

# *Communications Dashboard*

*(Control Rooms, Take a Cue from Facebook!),*

*Chapter 1*

2013 IEEE Aerospace  
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David W. Scott (Scotty)  
NASA – MSFC EO50  
scotty@nasa.gov  
256-544-3226

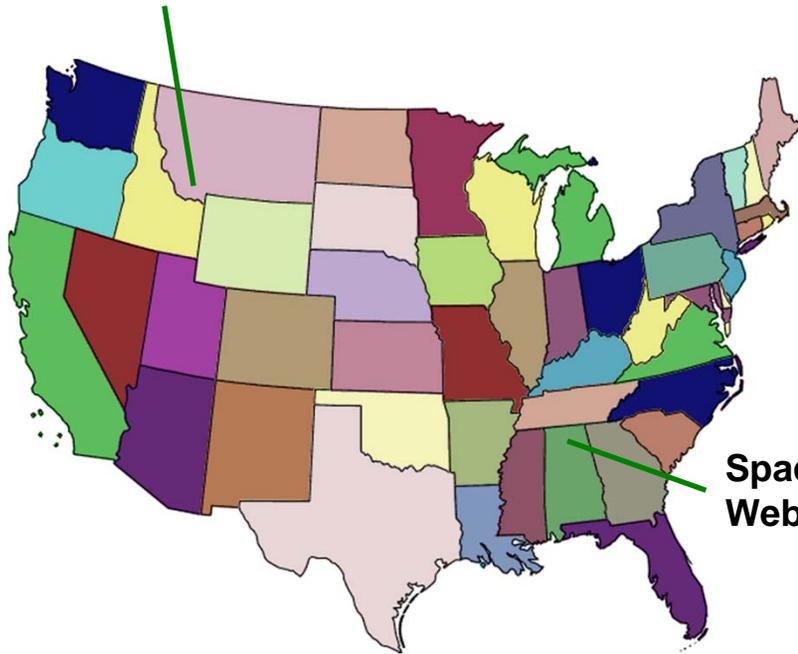
*Communications  
Dashboard*



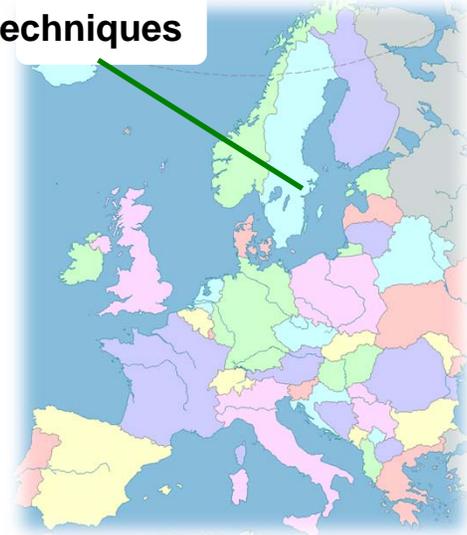
# History – A Paper Trail

**SpaceOps 2012 - Simplify ISS Flight Controller Communications and Log Keeping via Social Tools and Techniques**

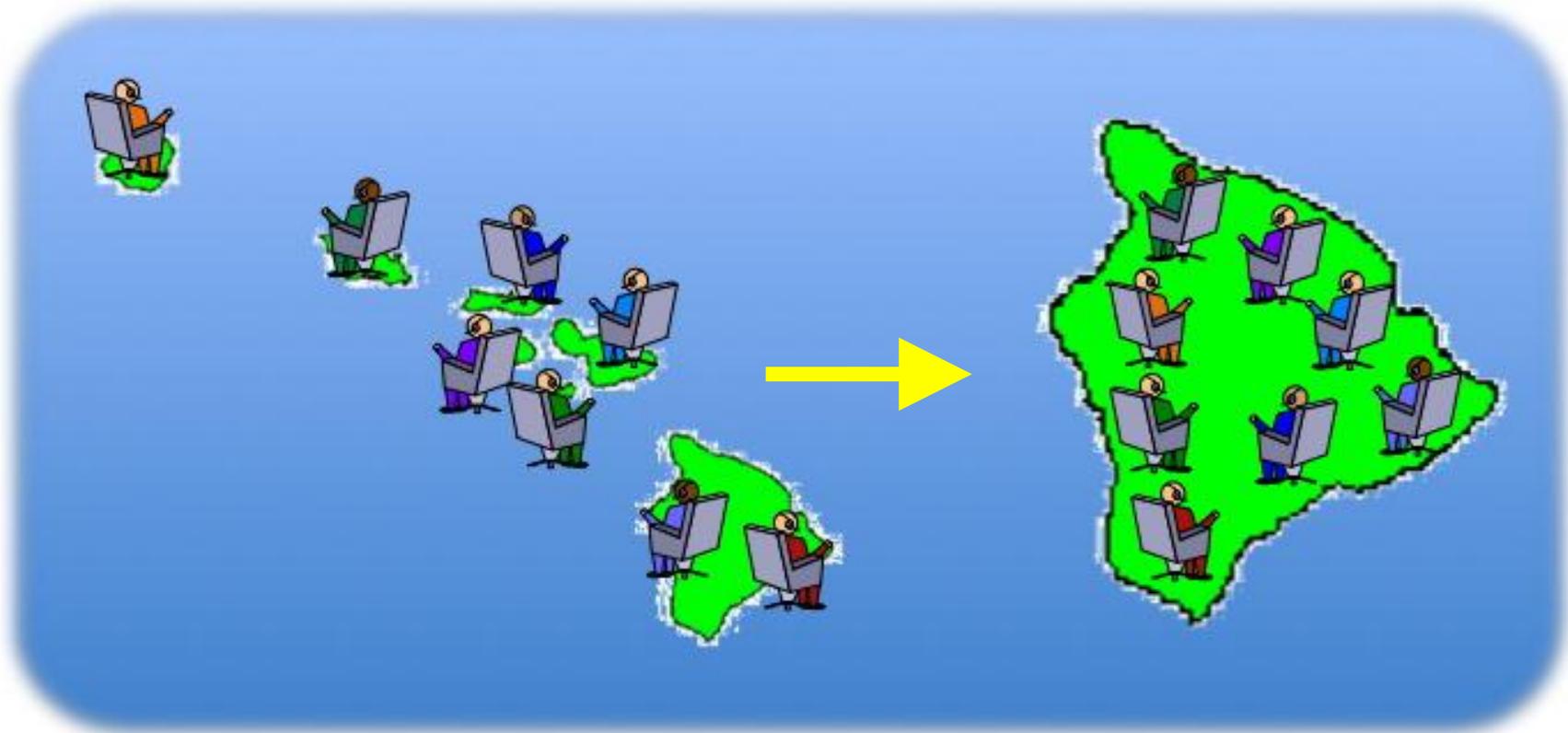
**2011 IEEE - Using Social Media for Engineering Support and Space Flight Operations Control**



