PROJECT MANAGEMENT AND PROJECT QUALITY IN LEAN ORGANIZATIONS

NASA Supply Chain 2012 Conference

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Theresa Beech

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OVERVIEW

1. Who is GMV USA and what do we do?

2. How does GMV USA do Quality?

3. GMV USA Project Management & Project Quality
   - Implications of Commercial and Institutional contracts

4. Lessons Learned and Observations

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WHO IS GMV USA?

GMV is….

- Private, woman-owned, technology business; Small Business under some NAICS codes
- Established in 1984 with affiliates in the US, Europe and Asia
  - GMV USA HQ in Rockville, MD has a *DoD FCL*
  - ISO 9001 & AS 9100 certified, *CMMI level 5 certified* for SW development
- *#1 Commercial Telecom Ground System Supplier* in the world
- *42% of all commercial telecom satellites launched in 2010* use GMV systems
- **285 missions** (LEO, MEO, GEO, HEEO, & interplanetary) operate with GMV technology
- 20% of all spacecraft (com, civilian & classified) launched in 2010 use GMV technology
- *Only company* to sell ground SW to space institutions around the world (NASA, NOAA, USGS, CNES, ESA, Eumetsat, Roscosmos, ISRO, ETRI)
- GMV ground systems deployed to **26 countries** on **6 continents**

GMV Institutional Customers

GMV Commercial & Industrial Customers

WHAT DO WE DO?

GMV provides *open, customizable, Commercial Off-the-Shelf (COTS)* Software solutions to the space market.

GMV supporting *4 of 12* spacecraft launched world-wide in Sept 2011

- 4 different buses
- 4 different launch sites
- 3 different manufacturers
- 3 different operators

from **Space News: September 12, 2011** issue

SEPTEMBER launches

Date	Launch site	Vehicle and provider	Payload and owner	Outcome or purpose
Sept. 10	Cape Canaveral Air Force Station, Fla.	Delta 2, Boeing	GRAIL, NASA	To launch two lunar orbiters to study the Moon's interior and thermal evolution.
Sept. 14	Baikonur Cosmodrome, Kazakhstan	Proton, International Launch Services	QuetzSat 1, SES	To launch a direct television broadcasting services satellite.
Sept. 17	Tanegashima Space Center, Japan	H-2A, Japan Aerospace Exploration Agency	IGS, Cabinet Satellite Intelligence Center	To launch an Information Gathering Satellite.
Sept. 22	Odyssey Launch Platform, Pacific Ocean	Zenit 3SL, Sea Launch	Atlantic Bird 7, Eutelsat	To launch a communications satellite.
Sept. 25	Plesetsk Cosmodrome, Russia	Soyuz 2-1b, Russian Space Forces	Glonass M, Russian Federal Defense Ministry	To launch a navigation satellite.
Sept. 25	Satish Dhawan Space Center, India	PSLV, Indian Space Research Organisation	Megha-Tropiques, India and France	To launch a satellite to study the water cycle and climate in the tropics.
Sept. 27	Kodiak Launch Complex, Alaska	Minotaur 4, U.S. Air Force	TacSat 4, Operationally Responsive Space Office	To launch the TacSat 4 demonstration communications satellite.
Sept. 29	Baikonur Cosmodrome, Kazakhstan	Soyuz, Russian Space Forces	Kanopus-Vulkan, Russian Federal Space Agency; Bel-KA 2, Belarus	To launch a remote sensing satellite and an Earth observation spacecraft.
September	Guiana Space Center, Kourou, French Guiana	Ariane 5, Arianespace	Arabsat 5C, Arab Satellite Communications Organization; SES 2, SES	To launch two communications satellites.
September	Baikonur Cosmodrome, Kazakhstan	Proton, International Launch Services	ViaSat 1, ViaSat	To launch a high-speed Ka-band Internet services satellite.
September	Xichang Satellite Launch Center, China	Long March 3B, China Academy of Launch Vehicle Technology	W3C, Eutelsat	To launch a communications satellite.
September	Jiuquan Satellite Launch Center, China	Long March 2F, China Academy of Launch Vehicle Technology	Tiangong 1, China Academy of Space Technology	To launch a Chinese mini-space station laboratory module.

Example:

GMV USA offers highly specialized, customizable, integrated multi-mission, multi-user planning & scheduling and bandwidth optimization and allocation capabilities.

- DoD operating in a resource constrained environment threatened by coverage gaps
- Smart, integrated planning & scheduling of *existing on-orbit assets* can **improve existing constellation performance as much as 10-20%**

GMV COTS SW products offer low-cost, rapid-deployment solutions to enhance existing and future DoD space operations

How does GMV USA do Quality?

- ISO 9001, AS 9100 certified
- CMMI level 5 certified
- Explicit permission to use the QMS of our affiliate GMV Aerospace and Defense SAU in Europe

What does this mean?

- QA Executive Committee: GM of Aerospace, GM of Defense, Director of the QMS, & President of GMV USA
- QMS started in 1997 and evolved over the years
- Very highly adapted to European & commercial markets
- QMS procedures being adapted and modified to reflect increasing US government market presence

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How does GMV USA do Quality?

