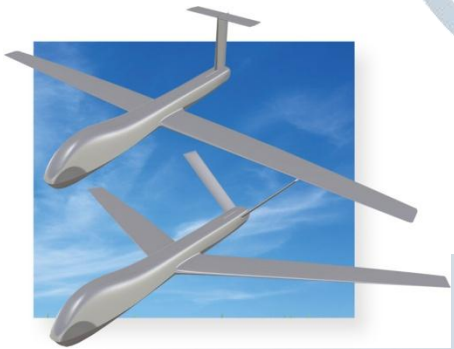




Systems
Trade-Studies



Proposal Development



Configuration
Definition

Dassault Systèmes Launches a New Industry Solution Experience: "Winning Program" for Aerospace and Defense

World's First Comprehensive Solution for Optimizing Early Program Phases and Program Development

VELIZY-VILLACOUBLAY, France – November 6, 2012 — Dassault Systèmes (Euronext Paris: #13065, DSY.PA), the 3DEXPERIENCE Company, world leader in 3D design software, 3D Digital Mock Up and Product Lifecycle Management (PLM) solutions, today announced the launch of a new industry solution experience for aerospace and defense companies called "Winning Program." Aerospace and defense companies will be able to configure the right concept for their customers and know from the earliest stages that they can deliver it on budget and on time.

Driven by aggressive targets for b
development time, companies in the
pressure to deliver proposals or offers
is one that is meeting all defined requ
identifying and effectively managing all
most companies because they lacked
reuse intellectual property across progr
one, and simulate the impact of decisio

"Winning Program" enables innovative
activities defining new offers and/or
requisite system engineering choices a
on new work can use "Winning Prog
processes. Those who are internally p
use it to manage their conceptual c
commercial item.

"It's been shown that the majority of c
the earliest stages of concept and prel
and visions that they include in thos
determine exactly how they'll execute. As a result, time and budget overruns have been far from unusual occurrences," said Monica Menghini, Executive Vice President, Industry and Marketing, Dassault Systèmes. "By providing a means to fully understand the elements of each proposal or offer, along with a detailed roadmap of how each element will be delivered, our 3DEXPERIENCE platform with the 'Winning Program' industry solution experience enables companies to increase their win ratio and deliver more innovative offerings to market without the associated risk."

With exponential improvements in the level of engineering detail and shared knowledge available in the conceptual design phase, "Winning Program" can significantly improve adherence to program costs and schedules. It provides a platform to optimize concept studies with more alternatives and more tradeoff studies, resulting in more accurate and realistic decisions. Integrated program and change management processes manage requirement changes to drive consistency and reduce costs. Ultimately, the solution enables companies to avoid risk by delivering a high fidelity proposal and the confidence they can succeed. In addition, it enables companies to capture all of the intellectual property created throughout the proposal phase to ensure that knowledge is not maintained only by individuals, but is captured as part of an integrated solution for reuse on future programs.

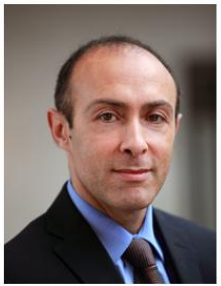
"Companies have very aggressive targets in term of product performance, cost and development lead time. It is in the conceptual design phase that many decisions are made that impact the success of a program," said Philippe Plouvier, senior partner, head of Roland Berger Strategy Consultants' global aerospace and defense practice. "Having an integrated solution targeting this early phase will help ensure that companies properly identify and plan so that over the full program lifecycle, they can meet or exceed these commitments."

To learn more about Winning Program and all of Dassault Systèmes' industry solution experiences for aerospace and defense, please visit: http://www.3ds.com/solutions/aerospace-defense/overview/.

###

PHILIPPE PLOUVIER

Senior Partner
Aerospace & Defense
High-Tech Systems
Transport



Ingénieur et titulaire d'un MBA à l'INSEAD, Philippe Plouvier bénéficie de 15 ans d'expérience dans le conseil de Direction Générale.

Après une première expérience au sein du Ministère de la Défense, Philippe Plouvier débute dans le conseil de Direction Générale en 1997. Il rejoint Roland Berger en 2000 pour y accompagner le développement des activités Aéronautique, Spatial et Défense ainsi que des industries de systèmes High-Tech (secteurs ferroviaire, nucléaire…) où il intervient depuis sur des problématiques de stratégie de croissance et d'amélioration de la performance opérationnelle.

