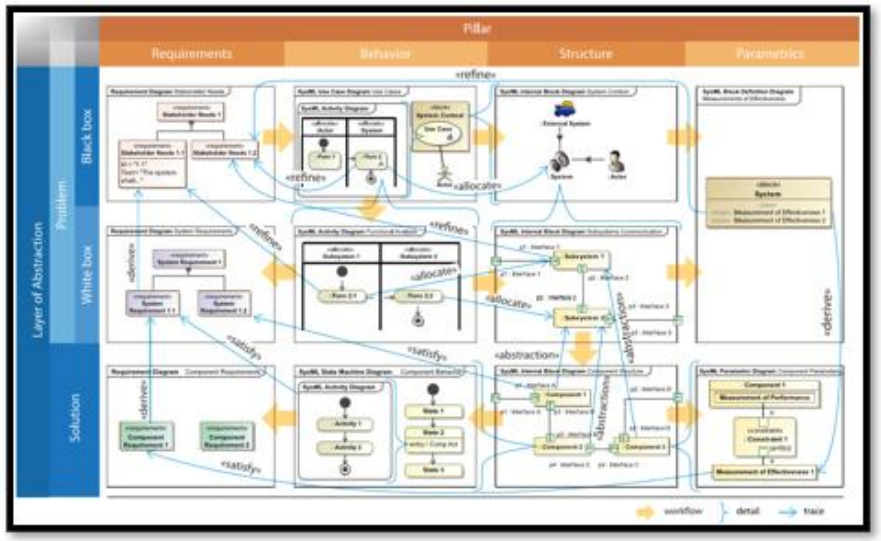
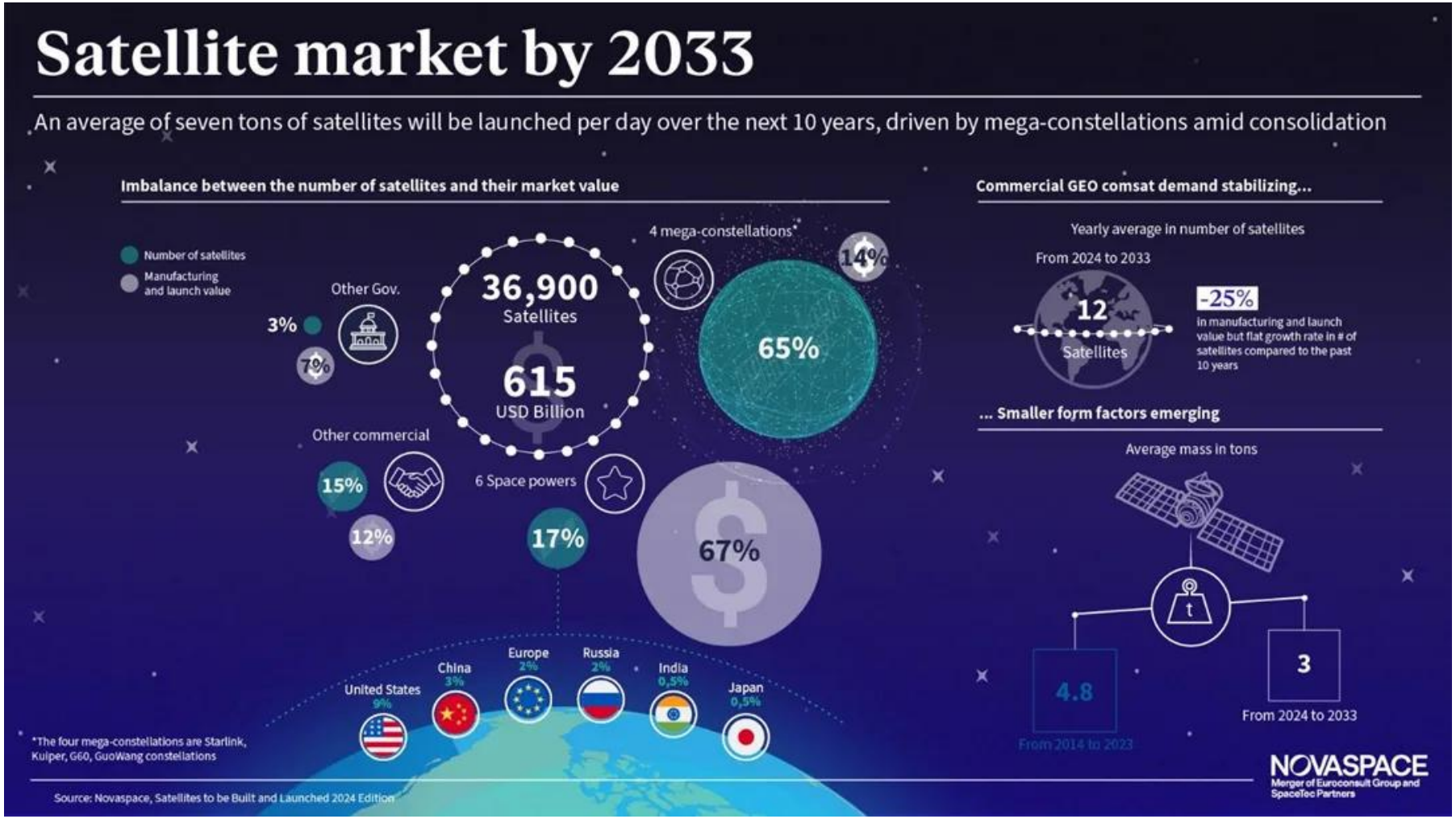

MASTERX

MÁSTER AEROESPACIAL DE SISTEMAS ESPACIALES (MASE)

DIRECTOR ACADÉMICO: DR. BERNARDO DELICADO, INCOSE ESEP



Boom



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Boom


Orbital altitude not to scale.
Satellite Service providers that also make the busses themselves.
GEO
MEO
LEO
VLEO
OHB
ASTRANIS
Rocket lab
Swissto12
MAXAR
Space Network Services
IMPULSE SPACE
BOEING
ASCENDARC
LOCKHEED MARTIN
TERRAN ORBITAL
APEX
K2 SPACE
MILLENNIUM SPACE SYSTEMS
SIERRA SPACE
MDA SPACE
nano avionics
BLUE CANYON TECHNOLOGIES
ThalesAlenia Space
REFLEX AEROSPACE
D-ORBIT
PORTAL
ENDUROSAT
TURION SPACE
AEROSPACELAB
CESIUMASTRO
MuonSpace
samara
BELLATRIX
ASTRO DIGITAL
YORK SPACE SYSTEMS
PROTEUS SPACE
AIRBUS DEFENCE & SPACE
SIDUS SPACE
REDWIRE
KREIOS SPACE
EOI
creotech
ALBEDO
Ball

