ALMA Integrated Computing Team (ICT): Implementation of International 4-region Structure
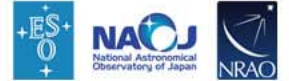
George KOSUGI (ALMA Project, NAOJ)
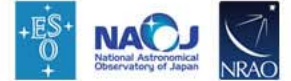
2020/1/16 技術シンポ

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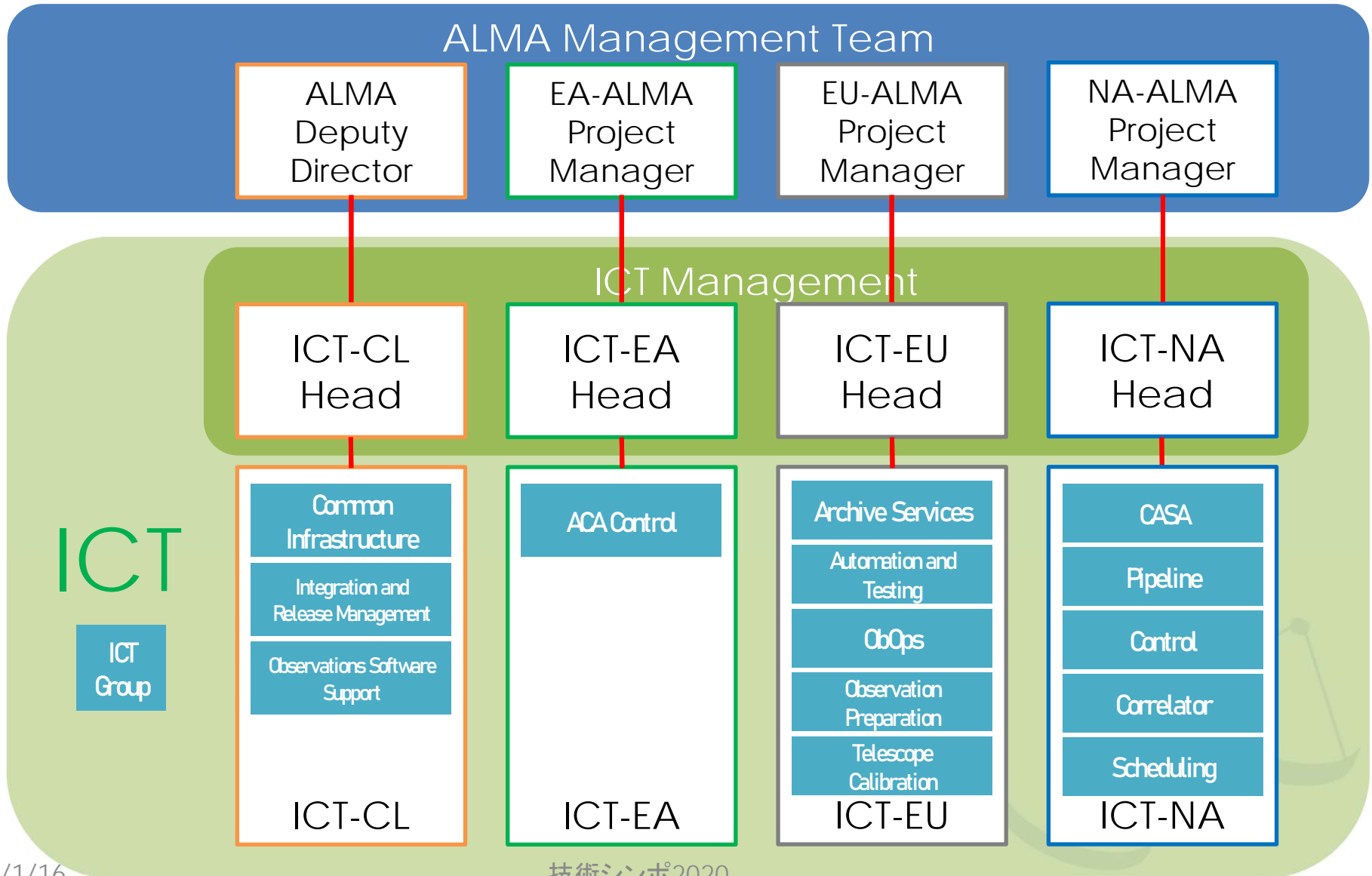4. Decision
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Role and Responsibility