- QA has direct involvement in all projects
  - QA reviews
  - QA inspections
- Organizational awareness at all levels of Quality in the product
- Skinny organization
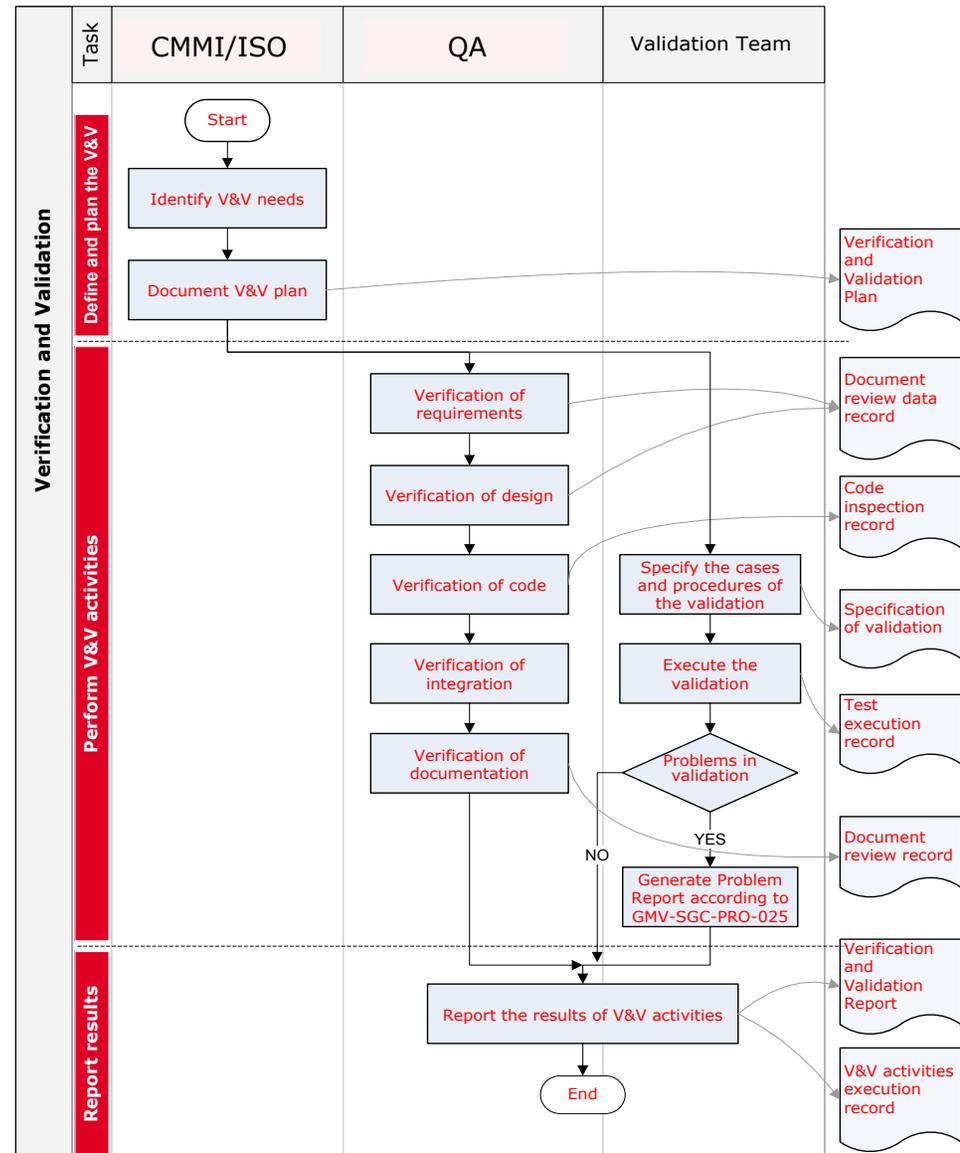
Project Management & Quality

Ultimate objective is to provide a quality product to the Customer on time and within budget

How do we do this?

- Well defined contract and requirements
- PM knows & understands reqs & processes from start
- Adequate team knowledge, resources, and tools
- Internal audits are essential
- Identify issues and address them early
- **Communicate! Communicate! Communicate!!!**
  - Both internally and with the customer => write critical points
- **Test! Test!! Test!!!**
- **Upper management support of QA & PM is essential**

Commercial vs. Government

COMMERCIAL
- Informal discussions with customer before/during RFP
- COTS based
- Relatively few custom requirements
- Firm, Fixed Price Always
- Ground system and Operations team are the Customers
- Very knowledgeable, repeat customers

GOVERNMENT
- Formal, inflexible procurement process
- Many reqs drive the process, not susceptible to negotiation
- Cost Plus
- Ground system and Operations team are separate from the procurement team
- High customer team rotation frequent

Commercial vs. Government

COMMERCIAL

- Award decisions driven by cost & Value
- No award protests ever
- Quick decision-making
- Short reqs phase
- Few ECRs
- Product documentation is customized, little new documentation
- Moderate # of meetings
- Extensive testing

GOVERNMENT

- Award decisions driven by requirements & process
- Frequent award protests
- Laborious decision-making
- Long reqs phase
- Many ECRs
- Products is highly customized w/extensive new documentation
- Many meetings/telecons
- Extensive testing

Commercial vs. Government

COMMERCIAL

- Training is concentrated
- Commercial best practices for QA
- External & internal QA project audits
- No QMS audits
- Cost & schedule drive the process
- Few schedule delays & very little cost overrun

GOVERNMENT

- Training is diffuse
- Extensive MA requirements
- External & internal QA project audits
- QMS audits
- Process driven
- Frequent schedule delays and cost overruns

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Lessons Learned & Observations

- Customers are usually knowledgeable about QA
- Customers are less knowledgeable about SW QA and even less about SW QA for a SW product
- Overall project management processes for Commercial and Government projects are the similar, but there are some differences:
  - Requirements phase
  - Documentation
  - Communication fluidity
- Internal development and testing processes vary little
- Fundamental project management very similar because all customers want a quality product

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Thank you

Theresa Beech

President

tbeech@usa.gmv.com

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