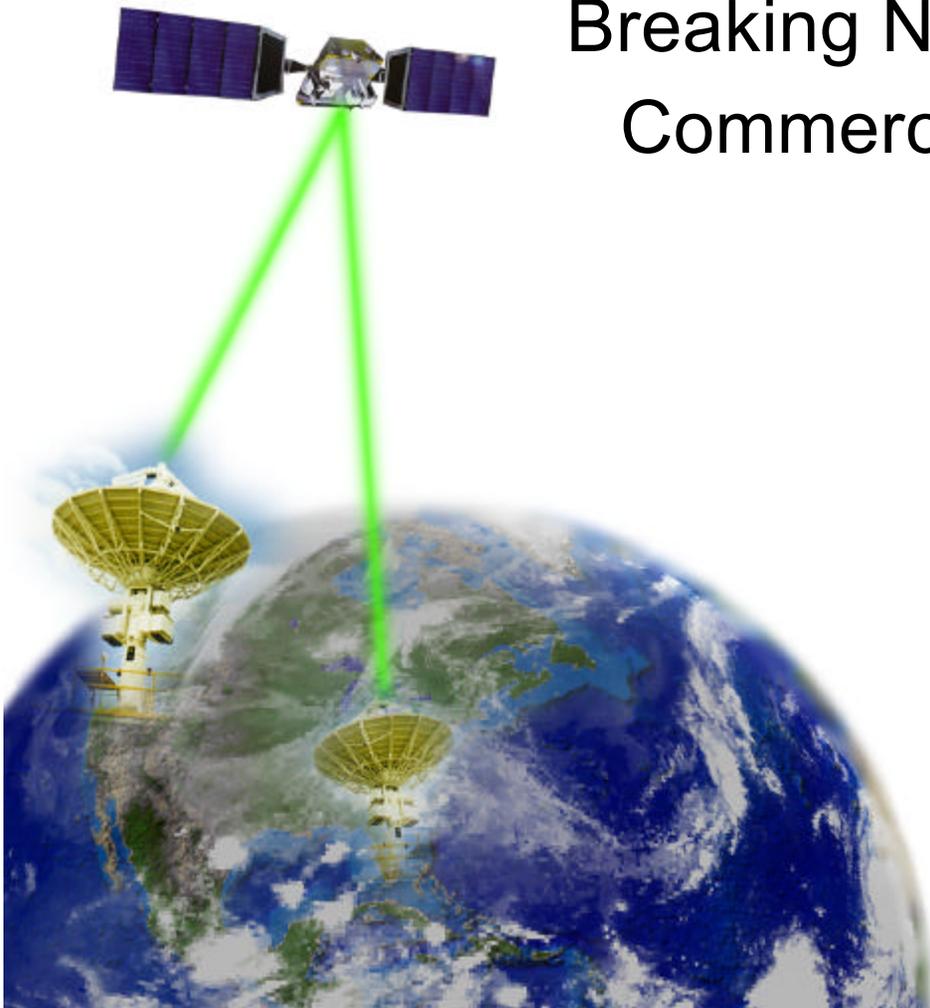


Commercial Versus Commercialization

DataLynx™ and NASA
Breaking New Ground in
Commercial Services



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Honeywell Technology Solutions Inc (HTSI)

Wholly-owned subsidiary of Honeywell Inc.

Headquartered in Columbia, MD; 80 Locations: 35 Countries, 25 States, DC, 2 U.S. Territories.

4,000 Associates; Annual Revenue 500 Million

More than 200 contracts:

Mission-critical Operations

Systems Integration

Calibration/Quality Services

Real-time Data Acquisition

Field Engineering

Logistics Services

Value Proposition:

Six Sigma Processes

Reduced total cost of ownership

Integrated asset management

Solutions-based Systems

Operational efficiency

50 years of providing traditional satellite services to government customer.

→ HTSI developed DataLynx so we could offer a complete set of commercial ground segment services on a fee-for-service basis.

→ DataLynx created its own multi-satellite capable ground segment infrastructure to support flight operations and antenna network services.

→ Pure commercial mission market veered from anticipated trend due to failed launches and failed satellite-dependent business.