Boom

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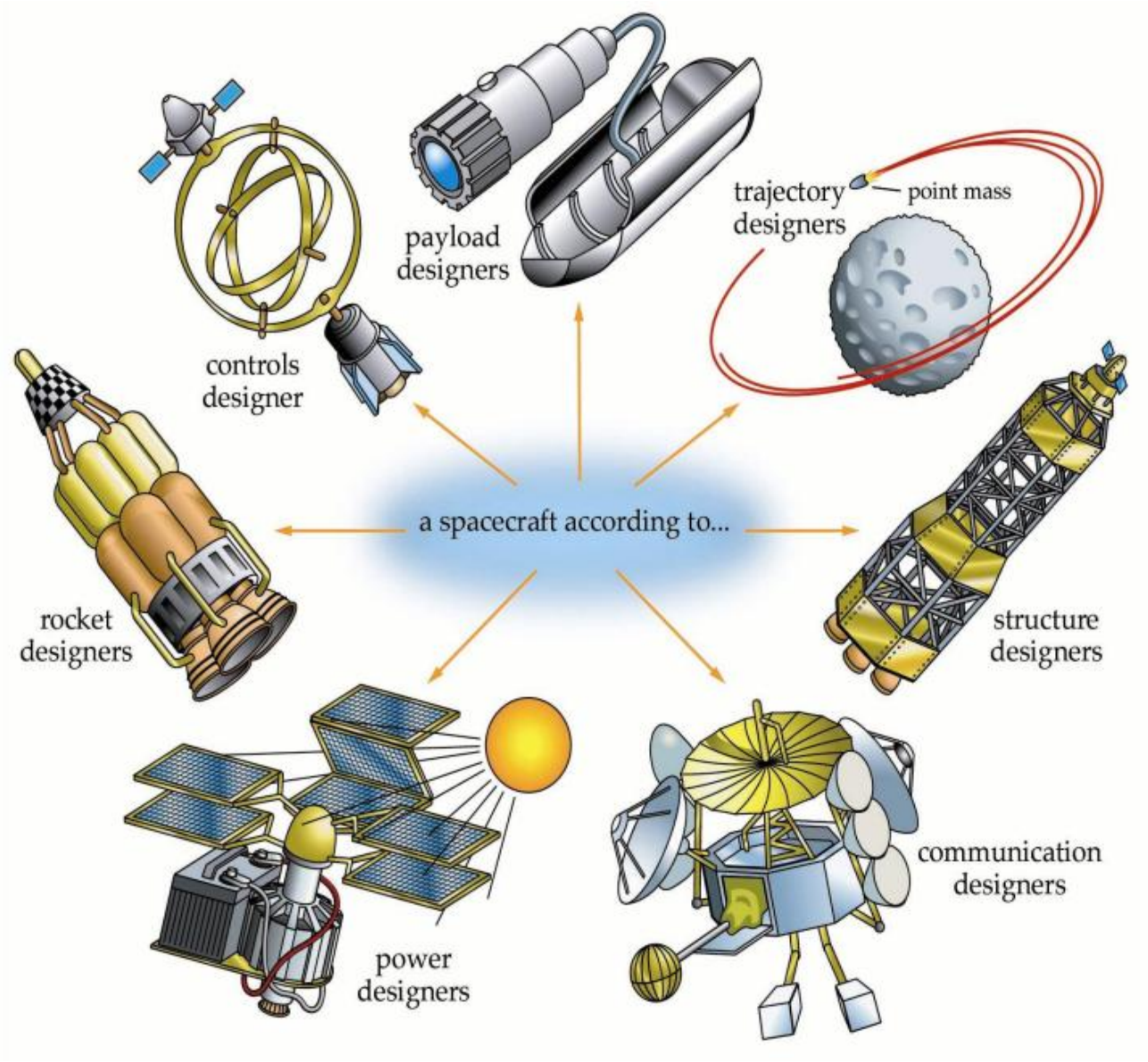
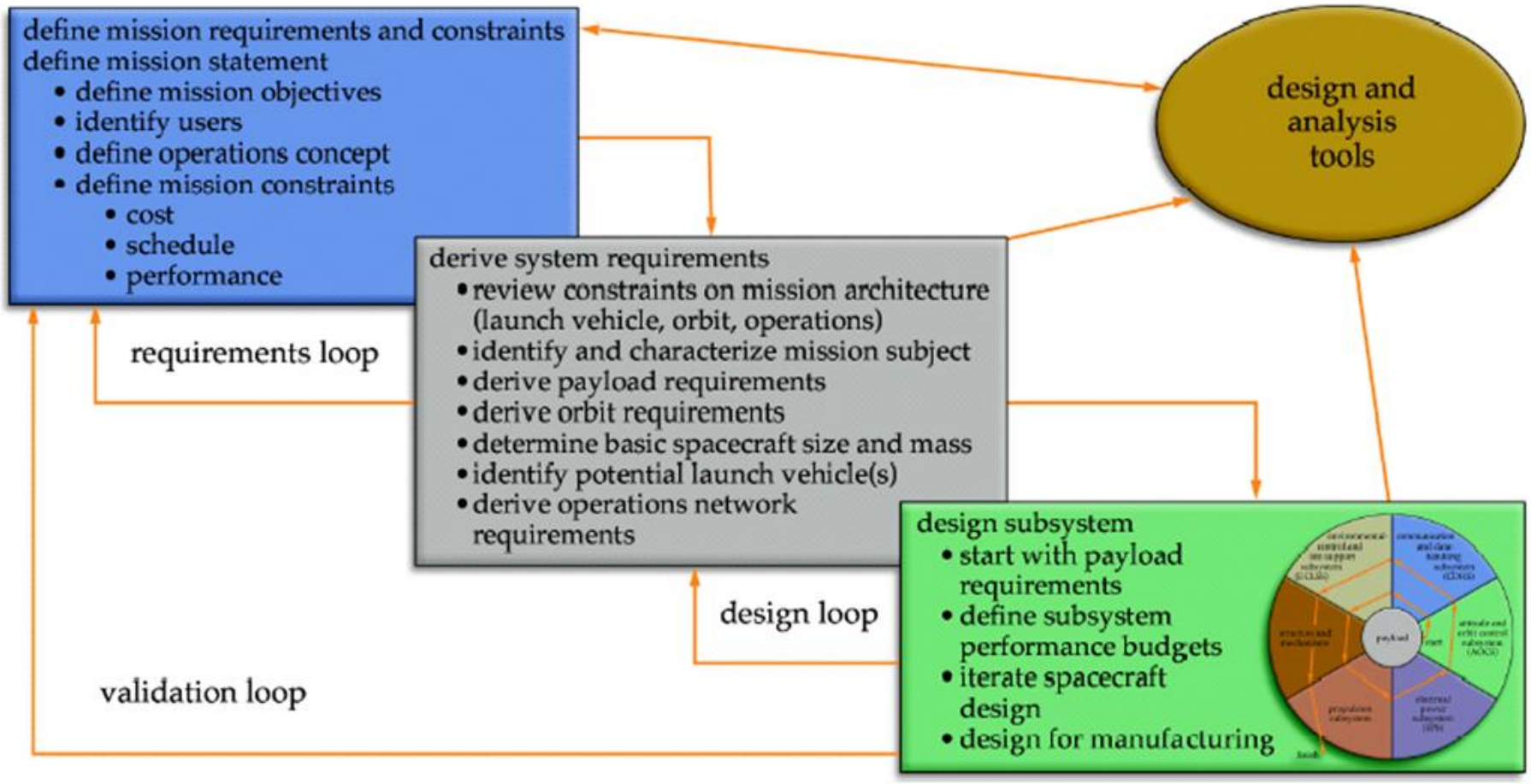
El porqué de MASE



