Department of the Air Force

Integrity - Service - Excellence

A3 Digital Operations Operations Enterprise Architecture (OpsEA)

Dr. Chip Elliott

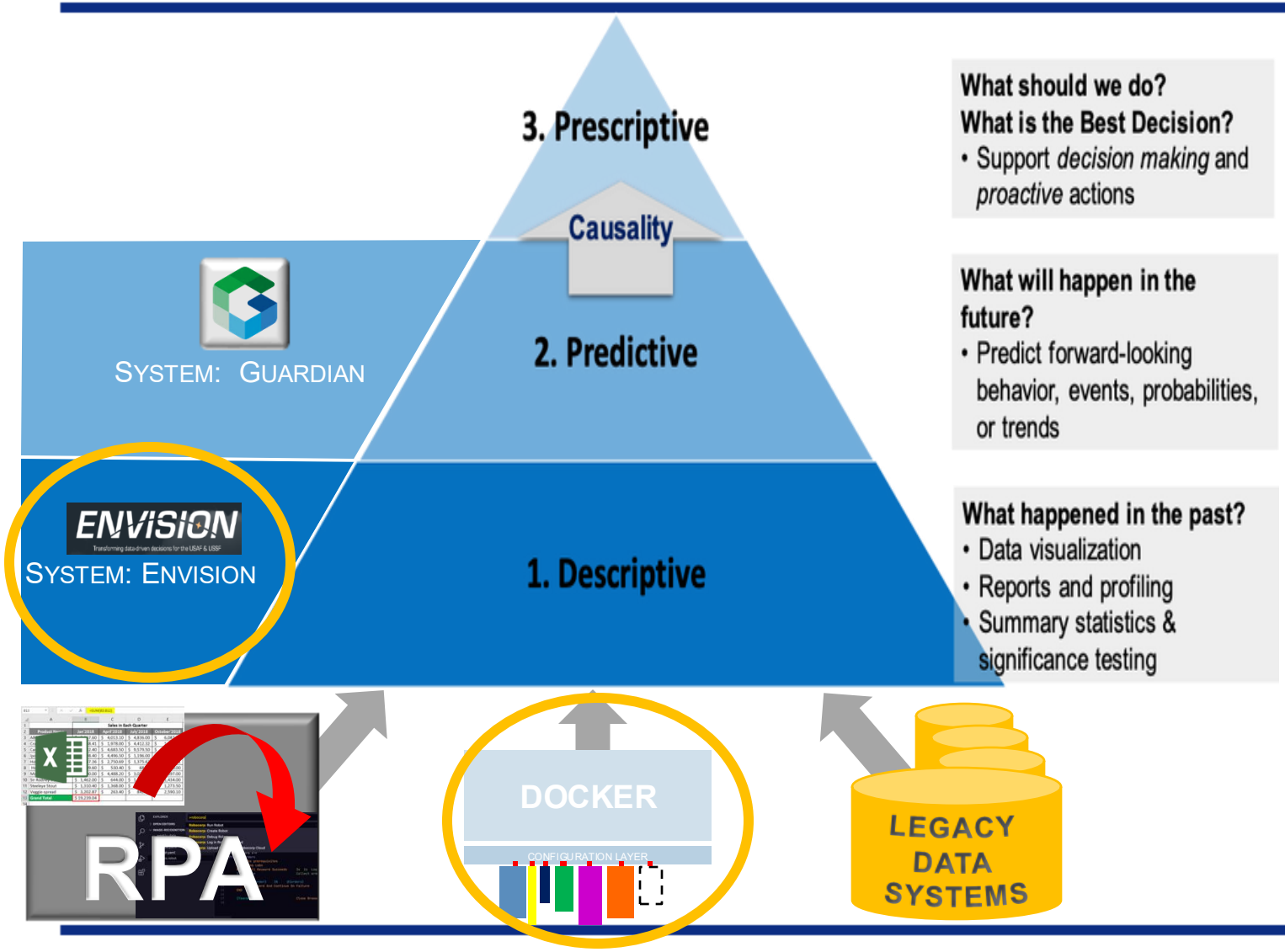
OBO Mr. George Forbes, HAF/A3

Unclassified

Why we are here

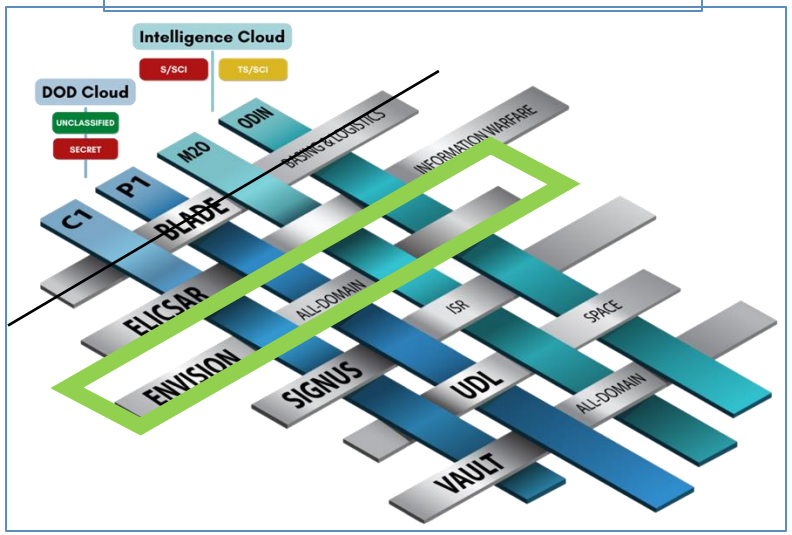
- **“We have the most pacing challenge we have ever faced – China, China, China. Ladies and gentlemen, we are out of time, we are out of time, we are out of time,” – Former SecAF**
- **“This is our time of consequence. What we do, the decisions we make, the actions we take, the Airmen we lead, and the way we do it, will define that next seminal event,” he said. “We will not turn away. We will lean into it. … The stakes are high. And the time is now.”– Former CSAF**
- **“I hope this is a bit of a call to action. I’m not asking for a teleportation machine. I’m not asking for a flux capacitor. I’m not asking for anything that is beyond the realm of the possible. This is all within our reach. But we need innovative solutions.” –Former VCSAF**

Operations Enterprise Architecture



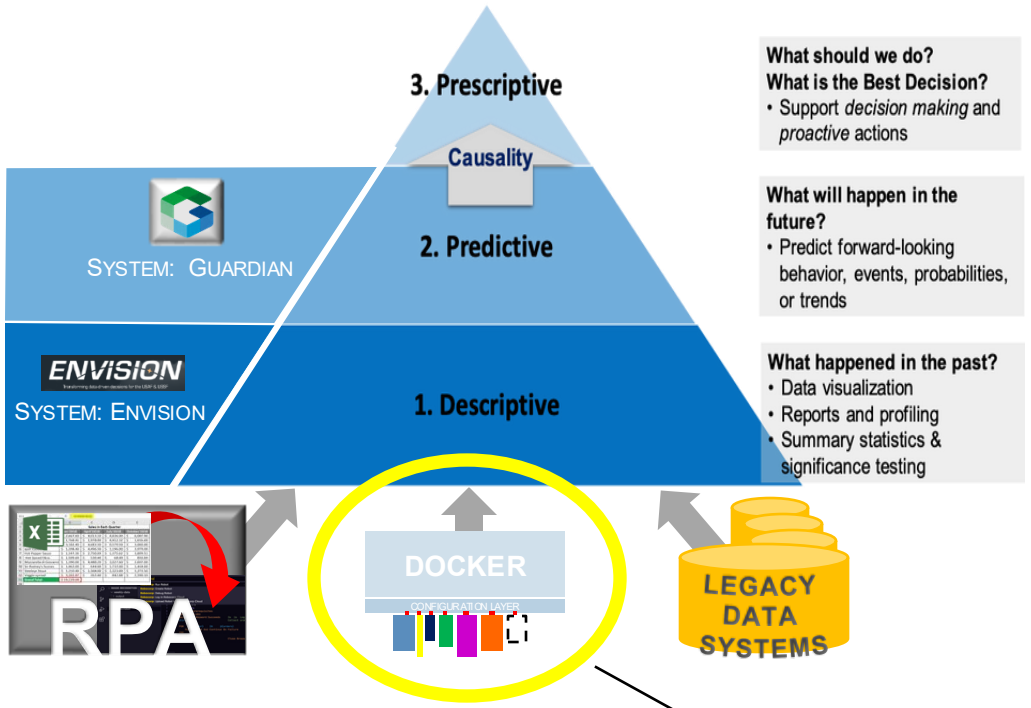
DAF Data & AI.

Introducing the DAF Data Fabric. Fundamentally redesigned and re-engineered to help you find authoritative data faster, easier, and make superior decisions.