- ALMA Integrated Computing Team (ICT)
  - The ICT's main responsibilities are the on-going software support, maintenance and feature development for all delivered ALMA Subsystems.
  - Responsibility for maintenance stays with the Executive who was responsible for the same deliverables during construction
  - ICT-CL is responsible for all operational matters, first level support and diagnostics, and the ALMA software release process.
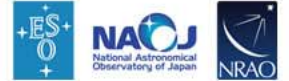
ICT Structure

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ALMA Management Team

ALMA Deputy Director	EA-ALMA Project Manager	EU-ALMA Project Manager	NA-ALMA Project Manager

ICT Management

ICT-CL Head	ICT-EA Head	ICT-EU Head	ICT-NA Head

ICT

ICT Group

ICT-CL
- Common Infrastructure
- Integration and Release Management
- Observations Software Support

ICT-EA
- ACA Control

ICT-EU
- Archive Services
- Automation and Testing
- ObOps
- Observation Preparation
- Telescope Calibration

ICT-NA
- CASA
- Pipeline
- Control
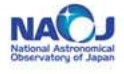- Correlator
- Scheduling

ICT Staffing

- **Software Maintenance & Development**
  - Covered by ICT-EA/EU/NA
  - Total ～50 FTE-year
  - Staffing level in EA is 25% (EU/NA 37.5% each)
- **Software Operations Support**
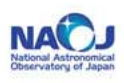 - Done by ICT-CL

ICT Implementation plan Document

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- Process, Guideline, Rules are defined and described in the ICT Implementation plan document
- Updated as needed

Decision

- Decisions are made by consensus in the ICT Management
  - Both the regional ICT (local institution) goals and the whole ICT goal should be taken into account
  - If conflicts, whole ICT shall take preference
- Consensus is the group resolution when opposing parties set aside their differences and agree on a decision that is agreeable to all. It is NOT a majority vote.
- Or escalation to AMT (ALMA Management Team)

- # Requirement category
  - ## Maintenance requirements
    - Corrective maintenance
    - Adaptive maintenance
    - Perfective maintenance
    - Preventive maintenance
  - ## Feature Requests
   - Construction features
    - New features
    - Improvements

Software Maintenance

- ## Corrective Maintenance
  - Fixing of bugs discovered by users of the software, typically at the observatory or the ARCs, but also internally.

- ## Adaptive Maintenance
  - Adapt software to changes in the environment: e.g., operating system, third-party software and hardware upgrades.

- ## Perfective Maintenance
  - Modification of the software to improve performance, stability or maintainability.

- ## Preventive Maintenance
  - Modification of the software to detect and correct latent faults in the software product before they become effective faults.
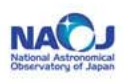
Flow of the feature requests
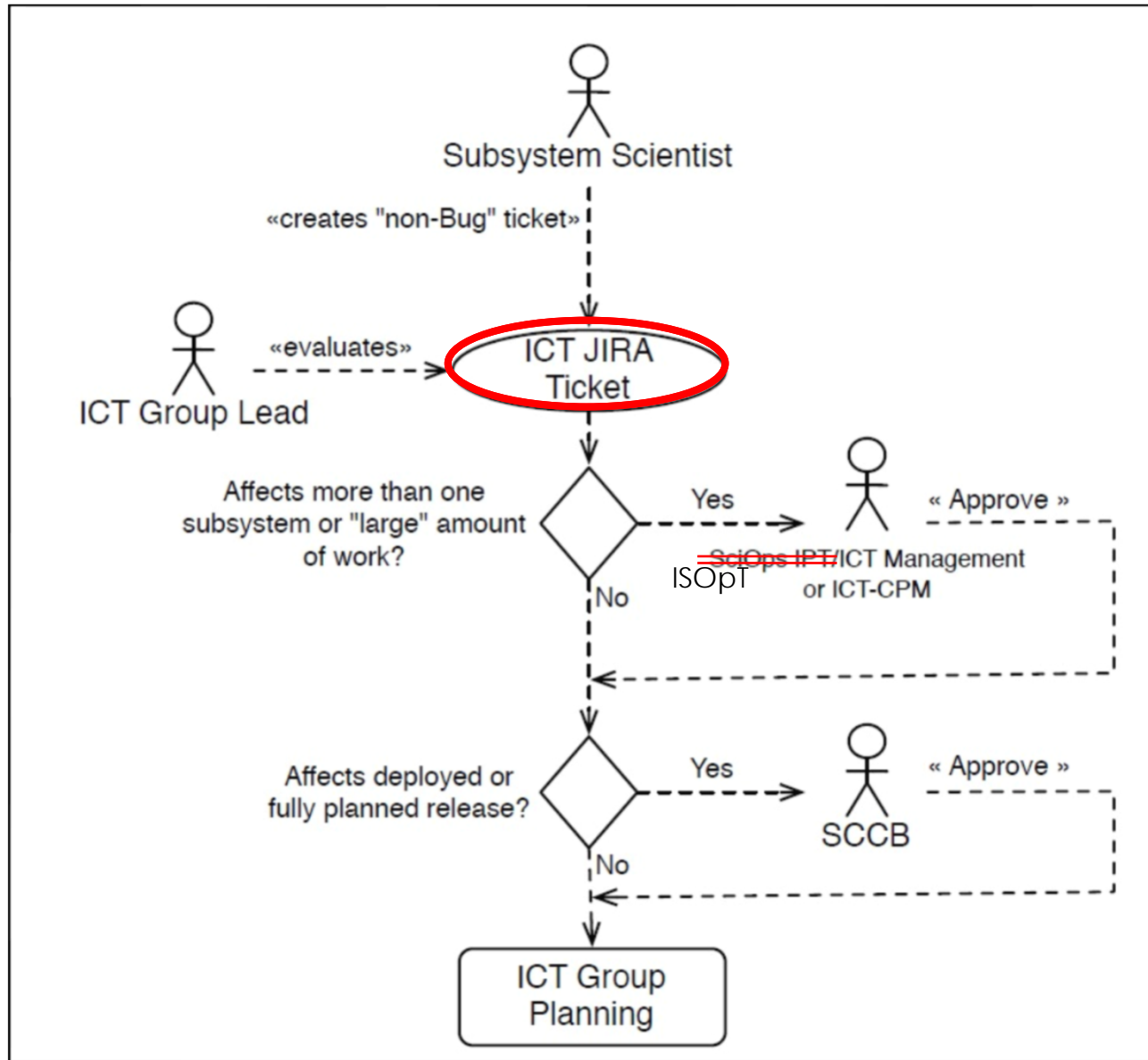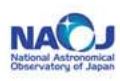
Process: Release and Acceptance of Software