Depuis janvier 2012, Philippe Plouvier est responsable de la Practice Aerospace & Defense au niveau international.

RG

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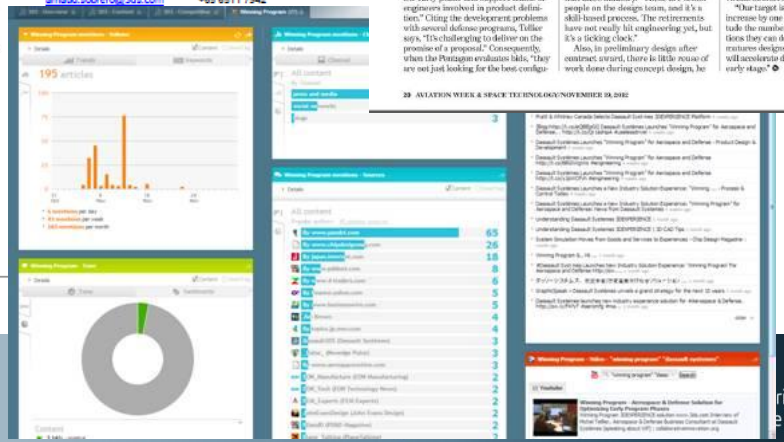


Inside Track

By Graham Warwick
Senior Editor-Technology
Graham Warwick-Mags at AviationWeek.com/leadingedge
gwarwick@aviationweek.com

COMMENTARY

Head Start

Can better conceptual design tools guarantee program success?

Decisions that determine whether a program can be successful are often made before the contract is even won. But conceptual design is still more art than science, practiced by talented engineers without the sophisticated, integrated tools available for development and manufacturing.

So says Dassault Systèmes, the leading supplier of three-dimensional design software, to explain its launch of a suite of design, collaboration, simulation and management tools aimed at the conceptual phase. Called Winning Program, the product brings to the early stages of a program capabilities available in the development phase through its integrated suite of Catia 3-D design, Dymola modeling, Simulia simulation and Enovia product data-management systems.

"The early phase is still quite unstructured, and an area of opportunity to improve processes," says Mick Tellier, vice president for aerospace and defense. "We have built a product lifecycle management platform to address the early phase and support teams of engineers involved in product definition." Citing the development problems with several defense programs, Tellier says, "It's challenging to deliver on the promise of a proposal." Consequently, when the Pentagon evaluates bids, "they are not just looking for the best configuration, the best proposal, but who is the most credible, who can deliver to budget and schedule, or they throw in a risk factor that skews the proposal."

Winning Program will help tackle the challenges industry faces by providing better tools at an earlier stage, Tellier says. "We have got to deliver programs more effectively. We have got to be better at collaborating, and at proving designs are producible. And we have to capture the institutional knowledge.

"When we talk to the customer, the initial answer is, 'We know how to respond to a request for proposals,'" Tellier says. "But how are you at delivering on a promise? Will you be able to do it three years time?" he says, referring to the wave of retirements that faces industry. "These are senior people on the design team, and it's a skill-based process. The retirements have not really hit engineering yet, but it's a ticking clock."

Also, in preliminary design after contract award, there is little reuse of work done during concept design, he says, and no "feedback loop" where difficulties encountered during development are fed back into concept design. This is because the design teams and tools are not connected. Conceptual design teams are "historically populated by the best and brightest engineers. This is not necessarily a community that collaborates effectively," he says.

Winning Program has four major components. A management platform allows the entire process to the program launch and start of preliminary design to be laid out, including conceptual and advanced design, case studies, technical trades and risk management. "It allows us to simulate the program itself and as we look at design trades, to simulate their impact on the program."

A conceptual design platform allows the product to be defined and its performance simulated using a "behavioral digital mock-up." This is an early-phase equivalent to the 3-D digital mock-ups produced using Catia, but focused on optimizing the system-level behavior of a design.

The conceptual model allows engineers to do architecture design using system models. "They can take the requirements, identify the functions needed, such as power, lift, etc., put those into a logical structure, such as propulsion, engine, etc., and mathematically model the design," Tellier says. This virtual functional model can then be "flown" through the flight envelope in simulations to analyze its behavior.

The third element of Winning Program is a simulation platform to prove out virtually the manufacturability of a design, and allow sourcing and production strategies to be decided.

