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The Infrastructure Service Provider (ISP)Cost Model

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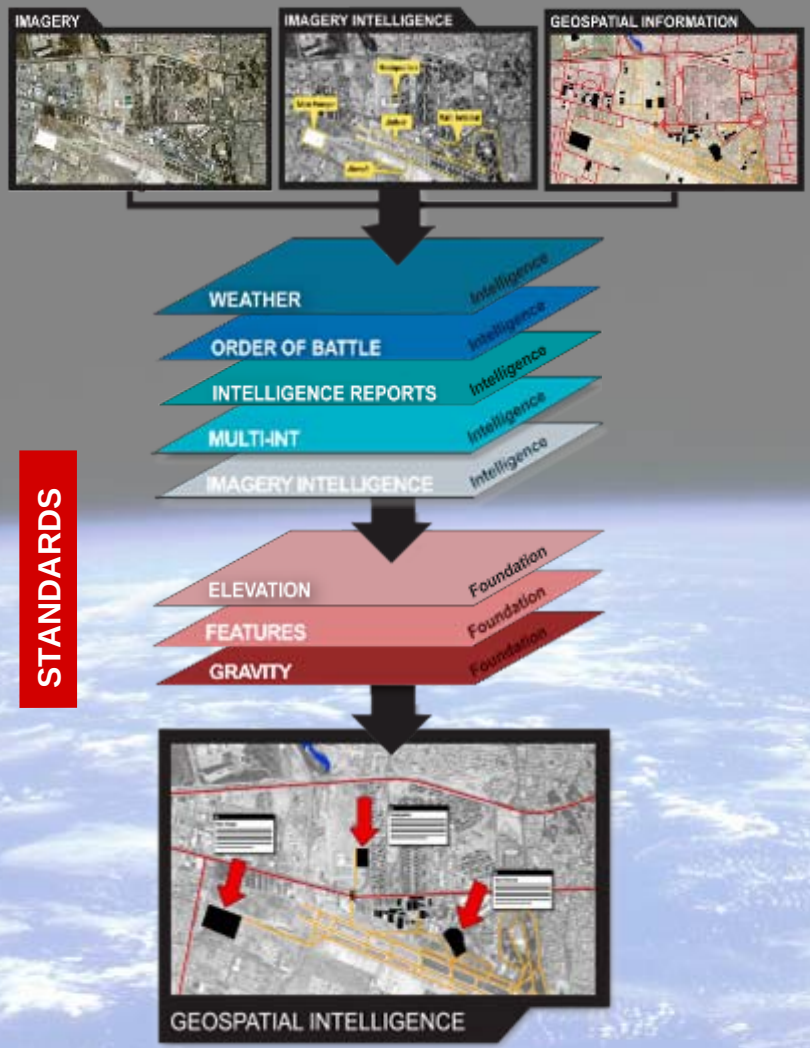
June 2011

ISP Cost Model

Background

Our Mission: The Nation's Eyes

The Layers of Geospatial-Intelligence (GEOINT)



GEOINT is composed of information layers, which answer such questions as…

- Where am I?
- Where are the natural and man-made structures? How do I navigate them?
- What does the area look like now? What might it look like after an event?
- What do we need to prepare for?
- Where are the friendlies? The enemies? When might they move?

What does this mean? What is the impact?