**SpaceOps 2010 –  
Web 2.0 for Space Flight Control Centers**



# Excerpts from: Simplify ISS Flight Controller Communications and Log Keeping via Social Tools and Techniques



Hugh Cowart, MSFC/TBE  
Hugh.S.Cowart@nasa.gov



David Scott, MSFC/NASA  
scotty@nasa.gov



Dan Stevens, JSC/USA  
Daniel.J.Stevens@nasa.gov

# History of Console and Log Layouts (Abridged)



1960s



1980s



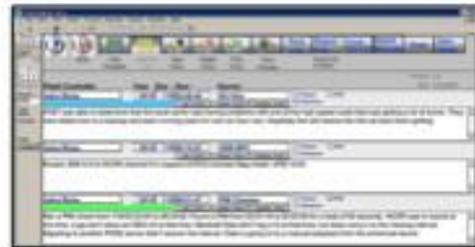
1990s



1960s – 1990s



2011

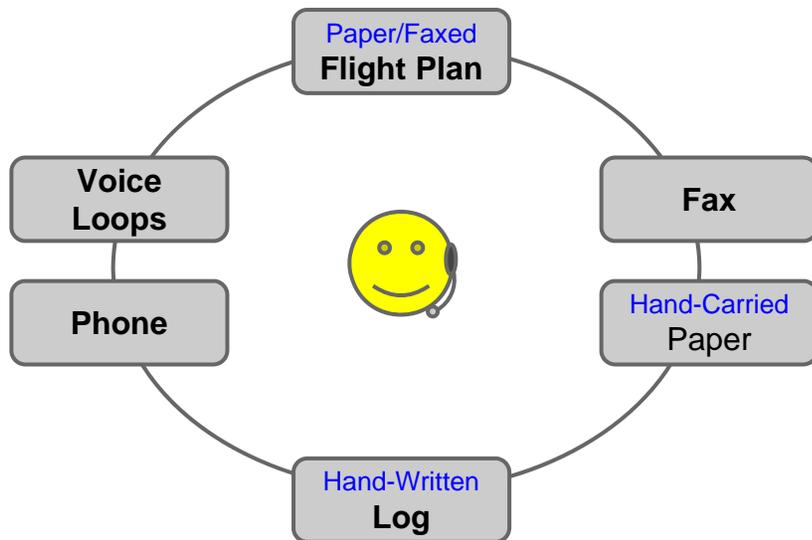


2000s



# NASA Flight Control Room Communications

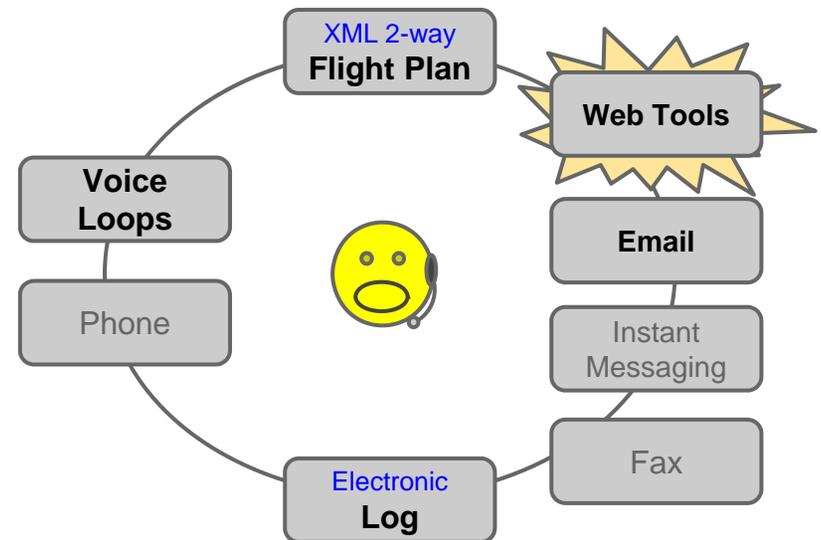
(Telemetry not included, remote site interfaces implied but not shown)