The fourth element is used to simulate operations and demonstrate integration of the design into the customer's environment, "to prove you can deliver effective value in the contexts of what they have," Tellier says, such as simulating unmanned-aircraft operations on a virtual aircraft carrier (see photo).

"Our target is very simple. It's to increase by one to two orders of magnitude the number of trades and iterations they can do," he says. "That's what matures designs, and Winning Program will accelerate design maturity in the early stages." ●

20 AVIATION WEEK & SPACE TECHNOLOGY/NOVEMBER 19, 2012

AviationWeek.com/awst

right questions
e the world.

Innovate with Zero Risk

ASTRIUM
AN EADS COMPANY

- **Who: Astrium Space Transportation**
  - EADS division responsible for Arianne family of rockets
- **Why: Need to Innovate**
  - Significant increase in competitors and competition
  - New types of payloads are driving next generation launchers
- **What: New generation launchers & spacecraft**
  - Ariane-6, LTSOR
  - Space Plane, ZEHST
- **How: Winning Program**
  - Collaborative platform for Multidiscipline design simulation & optimization (FDMU)
  - More robust solutions during pre-projects trade-off (design to cost)
  - Less non-productive actions (lean)
- YES, this is rocket science!

Aviation | Major Challenges

Manpower
Inadequate supply of trained personnel and experts to supersede aging workforce

Hidden Defect
Late discovery of critical design issues during Test or Operation

Rate
How to efficiently scale capacity to meet massive demand & growth projections

Program Integrity
Delivering programs on schedule, on target and on budget

Role Expansion
Sourcing future growth by expanding role in overall aircraft/system lifecycle

Environmental Impact
Private/public demand for clean aviation both in operation and in retirement

Certification
OEM's in emerging regions are striving to satisfy regulators and associated processes

Industry Trends and Challenges

ROLAND BERGER STRATEGY CONSULTANTS

THE 2012 SURVEY RESULTS ARE BASED ON CONTRIBUTIONS FROM SENIOR EXECUTIVES ACROSS THE EUROPEAN AEROSPACE & DEFENCE INDUSTRY

SAMPLE PORTRAIT

Survey responses from **more than 100 top managers across six countries** (Belgium, France, Germany, Italy, Spain, UK)

53 firms represented, covering a **range of business segments** (commercial aeronautics, defence & security, space)

Coverage of **different positions on the value chain**, from OEMs to Tier-1, Tier-2 and pure service providers

Approximately one third of the participants are **CEOs**

EXAMPLES OF PARTICIPATING COMPANIES

EADS, THALES, BOMBARDIER, MTU, HAMPSON, AEROTEC, BRÖTJE HEIZUNG, AOA, RECARO, Fokker, SAFRAN, Chemring Group, airberlin, DUNLOP, DIEHL, AIM AVIATION, AIRBUS, ASTRIUM, SPIRIT, DÜRR, RUAG, DAHER-SOCATA, ThyssenKrupp, ESG, DLR, PFW, ACENTISS, senior Aerospace, SOGERMA, SAFRAN, BAE SYSTEMS, LIEBHERR, CASSIDIAN, ATK, MEGGITT, babcock, Gardner, EUROCOMPTER, apph, OGMA, EATON, FINMECCANICA, IABG, e2v, mt AEROSPACE

RATE

	2008	2009	2010	2012
#1	Programme Managment	Programme Managment	Programme Managment	Programme Managment
#2	Market Strategy / Globalisation	Market Strategy / Globalisation	Market Strategy / Globalisation	Market Strategy / Globalistion
#3	Supply Chain	Flexibility	Product Strategy	Innovation and R&D efficiency
#4	External Growth/PMI	Marketing & Sales	Supply Chain	Supply Chain