API = Application Programming Interface
SDK =Software Developer Kit ~ ROE, policy/guidance/boundaries
RPA = Robotic Process Automation
OLEA = Office of Labor & Economic Analysis (USAFA)
*The Open Group Architectural Framework

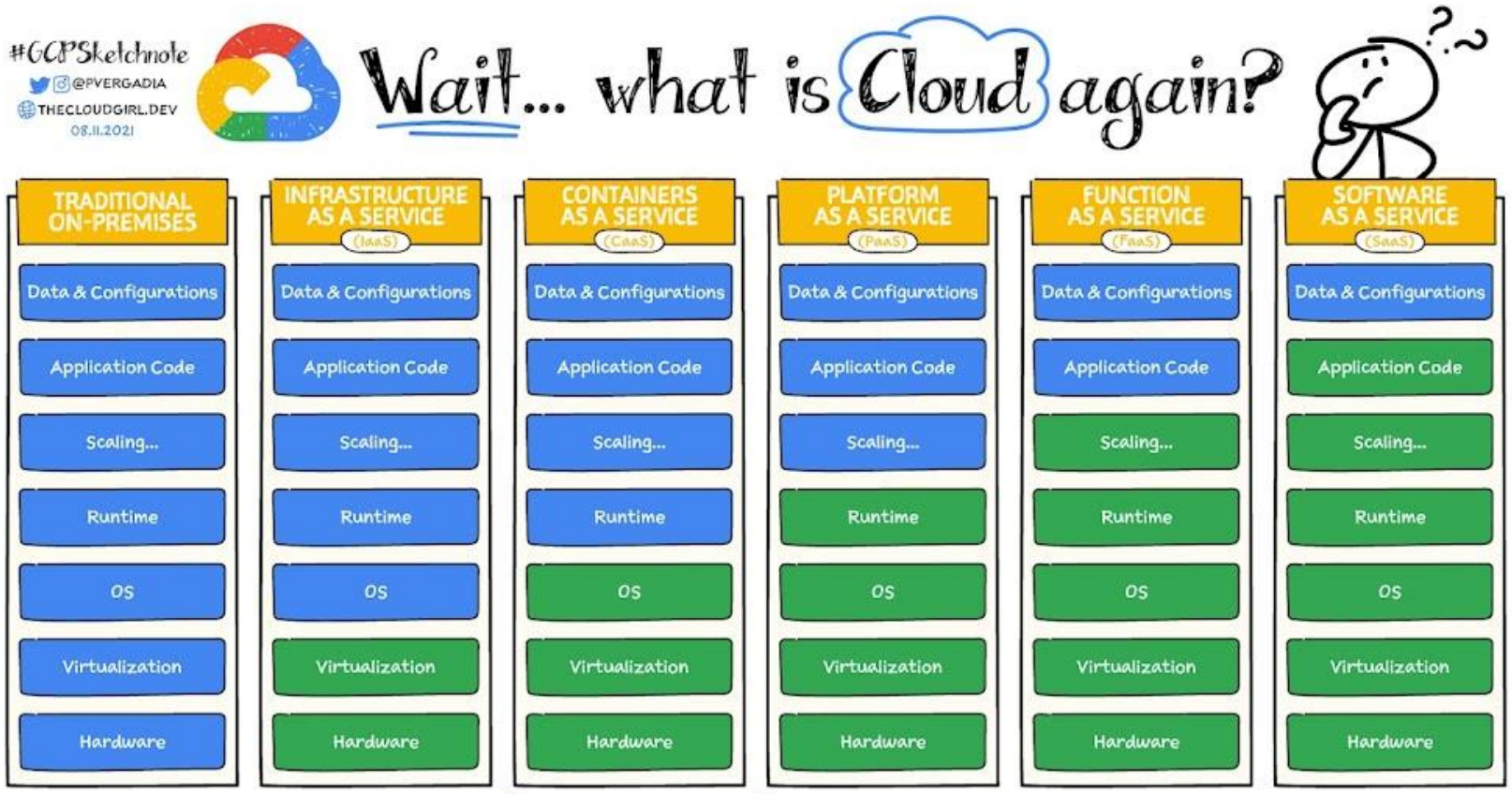
Scope of Inefficiency



- No HAF/A3 guidance discovered
- Result – Heroic efforts; no Organizational Cohesion
- Significant incompatibility, isolation, unsustainable efforts
- Dramatic overhead burdens
  - Technical
  - Financial
  - IT Fluency

Greatest resource investment

Service Models



ARMS
MILPDS
MPES
GTIMS
PEX

Cloud solutions
Platform1
Puckboard
TIMES
UDL

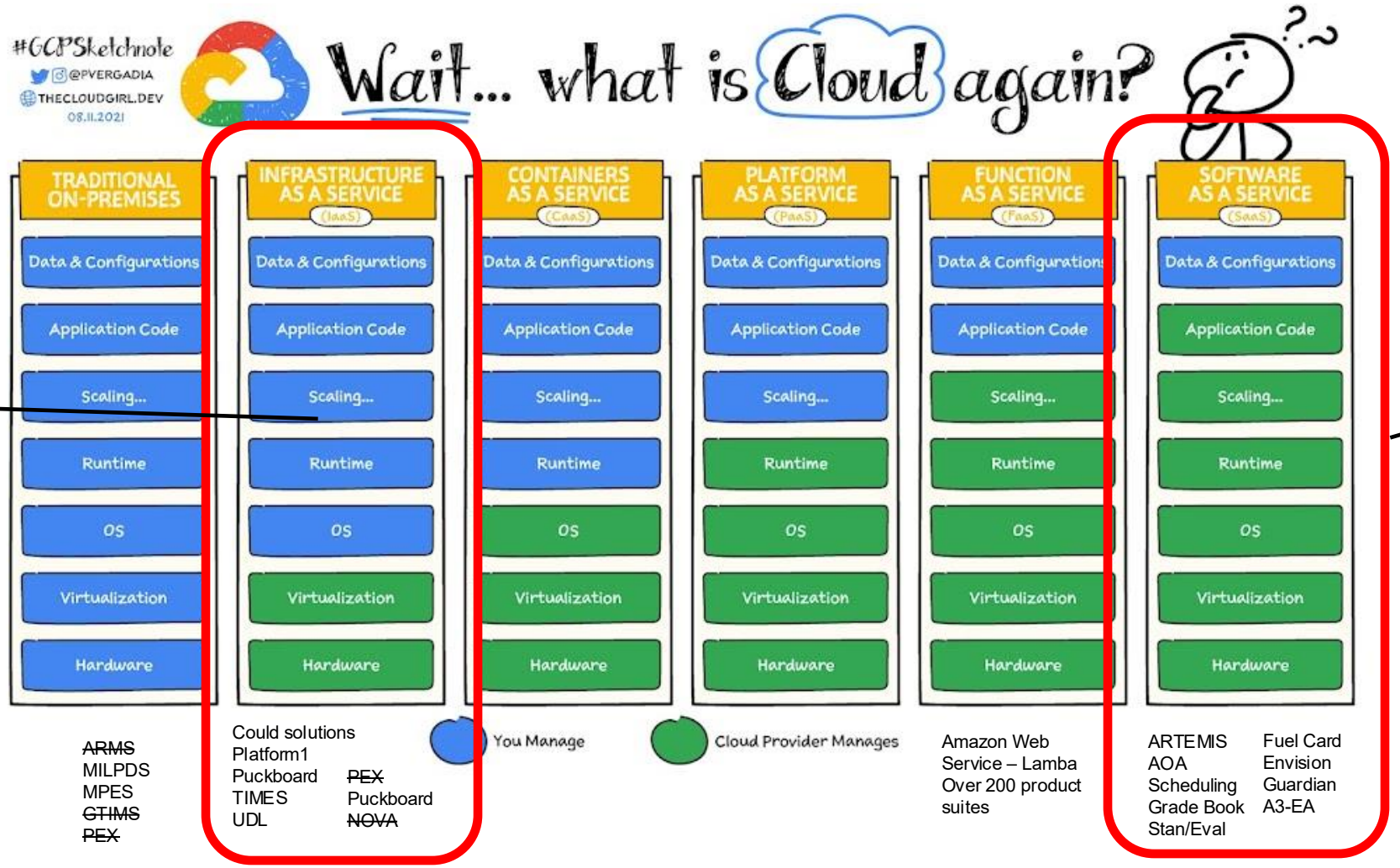
PEX
Puckboard
NOVA

Amazon Web Service – Lamba
Over 200 product suites

ARTEMIS
Envision
Guardian
A3-EA

[Source]

Service Models



Traditional or Conventional

OpsEA

~~ARMS~~
MILPDS
MPES
~~GTIMS~~
~~PEX~~

Could solutions
Platform1
Puckboard
TIMES
UDL
~~PEX~~
Puckboard
~~NOVA~~

You Manage

Cloud Provider Manages

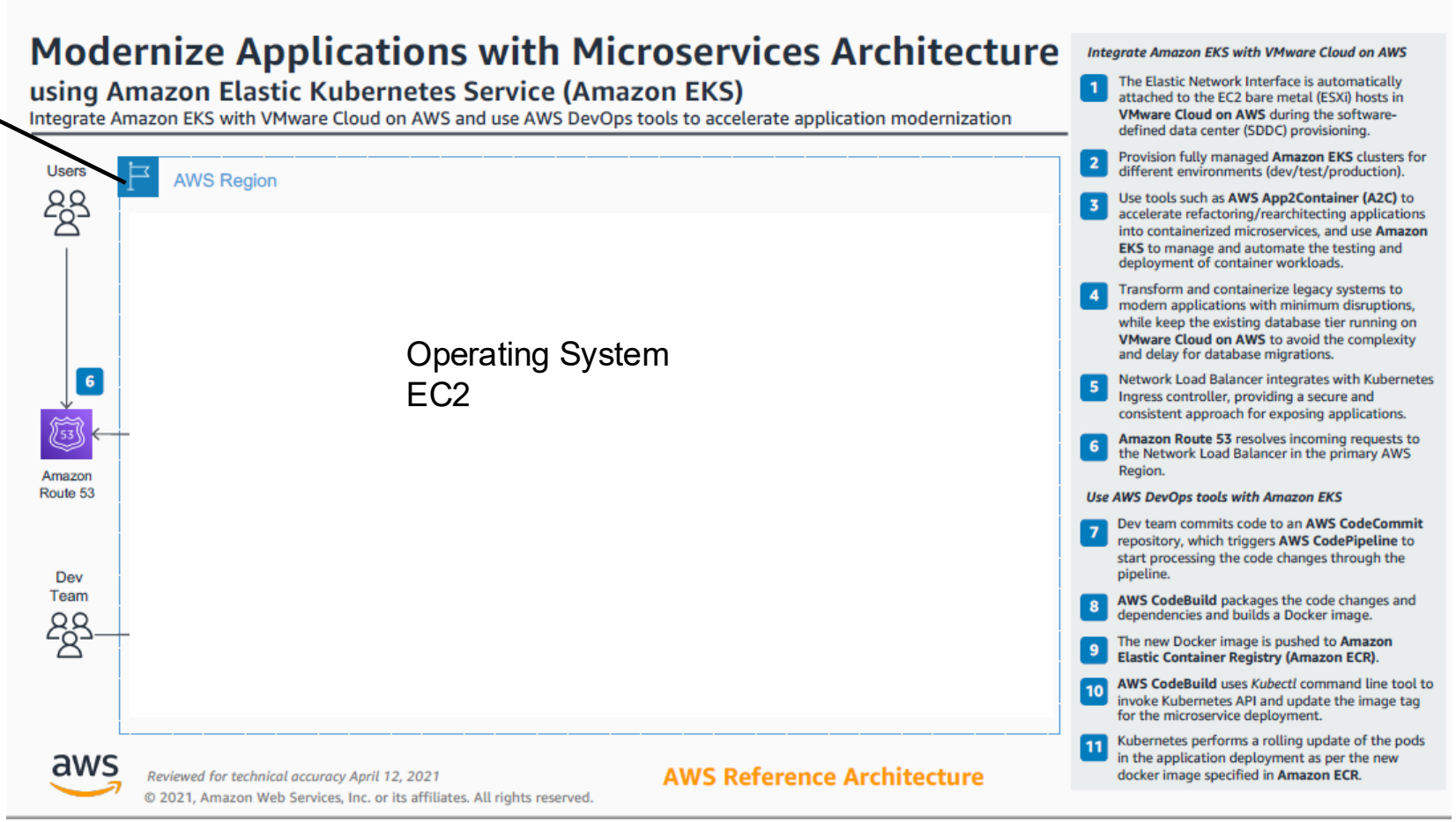
Amazon Web Service – Lamba
Over 200 product suites