El cómo - MASE


define mission requirements and constraints
define mission statement
• define mission objectives
• identify users
• define operations concept
• define mission constraints
• cost
• schedule
• performance
requirements loop
derive system requirements
• review constraints on mission architecture (launch vehicle, orbit, operations)
• identify and characterize mission subject
• derive payload requirements
• derive orbit requirements
• determine basic spacecraft size and mass
• identify potential launch vehicle(s)
• derive operations network requirements
design loop
validation loop
design subsystem
• start with payload requirements
• define subsystem performance budgets
• iterate spacecraft design
• design for manufacturing
design and analysis tools

Temario

M1-Space Environment

1.1. INTRODUCTION TO SPACE SYSTEMS AND SECTOR

1.2. SPACE ENVIRONMENT & SURVIVABILITY

1.3. ORBITAL MECHANICS

M2-Space Methodology

2.1. SPACE PROJECT MANAGEMENT

2.2. SPACE MISSION ANALYSIS AND DESIGN

2.3. SPACE SYSTEMS ENGINEERING

2.4. MODEL - BASED SYSTEMS ENGINEERING

M3- Spacecraft Design & Sizing

3.1. SPACECRAFT SYSTEM CONCURRENT PREDESIGN

3.2. SPACECRAFT SOFTWARE

3.3. SPACECRAFT ELECTRONICS

3.4. PRODUCT ASURANCE / QUALITY ASURANCE

3.5. RELIABILITY, AVAILABILITY, MAINTAINABILITY, SAFETY (RAMS)

M4- Subsystem Design & Sizing

4.1. PROPULSION SUBSYSTEM

4.2. THERMAL SUBSYSTEM

4.3. POWER SUBSYSTEM AND HARNESS

4.4. STRUCTURE SUBSYSTEM AND MECHANISMS

4.5. COMMAND AND DATA HANDLING (C&DH) and

COMMUNICATION SUBSYSTEMS

4.6. GUIDANCE, NAVIGATION & CONTROL (GNC) SUBSYSTEM

4.7. ATTITUDE AND ORBIT CONTROL SUBSYSTEM (AOCS)

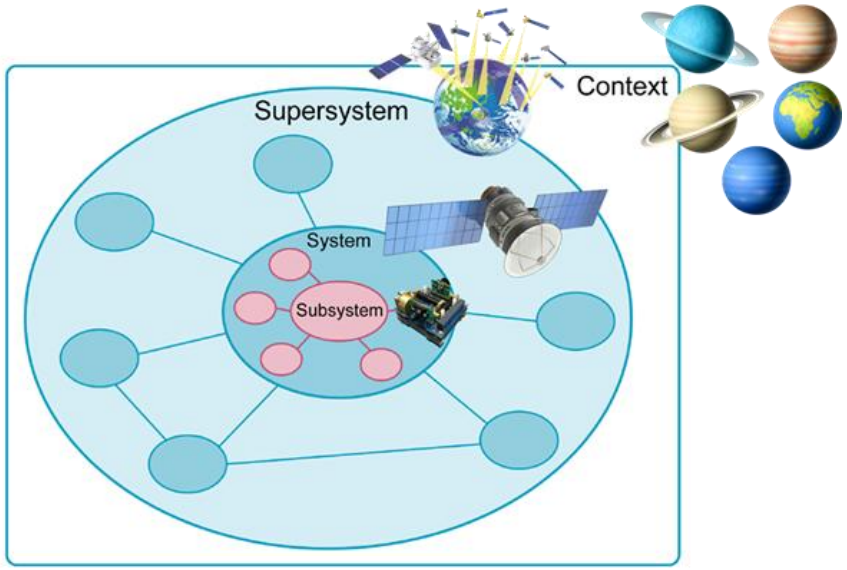
4.8. REMOTE SENSING PAYLOADS AND MISSION APPLICATION