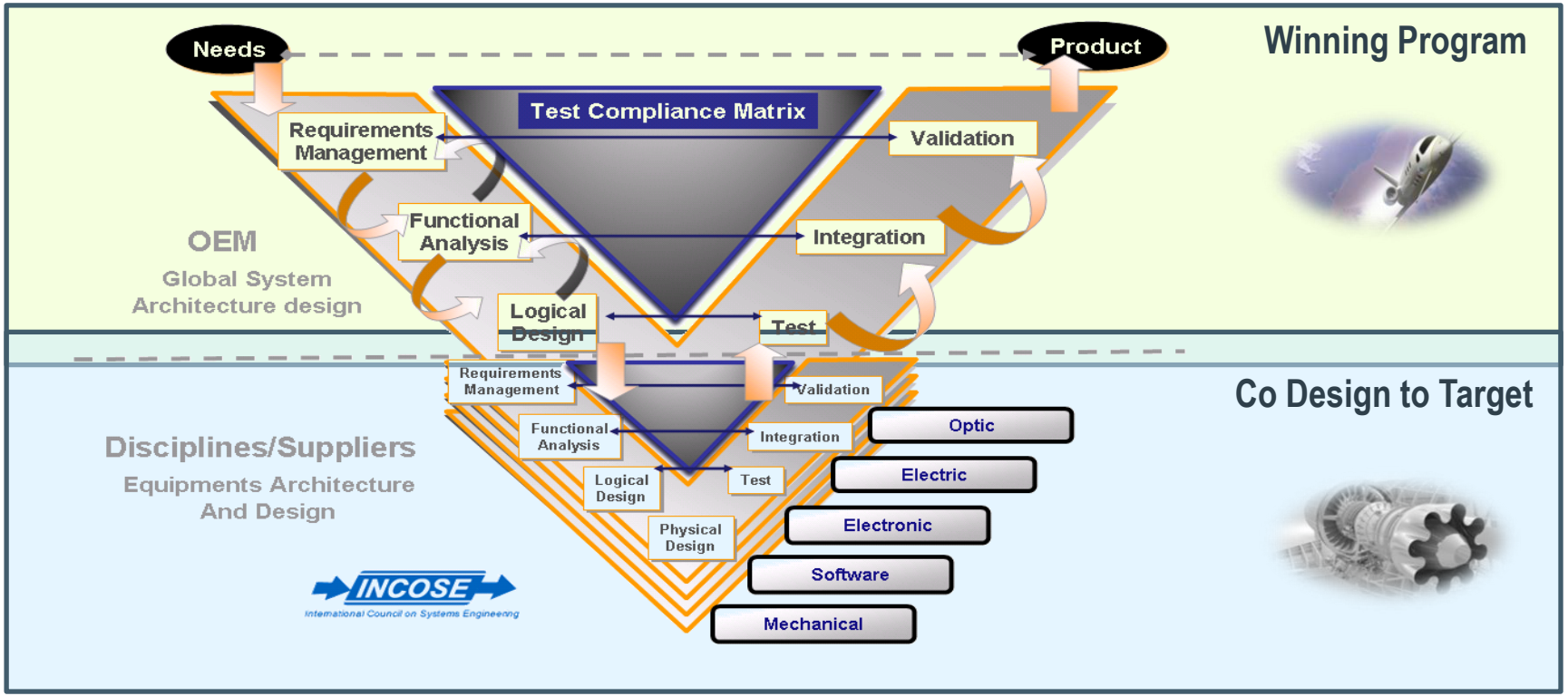
Manufacturing

Supply Chain

Market Strategy / Globalisation

Programme Managment

Program Development Excellence and Winning Program

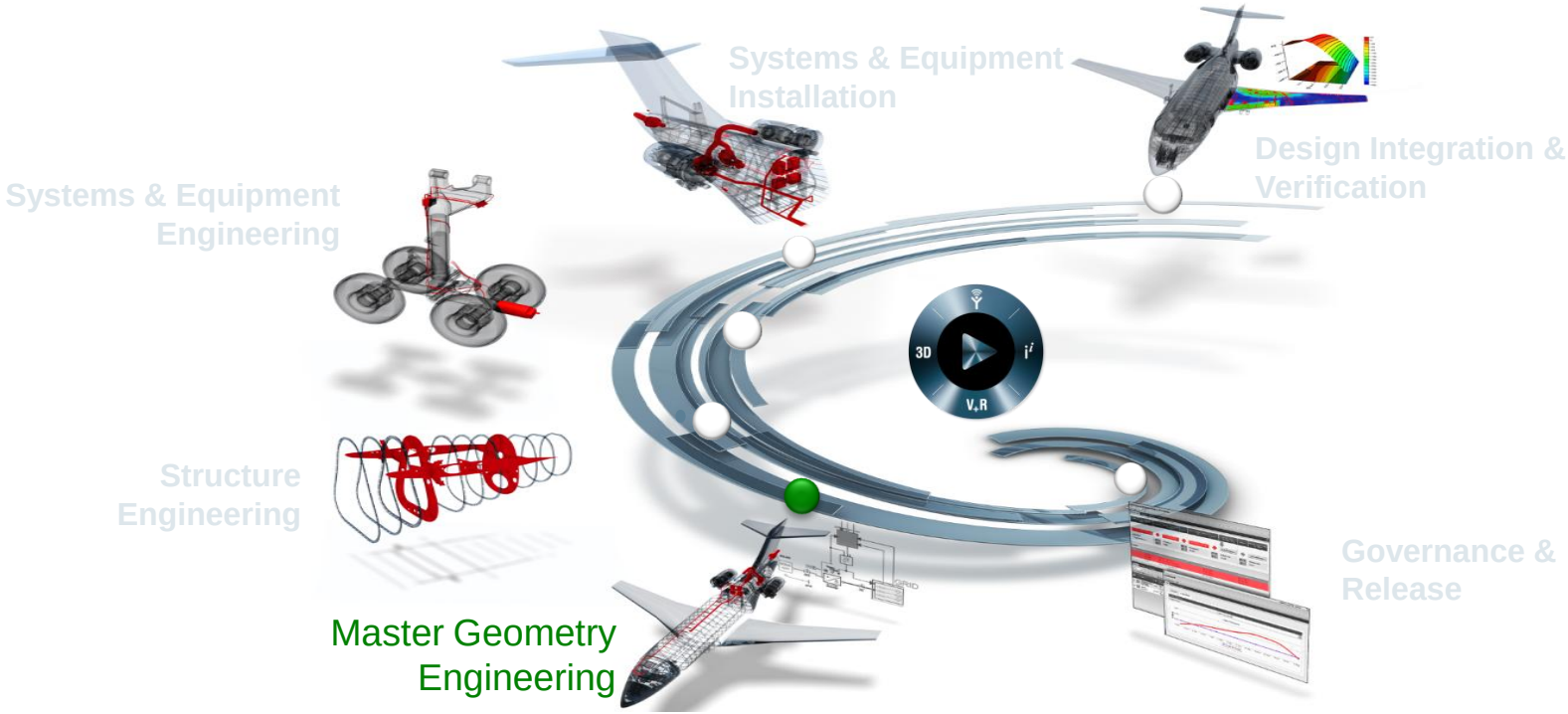


Co-Design to Target

① Ensure Program Integrity … with Live Execution to Targets

Co-Design to Target

② Initiate the Design Phases … released from Winning Program

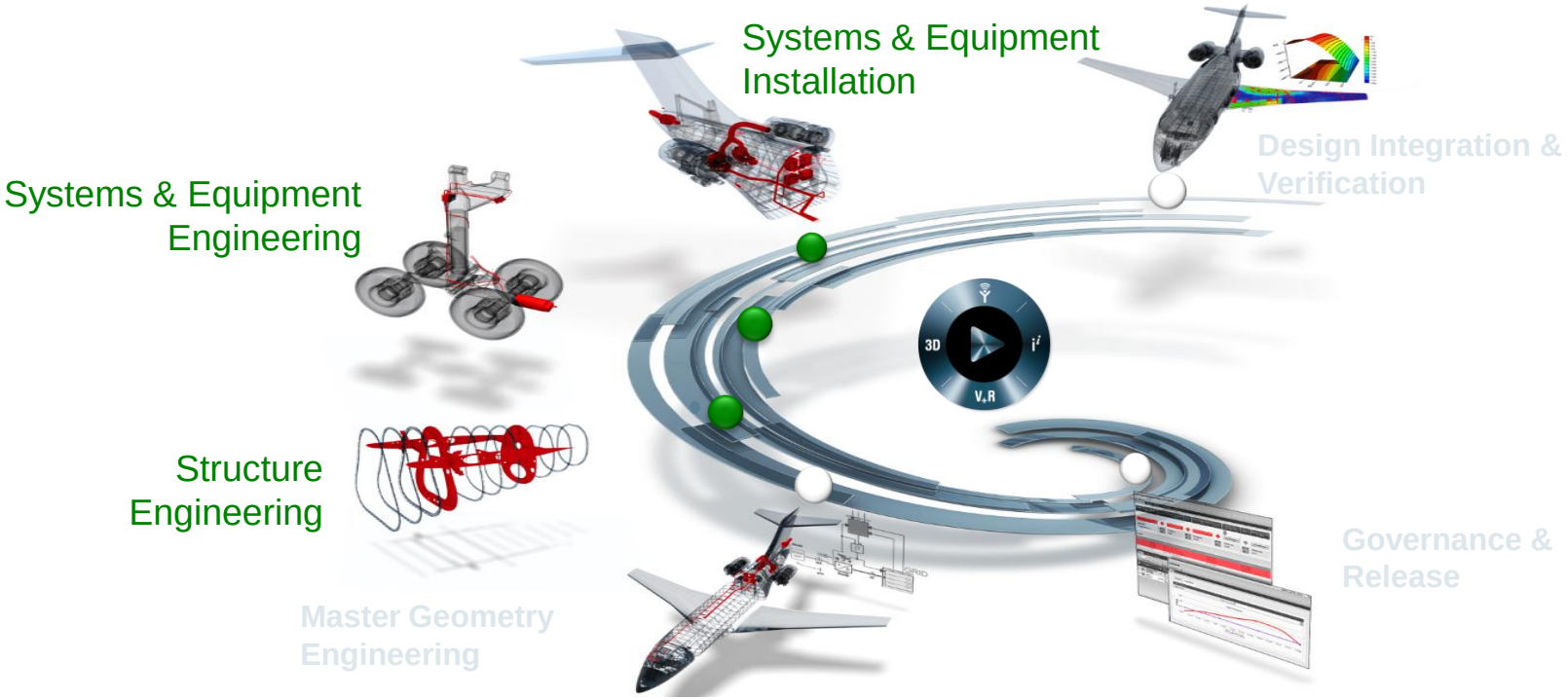


Aviation - Value Chain Segmentation

Company Business Model	Capabilities	OEM	Supplier	Co-Design To Target IPMs
Airframe OEMs	Airframe Design and Manufacturing Increase Program profitability by decreasing NRC and RC	●		
Propulsion	Full propulsion system design and manufacturing. Increase competitiveness by more innovative products and strategy of platform - Increase Program profitability by decreasing NRC and RC	●	•	
Aerostructure Tier1-Tier 2/ RSP	Full Aerostructures design and manufacturing. Increase revenues by more value delivered to OEMs . Increase operating margin by NRC and RC optimization	•	●	