Types of Data, Platforms, Analytical Expertise

Remotely Sensed Data

Panchromatic

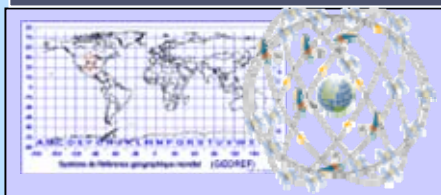
Infrared

Radar

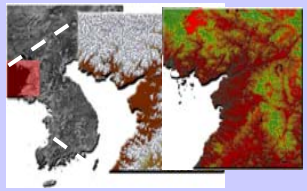
Multispectral

Hyperspectral

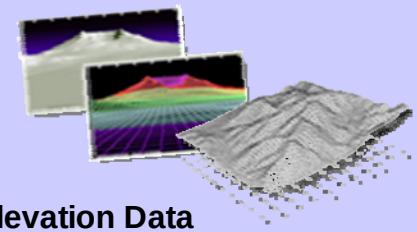
Physical Geography



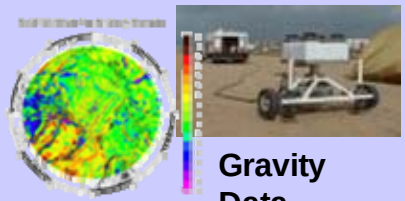
GPS Tracking and Coordinate Systems



Geology

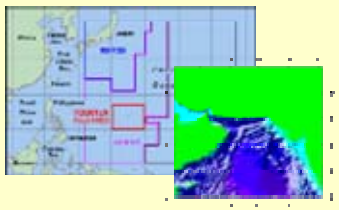


Elevation Data



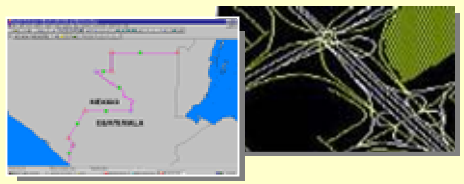
Gravity Data

Land Cover and Cultural Data



Hydrographic Data

Vegetation



Boundaries, Transportation and Infrastructure

Open Source

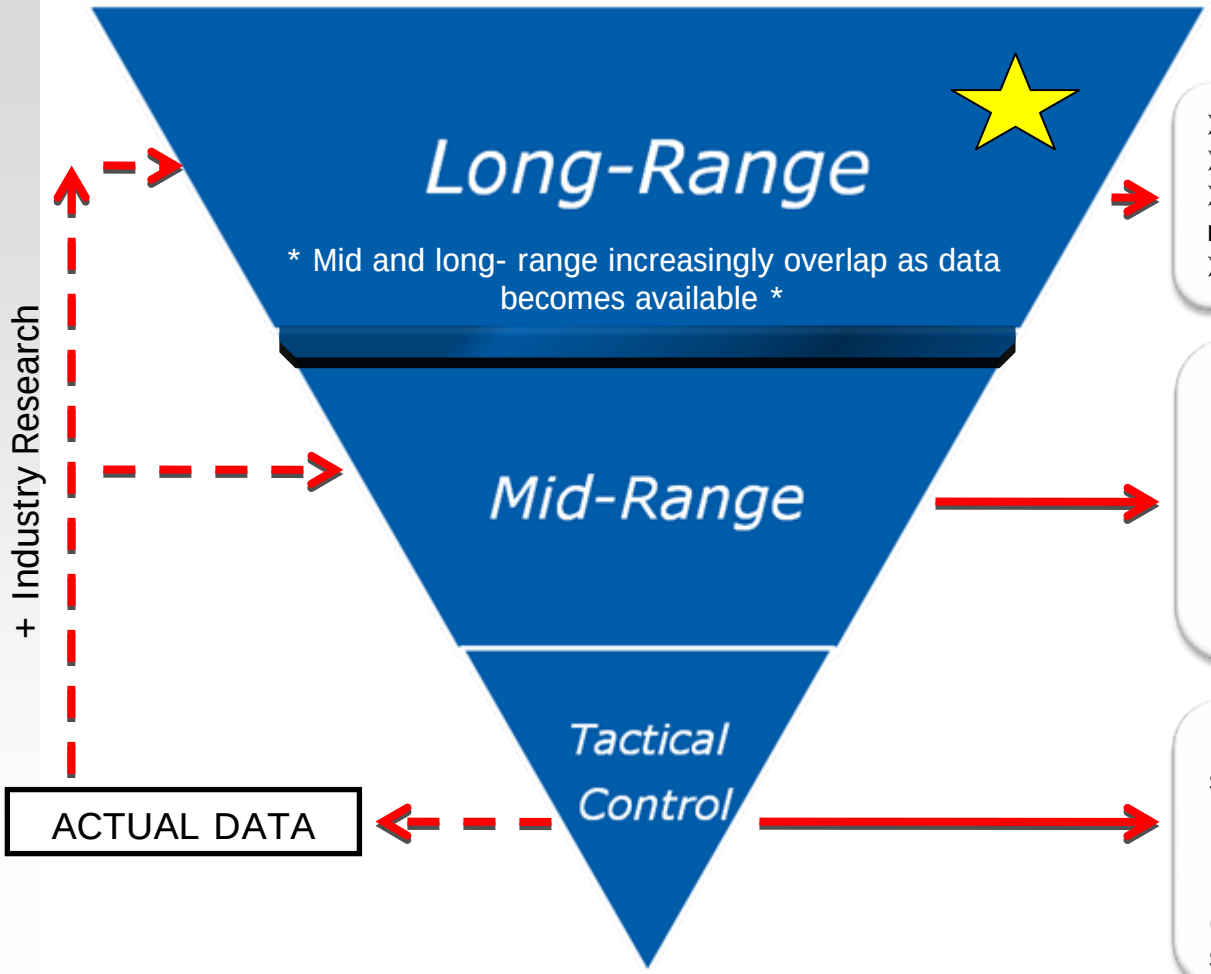
ISP Cost Model
Transition to ASP/ISP Paradigm