4.9. ASSEMBLY, INTEGRATION AND TEST (AIT)

M5 - In-Orbit Operations

5.1. GROUND SEGMENT AND OPERATIONS

5.2. SPACECRAFT MAINTENANCE, SUPPORT AND DISPOSAL



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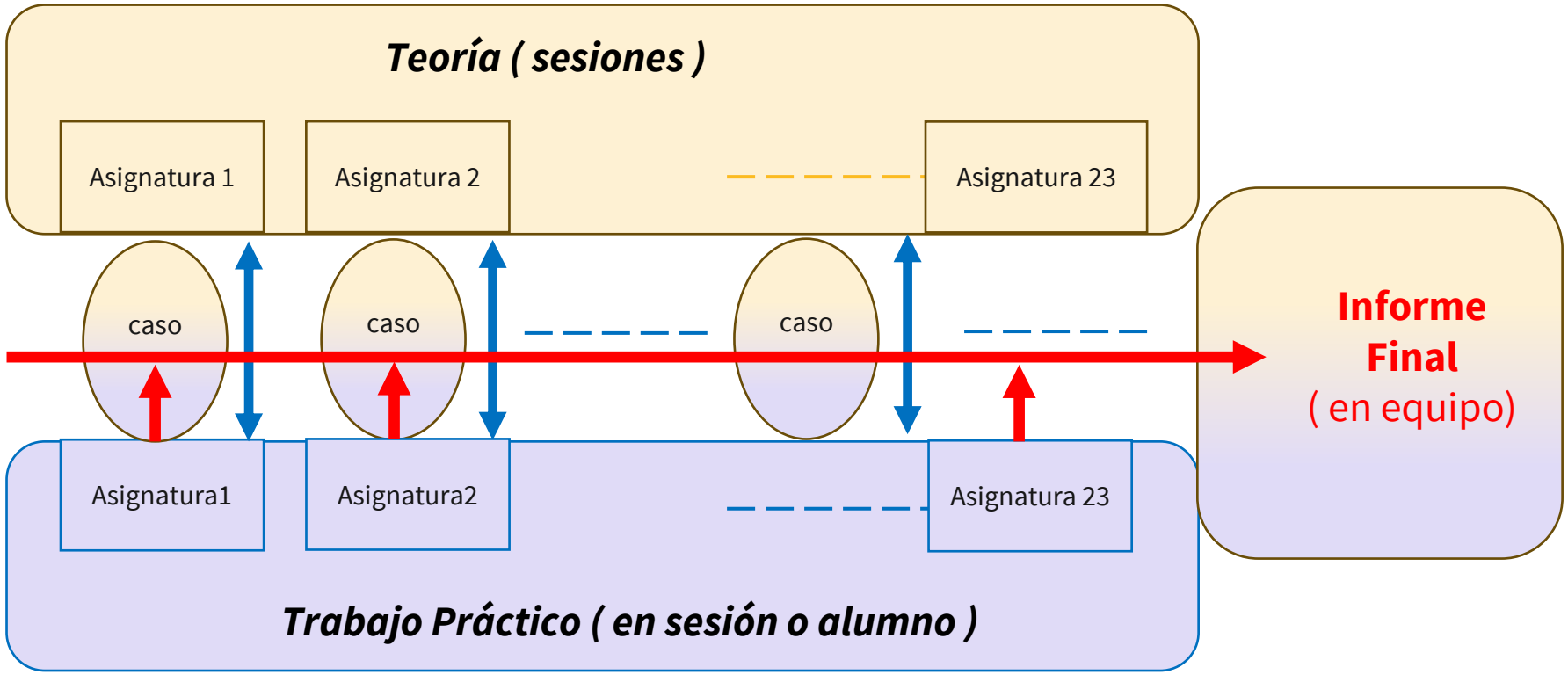
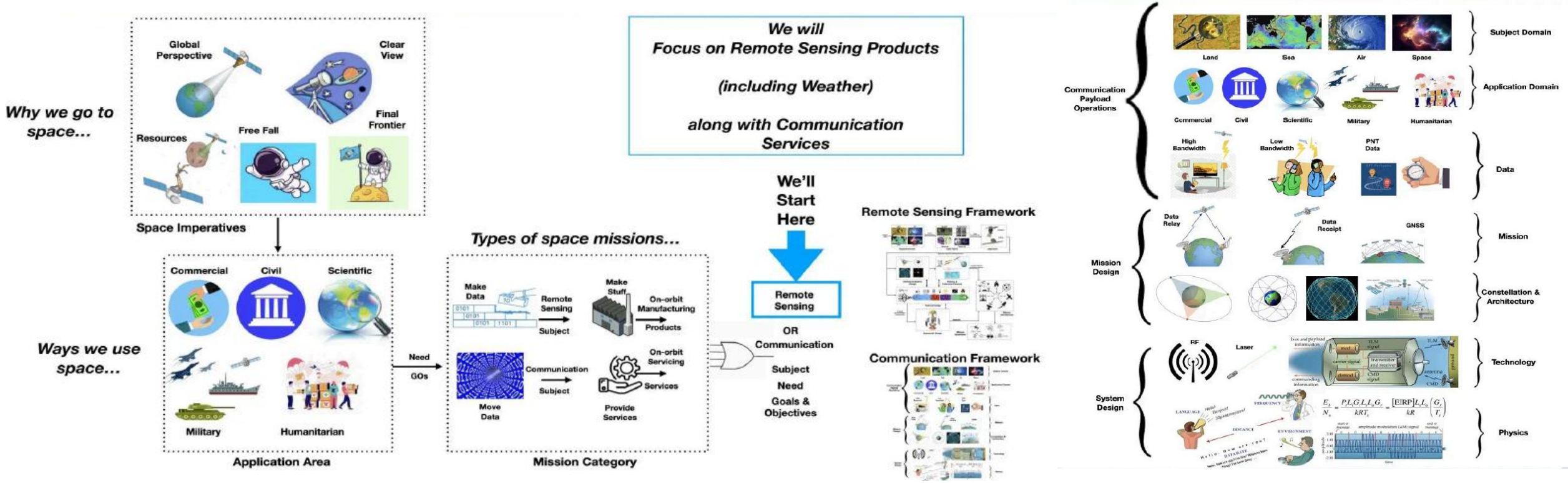
Modelo docente