ARTEMIS
AOA
Scheduling
Grade Book
Stan/Eval
Fuel Card
Envision
Guardian
A3-EA

[Source]

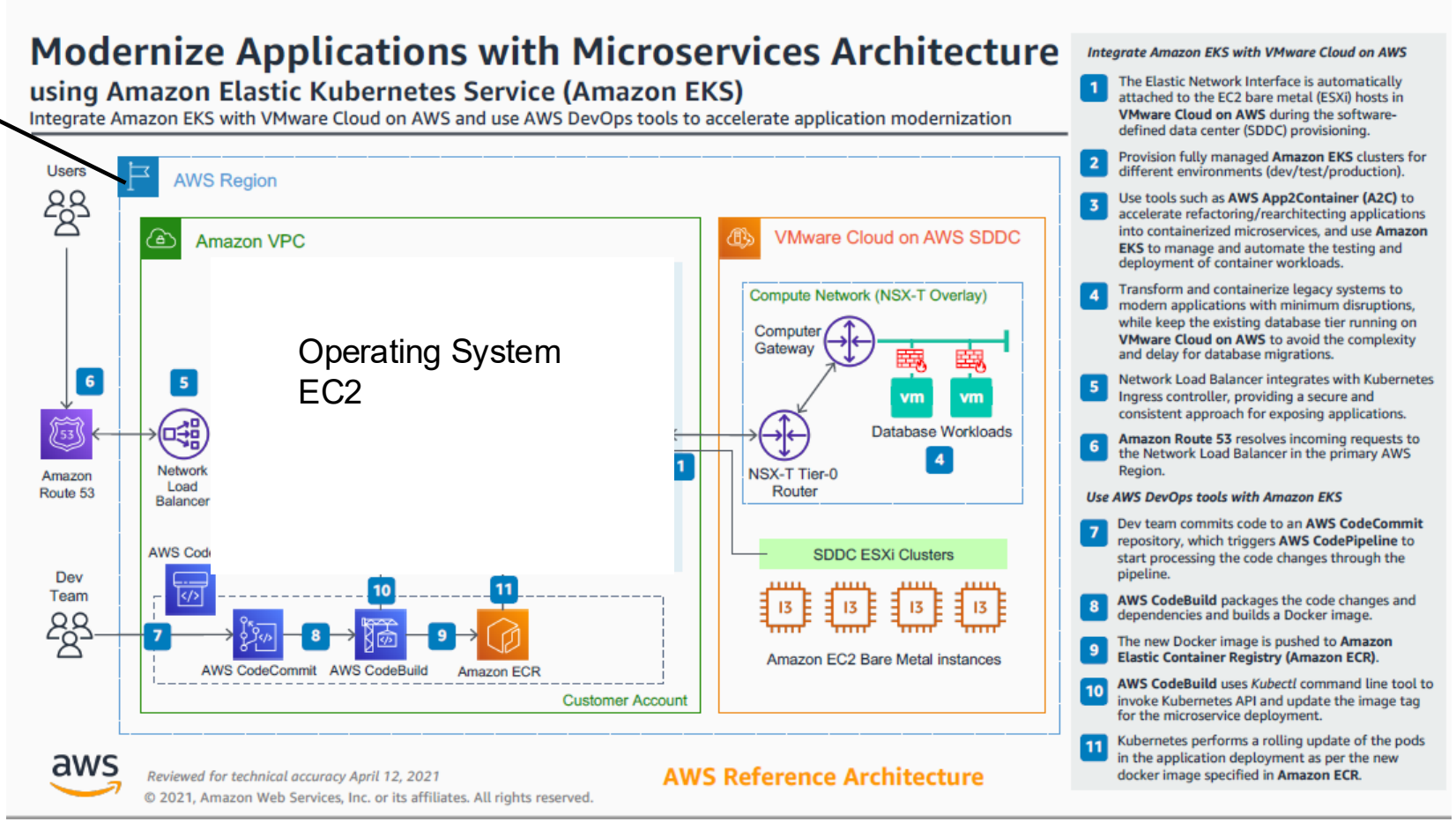
Infrastructure as a Service (IaaS)

cloud



Platform as a Service (PaaS)