Aerostructure Tier2/Tier 3	Mainly Build to Print companies Increase operating Margin by optimizing NRC		●	
Engineering Services	Challenges – Engineering efficiency		●	
Systems & Equipment suppliers	Full systems design and manufacturing. Strategy of platform Increase revenues by more value delivered to OEMs .	•	●	

Co-Design to Target

③ Integrate the Design Chain … with Optimized Value Streams



Program Integrity = On Time + On Target + On Budget

- **Who: Bell Helicopter**
  - $3.2B Helicopter division of Textron
  - 10k employees based in Fort Worth, TX USA
- **Why: 1st to Market**
  - Accelerated development plan to meet fastest growing market segment
- **What: BELL 525 Relentless**
  - World's first "super-medium" helicopter
- **How: Co Design to Target**
  - Constant visibility of progress and status
  - Integration of master planning, contracts, indicators, requirements, work, people and design.
  - More robust solutions (design to cost)
  - Reduce costs during design phase (lean)

1st program in Bell's history delivered

… On Time + ON Target + On Budget

Aviation | Major Challenges

Hidden Defect
Late discovery of critical design issues during Test or Operation

Manpower
Inadequate supply of trained personnel and experts to supersede aging workforce

Program Integrity
Delivering programs on schedule, on target and on budget

Rate
How to efficiently scale capacity to meet massive demand & growth projections

Role Expansion
Sourcing future growth by expanding role in overall aircraft/system lifecycle

Environmental Impact
Private/public demand for clean aviation both in operation and in retirement

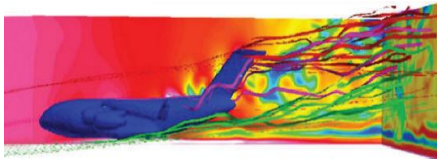
Certification
OEM's in emerging regions are striving to satisfy regulators and associated processes

Focus on a Sample Program (C17)

*T&E : Test & Evaluation
Source: RAND report for Air Force

Development Cost = $7,450M

T&E* Cost = $1,490M
(20%)