Caso Conductor



Objetivo principal MASE : Visión Global del Dominio Espacial



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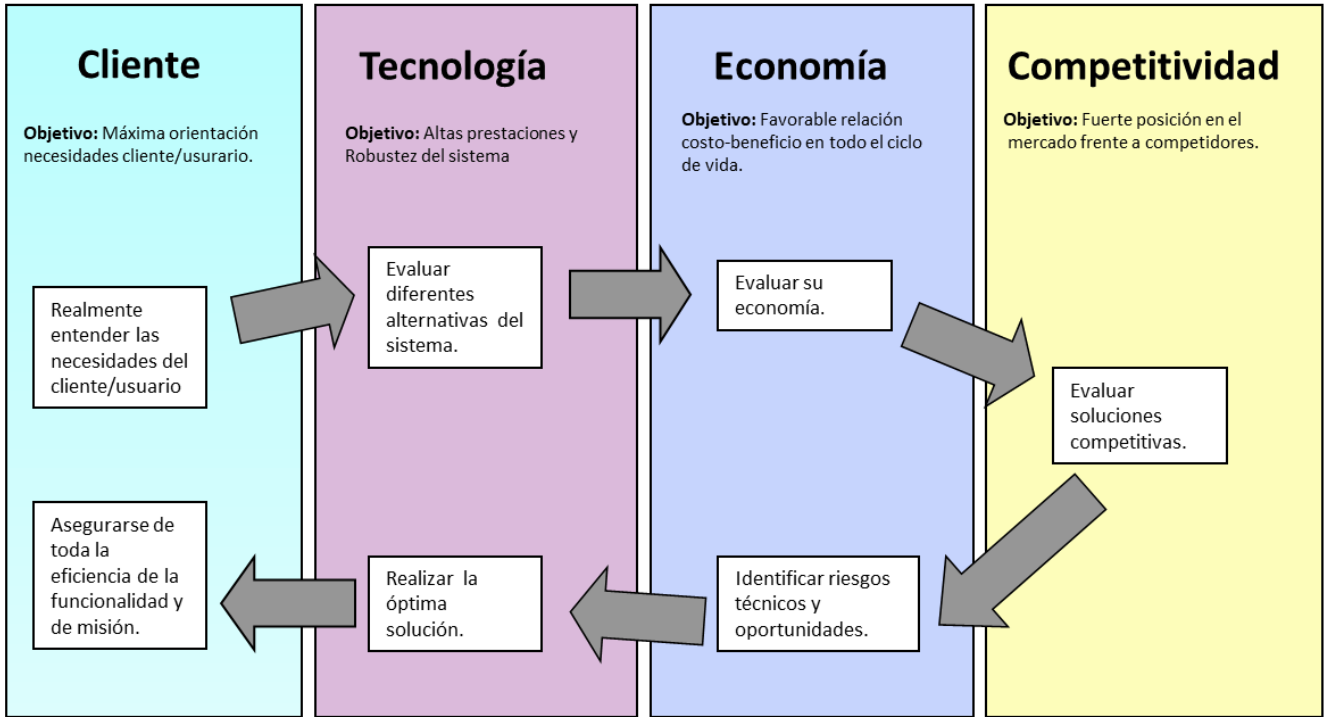
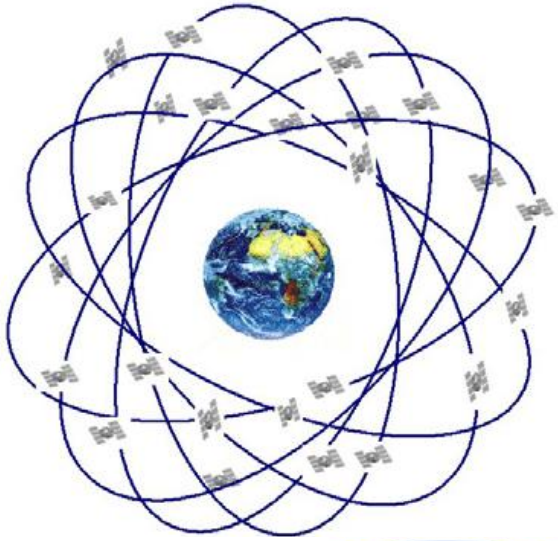
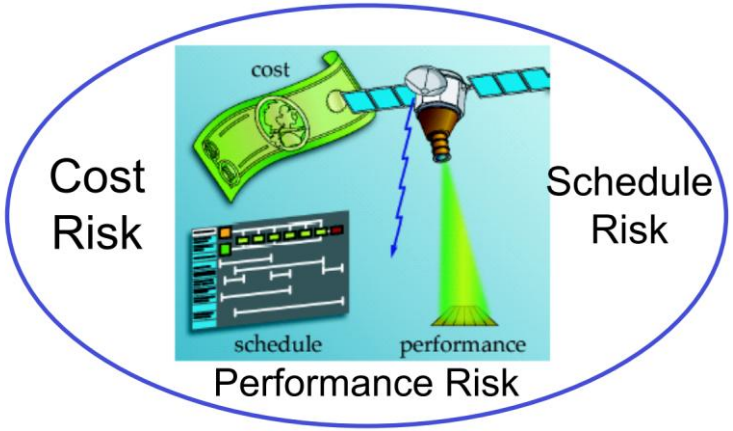
Objetivo principal MASE : Visión Global de estos 4 pilares

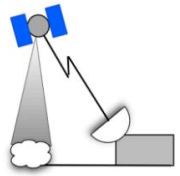






Objetivo técnico 1 :Comprender el ciclo de vida completo, y sus baselines

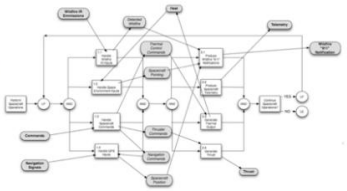
Phase 0 Mission Analysis	Phase A Feasibility	Phase B Preliminary Definition	Phase C Detailed Definition	Phase D Qualification and Production	Phase E Operations / Utilisation	Phase F Disposal
Support the customer in identifying their needs; propose possible system concepts	Finalise the expression of needs; propose solutions to meet the perceived needs	Establish system preliminary definition for selected option; demonstrate the solution meets the technical requirements to schedule, cost and organisation requirements	Establish the system detailed definition; demonstrate capability to meet the technical requirements	Finalise the development of the system by qualification and acceptance; finalise the preparation for operations and utilisation	Support the launch campaign; support entities in charge of operation and exploitation; support anomaly investigation	Support the entity in charge of disposal



Mission Baseline

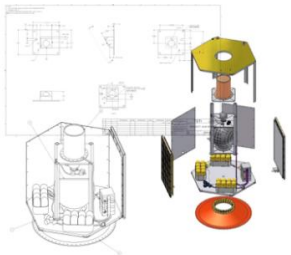
3.1 System shall consist of...
3.2 System shall interface to.
3.3 System shall provide....