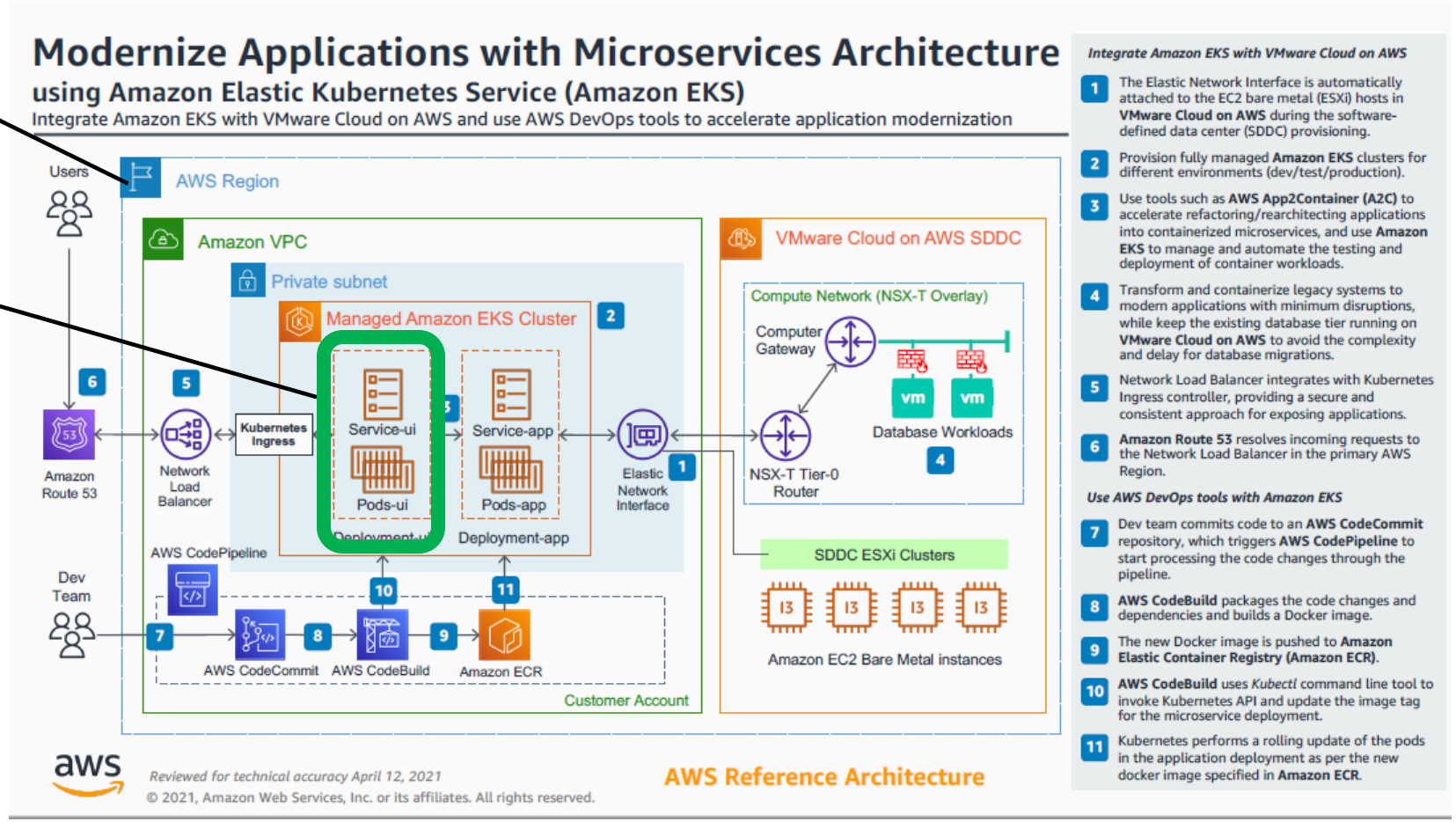
cloud



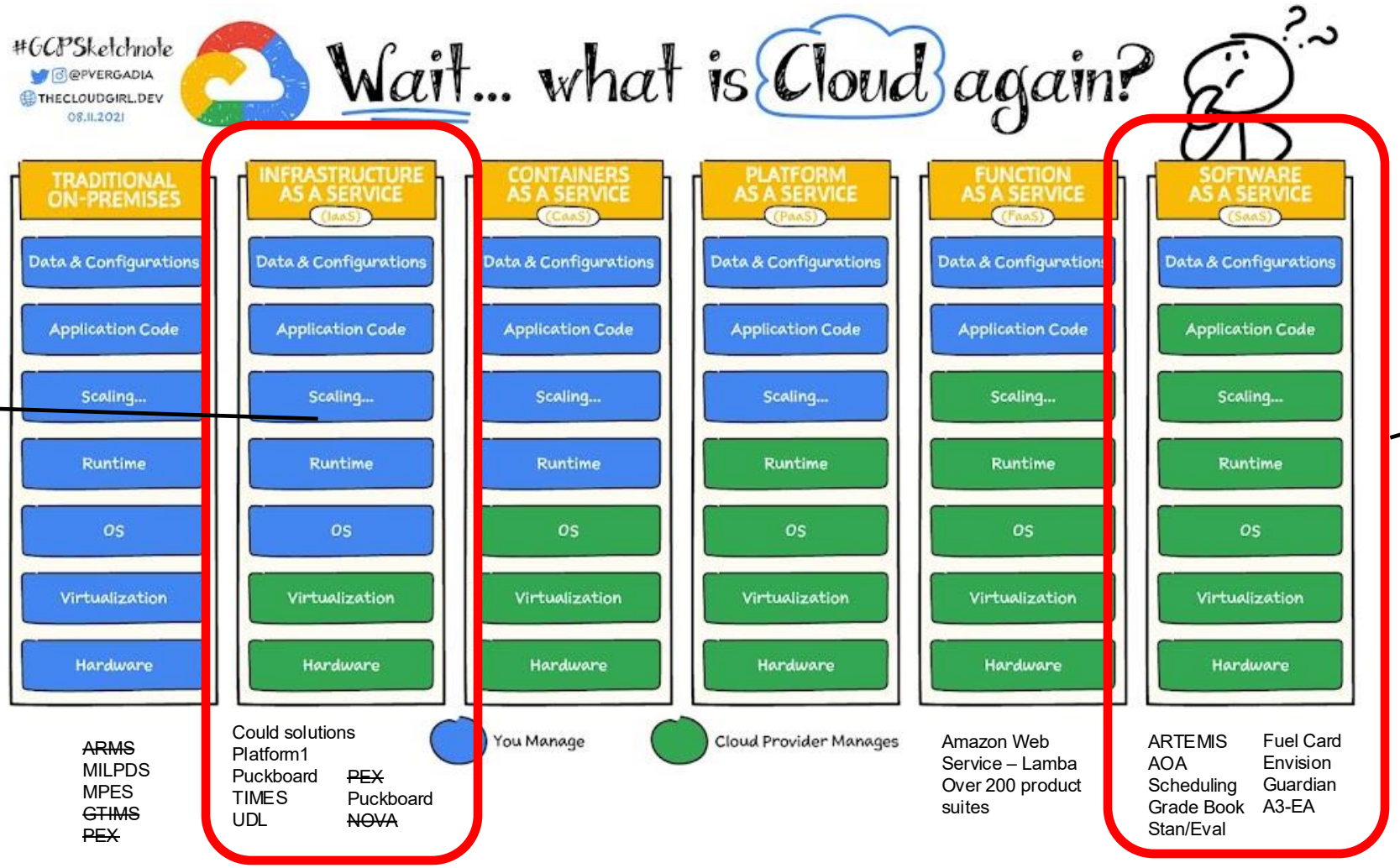
Docker/Container

cloud

App

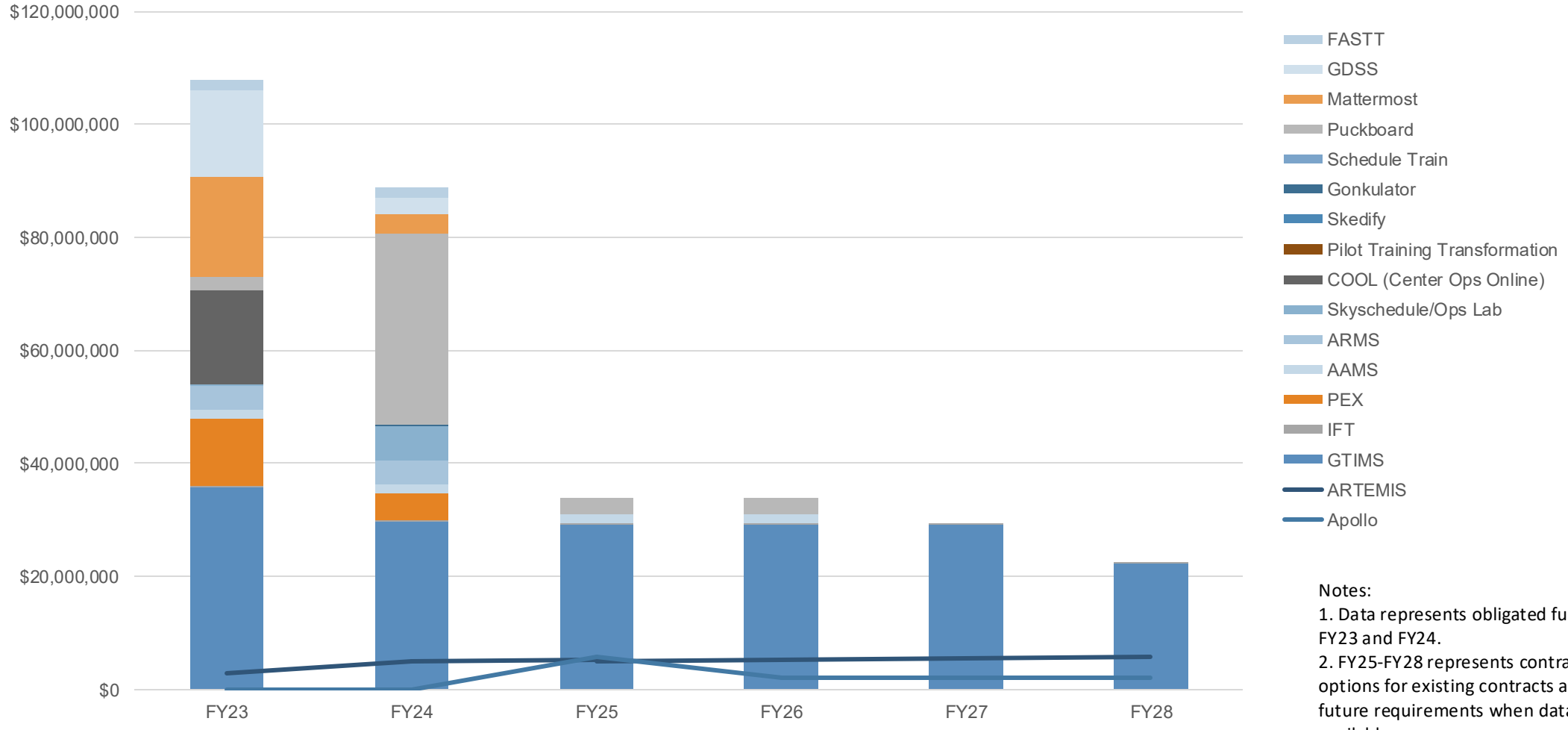


Service Models



Source

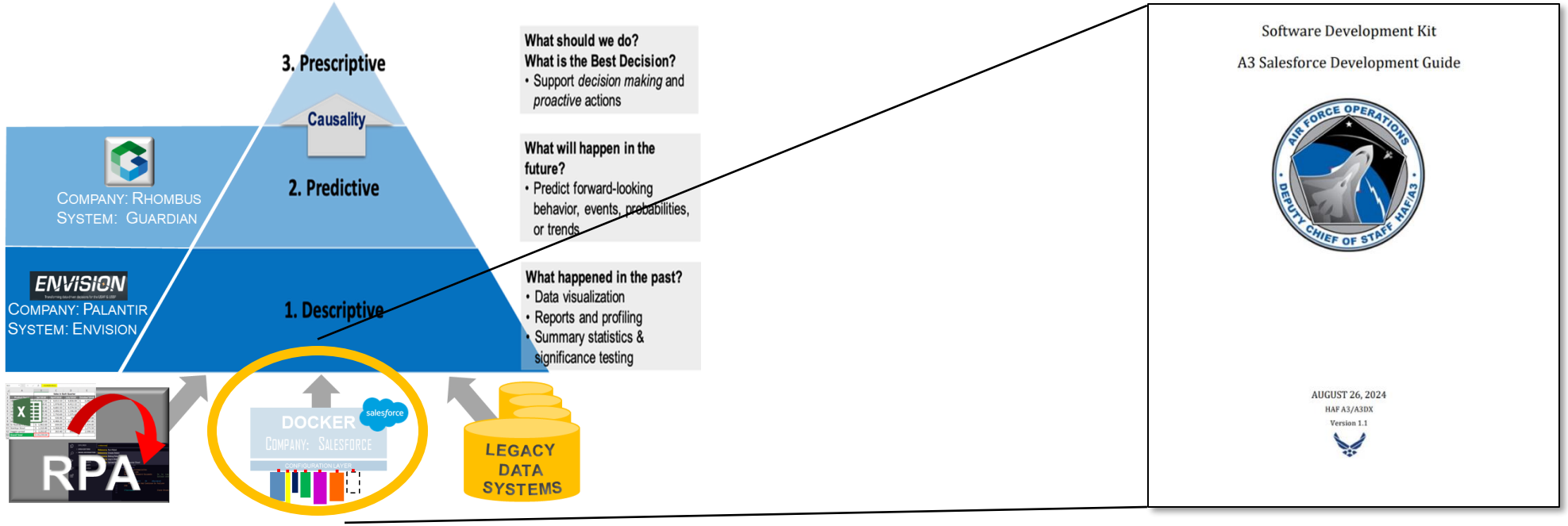
Tangible Direct Costs



Notes:
1. Data represents obligated funds for FY23 and FY24.
2. FY25-FY28 represents contract options for existing contracts and some future requirements when data was available.