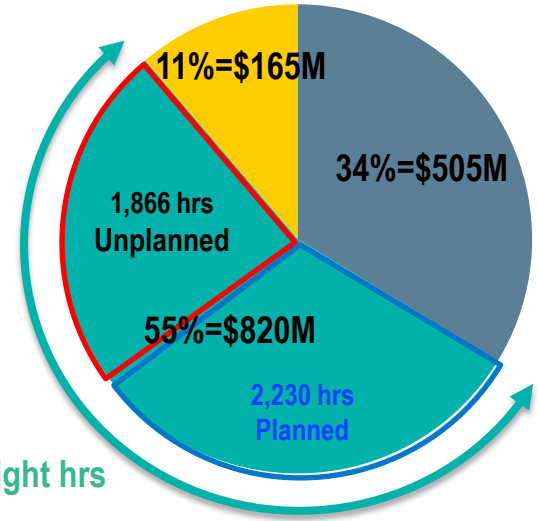


Development Duration = 169 months

T&E duration = 42 months
(25%)

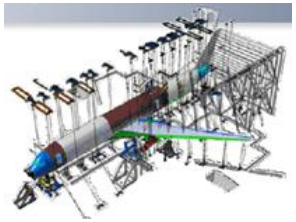
Cost impact (in %)

Ground Flight Virtual Simulation



=4,096 flight hrs

Why



Could this have been avoided?

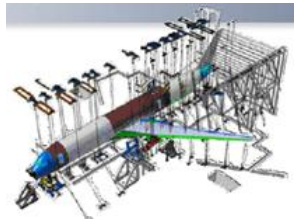
Not a technological limitation

→ Simulation tools have proven their ability to model the most complex of cases

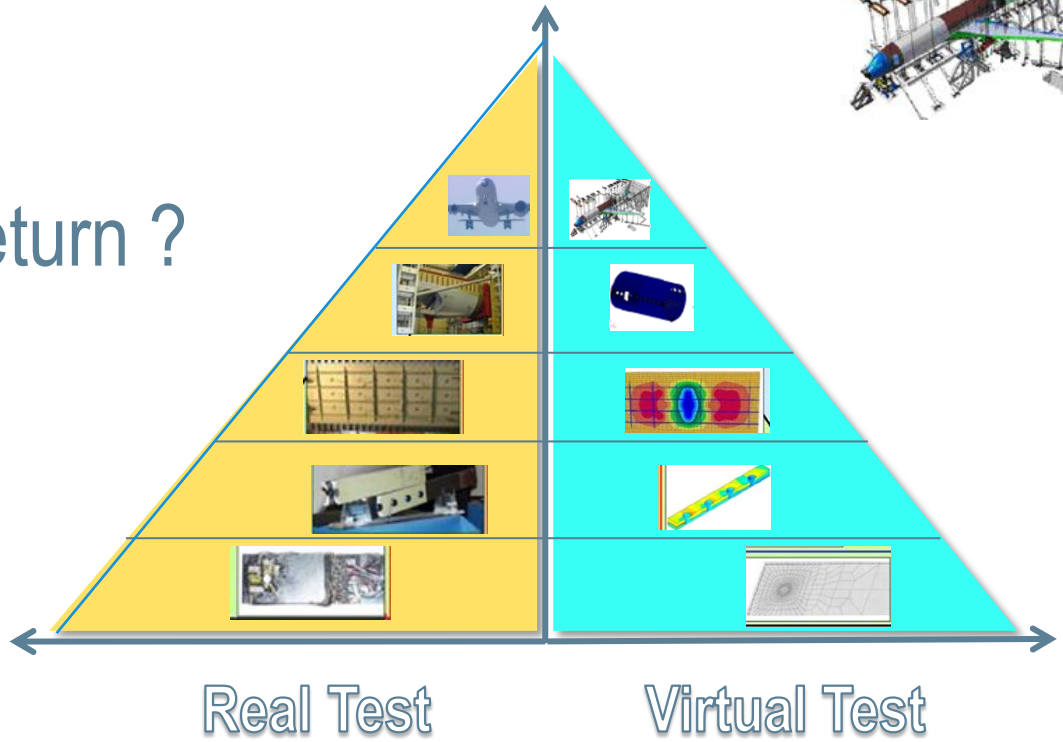
Not a Financial/Schedule limitation

→ Preventing the un-forecasted costs associated to latent issues are a recognized expenditure

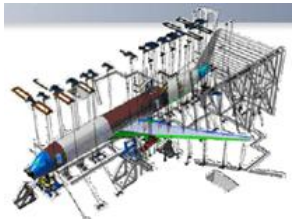
Where to invest ?
What to invest ?
Did I get the right return ?