System Baseline

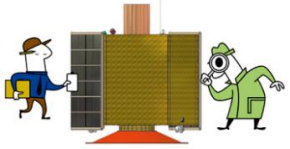


Functional Baseline

Design-to Baseline



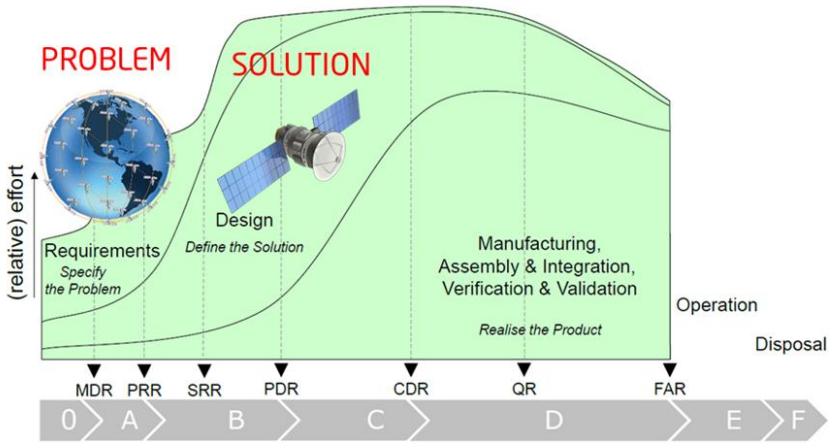
Build-to Baseline

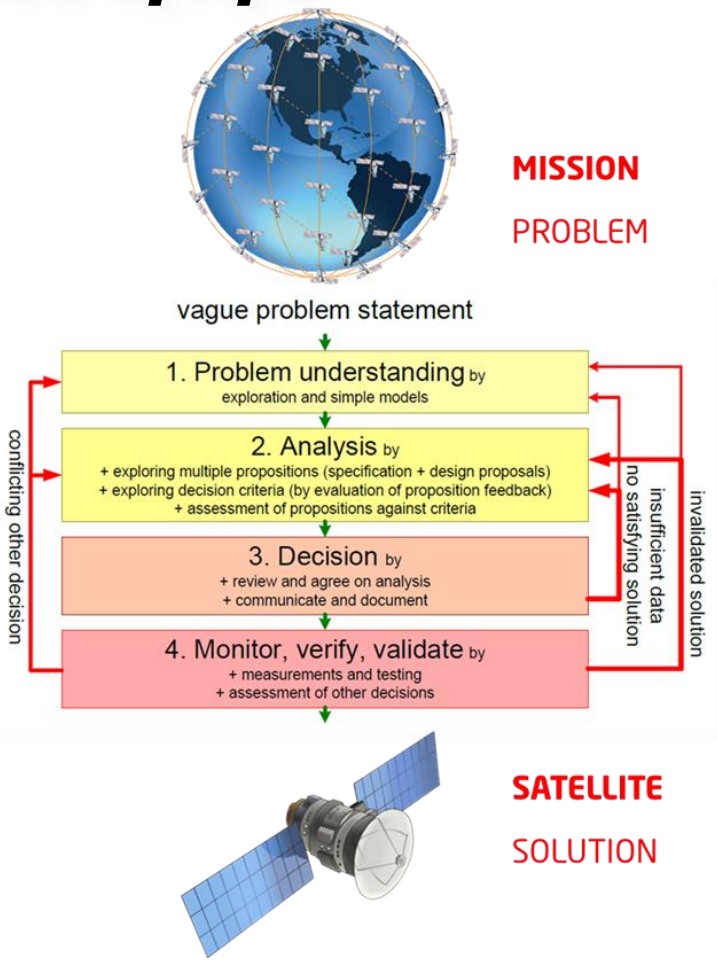


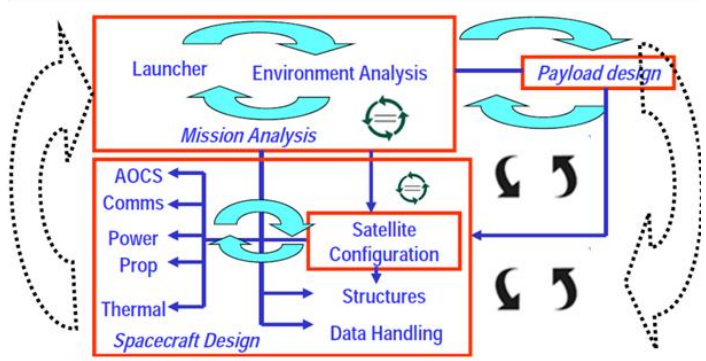
As-built Baseline

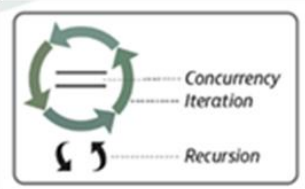
As-deployed Baseline

Objetivo técnico 2 : Comprender iteración, recursión y concurrencia entre problema versus solución con foco fases 0/A/B









