Extracting a Real-Time Force Readiness Picture From Big Data

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• Force Readiness assessments
• Big Data and your C2 Systems
• Effectively accessing the information in your C2 Systems (silos, staff, tools, access)
• Using that information to assess Force Readiness (encoding against common elements, current vs future status, OLAP)
• Big Data is not everything
• Conclusion/ Q&A
Assessments of Force Readiness can come in many forms, including:

• Directives from Head Quarters to provide specific types of assets & trained people in readiness to meet Directed, Minimum and Operational levels of capability.

• Forward looking assessments and evaluations to determine the impacts of maintenance, staffing and process changes.
THE INFORMATION UNDERLYING FORCE READINESS ASSESSMENTS

• How many qualified crew do you have?

• How many assets are available now and into the future?

• What maintenance is scheduled or expected?

• What are your projected availabilities for crew & assets?
ACCESSING THE UNDERLYING INFORMATION

IS YOUR INFORMATION IN MULTIPLE DIFFERENT C2 SYSTEMS?
STEPS TO OBTAINING A CONSOLIDATED VIEW

1. Provide a single point of reference

2. Establish shared definitions for common information elements

3. Have trained, authorised staff with the right tools
Step 1: Single Point of Reference

- **Must avoid creating data silos**
- **Common C2 System across all platforms & divisions**
  - Single vendor to deal with
  - All units using the same coded information & definitions
  - One central database to access
- **Data Warehouse**
  - Addition of yet another computer system
  - More infrastructure to purchase & maintain
  - Processes to establish and maintain
  - Must be refreshed frequently at a suitable rate
STEP 2: ESTABLISH COMMON INFORMATION ELEMENTS

- Provide a common definition of elements including maintenance status, sortie results, qualifications, currencies, etc
- Must be defined at HQ level and promulgated to all units
- Provides a basis for comparison across units & platforms
- Facilitates the encoding of Force Readiness directives into element comparisons
Step 3: Trained Staff with Effective Tools

- Approved staff with access to the database(s) underlying your C2 Systems
- Suitable reporting and analytic tools such as MS SQL Server Reporting Services, Crystal Reports, etc
- Vendor provided data dictionaries
- Trained in using the tools to access the information
- Access to Subject Matter Experts to help determine the required reports and metrics
The Consolidated View of Your Information

- CURRENCIES & QUALIFICATIONS MAINTENANCE OPERATIONS
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Single Point of Reference

Normalised Data Feed

Standardised Coding
AUTOMATING FORCE READINESS ASSESSMENTS

- Force Readiness Directives
- Encoding a Directive
- Applying the encoded Directive
- Current vs Future reporting
- Whole of Force reporting
EXAMPLE FORCE READINESS DEFINITIONS

• Large transport aircraft and suitable crews that are ready within 24 hours to deploy for two weeks of humanitarian assistance to the Asia/Pacific region

• Search & Rescue aircraft with crew that can reach a specific area of coverage within one hour of notification

• Combat aircraft with specific munitions and specially trained crew ready to deploy within two hours
• **AIRCRAFT AVAILABILITY**
  – Aircraft can not already be assigned to a high priority mission
  – Aircraft must be able to arrive at the staging base with sufficient time for checks, refueling and loading
  – Aircraft must have sufficient flight hours before its next major maintenance

• **CREW AVAILABILITY**
  – Located on base or can return to base within required times
  – Holding suitable qualifications that do not expire during the deployment window
  – Required currencies in place and not expiring during the deployment window
Apply the Encoded Directive

- Having encoded the Directive it can be applied against the database using a series of queries

- Examples include:
  - SELECT ALL AssetNumber FROM Aircraft WHERE location = 'AMB' AND MissionPriority < 3
  - SELECT ALL Name FROM Crew WHERE Location = 'AMB' AND MedicalExpiry < Today()+21

- Ideally these queries would be automated via scripts for a vendor developed engine
Traffic Lights and Control Panels

- Once a Directive has been assessed, it can be displayed as an easily understood “Traffic Light:”
  - Red = Failed to meet the Directive
  - Amber = Just met the Directive
  - Green = Exceeded the Directive (eg: multiple assets & crew available)
- Multiple Directives can be displayed together in a “Control Panel” facilitating comparison across units, wings or groups.
COPING WITH NEW OR CHANGED DIRECTIVES

• Ability to modify and/or add Directives without having to re-code the assessment engine.

• Avoid developers having to know Directives that are classified as Secret or higher.

• Should be able to encode using your common information elements and assessments.

• The assessment engine should only change when a new type of assessment is required.
Applying Multiple Directives

• Readiness assessment is made up of multiple Directives.

• Must be able to tag a Directive as “exclusive.”

• Must be able to assess Directives in order of priority (highest first) and exclusiveness.
• Once a Force Directive has been encoded it can be assessed on a daily basis
• The results of each day’s assessment can be stored in a new results set
• This historical view can let commanders assess the factors that were in effect at peak & trough readiness points
• As with any other results sets, this can be used to perform trend analysis and identify areas of concern
CURRENT VS FUTURE ASSESSMENT

- Project readiness into the future
- Take current status and scheduled events into account when looking forward
- Quickly identify areas where staffing & asset levels need attention to maintain readiness
Whole of Force Reporting

• Multiple Directives can be assessed and the results kept to allow Force Readiness views at the Unit, Wing, FEG and Whole of Force levels.

• Approved staff can access readiness information and “drill down” through the Force structure to identify unit performances.

• Allows approved staff to identify how specific Directives were (or were not) being met.
• Establishing consolidated reporting will require effort, planning and direction to implement

• Will significantly reduce the mandraulic effort associated with assessing Force Readiness

• Benefits go well beyond Force Readiness assessments

• Can also be used to gain insights into operational improvements
Currently mining well over 15 years of training data.

Replacing instinct with knowledge when selecting candidates and their career path.

Also being applied within FEGs for pilot progression.

Importance of common information elements to help know what information to keep and how to code it.
BIG DATA – GOOD & BAD

The Good:
• Identification of trends
• Assessment of the impacts from changes
• Insight into operational improvements
• Must have top-down driven common information elements

The Not-So-Good:
• Projects forward based on past experiences
• Past doesn’t always predict the future
• Information overload
• Investment required to exploit Big Data
• Any questions?