



412th Test Wing



War-Winning Capabilities ... On Time, On Cost



U.S. AIR FORCE

**Innovation:
Setting Conditions for T&E
Exploration**

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412 RANS

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Integrity - Service - Excellence



Overview



- Introduction
- Background
- Quick Kills
- Collaborating with Innovative Companies
- Process and Path Forward
- Conclusion
- Questions

“I have not failed. I've just found 10,000 ways that won't work.”

- Thomas Edison



Introduction



- Capabilities of the USAF in High Demand across the Globe
 - Requires increased agility
 - Requires innovation at every level
 - Requires that we create “A Culture of Innovation”
- Why has the 412 TW chosen to add Innovation as a Major Goal within their Strategic Plan?
 - We need to provide increased “Value to Customers” at a lower cost and reduced timeline
 - Ultimate Customer: The Warfighter
 - Deliver War-Winning capabilities effectively and efficiently



Background



- 412 TW/CC Brigadier General Carl Schaefer
 - Discover Innovation “DT Game Changers” for nation
 - Move from “sequestration mindset” to 5 to 10 years out
 - Edwards AFB continues to be known for DT&E and combat capability innovations
 - Encourage and capitalize on our talent to innovate
- 412 TW has developed, implemented and executed a highly effective Strategic Action Plan for the last 3+ years
 - Goal 5: Develop a Strategic Innovation Plan
 - Must be ready to accomplish today’s test mission in the smartest way possible
 - Must also prepare for tomorrow’s mission



Background – cont'd



- Team Development
 - Hand-picked ~15 personnel across 412 TW
 - Added key advisors from across the TW with an emphasis on engineering and technical expertise
 - Three Teams:
 - Team 1 – Quick Kills
 - Team 2 – Quick Kills
 - Team 3 – Process Development: Develop process that empowers personnel across the 412 TW to innovate and that contributes to an Innovative Culture
 - Innovation Master Plan
 - Process Guide



Background – Concluded



- Team Development – Concluded
 - Identified Background material to get team up to speed:
 - The Innovation Master Plan – Langdon Morris
 - Agile Innovation – Langdon Morris
 - Continuous flow of Innovation Articles and information to the 412th Innovation Team and stored on Share Drive
 - One Year initial commitment with an opportunity for continued commitment
 - Contract with Supervisor/Parent Organization
 - Four hours per week



Quick Kills



- Objective: Identify, develop, fund and complete projects within a 90-day timeline (target) to demonstrate Innovation and Value
- Initial 2 Projects chosen from over 10:
 - **Portable Manned Interface Cockpit (PMIC)**
 - **Single Operator Multiple Antennas (SOMA)**



Quick Kills - PMIC Evolution



412 TW



Concept

- Current cockpits single purpose
- No ability to rapidly build up multi-configuration ops
- Large systems requiring dedicated facilities



Design

- Create a portable manned interactive cockpit
 - Add friend or foe air entity as needed
 - Low cost, quick response
 - Support various types of aircraft cockpit models



Realization

- Rapid multi-ship
- Low cost, reconfigurable, portable configuration
 - Industry standard protocols
 - Interoperability via DREN

90 Days





Quick Kills - SOMA



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Current

- One operator per TM tracking system (antenna)
- Range has 10 fixed, 4 mobile TM tracking systems
- Two TM tracking systems at CTF areas
- Reduced operations labor cost



Design

- One person can simultaneously track three TM ops
- Remote control all TM tracking operations
- Implement expanded slave-tracking
- Workforce multiplier – Operators can be cross-utilized



Realization

- 12% reduction in cost
- 25% increase in telemetry antenna availability
- Cross-trained personnel sufficient for additional MCR