→ We refocused DataLynx on Government / NASA commercialization approach outsourcing traditional Government services to qualified commercial suppliers.

ataLynx plus 50 years of satellite ground segment and operations services

DataLynx Overview



Charter:

Cost-effective, fee-for-service space operations and telemetry, tracking, and control (TT&C) capabilities to support "earth-orbiting" or similar assets.

Turn-key custom systems solutions.

Service Offerings:

Tracking, data acquisition, and commanding (TDAC).

Satellite asset management and operations (SAMO).

Data management and processing (DP/DM).

Non-Traditional asset management and operations

System Attributes:

24X7 Monitor and Control.

Remote Operations of Network Assets.

Satellite Asset Management.

E-Commerce Customer Interface.

ighest level o assurance while reducing cost to our customers

DataLynx Locations



eographically dispersed to provide a ull range o primary back-up support

Challenge: True Lifecycle Approach

Challenge

Utilizing a deterministic fee for service business model, supporting full lifecycle accountability.

DataLynx Response

Comprehensive fee for service methodology at or below current cost-plus operations and maintenance rates.

Inclusive pricing:

Included in existing cost-plus contracts

System operations.

Not within existing cost-plus contracts

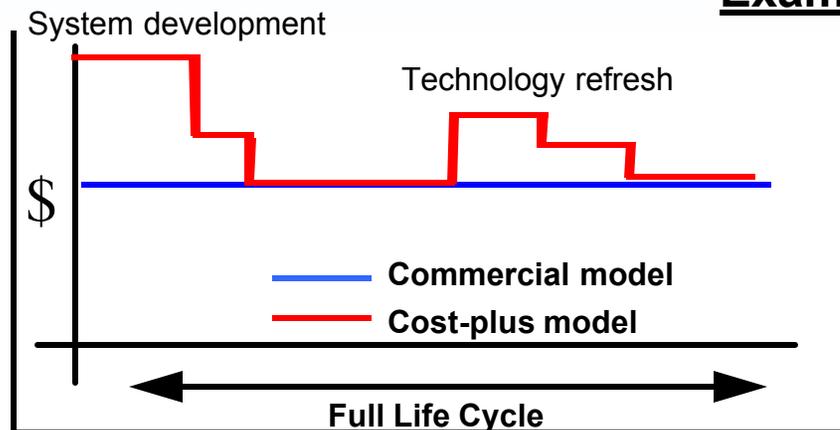
Full system depreciation.

System sustainment (to Depot Level II).

Facilities.

Multi-mission/Multi-Agency economies of scale
NASA/Military/Commercial/International).

Example



System development, upgrades, and technology refresh are included within the commercial business model (this is not the case in the Cost-plus world).

Total Cost of Service contract and approach now being used as a model for other NASA commercialization efforts

Challenge: Traditional Expectations vs. Commercial Viability

Challenge

Ensuring reliable commercial services comparable to those designed and developed with government capital to mission-specific government specs.

DataLynx Response

Develop contract document that:

Defines products and services in contractual terms that apply across multiple missions.

Focuses on end goal - not on the design and implementation.

Does not attempt to cover all possible issues, but defines reliable process for responding to issues.

Accommodates negotiations that impact existing commitments and relationships.



Example



On the EOS contract, CSOC/NASA bought, for the first time, services essential to the health and safety of their missions from a commercial provider.

Pre-existing commitments were mission-specific, had been established on a case-by-case basis, and could not be modified.

Contract and approach now being used as a model for other NASA commercialization efforts

Challenge: Redefining the Customer's Role

Challenge

Shifting control and responsibility from the government customer to the commercial provider - Fixed Price cost control vs. Cost Plus technical control.

DataLynx Response

Define the customer up front and determine who has authority to give direction.

Maintain control of internal operations and resulting service levels.

Agree to user priorities during contract negotiations and reflect in final price.

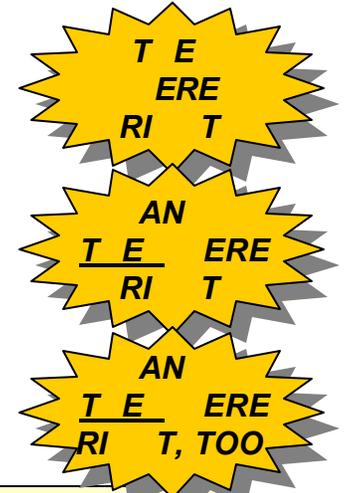
Report only quantity and quality of services to customer on a pre-defined schedule.