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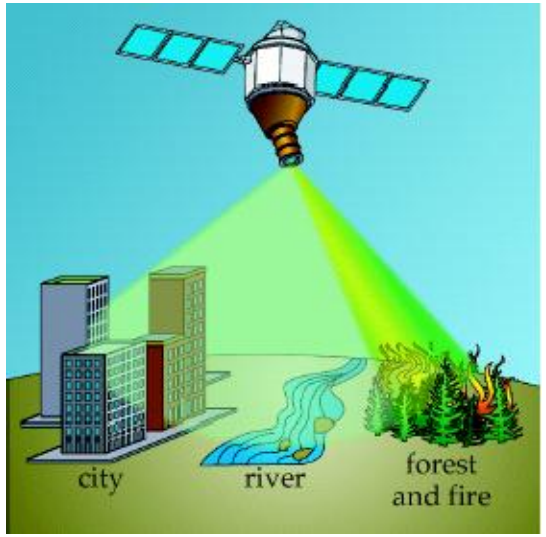
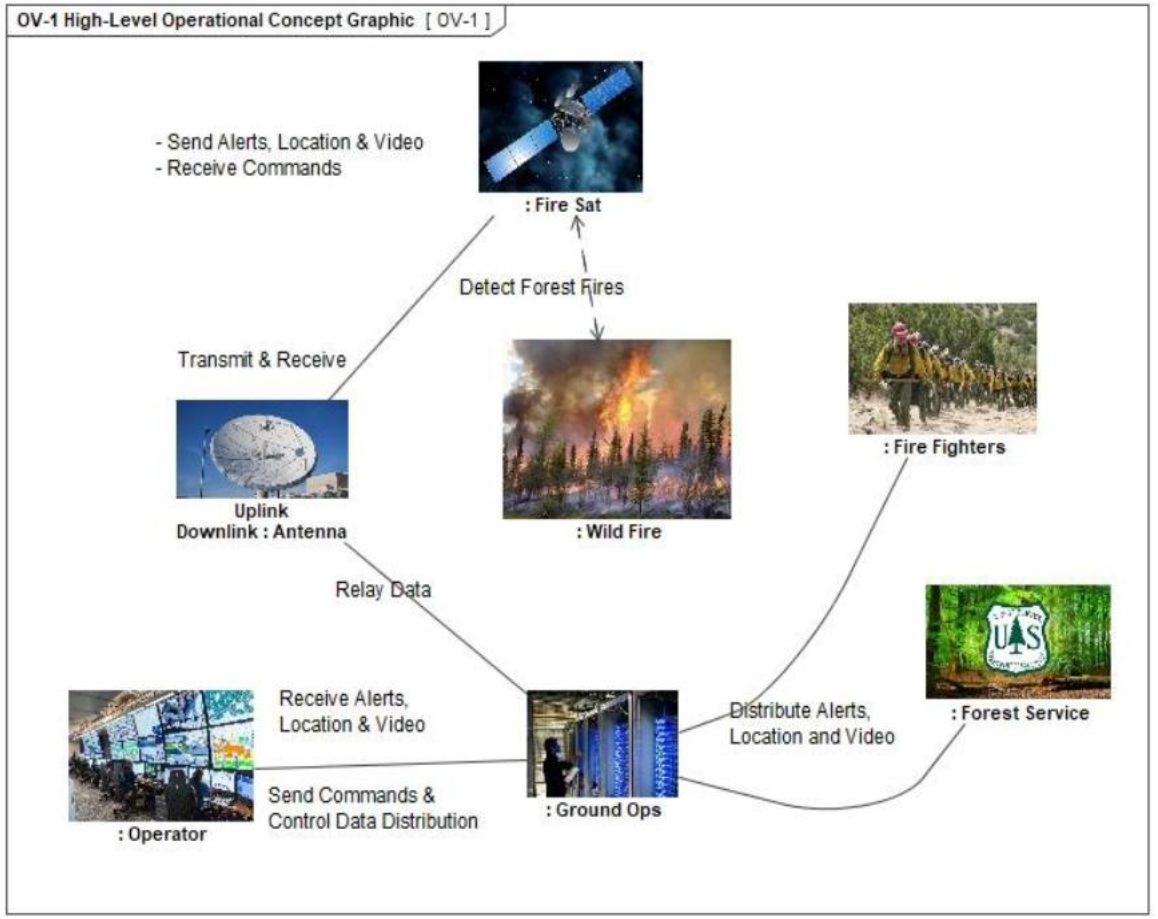
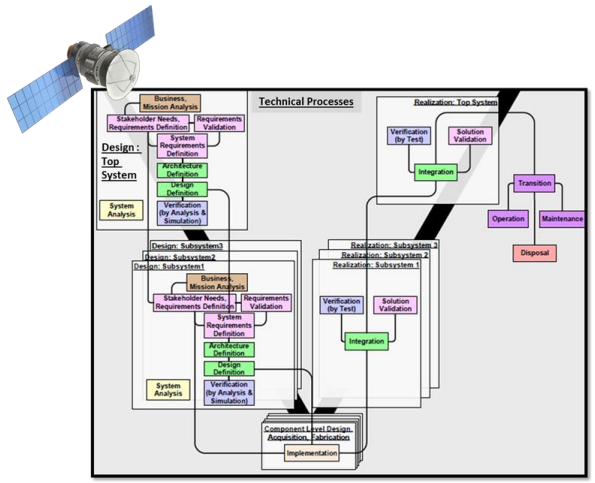
Caso conductor

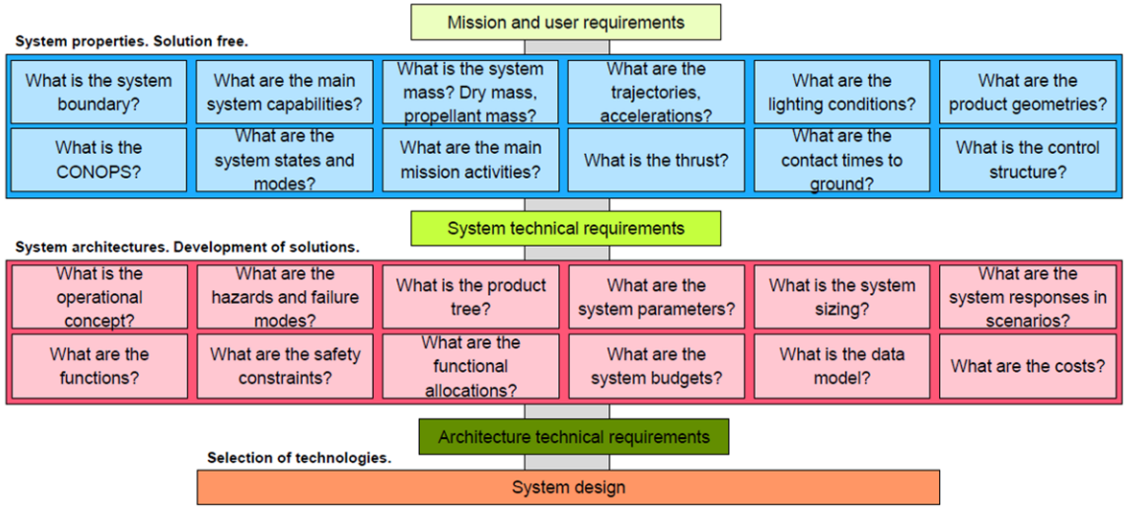
Los incendios forestales catastróficos son cada vez más frecuentes. Cuando el incendio se detecta temprano, es más fácil tomar decisiones para su control y, de este modo, se optimiza el uso de los recursos disponibles y se alerta al público en general. Dada la importancia del uso de la tecnología de teledetección por satélites para el monitoreo y la preservación de los recursos naturales, MASE utilizará como caso conductor la clásica misión **FireSat**.