1960s to 2000

Most manned flight operations days to weeks

Agency Front Room Interfaces



2011

24/7 manned flight operations

Agency Front Room Interfaces



Explosion of activities, data, web tools and comm paths

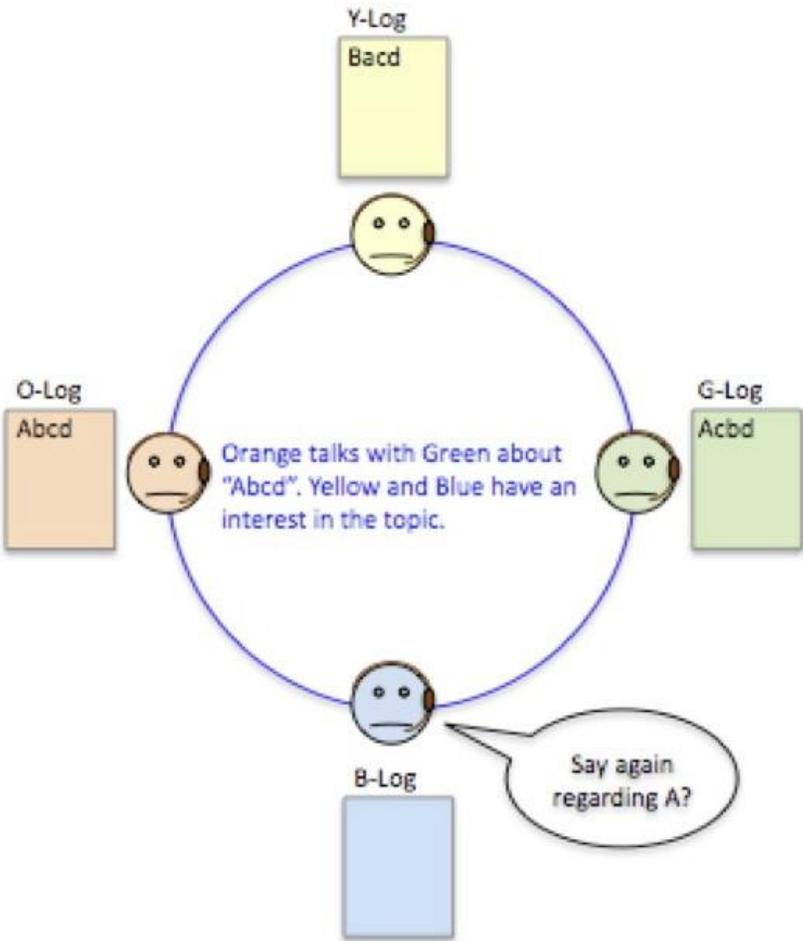


**For 50 years  
we've unified information in our heads  
or via manual integration.**

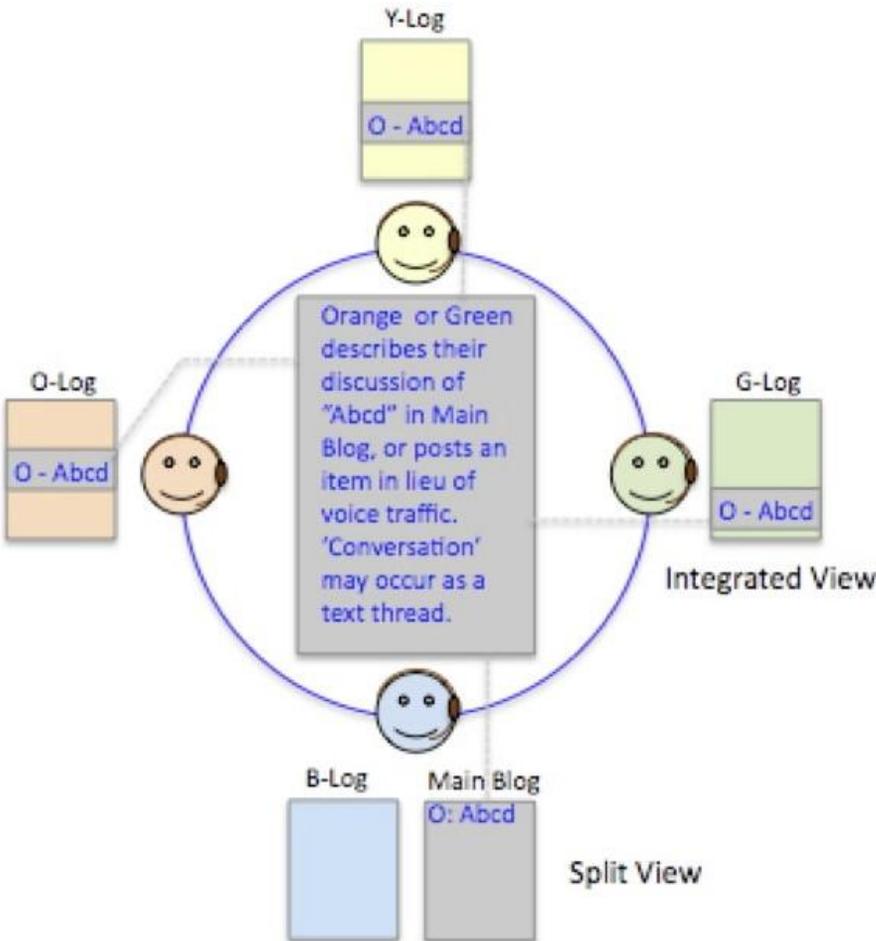
**Why not be nice to our heads with  
tools that integrate information intrinsically?**