Example

Who's the customer when it comes to contract negotiation, security, scheduling, etc.?

- Missions were the end-user which gave them authority to give direction.
- CSOC was the procuring agency which gave them authority to give direction.
- NASA was the Government Customer which gave them authority to give direction.



Small, but inclusive, team communicates issues, objectives, and resolutions

Challenge: Defining Requirements and Standards

Challenge

Ensuring best value services that meet mission requirements.

DataLynx Response

Use Service Level Agreement (SLA) approach with pre-defined metrics for quality and availability.

Determine minimum and maximum range of services needed over time, and associated costs.

Adopt standards that ensure consistency, facilitate use of COTS, and reduce costs.



Examples



For each EOS spacecraft, DataLynx service definitions include all data types, their origin and destination commanding modes, telemetry data rates, and their combinations mode and medium for delivery data latency, data processing before delivery, and data storage

Then the contract specified a minimum level of guaranteed service, as well as the maximum expected.

DeFacto standardization through successful ongoing procurement competitions reduces customization and resources costs.



Ensuring high quality at a reasonable cost

Challenge: Defining and Reporting Metrics

Challenge

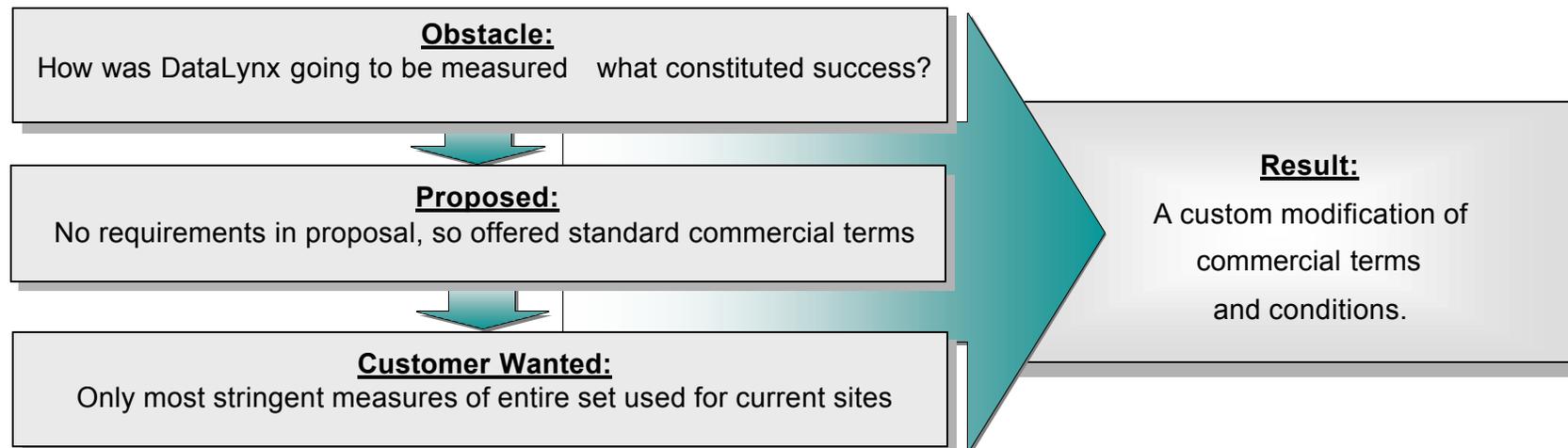
Establishing evaluation criteria that is both precise and realistic in the commercial environment.

DataLynx Response

Define minimum rates of system availability and operability.
Identify penalty if rates are not met.
Ensure flexible approach to match performance of existing Government service.
Define products and services in contractual terms that apply across multiple missions.



Example



Must reconcile commercial and government metrics that determine compliance

Challenge: Scheduling a Shared Resource

Challenge

Instilling customer confidence in sharing vital resources with other users.

DataLynx Response

Integrate commercial scheduling tools and services with existing mission-specific applications.

Provide web-based scheduling tools with predefined formats to reduce margin for error.