- The GEOINT mission is information; therefore, systems are primarily Information Technology (IT) based
- In response to out of control IT operating and support costs, moving to an Application Service Provider/Infrastructure Service Provider (ASP/ISP) approach to providing IT
  - ASP: Application Service Provider responsible for providing mission applications – primarily software
  - ISP: Infrastructure Service Provider responsible for providing the infrastructure on which the applications ride – hardware and infrastructure related software
- ISP is expected to achieve improvements through
  - Common operating environments
  - Eliminating duplication of equipment and effort
  - Right-sizing services by managing to appropriate service levels (implementing ITIL 3 processes)
  - Centralizing acquisition and management of IT services
- Impact to financial planning, tracking, and analysis
  - Requires new structures for planning, budgeting, and accounting systems
  - Existing cost/technical/performance data and estimating methods are based on program vs. service structure

ISP Cost Model

Functional Design

ISP Cost Model
Need More Than One!



= ISP Cost Model

- Estimates an agency-wide cost
- Vendor agnostic
- Limited detail on specific user requirements (application complexity)
- Used for budgeting, high level analyses

- Estimates the cost to the agency of providing each specific service
- Vendor specific or agnostic
- Addresses specific user requirements
- Used for trade studies, source selection evaluations, application planning, and budget and program builds

- Tracks and estimates current and short term costs
- Specific provider
- Actual/immediate user requirements
- Used for day to day operations such as determining cost of installing the next server/service level management

Models should be complementary!

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ISP Cost Model
The IT Service Provider Paradigm Shift