# Isolation -> Divergence

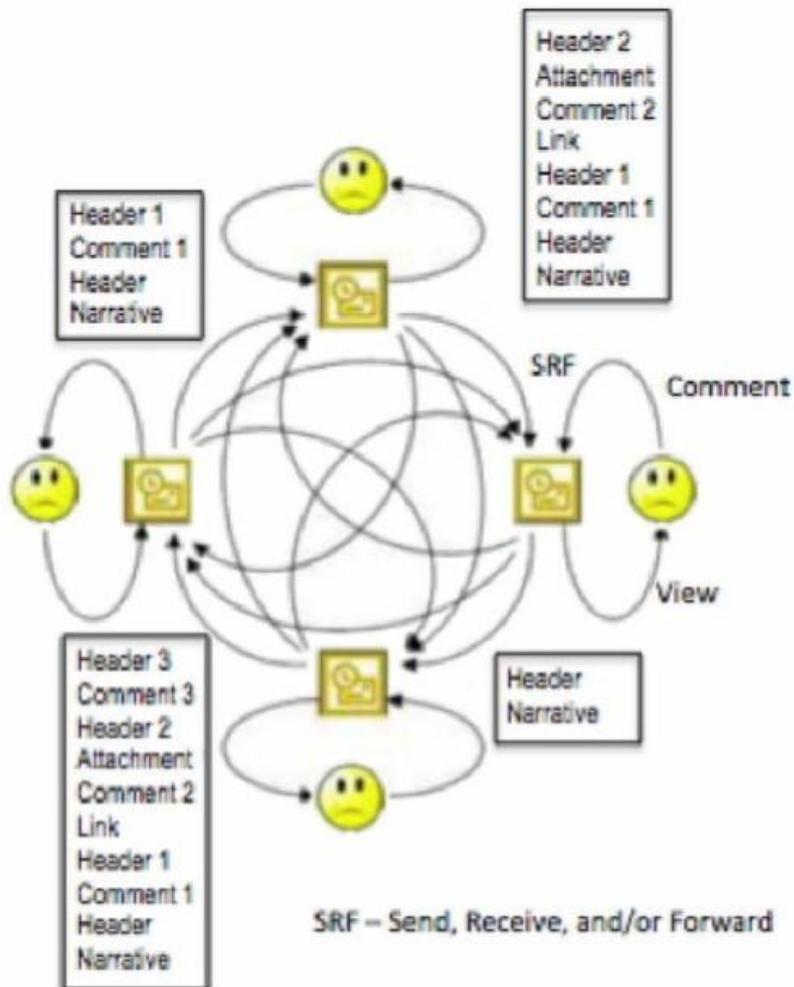


# Interleaving -> Sync

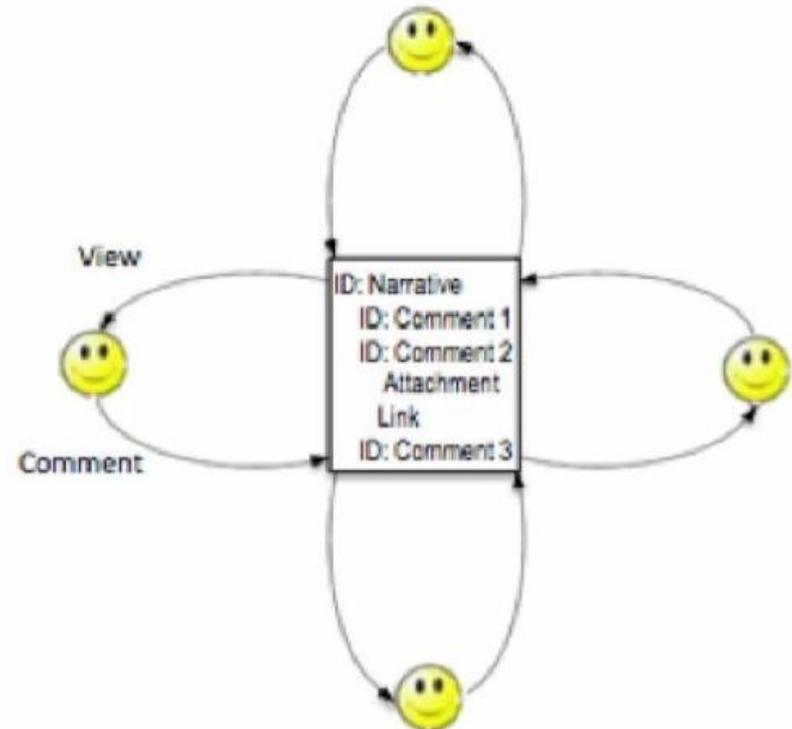


**Discover and resolve overlaps and underlaps while they're small!**

## Lost in headers



## Cut the clutter



Emoticon-and-squiggle patterns courtesy of Kevin Jones/MITS-MSFC IS30

**Having a single instance of a conversation provides natural focus on "the right stuff."**

**Communication tools that cut to  
(and preserve a record of)  
the chase!**

# POIC's Console Log Tool – CoLT

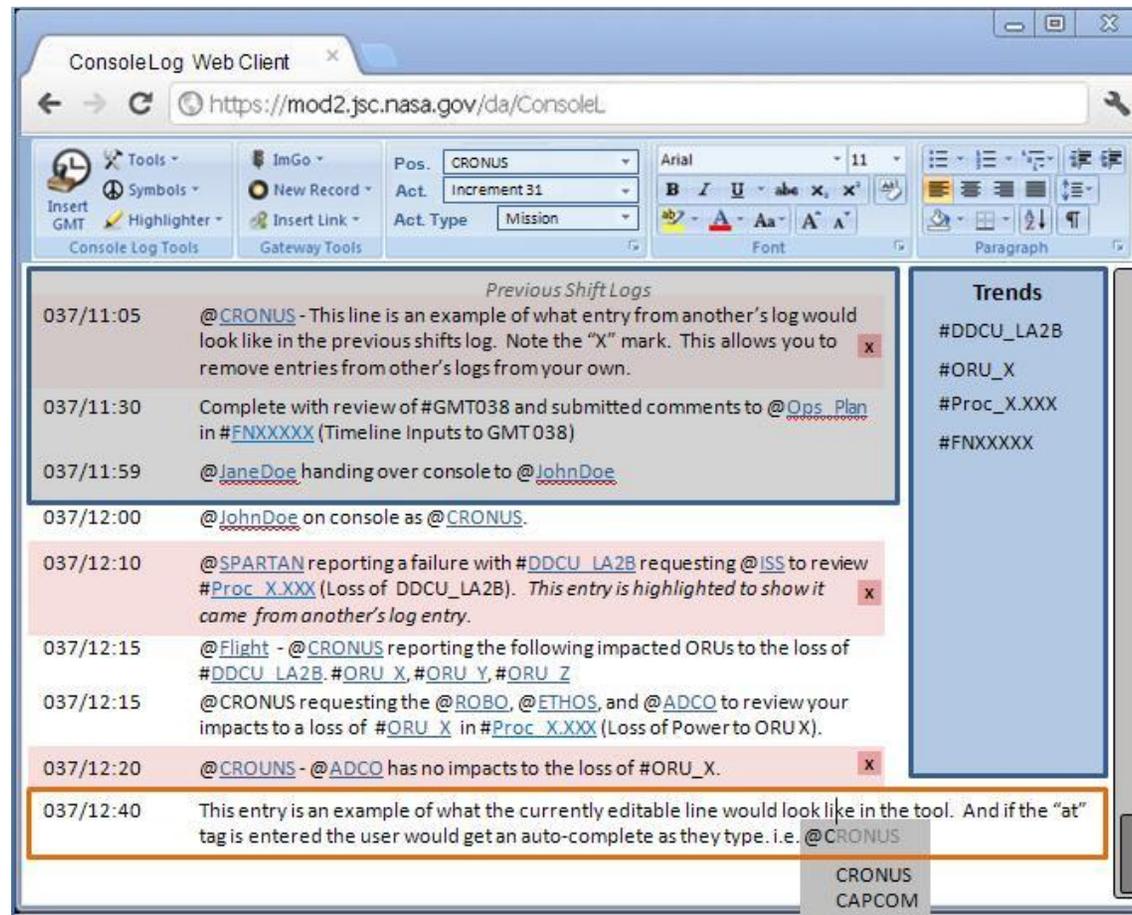
Log / Entry:	Title:
Cadre Inputs Log / 663578	Primary Log entry
GMT: 2012/116:21:02:07	Shows this entry as being in a primary log with the following entry in a secondary log with entries interleaved in chronological order
Local Time: 2012/116 15:02:10	
Author: Cowart, Hugh	
Category:	
Flags:	
Future Event Time:	
Payload:	
Log / Entry: DMC Prep / 663576	Flagged Entry, In this case defined as an item to go in a team weekly report. E-mail is sent to a designated team lead. Category is about a common topic for our team, Future Time is also filled in as the information may pertain to a 'go live date' in the future for a piece of on orbit equipment
Author: Cowart, Hugh	
Category: ODAR	
Created Time: 2012/116 20:46:35	
Flags: Weekly Input - Important	
Future Event Time: 2012/165 00:00:00	
HOSC Time: 2012/116:20:46:32	
Local Time: 2012/116 14:46:35	

Web-based log provides “anywhere” access and ability to interleave entries from multiple logs

Communications integration (Notifications, Comments, Reports, Subscriptions, Future Events) streamlines information flow among team members

Direct back room participation in log decreases reliance on email (and its chains)

# Social Console Log (Concept)



Provides simple but powerful tools for sharing and organizing information

Trend information is useful both in real time and during post event analysis

Auto-complete function keeps consistent target and subject information readily accessible

# Console Communications Dashboard (Concept)

Hailing		To Fr Where	
POD			
OC1			
OC2	● OC Loop		
DMC			
PRO1			
PRO2			
LIS			
STOW			
PPM			
POM			

Day/Time	Loop	Entry
201/1510	POD	POD asked PSE and I to work ABC. Took conversation to PAYCOM chat.
201//1513	S/G2, POD	ISS CDR called: Payload XYZ output temp 45C, should be 42. Confirmed we see same in telemetry. GO to perform MAL procedure 4.002
201/1525	201/1525	Advised POD re: ABC, recommend DEF because of GHI. POD will check with FLIGHT and get back to us. <a href="#">PAYCOM Chat details</a>

Chat: Title of Specific Conversation (Distribution)
025/1432 OC: (From other conversation)
025/1512 PAYCOM:: I think ABC is happening because ... (Interrupted by flight crew call-down)
025/1513 PSE: (While PAYCOM is working crew call) Checked document such-and-so ... (Details, details)
025/1522 PAYCOM: OK, we suggest DEF because of GHI. I'll go to POD.