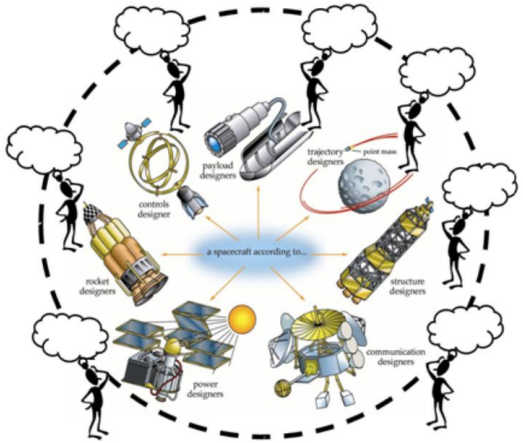


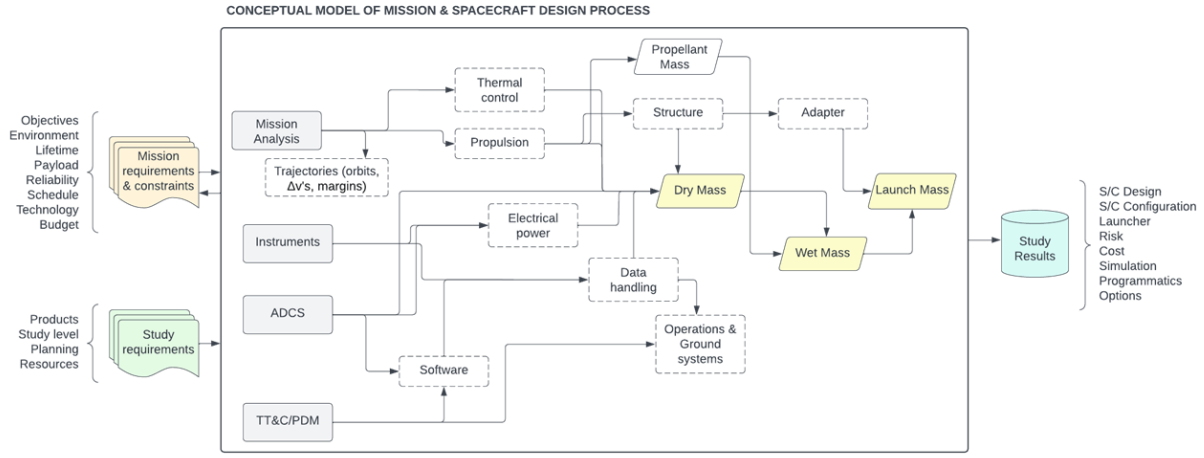


Informe final









Informe Final
(en equipo)

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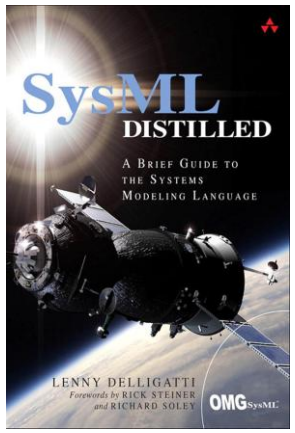
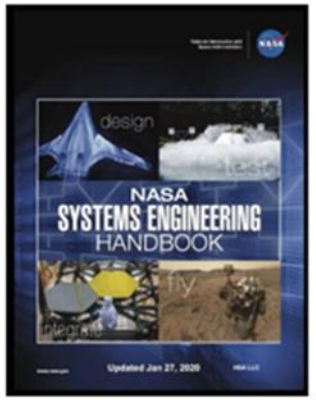
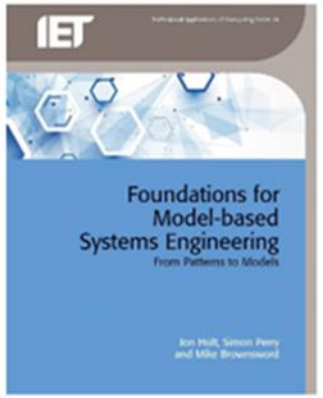
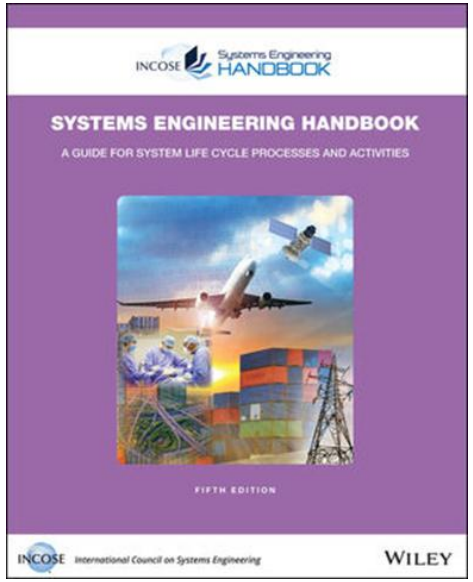
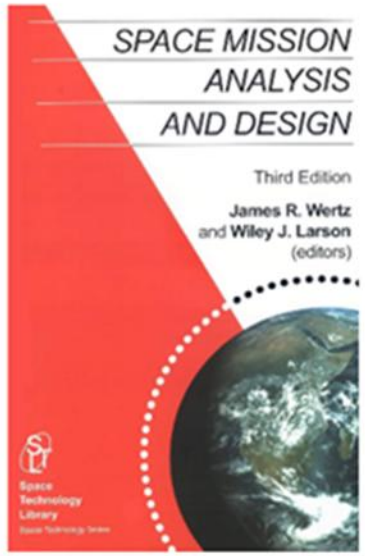
Referencias

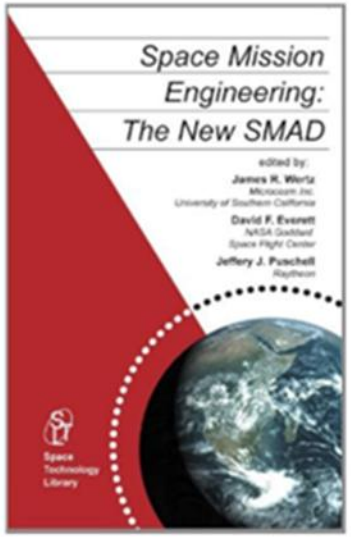


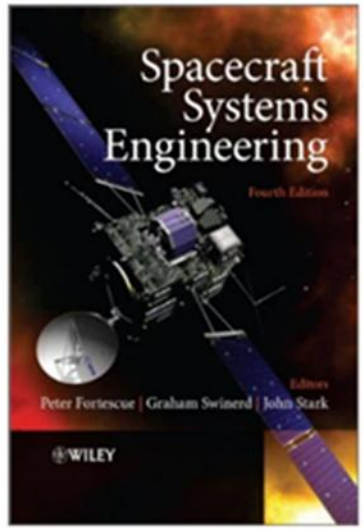












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