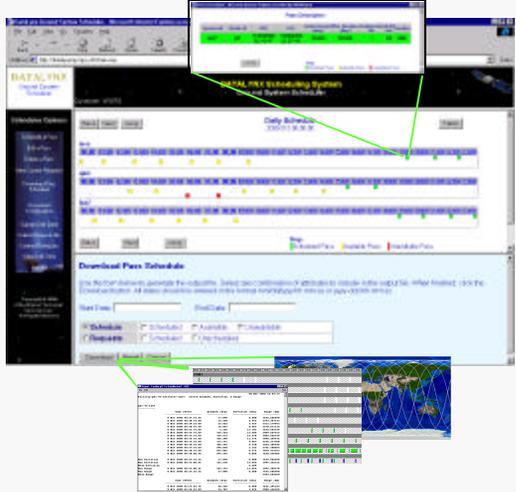
Example

Customer originally wanted DataLynx to look like any other NASA node to the NASA scheduling system (WOTIS).

WOTIS

```
W0106-4486,EO1,PF1,2001036004321,2001036005314,TR4,1096,S1
W0106-5403,EO1,PF1,2001036004327,2001036005307,,1096,X1
W0106-3876,QSCAT,PF1,2001036033515,2001036035004,TR4,8501,S1
W0106-5405,EO1,PF1,2001036053109,2001036054334,,1099,X1
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W0106-3878,QSCAT,PF1,2001036065503,2001036070907,TR1,8503,S1
W0106-4494,EO1,PF1,2001036084754,2001036085921,TR4,1101,S1
W0106-5407,EO1,PF1,2001036084804,2001036085912,,1101,X1
W0106-3880,QSCAT,PF1,2001036101226,2001036102449,TR1,8505,S1
W0106-3881,QSCAT,PF1,2001036115007,2001036120344,TR1,8506,S1
W0106-4870,QSCAT,PF1,2001036132823,2001036134323,TR1,8507,S1
W0106-3883,QSCAT,PF1,2001036150813,2001036152322,TR1,8508,S1
W0106-2346,L7,PF1,2001036203129,2001036204555,TR1,9644,S1
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W0106-2348,L7,PF1,2001036203256,2001036204429,,9644,X2
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W0106-3975,AM1,PF1,2001036224903,2001036230206,,6052,X1
W0106-3974,AM1,PF1,2001036224908,2001036230201,TR3,6052,S1
```

DataLynx



DataLynx offers web-based scheduling with predefined file formats.

Managing expectations and compromise - know where to draw the line

Challenge: Meeting Customer Security Needs

Challenge

Reconciling commercial practices with Government (civilian and national security) practices.

DataLynx Response

Offer standard commercial security basic firewall, SSL2/3, Password, etc.*

Augment with commercial security AND non-binding security audit.

** Though not considered network security, mission-specific encryption is available*

Examples

➤ **Had to appease multiple constituencies**

Mission-level (Terra, LandSat7, etc.)

Program-level (CSOC/EOS)

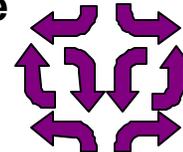
Agency-level (NASA)

Contractual Customer

➤ **Security fragmented loss of single security interface**

Originally single interface to NISN

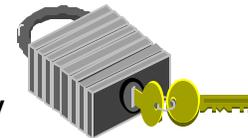
Became multiple (standard) interfaces to each mission



➤ **Trades**

On-line redundant firewall vs. cold spare

Push/pull FTP transfers effect on firewall policy



Recognize when requirements are outside of customer or provider baseline compromise or compensate

The Outcome

✓ **Subtle distinction being drawn**
Difference between Commercial
and Commercialized

✓ **DataLynx is pathfinder for
NASA commercialization efforts**
Not just looking at commercial
products, but services in non-
traditional outsourcing domains

✓ **Many missions currently certified
and flying using DataLynx Network**
Back-up Mission Ops Centers
certified and operational
Flight Operations for upcoming
missions in progress

✓ **First commercial entity certified**
As Node in EOS Polar Ground
Network
As Node in NISN/OpenIONet
for Flight Dynamics products

✓ **Established Record of Performance Success**
99.6% Proficiency for CY02
Numerous successful emergency supports

Commercialization is a necessary step to all commercial service supply