Status Panel	
Ku Until	S Until
AOS ● 15:43	○
LOS ○	● 15:38
Countdown	
DPC ○ 2:15:20	
AFD ○ 7:13:32	

Unified interface for multiple communication tools

Text chat complements/augments voice loop discussions

Opportunity to significantly improve voice loop management

# Takeaway from “Simplify Ops Comm & Log Keeping”

## Presentation and Storage

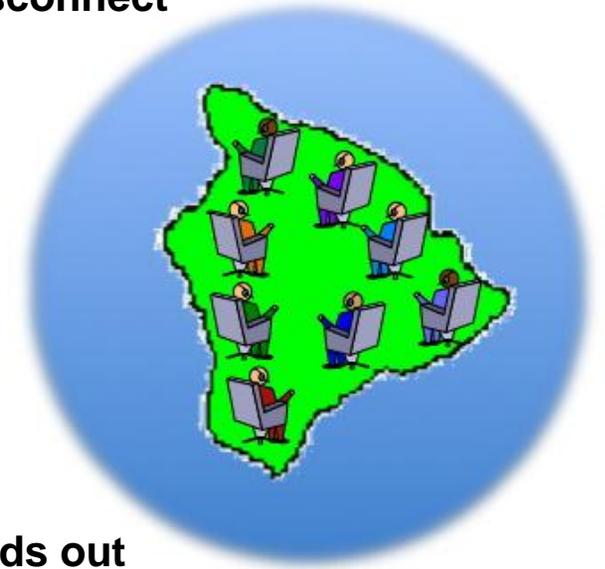
Same instance viewed by multiple parties -> even better sync  
Represented in fewer places -> fewer opportunities for disconnect  
Discoverable when needed, invisible when not

## Text conversations within logs or as linked adjuncts

Excellent retention, organization and visual persistence  
Relieve load on voice loops

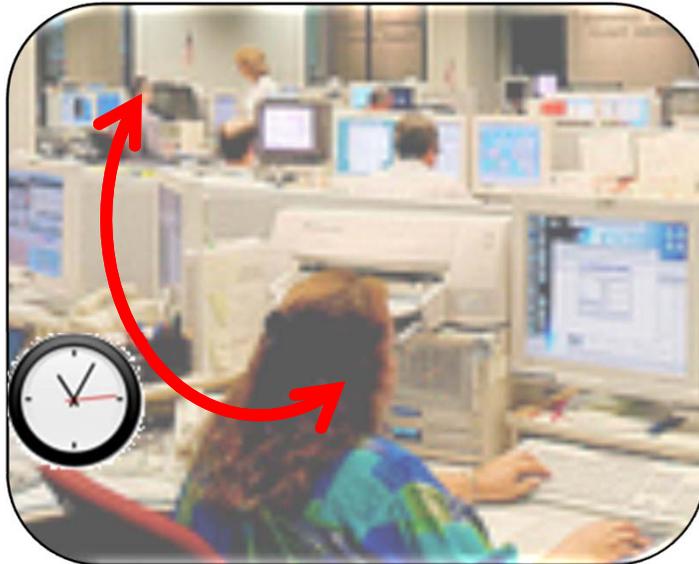
## Voice communication

Less "clobbering" and talk-over -> important content stands out clearly



# A Critical Concept

Voice

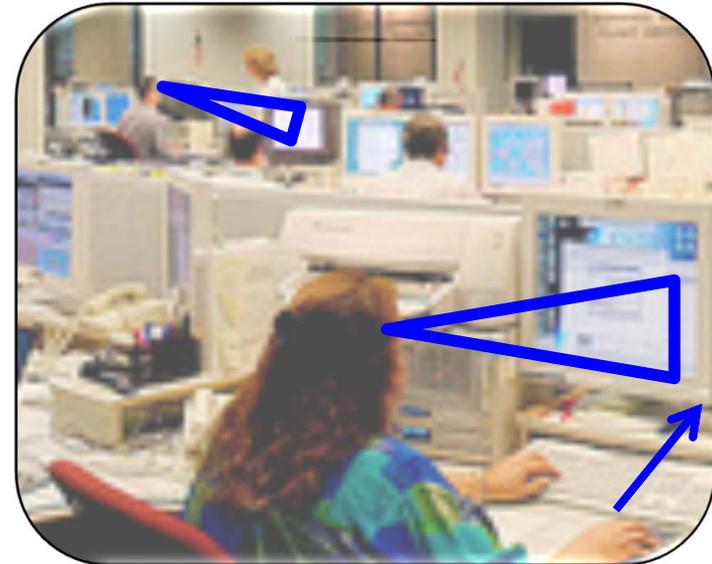


Serial

Fluid and quick  
Expressive and humanizing

Fleeting – “Say again?”