120 Days



Collaborating with Innovative Companies



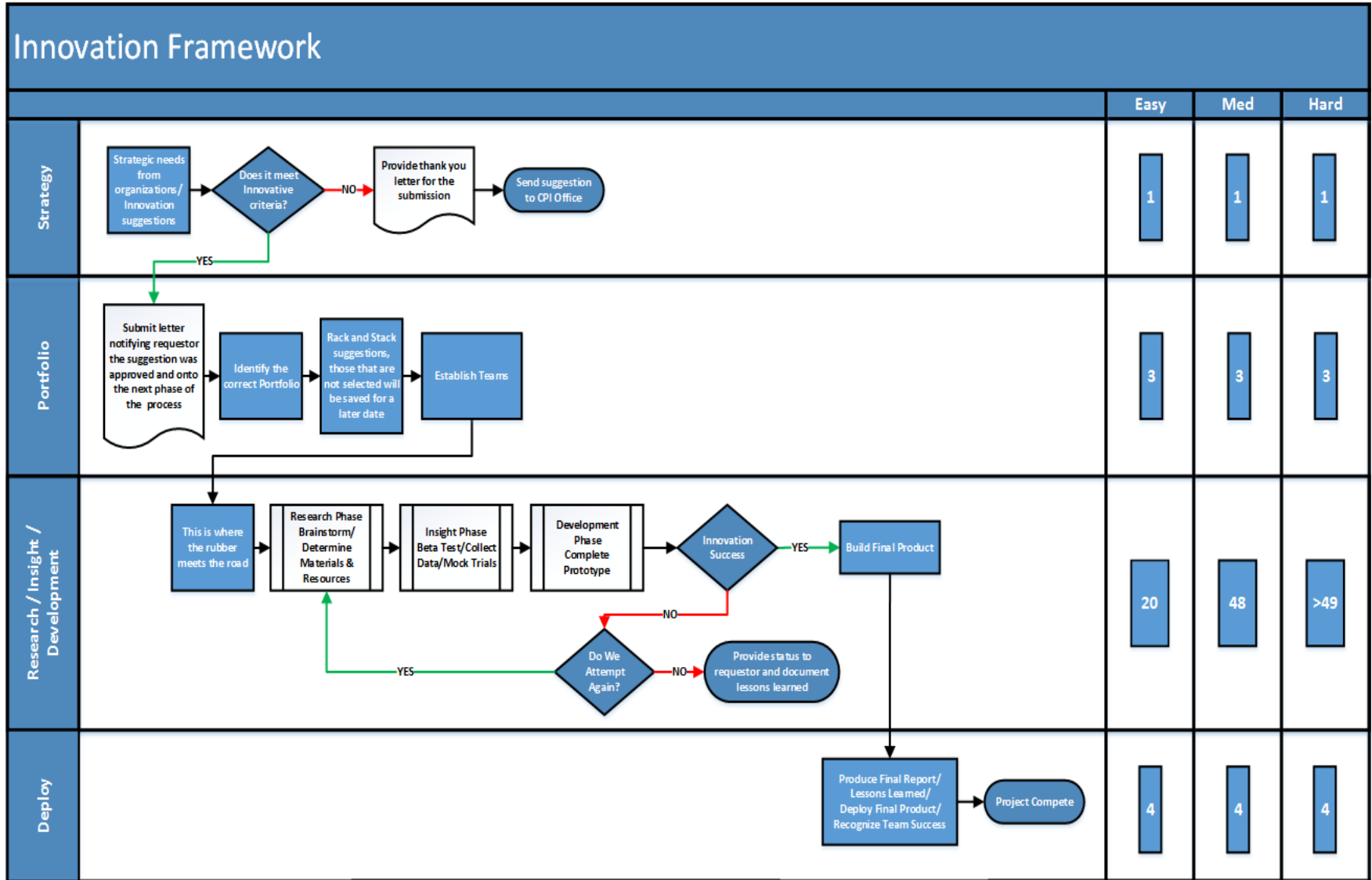
- Approach
 - Meet with “Those Who Do” vs “Consult Only”
 - Develop Questionnaire to “Maximize Value”
- Trips to Innovative Companies
 - JPL
 - Skunkworks
 - SpaceX
- High Value to-date:
 - Developing Innovation Network of “Those Who Do”
 - Companies have years of experience in Innovation
 - Cultures of Innovation and Unique Mindsets
 - Integrating information learned into Innovation Culture



Process and Path Forward



412 TW



LimFac: Contract Orders and Long Lead Items

Easy = 1 – 28Days / Med = 29 – 56Days / Hard = 57Days +



Process and Path Forward – Concluded



- Path Forward
 - Complete IMP and Process Guide
 - Kickoff Innovation across 412 TW with Key Groups
 - Hire SIO and Admin Clerk
 - Re-group Team for second “One-year Contract”
 - Continue toward developing “Innovation Culture” and move us toward innovative and cost effective war-winning solutions and capabilities
 - Planned Innovations
 - Portable Airborne Telemetry Boresight (PATB)
 - Phased Array Telemetry Acquisition System (PATAS)



Conclusion



- **The 412 TW must Innovate to maximize value to the USAF and our ultimate customer: the Warfighter**
- **We have completed some “Quick Kills” to start our Innovation Engine**
- **Collaborating with Innovative Partners who have successfully Innovated**
- **Innovating to continue to move “Toward the Unexplored”**

A Healthy percentage of projects should fail because failure is an indication that we’re pushing the limits of our current understanding hard and persistently enough to be sure that we are extracting every last bit of value from every situation, and at the same time preparing for a broad range of unanticipated futures.

- The Innovation Master Plan



Questions?





Back-up Slides





Planned Innovations - PATB



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Current

- Bore sights using fixed towers
- Sub-optimal calibrations caused by unwanted ground clutter
- Inability to measure slew rates and antenna pattern



Design

- Create a portable airborne L, S and C band telemetry transmitter
- Station keeping capabilities
- Operational altitude of 300 feet AGL



In Development

- Improve antenna auto-track capabilities
 - Reduce loss-of-track events
- Portable, Low cost, reconfigurable
- Additionally: tower video inspections
 - Safer and cheaper alternative

150 Days



Planned Innovations - PATAS



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Current

- Telemetry (TM) antenna tracking systems require line of sight
- One TM antenna per test article
- Range has 10 fixed and access to 2 NASA antennas
- Edwards taxiways and CTFs renowned for poor TM reception (caused by multipath)



Evaluation

- Investigate phased array telemetry acquisition system
- Potential is to replace all 12 existing antennas with 3 fixed units.
- Covers the entire Edwards Range
- Has no moving parts



End Goal

- Improved TM quality to our customers on taxiways and parking areas
- Increased operational capability - Antenna scheduling obsolete
- Significant reduction in TM operations

90 Days/S&T Funded