Software Development Kits (SDK)

- Fosters technical collaboration
- Standardizes applications for enterprise-wide replicability and adaptation
- Enables rapid deployment and scalability through pre-approved Authority to Operate (ATO)

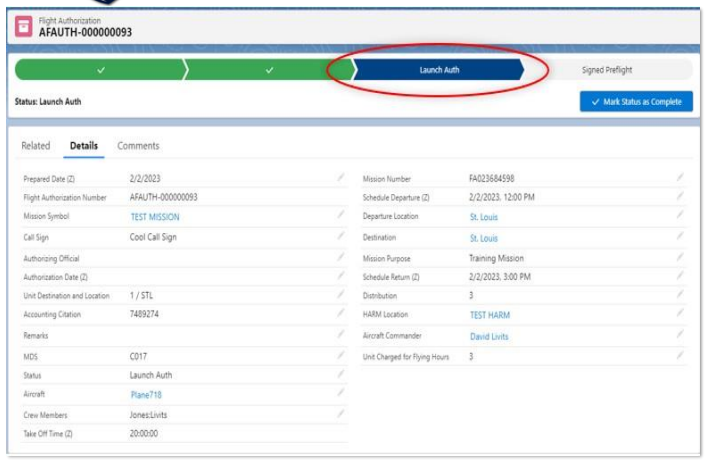


Applications and Data Collection

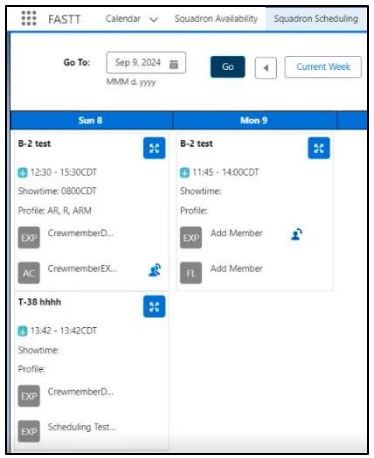
ENVISION
Transforming data-driven decisions for the USAF & USSF

1. Descriptive

ARTEMIS
AVIATION RESOURCE TOOL ENTERPRISE MISSION INFORMATION SYSTEM
ARMS Modernization Program



FASTT



ACC funded/AFGSC developed

salesforce
appexchange
TRIP PLANNING.BIZ

APOLLO
FLYING TRAINING MANAGMENT SYSTEM

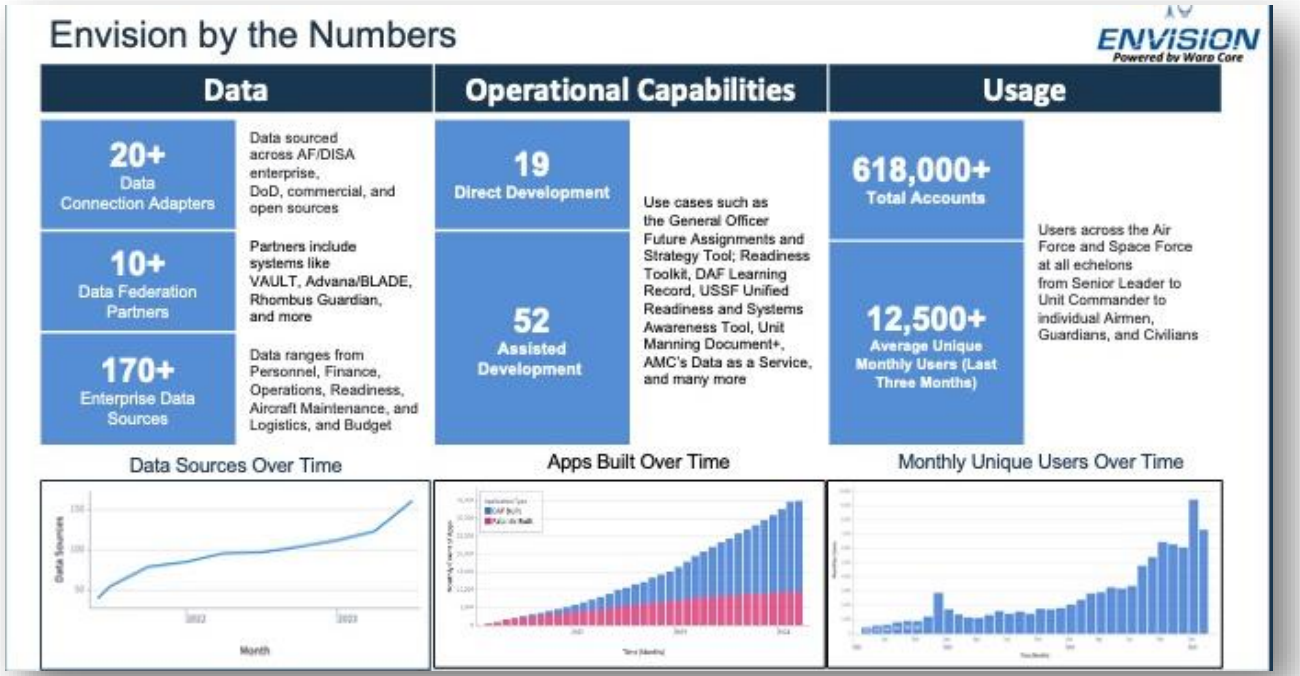
Beginning FY25

- Scheduling 2.0
- Stan/Eval
- Gradebook

Envision Connects Data Sources to Analysts

ENVISION
Transforming data-driven decisions for the USAF & USSF

1. Descriptive



Acceleration in data sources, applications built, and usage/adoption over time has accelerated information sharing and analysis across applications serving the A3 community at all echelons

Envision AFFORGEN & Readiness Lines of Effort

Unit/Wing Level

Aircrew Readiness | **Envision Readiness Toolkit**

- Aircrew Readiness tools track in unit summary views
  - Airman readiness
  - CMR status
  - FHP execution
  - other key readiness metrics.

Numbered AF/AOC Level

AFFORGEN-CERT

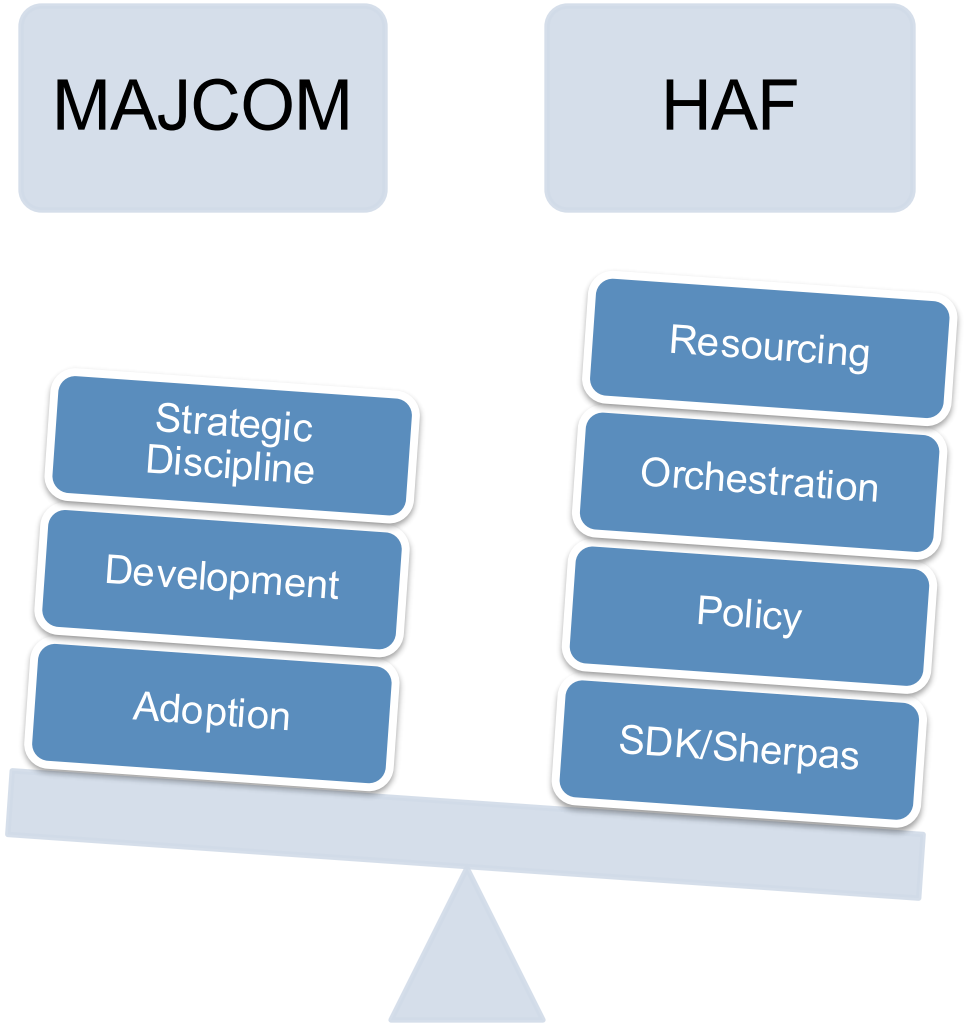
- Reduce the manhours required to build a sight picture units'
  - employment,
  - readiness, and
  - strategic initiatives status.
- Tracks metrics needed for AFFORGEN-CAF Force Element Certification
- Central data repository on top of authoritative data that enables analysts to deliver better operational insights for planning decisions

MAJCOM/HQ USAF Level

AFFORGEN-GFM

- GFM COAs that visually depict trade-offs over time in a manner consumable by the Joint Force.
- Expedite strategic decision cycles via automated data connections and calculations and decrease reliance on manual and ad-hoc RFIs.
- Increase transparency across the Joint Force and within the DAF on GFM decision-making.