Text/Graphics



Semi-Parallel / Parallel

Visually persistent  
Easy to review; linkable

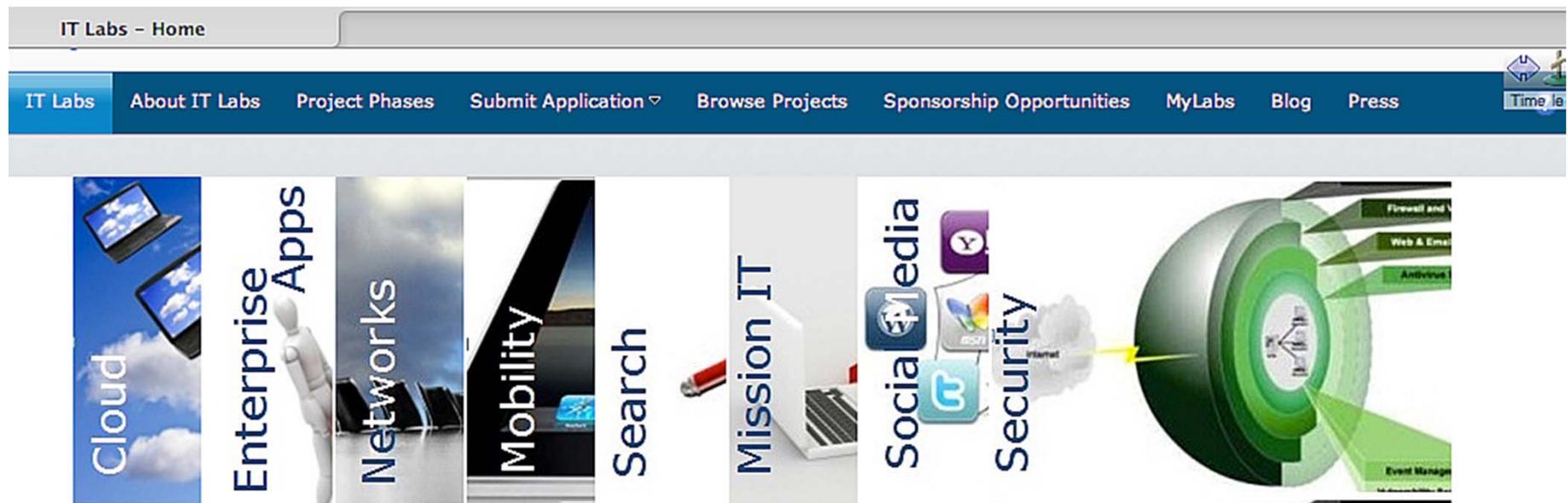
Slower to create than voice

# NASA IT Labs

HQ activity sponsoring small, innovative IT projects

Good place to shop for ideas, developers, and sponsorship

<https://labs.nasa.gov> (need to be inside NASA firewall)



**EXPLORE.COMMENT.ENGAGE.LEARN.EDUCATE.CREATE.CONSTRUCT.PIONEER.SHARE.CONNECT.**

**IT Labs** is the Technology and Innovation Division of NASA's CTO-IT in the Office of the Chief Information Officer (OCIO). We are committed to empowering NASA's scientists and engineers with the most innovative information technology in the world.

The annual **IT Labs Project Call** for FY 2013 is **4 February - 21 March**. Preview the **Project Call Timeline** and prepare your innovative ideas to meet the **Project Proposal Evaluation Criteria**.

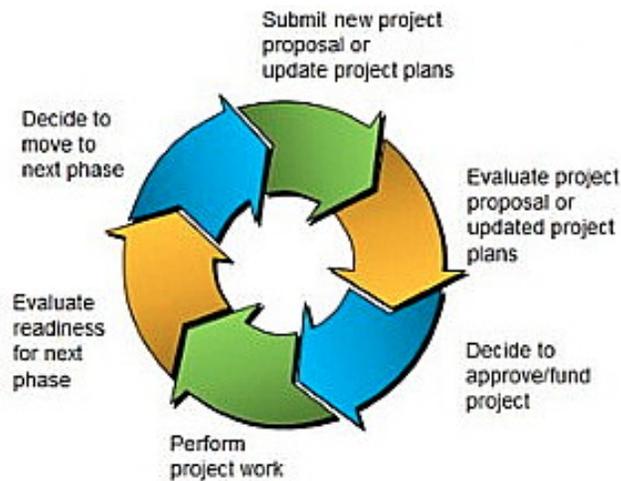


Annual Report  
2011 - 2012

# IT Labs Project Phases

Each Phase typically 90-120 days, <\$30K

Annual call for new projects Feb-Jun



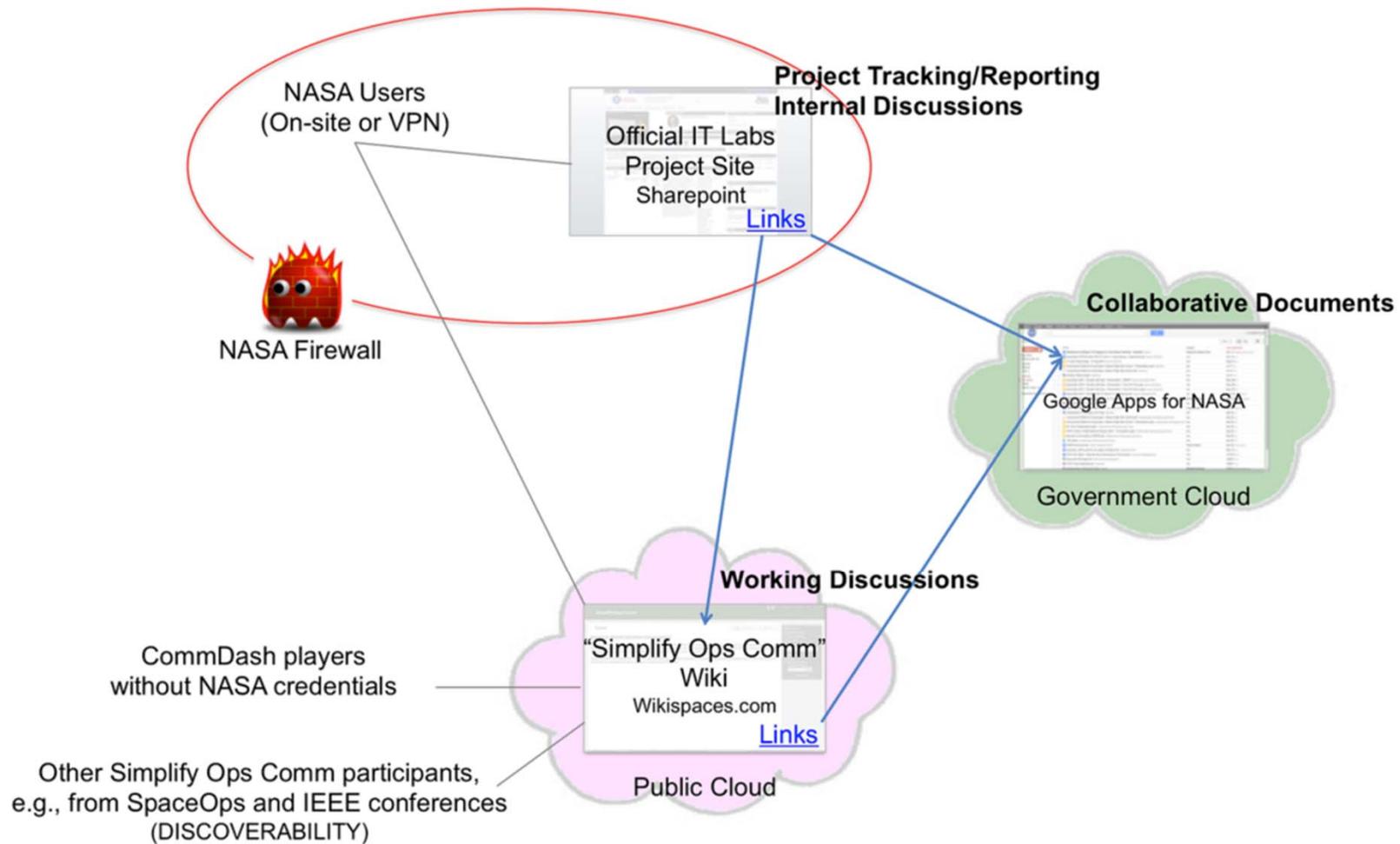
**Idea/Issue** - Exploration of a capability or technology that has potentially significant value to users