Product CES	Cost Element	2008	2009	2010	2011	2012
	Total LCCE	**$ 96,970,481**	**$ 73,099,092**	**$ 64,158,822**	**$ 78,951,772**	**$ 64,095,994**
	ECP's	$ 6,965,312	$ 5,097,139	$ 1,878,298	$ 1,582,263	$ 1,322,250
1.0	**Research, Development, Test and Evaluation (RDT&E)**	**$ 57,044,262**	**$ 42,830,979**	**$ 13,202,782**	**$ 9,393,896**	**$ 8,833,668**
1.1	System Engineering/Program Management	$ 9,214,193	$ 6,537,164	$ 2,081,298	$ 2,640,905	$ 1,523,235
1.2	System Integration / Test & Evalutation	$ 7,850,062	$ 5,547,214	$ 1,649,525	$ 1,859,699	$ 1,217,437
1.5	Developed Software	$ 38,316,630	$ 29,496,990	$ 9,057,259	$ 4,598,229	$ 5,835,704
1.6	COTS Implementation	$ -	$ -	$ -	$ -	$ -
1.11	Training Development	$ 1,663,377	$ 1,249,610	$ 414,700	$ 295,063	$ 257,291
2.0	**Procurement Defense Wide (PDW)**	**$ 21,454,232**	**$ 11,157,740**	**$ 5,208,340**	**$ 7,725,621**	**$ 5,057,165**
2.1	Operational Hardware Procurement	$ 7,307,588	$ 1,010,836	$ 1,156,604	$ 1,156,604	$ 1,156,604
2.1.1	Workstations	$ 50,523	$ -	$ 8,530	$ 8,530	$ 8,530
2.1.2	Servers	$ 7,257,064	$ 261,854	$ 1,148,074	$ 1,148,074	$ 1,148,074
2.1.3	Storage Equipment	$ -	$ 748,982	$ -	$ -	$ -
2.1.4	Peripherals	$ -	$ -	$ -	$ -	$ -
2.1.8	Communications Infrastructure (LAN/WAN)	$ -	$ -	$ -	$ -	$ -
2.1.8.1	Local Area Network (LAN)					
2.1.8.2	Wide Area Network (WAN)					
2.1.9	Communication Line Procurement & Installation					
2.2	Operations Software Procurement	$ 446,749	$ 2,157,949	$ 192,626	$ 192,626	$ 192,626
2.2.1	Commercial Off-The-Shelf Software	$ 446,749	$ 2,157,949	$ 192,626	$ 192,626	$ 192,626
2.2.1.1	COTS SW Enterprise	$ 424,827	$ 2,157,949	$ 185,451	$ 185,451	$ 185,451
2.2.1.2	COTS SW Non-Enterprise	$ 21,922	$ 7,175	$ 7,175	$ 7,175	$ 7,175
2.3	Initial Training	$ 294,614	$ 650,228	$ 145,987	$ 145,987	$ 145,987
2.4	Initial Documentation	$ 1,915,831	$ 1,474,486	$ 452,863	$ 229,911	$ 291,785
2.5	Site Activation	$ 1,644,182	$ 647,008	$ 859,201	$ 2,229,317	$ 864,153
2.5.1	Site Surveys	$ -	$ -	$ 325,187	$ 243,890	$ 243,890
2.5.2	Site Installation	$ 1,644,182	$ 647,008	$ 534,014	$ 1,985,427	$ 620,262
2.5.3	Software Only Installs					
2.6	COTS Software Upgrades					
3.0	**Operations & Maintenance (O&M)**	**$ 11,501,675**	**$ 12,313,234**	**$ 43,869,402**	**$ 60,249,992**	**$ 48,882,911**
3.1	Sustaining Engineering	$ 2,055,616	$ 2,055,616	$ 5,423,182	$ 6,735,039	$ 6,735,039
3.2	Hardware Maintenance	$ 408,354	$ 901,699	$ 1,099,689	$ 824,469	$ 1,355,216
3.2.1	Hardware Operations Site Maintenance	$ 41,754	$ 490,209	$ 542,059	$ 176,031	$ 615,970
3.2.1.1	Workstations	$ -	$ 3,031	$ 3,031	$ 3,543	$ 1,024
3.2.1.2	Servers	$ 41,754	$ 477,177	$ 492,889	$ 126,349	$ 614,946
3.2.1.3	Storage Equipment	$ -	$ -	$ 46,139	$ 46,139	$ -
3.2.1.4	Peripherals	$ -	$ -	$ -	$ -	$ -
3.2.1.8	Communications Infrastructure (LAN/WAN)	$ -	$ -	$ -	$ -	$ -
3.2.1.8.1	Local Area Network (LAN)					
3.2.1.8.2	Wide Area Network (WAN)					
3.3	Software Maintenance	$ 3,857,025	$ 3,959,777	$ 16,790,941	$ 17,444,493	$ 17,766,269
3.3.1	COTS SW Maintenance	$ 437,181	$ 544,893	$ 1,041,232	$ 1,137,104	$ 1,232,976
3.3.1.2	COTS Software Maintenance for Operations	$ 183,695	$ 288,447	$ 782,786	$ 827,090	$ 871,394
3.3.1.2.1	Non-Enterprise COTS Software Maintenance	$ 10,558	$ 15,600	$ 15,693	$ 17,344	$ 18,994
3.3.1.2.2	Enterprise COTS Software Maintenance	$ 173,137	$ 272,847	$ 767,093	$ 809,747	$ 852,400
3.3.2	Developed Software Maintenance	$ 3,673,330	$ 3,673,330	$ 16,008,155	$ 16,617,403	$ 16,894,875
3.4	Recurring/Follow-on Training	$ -	$ -	$ 121,601	$ 145,987	$ 145,987
3.5	Network Administration/Help Desk	$ 624,272	$ 644,696	$ 734,911	$ 825,126	$ 915,342
3.6	Communication Lines	$ -	$ -	$ -	$ -	$ -
3.6.1	DISN Leased Line Cost					
3.6.2	Commercial Line Leaase					
3.6.3	IGC Line Maintenance					
3.8	Disposal /Recapitalization					
3.16	Operational Hardware Upgrades	$ -	$ -	$ -	$ 7,257,064	$ 431,240
3.16.1	Workstations	$ -	$ -	$ -	$ -	$ 50,523
3.16.2	Servers	$ -	$ -	$ -	$ 7,257,064	$ 261,854
3.16.3	Storage Equipment	$ -	$ -	$ -	$ -	$ 118,863
3.16.4	Peripherals	$ -	$ -	$ -	$ -	$ -
3.16.8	Communications Infrastructure (LAN/WAN)	$ -	$ -	$ -	$ -	$ -
3.16.8.1	Local Area Network (LAN)					
3.16.8.2	Wide Area Network (WAN)					
3.16.9	Communication Line Procurement & Installation					

- **Cost Element and Work Breakdown Structures Change**
- Traditional Program Structure is by function:
  - Application Development (Blue)
  - IT Infrastructure (Yellow)
  - Mix of Applications and IT Infrastructure (Green)
- IT Service Structure: IT Infrastructure only (Yellow) and IT infrastructure portion of mix (Green)