Roles & Responsibilities



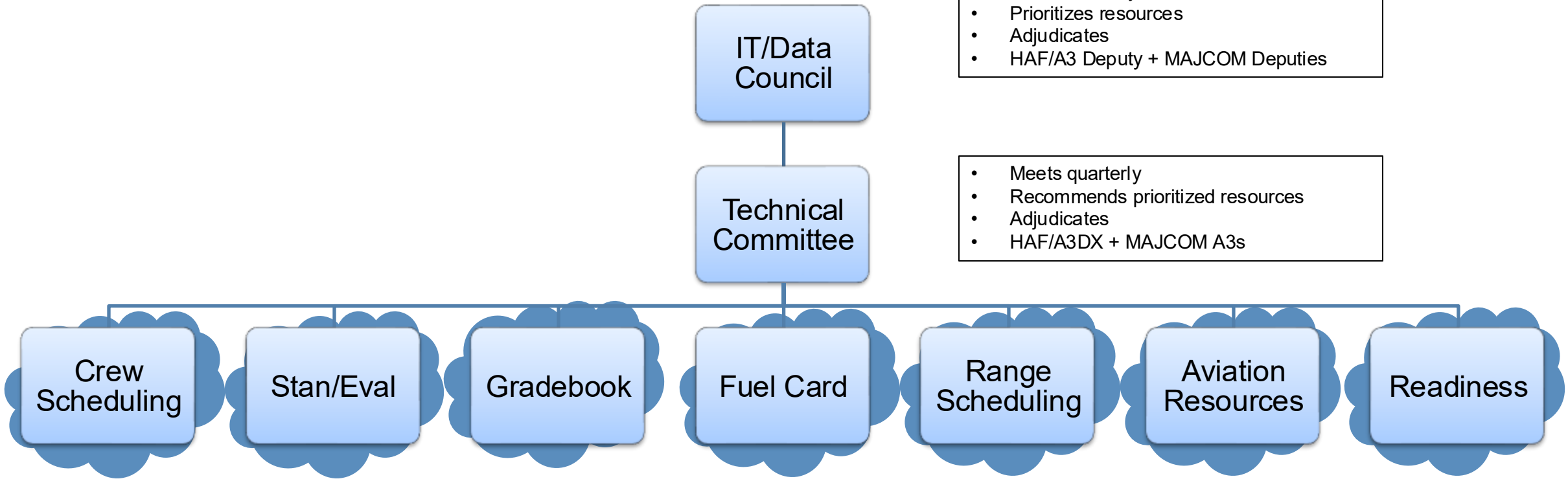
Cost Model


A3 organization
unique organization
Annual user based subscription
SOFTWARE AS A SERVICE
(SaaS)
Data & Configurations
Application Code
Scaling...
Runtime
OS
Virtualization
Hardware
ARTEMIS
ARMS Modernization Program
APOLLO
FLYING TRAINING MANAGMENT SYSTEM
FASTT
salesforce
appexchange
AIR FORCE RESERVE
AIR MOBILITY COMMAND
70,000 users
unique cost
unique data objects

What's next

- Future applications
  - Holistic Readiness – DCAPES, DRRS, CSAF Reporting
  - Adaptations of core Apollo
- OpOrd release at Aircrew Sumit 2024
- MAJCOM
  - Stay the course on your existing applications
  - Carefully consider outyear plans
  - Strategic discipline
- HAF
  - Orchestrate
  - Foster a Pathway of Innovation
  - Resource

Governance



- Meets annually
- Prioritizes resources
- Adjudicates
- HAF/A3 Deputy + MAJCOM Deputies

- Meets quarterly
- Recommends prioritized resources
- Adjudicates
- HAF/A3DX + MAJCOM A3s

- Meets as needed
- Crowd sourced based on interest
- Prioritizes resources
- Adjudicates
- Community of Practice Lead
- Open to anyone/any COMMAND

Training & Adoption

AFFORGEN CERT
homepage

Envision

Announcements

...

User Support

Open User's Guide
...
...

Applications

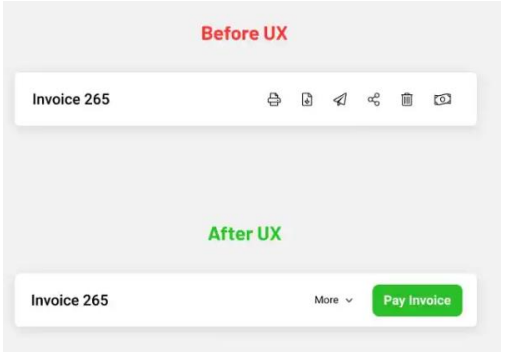
...

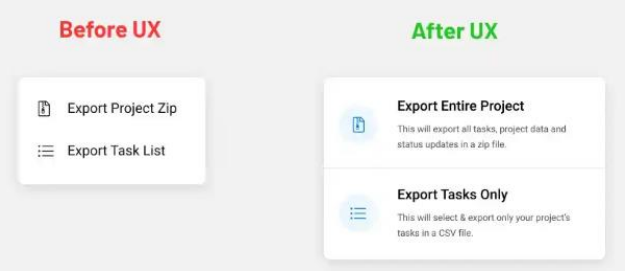
View Video Tutorials

CONTENT ON SIPR

Open up hub of embedded videos

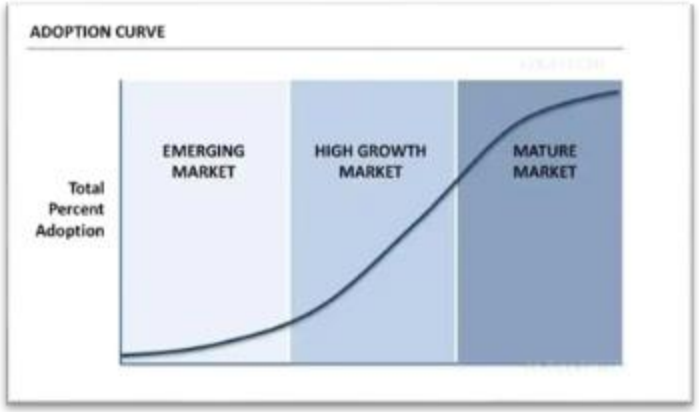
Open User Guide from left hand side of home screen

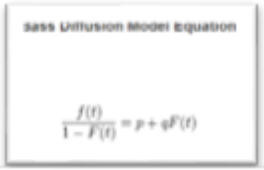


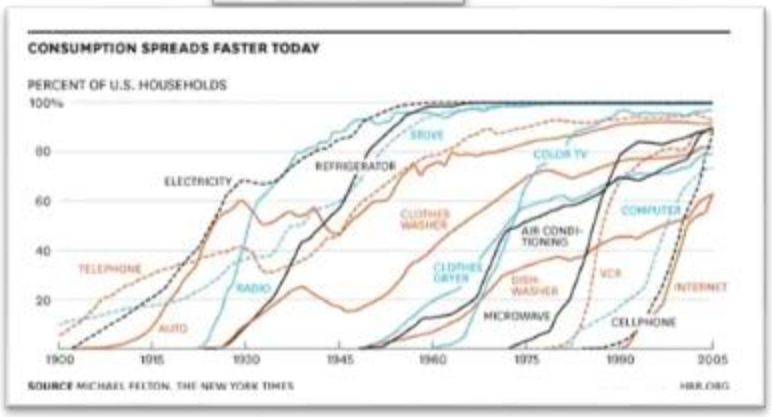


Its not a training issue, it's a design issue

Are we achieving Network Effect/Adoption?







- Adoption curves are predictable
- Based on Bass Diffusion Model Equation
- We are following, predictable pattern, there is no question we can predict our adoption

QUESTIONS?

Back-Up Slides

Envision AFFORGEN & Readiness Lines of Effort

Aircrew Readiness LOE & Envision Readiness Toolkit Rollout

HAF/A3T & MAJCOM A3s

- Built in partnership with HAF/A3T, 1FW, 2BW, and 27SOW, Aircrew Readiness tools in Envision track Airman readiness, CMR status, FHP execution, and other key readiness metrics in unit summary views.
- Envision provides a comprehensive data implementation layer for the A3 organization.

AFFORGEN-CAF LOE

15AF

- Enable 15 AF CC and stakeholders to maintain situational awareness and make timely decisions based on current and accurate information.
- Reduce the manhours required to build a sight picture of 15 AF and subordinate units' employment, readiness, and status of strategic initiatives.
- Increase trust in the accuracy of the AFFORGEN-CAF Model and tracking metrics needed for AFFORGEN-CAF Force Element Certification.