**Proof of Concept** - A thesis or demonstration to see if the proposed capability would work in the target environment

**Prototype** - Limited-scope trial, representative of the eventual implementation, aimed at a specific business problem

**Pilot** - Small-scale implementation of the technology that includes a representative subset of customers and other stakeholders

# Collaboration Paths (Crossing the firewall safely)



Migrating wikispace functions to Google Apps

# CommDash Functions - User Perspective

Voice traffic related to chat:

- 025/1510 PAYCOM and PSE, POD on POD loop: Could you work situation ABC and summarize on this loop when finished?  
PAYCOM: Wilco – PSE, meet me on PAYCOM chat? PSE: Wilco.
- 025/1525 POD, PAYCOM on POD loop: We've finished working ABC, and recommend DEF because of GHI.  
POD: Thanks, PAYCOM and PSE. I'll discuss with FLIGHT and get back with you.

(Interested parties can review the detailed discussion by viewing the PAYCOM chat channel between 1510 and 1525.)

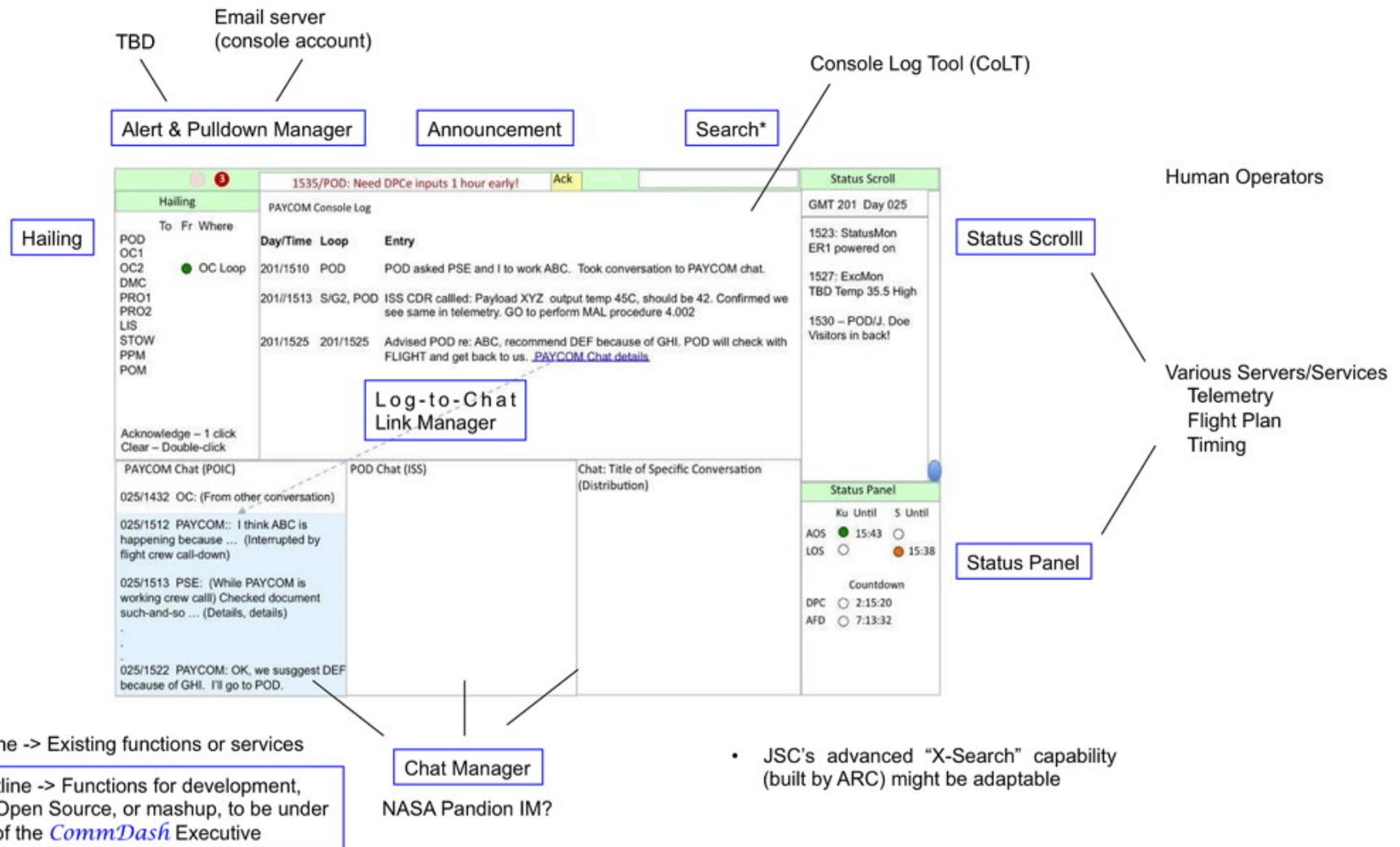
The screenshot shows the CommDash interface with several callouts explaining its features:

- Alerts & Pulldowns, e.g., messages, action items:** A notification bubble with the number '3' is shown above the Hailing section.
- Major Announcements:** A banner at the top displays '1535/POD: Need DPCe inputs 1 hour early!' with an 'Ack' button.
- Search:** A search input field is located in the top right.
- Hailing:** A list of stations (POD, OC1, OC2, DMC, PRO1, PRO2, LIS, STOW, PPM, POM) is on the left. A 'Silent Hailing' button is also present.
- Console Log:** A table displays chat entries:
 

Day/Time	Loop	Entry
201/1510	POD	POD asked PSE and I to work ABC. Took conversation to PAYCOM chat.
201//1513	S/G2, POD	ISS CDR called: Payload XYZ output temp 45C, should be 42. Confirmed we see same in telemetry. GO to perform MAL procedure 4.002
201/1525	201/1525	Advised POD re: ABC, recommend DEF because of GHI. POD will check with FLIGHT and get back to us. <a href="#">PAYCOM Chat details</a>
- Status Scroll:** A scrollable list of system statuses: 'GMT 201 Day 025', '1523: StatusMon ER1 powered on', '1527: ExcMon TBD Temp 35.5 High', and '1530 – POD/J. Doe Visitors in back!'.
- Chat:** Three chat windows are shown: 'PAYCOM Chat (POIC)', 'POD Chat (ISS)', and 'Chat: Title of Specific Conversation (Distribution)'. The POIC chat shows messages from 025/1432 to 025/1522.
- Status Panel:** A panel on the right shows 'Ku Until' (15:43) and 'S Until' (15:38) with status indicators, and a 'Countdown' for 'DPC' (2:15:20) and 'AFD' (7:13:32).