Storage Services	$ 200,000	$ 275,000	$ 310,000	$ 315,000	$ 326,000

- IT Services are for a single infrastructure function such as processing or storage
- Includes all "acquisition/ownership" costs associated with that function – R&D, Procurement, O&S (including recapitalization)
- Shows costs in the year the function is used – amortizes capital expenditures
- Usually a cost per quantity, per performance/service level, per period of time
  - $ for 1 TB, online, for 1 year

2008	2009	2010	2011	2012

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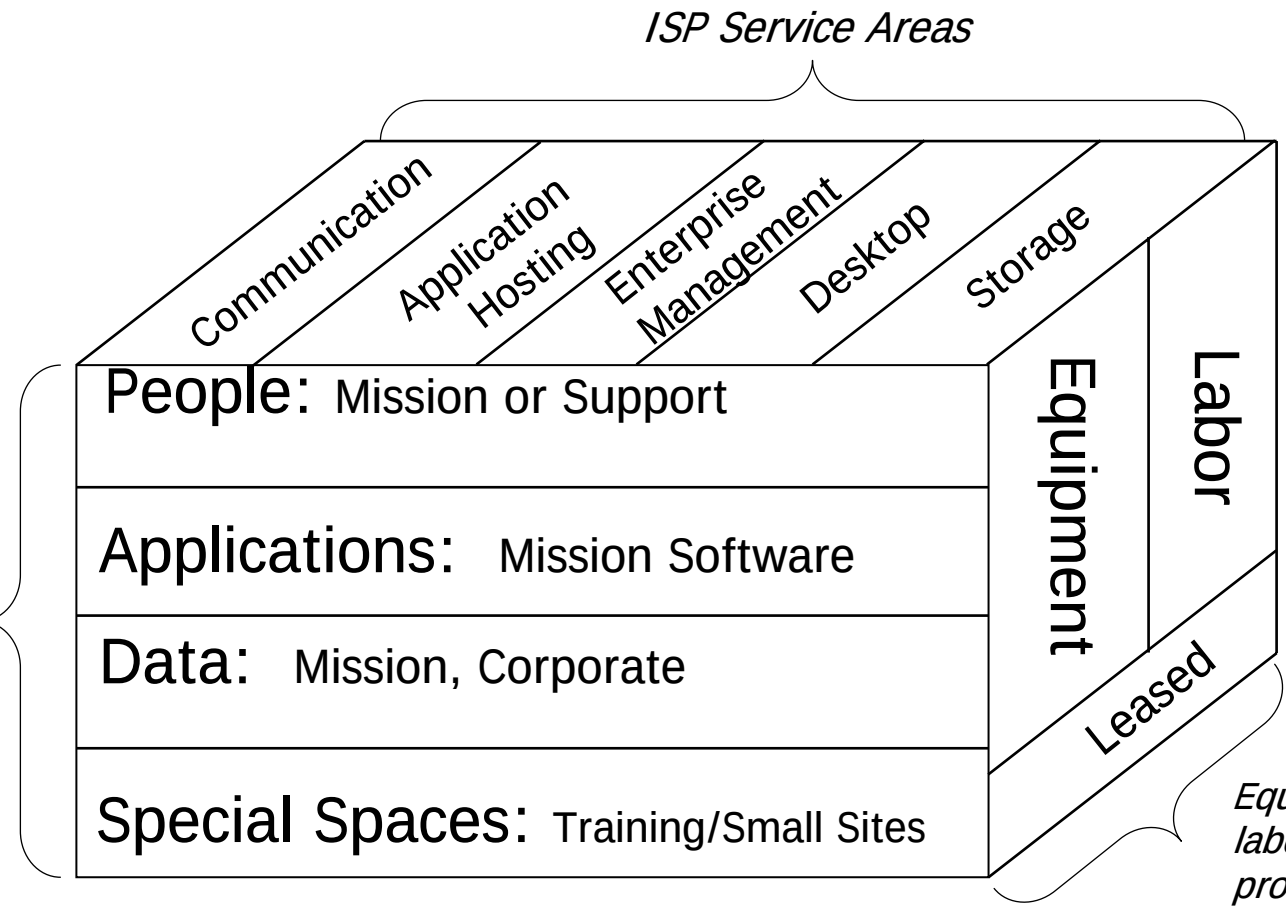
ISP Cost Model
Functional Design: Influences