JFACC Readiness Pathfinder

USAFE, 603 AOC

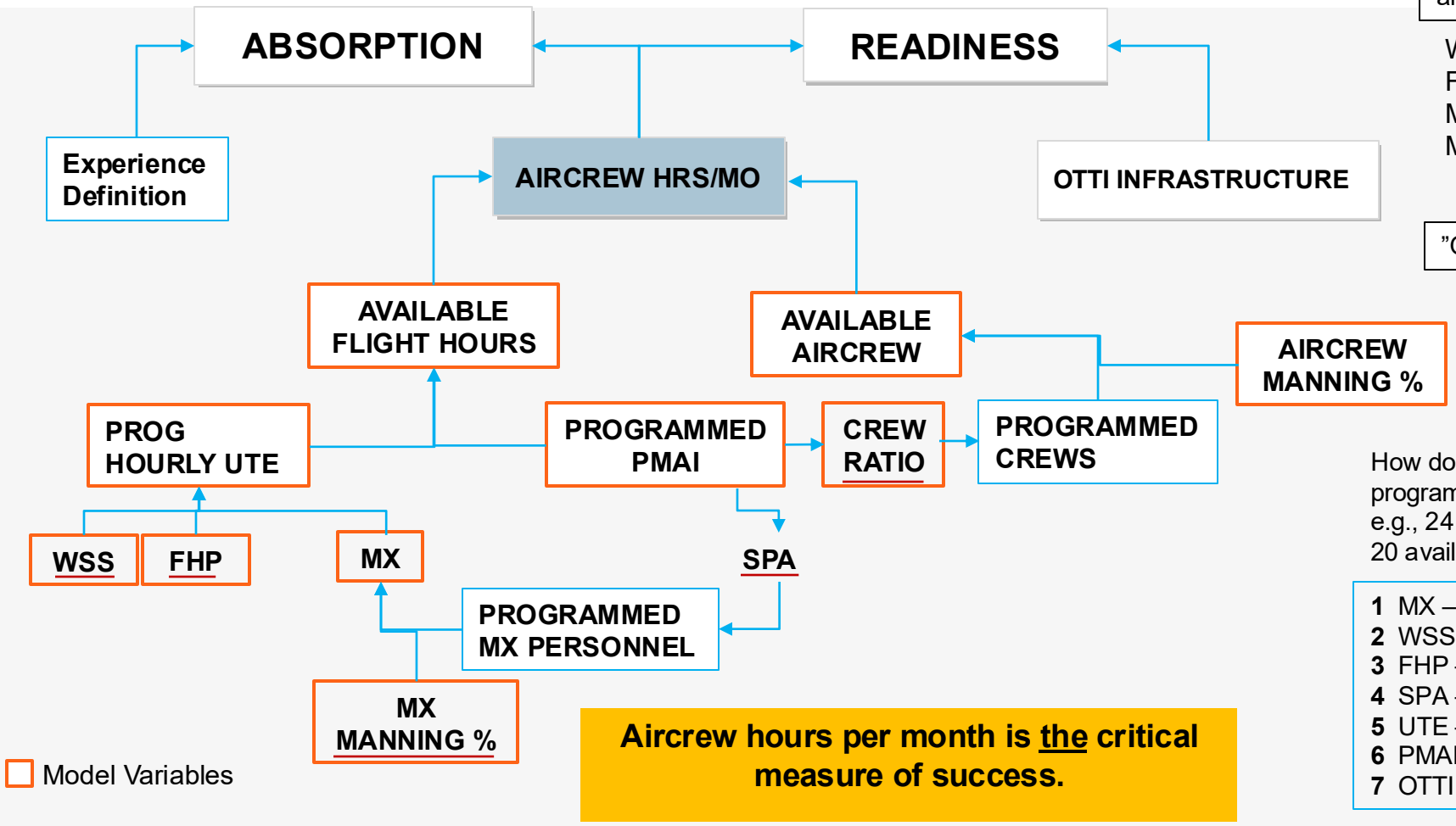
- Deliver O&I briefing capabilities on personnel and communications, and beginning to integrate logistics and operations to provide better situational awareness of command and control–relevant factors for USAFE-AFAFRICA leadership.
- Develop a central data repository on top of authoritative data that enables analysts to deliver better operational insights for planning decisions across two large theaters (Africa and Europe), reducing manhours and reliance on manual processes.

AFFORGEN GFM LOE

HAF/A3 & A3O

- Enable the A3 staff to develop GFM COAs that visually depict trade-offs over time in a manner consumable by the Joint Force.
- Expedite strategic decision cycles via automated data connections and calculations and decrease reliance on manual and ad-hoc RFIs.
- Increase transparency across the Joint Force and within the DAF on GFM decision-making.

Modeling the Readiness Enterprise



Aircrew hours per month is the critical measure of success.

"Inside the Ops Unit" variables affecting both aircrew absorption and inside the FYDP readiness:

- WSS $
- FHP $
- MX SPA
- MX MANNING
- TAI CODING / AVAILABILITY
- CREW RATIO
- AIRCREW MANNING

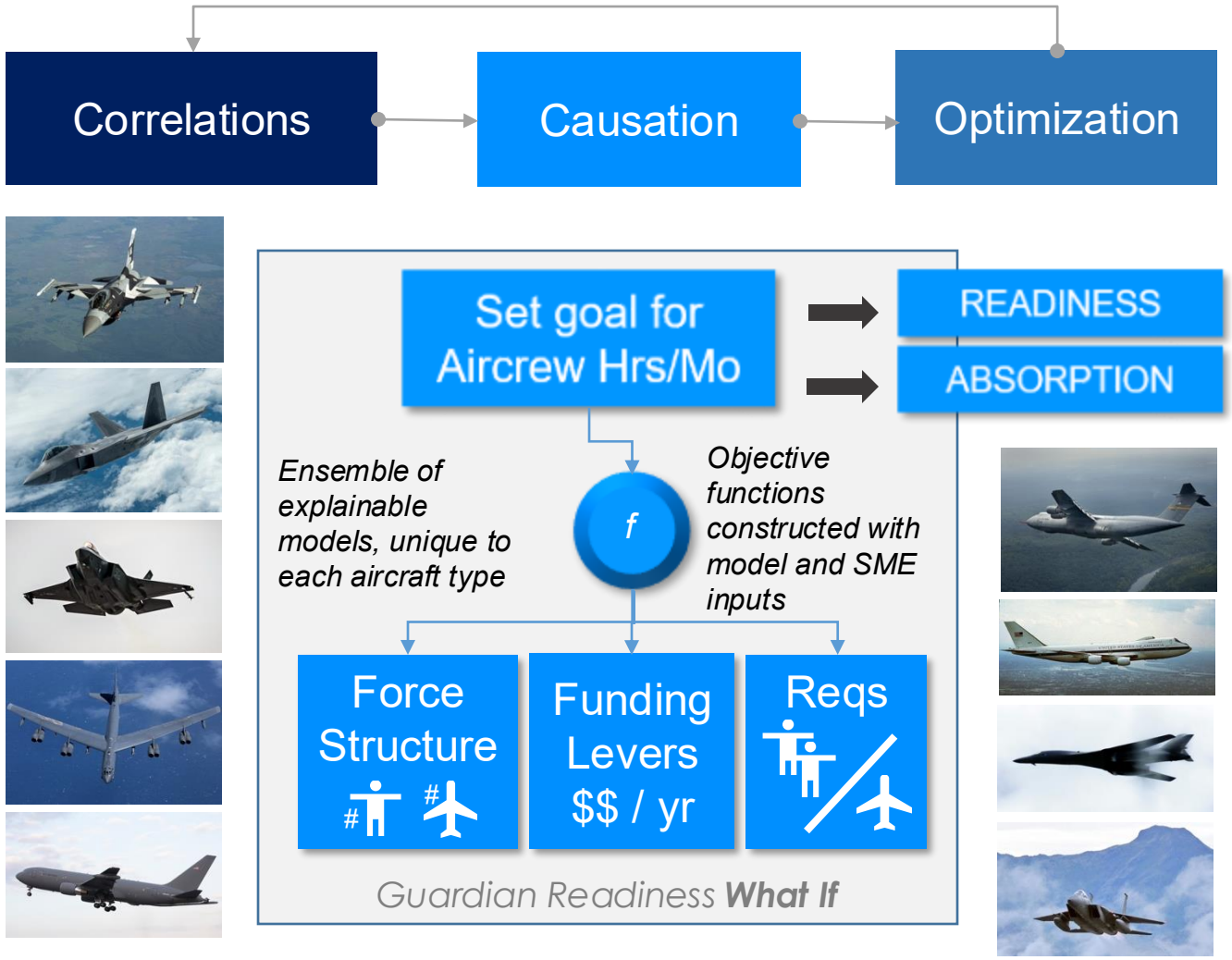
"Outside the Model"... For now… More to do…

- RETENTION RATES
- RATED STAFF ALLOCATION
- PRODUCTION PIPELINE FLOW RATES

How do we model mismatches between programmed TAI and de facto TAI?
e.g., 24 TAI / 2 BAI unit with 6 A/C in depot / mod…
20 avail

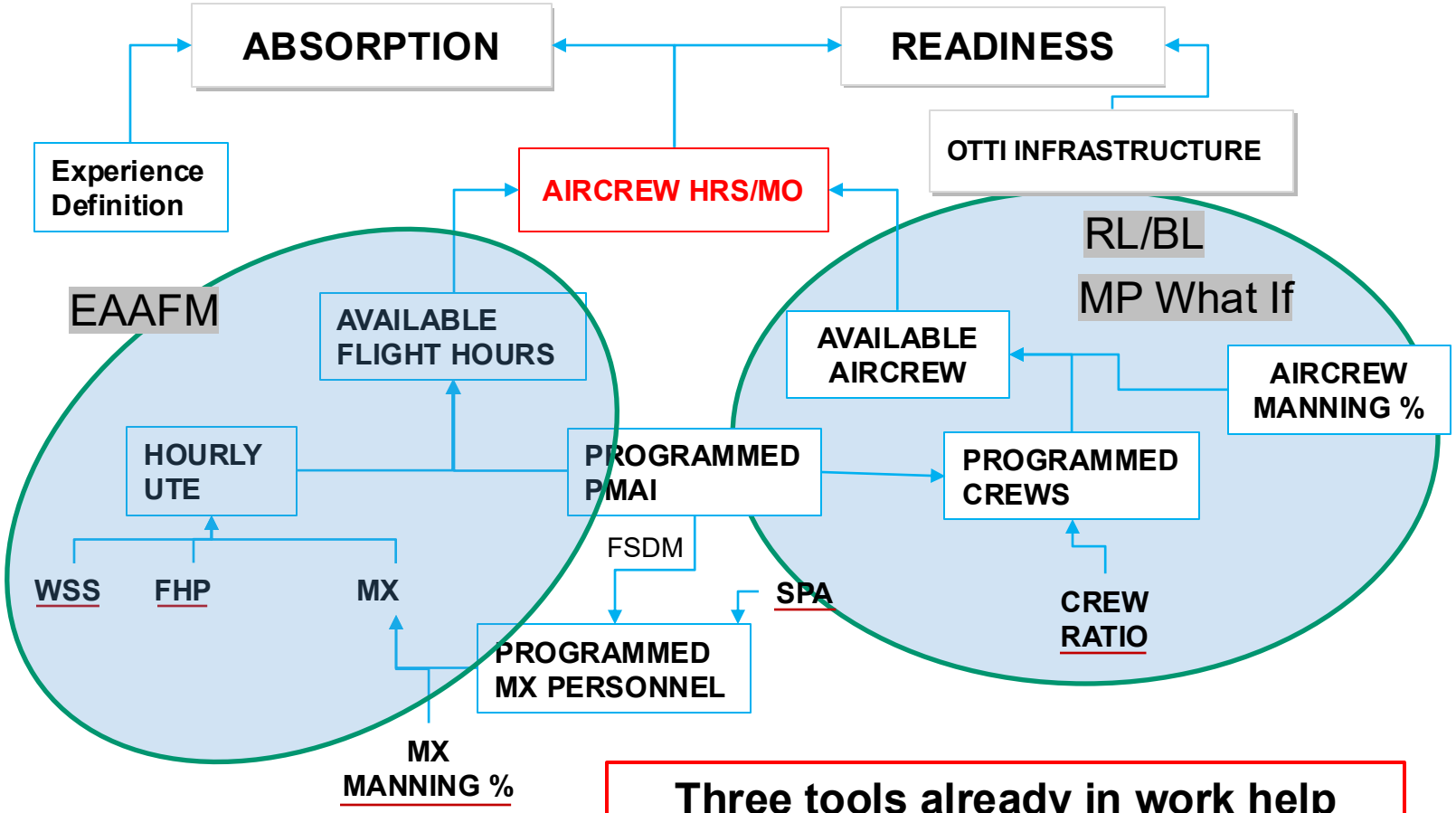
1. MX – Maintenance
2. WSS – Weapons Systems Sustainment
3. FHP – Flying Hour Program
4. SPA –
5. UTE – Utilization Rate
6. PMAI – Primary Mission Aircraft Inventory
7. OTTI – Operational Training and Test Infrastructure

How Do We Increase Aircrew Hours/Month?