- Testing for software quality
  - **Phase A**: Implementation and Development testing by software developers
  - **Phase B**: Integration and *Verification* testing by ICT-IRM team (or persons organized by ARC/DSO for user facing offline software)
  - **Phase C**: Science and Engineering *Validation* testing by Astronomers or Engineers (users)
- User acceptance = Verification✔ & Validation✔

Verification and Valdation
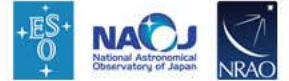
- **Verification**: *"Are we building it right?"*
  - Proof that software conforms to the requirements
  - Can be done by the developers, software testers, and science operators
- **Validation**: *"Are we building the right thing?"*
  - Proof that the software products scientifically correct output
  - Confirm that the user requirements have been well understood and translated into software requirements that have been implemented accordingly
  - Must be done by subsystem scientists and/or engineering staff who required the functionality

Release and Acceptance of Software

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- Two different release cycles
  - Online software: one release per year
  - Offline software: release every two months
- Formal Acceptance
  - Test Report Review (TRR): To determine that an Online release is ready for additional formal acceptance testing
  - Acceptance Testing: Final testing step for Online release. "End-to-end tests"
 - Acceptance Review: Final acceptance report including acceptance checklist and results

- To enhance communication, following F2F meetings are defined
  - ICT Planning and Coordination Meeting
  - ICT Management Meeting
  - ICT Leads Meeting
  - ICT Review Meeting
  - ICT/ISOpT Management Meeting
  - Requirements Gathering and Progress Meeting
  - ICT Subsystem developers Meetings (Cross-regional subsystems)

Telecons
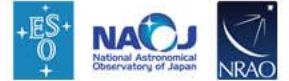
- Regular weekly / bi-weekly / monthly telecons to report updates
    - ICT Management telecon
    - ICT Subsystem developers telecons
        - CASA
        - Pipeline
        - IRM
        - Archive
    - ICT-ISOpT telecon
    - SCCB (Software Change Control Board) telecon
    - CSCG (Control Software Coordination Group) telecon
    - …

International Project, what we need?

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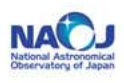In search of our Cosmic Origins

- Proper definition and documentation of *processes* is essential
- Progress tracking and information sharing by *visualizing* each tasks
- Use of proper software tools
- Close communication through frequent telecon or F2F sometimes
  - Recognize differences in culture, national character, and way of thinking
- Build trust through the communication and contribution

However, all of above are useful for any domestic projects as well

Questions?

Thank you…