Reference Frame in Practice Kobe, Japan, 29-30 July 2017



Delivering GNSS Products to End Users

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ASEAN, ANZ, JAPAN, KOREA







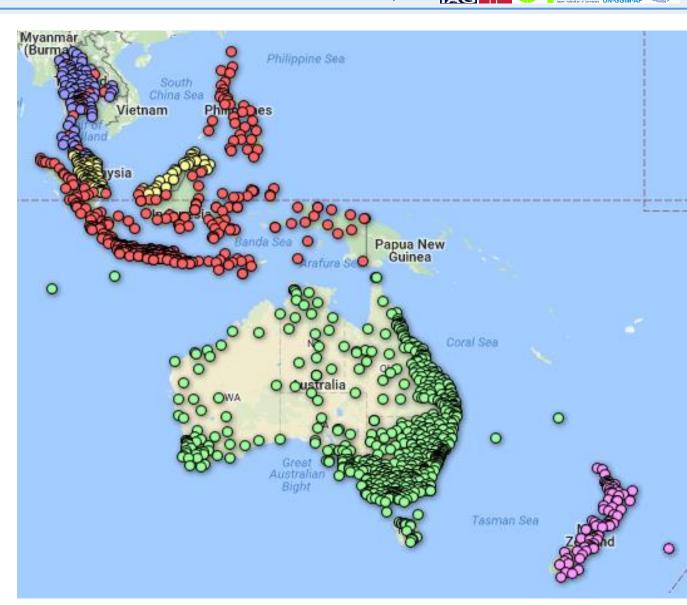


"Known" GNSS Infrastructure

FIG/IAG/UN-GGIM-AP/ICG/GSI/JFS
Technical Seminar Reference Frame in Practice
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FIG

Streaming 1sec Obs Generating RINEX

ASEAN & ANZ >1000 Stations



"Known" GNSS Infrastructure

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FIG

Streaming 1sec Obs Generating RINEX

ASEAN & ANZ >1000 Stations

JAPAN & KOREA >1700 Stations



The GNSS Infrastructure will deliver these <u>Data Products</u>:



- POST-PROCESSING (RINEX)
 - 30 second files to support long term positioning
 - 1 second files to support post-processed kinematic surveys



- REAL-TIME (RTCM)
 - Single Base Corrections
 - Nearest Base Corrections
 - Network RTK Corrections
 - MAC,VRS,FKP



SYSTEM STATUS

Mechanism to deliver these <u>Data Products</u>:



- POST-PROCESSING (RINEX)
 - Via FTP Sites or WEB Sites



- REAL-TIME (RTCM)
 - Via NTRIP Casters



- SYSTEM STATUS
 - Via WEB Sites or Mobile Phone Apps

The "Higgins" Model

FIG/IAG/UN-GGIM-AP/ICG/GSI/JFS
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FIG JFS

Specify

Stations

Network

Process

Deliver

Specify System

- Target Density,
 Coverage,
 Accuracy,
 Reliability and
 Availability
- Site Quality
- EquipmentQuality
- GeodeticReference Frame
- Data ServicesProduced
- Data AccessPolicy

Own Stations

- Site Selection
- •Site Construction
- EquipmentPurchasing
- •Station Data Comms
- Site Maintenance
- Equipment Replacement Cycle

Network the Data

- Data Comms from Network Stations
- Control Centre
- •Quality Control of Raw Data
- Data Archive

Process Network

- Copy of Network
- Data Processing
- Production of Data Streams
- Data Wholesaling
- Retailer Support

Deliver Service

- Retail Sale of Data Products
- Marketing
- Rover Equipment Support
- •End User Support
- Liaison with User
 Comms Providers