- Executed flying hours per aircrew is a ***key measure***
- quick & reliable "what-if" excursions to determine optimal investment profiles, across time and cost centers, in a resource-constrained environment.
- Tool enables optimization that maximizes desired outcomes and provides predictions on potential higher order effects.

Factors Affecting Aircrew Hours Per Month



Three tools already in work help inform both the MX and Pilot side of the equation

Enterprise Aircraft Availability Forecasting Model (EAAFM)

- Inputs – POM, CAFDEx, PBES, LIMS-EV, FSDM, etc.
- Output – AA insights sensitive to changes in resource variables

ACTF (RL/BL)

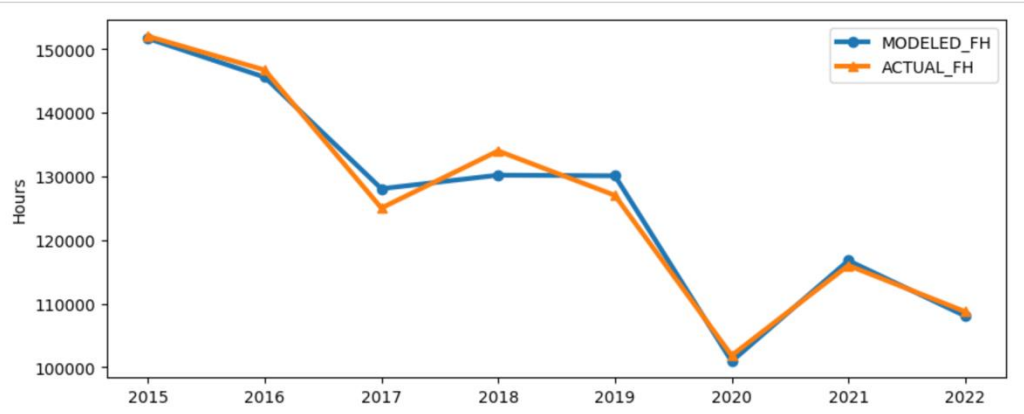
- Inputs – MPES, MilPDS, etc.
- Output – Near instant updates to RL/BL display, added Purple Line "What If" incorporating force structure and/or pilot ratio changes

MP What If

- Inputs – PAI/FY, UMD, Manning Equations
- Output – MP required and costs associated

Model Fit & Assumptions

- Models are run with all possible combinations of input variables
- Causality is preserved by introducing expected change in input---> output behavior
- Linear model provides an easy way to understand path for sensitivity analysis and variable interaction
  - Informs non-linear modeling assumptions and configuration
- Co-linearity is considered between variables



Best Fit from Model Iterations considering all combination of variables

MODEL	R2	WSS	FHP	PAI	MC (H)	MX_MANNING	AIRCREW_MANNING
WSS+FHP+PAI+MC (H)+MX_MANNING+AIRCREW_MANNING	0.980000	0.230000	-0.200000	0.330000	0.850000	1.040000	-1.000000
FHP+PAI+MC (H)+MX_MANNING+AIRCREW_MANNING	0.980000	nan	-0.050000	0.270000	0.760000	0.840000	-0.680000
WSS+PAI+MC (H)+MX_MANNING+AIRCREW_MANNING	0.980000	-0.070000	nan	0.250000	0.730000	0.780000	-0.590000
PAI+MC (H)+MX_MANNING+AIRCREW_MANNING	0.980000	nan	nan	0.250000	0.730000	0.840000	-0.690000
WSS+FHP+PAI+MC (H)+MX_MANNING	0.980000	-0.460000	0.240000	0.180000	0.580000	0.420000	nan
WSS+FHP+MC (H)+MX_MANNING+AIRCREW_MANNING	0.980000	-0.510000	0.300000	nan	0.600000	0.470000	-0.110000
WSS+FHP+MC (H)+MX_MANNING	0.980000	-0.570000	0.340000	nan	0.570000	0.400000	nan
WSS+FHP+PAI+MC (H)+AIRCREW_MANNING	0.980000	-0.920000	0.530000	0.080000	0.380000	nan	0.650000
WSS+FHP+MC (H)+AIRCREW_MANNING	0.980000	-0.960000	0.570000	nan	0.390000	nan	0.650000
WSS+MC (H)+MX_MANNING+AIRCREW_MANNING	0.980000	-0.050000	nan	nan	0.830000	0.930000	-0.860000
FHP+MC (H)+MX_MANNING+AIRCREW_MANNING	0.980000	nan	-0.000000	nan	0.830000	0.980000	-0.940000
MC (H)+MX_MANNING+AIRCREW_MANNING	0.980000	nan	nan	nan	0.830000	0.980000	-0.940000
WSS+PAI+MC (H)+MX_MANNING	0.970000	-0.300000	nan	0.440000	0.680000	0.440000	nan
WSS+FHP+PAI+MX_MANNING+AIRCREW_MANNING	0.960000	-1.610000	1.020000	-0.070000	nan	-0.630000	1.620000
WSS+FHP+MX_MANNING+AIRCREW_MANNING	0.960000	-1.540000	0.980000	nan	nan	-0.600000	1.580000
FHP+PAI+MC (H)+MX_MANNING	0.950000	nan	-0.090000	0.790000	0.650000	0.460000	nan
PAI+MC (H)+MX_MANNING	0.940000	nan	nan	0.760000	0.590000	0.460000	nan
WSS+FHP+PAI+AIRCREW_MANNING	0.940000	-0.880000	0.700000	0.100000	nan	nan	0.500000
WSS+FHP+AIRCREW_MANNING	0.940000	-0.940000	0.750000	nan	nan	nan	0.500000
WSS+MC (H)+MX_MANNING	0.940000	-0.560000	nan	nan	0.870000	0.420000	nan
WSS+PAI+MC (H)+AIRCREW_MANNING	0.930000	-0.540000	nan	0.590000	0.530000	nan	0.570000
WSS+FHP+PAI+MX_MANNING	0.920000	-0.560000	0.540000	0.130000	nan	0.220000	nan
WSS+FHP+MX_MANNING	0.920000	-0.640000	0.610000	nan	nan	0.210000	nan
WSS+FHP+PAI+MC (H)	0.890000	-0.590000	0.390000	-0.050000	0.170000	nan	nan

Revitalizing arms to Artemis

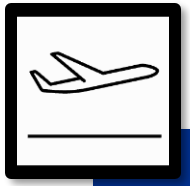
The ARMS legacy system is overwhelmingly manual, disparate, and inefficient.

Your input is vital to ensure this effort is developed, tested, and validated by real Airmen… making it truly field-owned.

ARTEMIS will eventually provide improvements to reinvent the system, maximize operational effectiveness, and eliminate the long-winded investigation process.

SMALL GROUP TRY OUT (SGTO) FEEDBACK

14th Airlift Squadron at Joint Base Charleston from 6 – 10 March 2023

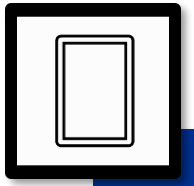


FTP

- Complete **ARMS 1:1 rebuild**
- **Model Puckboard visual –** training hour comparisons
  - ***Expected*** *vs* ***Actual*** *hours flown*
- **Data Visualization –** all activities *completed* and *pending* for X Airman

DESKTOP

- **Adjust approval process** – ability to *recall* / *accept* / *deny* within a FA
- **Open security model** – SARM, Launch Officials, and Aircrew can edit FA at anytime



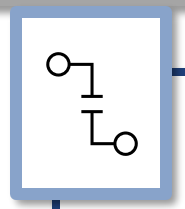
TABLET

- **Model Puckboard visual** – grid-like view
- **Aircraft Commander (AC) override** – aircrew member can make themselves AC
- **Offline capabilities**

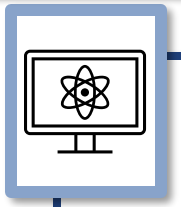
**__Puckboard__ is a data-powered software application to plan aircrew qualification flights automatically, which allows schedulers to match ACs, pilots, and loadmasters with available flights to complete currency requirements.*

HOW WILL THIS CHANGE AFFECT AIRMEN?

With ARTEMIS, the 1Charlie and Aircrew community will benefit from…



Reduce data disparity amongst a multitude of systems

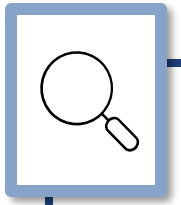


Streamline daily taskers into one comprehensive source of truth

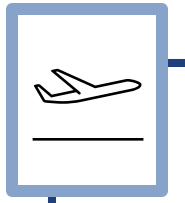
Ability to own and easily access career data

Automate manual processes and procedures

****paper binder***



Eliminate the backwards process of investigation and remediation



Accessibility of use mid-mission

****future state***

What ARTEMIS will <u>not</u> replace is the human element