Additional callouts include: 'Clicking link highlights appropriate text in chat or pops new window (avoid cut & paste!)', 'Who can access chat channel/conversation, e.g., POIC, all ISS Centers, named participants', 'Less voice coordination and repetition/relay/copying because relevant content is already at hand!', 'Chats/Blogs/Discussions relevant to user or task (user can easily swap in/out, rearrange)', and 'Always-visible global and/or user-interest statuses'.

# CommDash Functions – What to Develop/Mashup



# Unique Features (compared to current SNSs) to Develop/Mashup

## Frames

Quick control of frame sizes and relative locations



## Chat Streams

View multiple streams concurrently

Swap out streams very quickly and simply

Create dedicated streams on the fly

Manage access dynamically

Index streams, e.g., similar to email inbox



## Alert & Pulldown Functions

Console email account access

Individual work email access

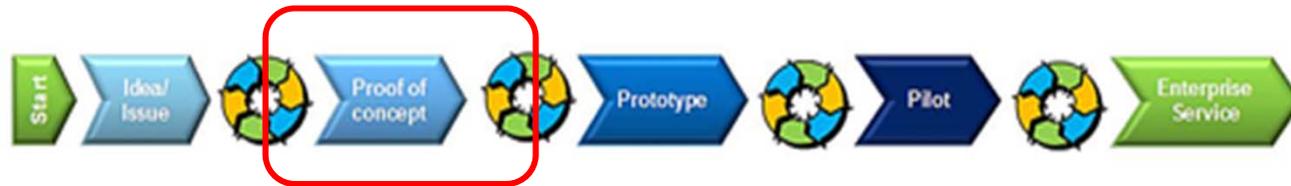
Hailing tailored to specific ops/project environment

User-defined notifications, reminders, etc.



# What happens next? Options!

## IT Labs Phase 2



## eXploration Habitat 2014 Academic Innovation Challenge



You wanna play? Let's talk!

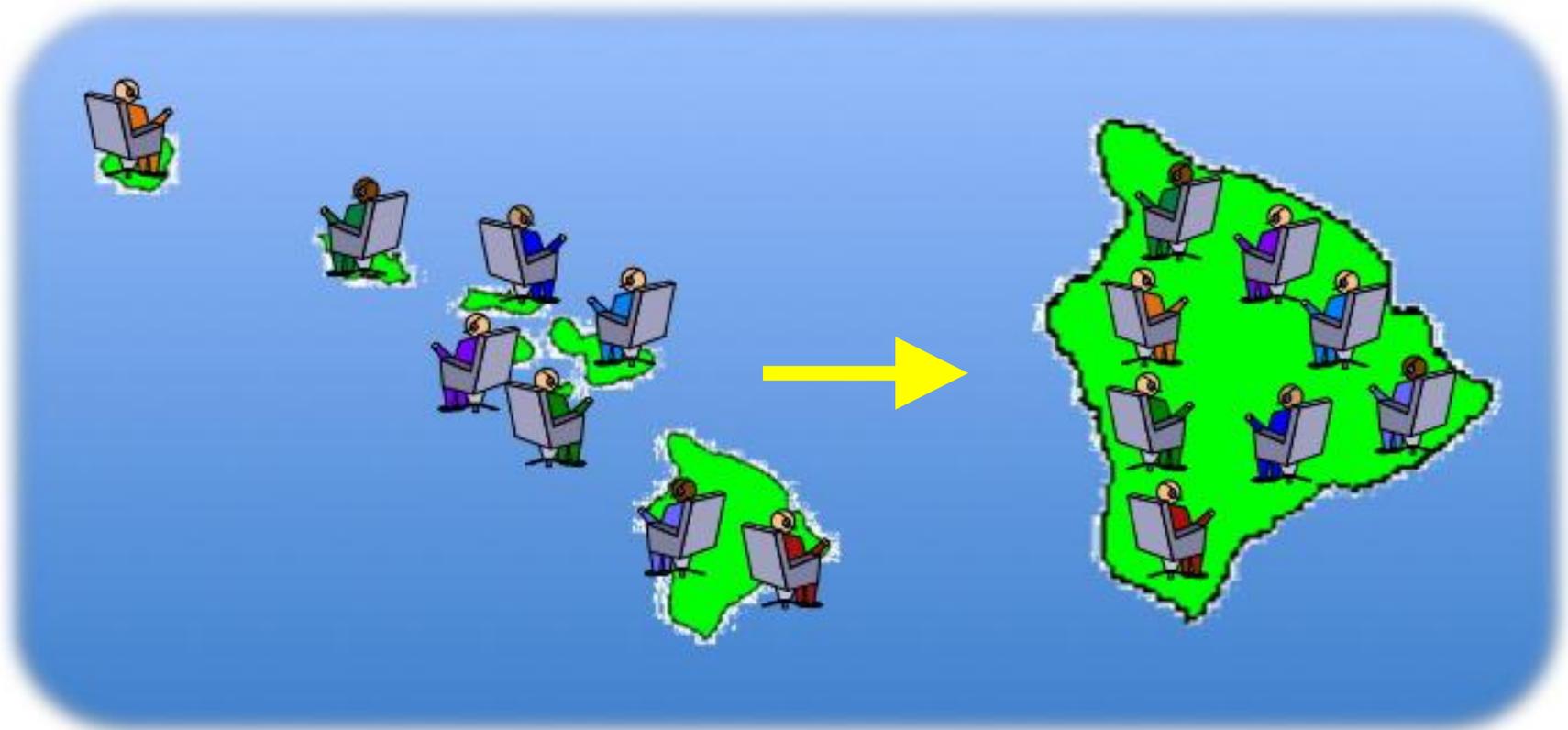


[scotty@nasa.gov](mailto:scotty@nasa.gov)

256-544-3226

256-227-0339 voice/text

Separate capture scatters. Shared capture gathers.



*Aloha!*