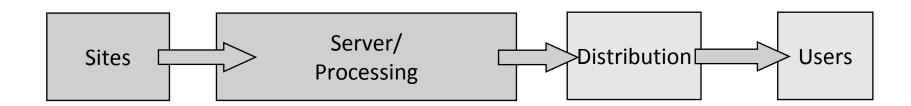
Governance

Courtesy of M.Higgins, DNRM, QLD, Australia

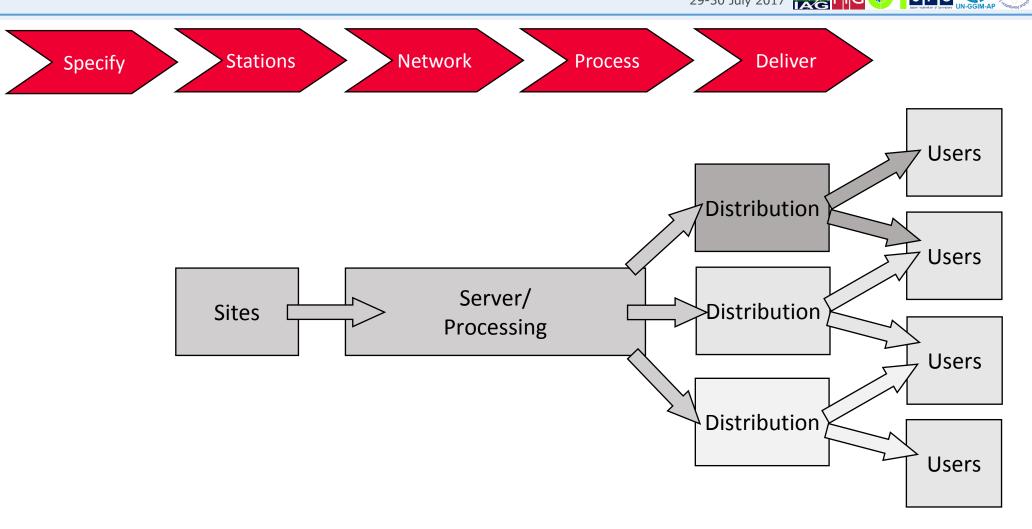
FIG Vice President (2007-2010)

FIG Commission 5 Chair (2003-2006)