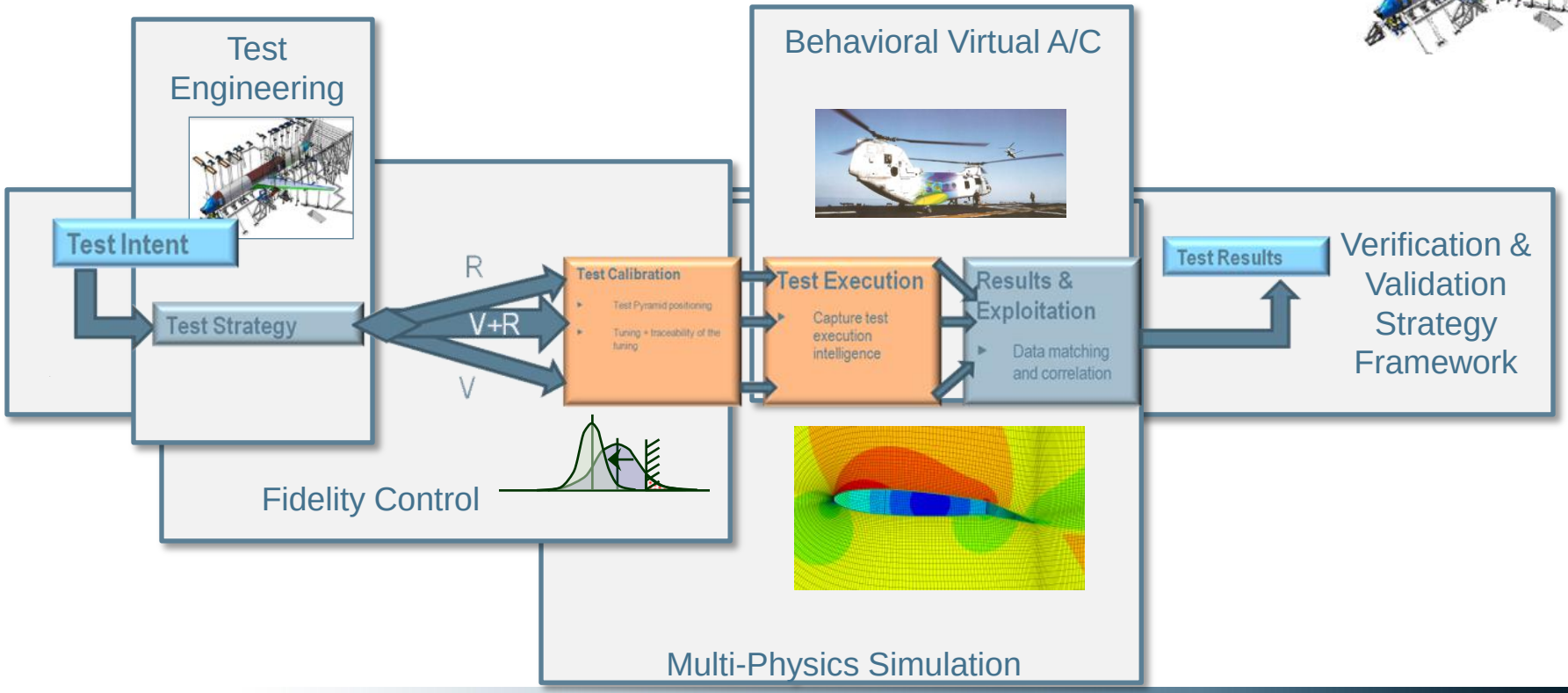


Virtual vs Physical
Top Down vs Bottom Up
Which scenarios and cases
Right fidelity for right objective



Virtual Test Integration between IPMs






IF WE
go on a cruise,
does it have to be at sea level?
Flying cruise liners –
a dream our software could bring to life.
3D
V,R
3DEXPERIENCE
It takes a special kind of compass
to understand the present and
navigate the future.
Discover more: 3DS.COM/AEROSPACE
DASSAULT SYSTEMES
IF WE ask the right questions
we can change the world.