Specify Stations Network Process Deliver



Grow the User Base
Grow the Incoming Revenue Base



Business Models - Revenue



Users are willing to pay for a Service

for example Telecommunications companies



Competition is healthy and drives innovation

Consider appointing additional GNSS Data Service Providers

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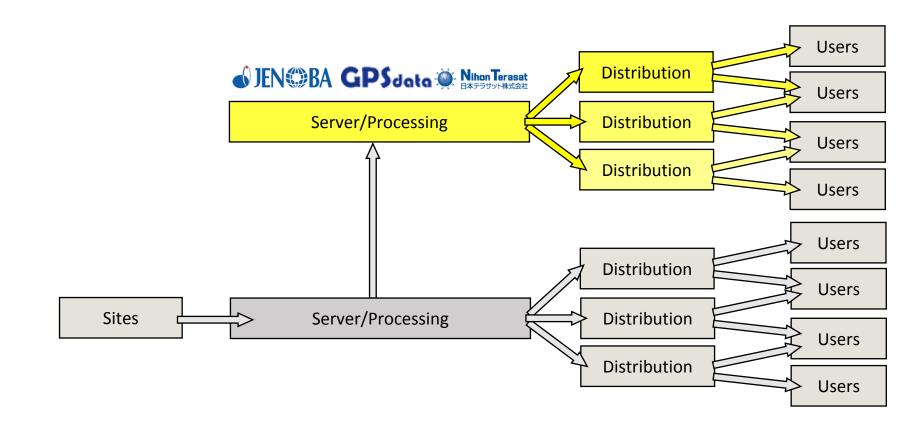
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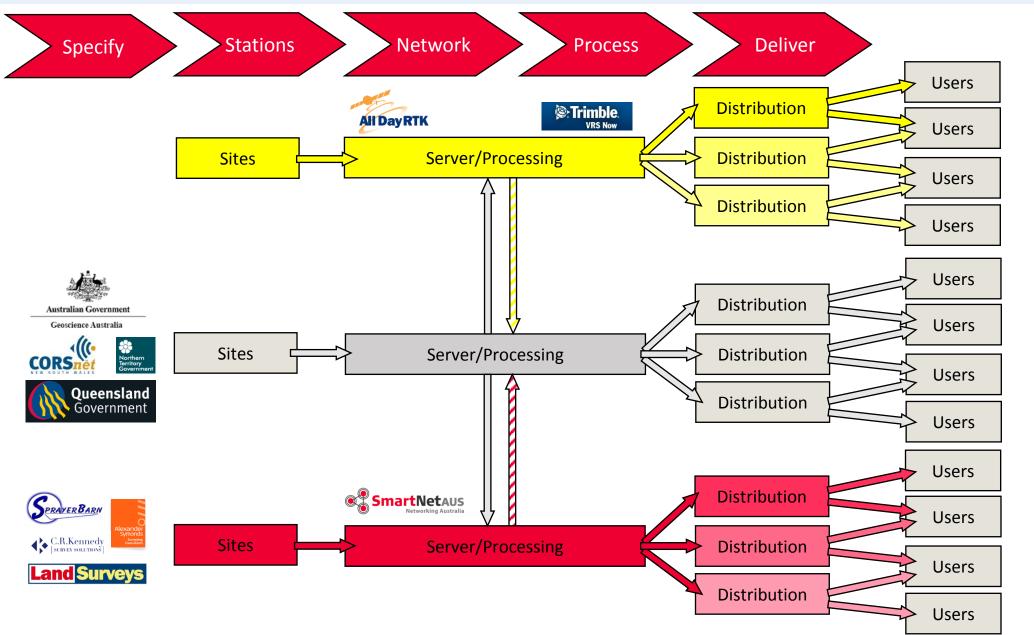


Business Models – Data Flow

FIG/IAG/UN-GGIM-AP/ICG/GSI/JFS Technical Seminar Reference Frame in Practice

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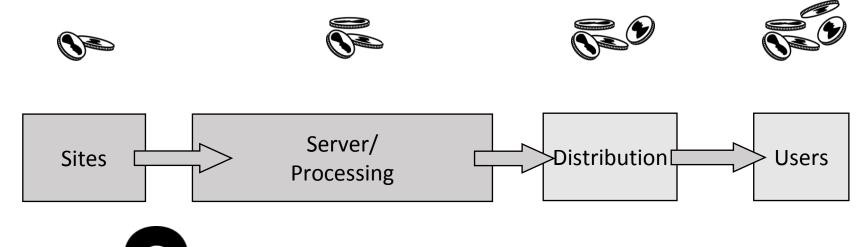
Each Service Provider will provide unique Service offerings:

- Temporal Licenses
 - Timed Licenses
 - Annual, Monthly, Daily, Hourly
 - Quantitative Licenses
 - Epochs, Seconds, Minutes, Hours
- Spatial Licenses
 - National, Regional, Local
- Accuracy Specific Licenses
 - DGPS, PPP, RTK, nRTK
- Application Specific Licenses
 - Survey, Construction, Agricultural, Intelligent Transportation, Airborne
- Support Services
 - All in one Mobile Connectivity and GNSS Data Provision



Business Models - Revenue

Specify Stations Network Process Deliver



Grow the User Base

Grow the Incoming Revenue Base

Share the Revenue with:

Distributors, Service Providers and Operators

It's in **EVERYONES** interest to maintain the SITE infrastructure

Examples of Revenue models for SITE Owners/Operators

- Free model: Use as is. No guarantees, no support
- Fixed fee: Recover operational and depreciation costs
 - Staged based Targets for Resellers. Higher initial payments but significantly reduced when targets are reached
- Royalty model:
 - Percentage of User Fees, irrespective of Usage, OR
 - A Percentage of User Fees, based upon Users actual usage of Sites.

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