- Limited service cost/technical/performance data – historic data is program based
- Independent inputs must be reasonably collectable and projectable for the future
- Detail must be at a level that doesn't impose an unacceptable data collection burden yet provides sufficient insight for planning and budgeting
- Need to see cost by multiple breakouts (service area, appropriation, etc.)
- Must capture cost of any delivery method and vendor mix - (vendor agnostic)
- Must capture entire agency infrastructure, current and future

ISP Cost Model
Functional Design: Overview

- Model estimates the ISP costs based on the "Consumers" of the ISP where "Consumers" aren't just people. Consumers are defined as:
  - The number and type of ***people*** supported
  - The number and type of ***applications*** hosted
  - The volume and tier of ***data*** stored
  - The ***special spaces*** such as conference centers, training facilities
- Model describes equipment and labor profiles for each type of consumer
  - To deliver services to the "Consumers," the ISP must provide some amount of equipment (hardware and software) and some amount of labor
    - Equipment profile describes the equipment necessary to deliver that service for that consumer, i.e. analyst needs a high-end thick-client desktop, two monitors, two phones, a portion of a plotter, a portion of a printer, a portion of a router, a portion of shared file storage, personal storage, etc.
    - Labor profile describes the amount of labor necessary to deliver that service: full life-cycle cost
  - Consumer profiles must capture all equipment and labor so individual consumers carry a portion of shared
- Costs are assigned to/generated for each profile
  - Based currently on mix of actual data, industry standards, rules of thumb
  - Goal is to collect service cost data and develop new CERs
- Number of Consumers * (Cost of Equipment Profile and Cost of Labor Profile) = Cost to Deliver the Service

ISP Cost Model
Functional Design



ISP baseline describes the "Consumers" by location and captures changes over time.

Actual model has additional dimensions
- *Time*
- *Cost Elements*
- *Appropriation*
- *Location*

Equipment and labor may be procured together through an external service provider.

Cost of relevant equipment and labor profiles are multiplied by the number of "Consumers" to get the total cost of ISP.

ISP Cost Model

The Model

ISP Cost Model
Model Requirements

- Model in Excel because of availability but design like a database in anticipation of move into enterprise repository
- Show costs by different breakouts
  - Service area
  - Consumer
  - Equipment/Labor/Leased
  - Appropriation
  - Cost elements
  - Time
  - Location
- Regularly add and modify consumer profiles and other inputs
- Show changes over time, i.e. capture change in operating environment, add more people, increase data storage volume
- Estimate full life-cycle costs

ISP Cost Model
Model Structure

- There are five basic components to the model: BOM, Equipment Profiles, Labor Profiles, Calculation Space, and Output
- BOM
  - Contains all enterprise hardware with unit costs
  - Software is calculated as a percentage of hardware; specific software detail would be captured in the Mid-Range and Tactical models
  - Service area is assigned to equipment in BOM (Application hosting, storage, desktop, etc.)
- Equipment Profiles
  - Contains list of equipment for each consumer
    - Shows portion of shared items for each consumer (printers, routers, etc.)
    - May have multiple types of consumers (Analyst People, Admin People, Mission Data, Corporate Data)
- Labor Profiles
  - Applies variety of estimating methods to hardware, software, number of people, etc. to arrive at labor portion of life-cycle costs

ISP Cost Model
Model Structure

- Calculations *(Excel is cumbersome!)*
  - Load inputs into the model by location by year
    - Consumer information (quantity and applicable profile)
    - Select appropriate cost elements, refresh cycles, deflation options, etc.
  - Model combines data from BOM and profile components and applies necessary estimating methods
- Output
  - User selects desired output formats and information
  - Data is pulled from the Calculation component and summarized as specified

ISP Cost Model
Data Sources

- Data sources for the ISP cost model are shown below
  - Sources are readily available – for the most part
  - New campus source will likely be replaced by evaluation of individual sites
  - All sources to be updated as new data sources become available

- BOM
  - Pulled from contracts and ECPs
  - GSA and vendor pricing
  - Software factor from agency programs and industry research

- Equipment Profiles
  - People: Based on new campus provisioning; adjusted for other locations and hardware mixes
  - Applications and data storage: Based on current data center costs (*additional research underway*)
  - Special Spaces: Based on new campus for major sites; external sites used standard representative profiles developed by SMEs

- Labor Profiles
  - Agency acquisition CERs
  - Limited actual costs from data centers
  - Industry standards

- Consumers
  - People by location: agency manpower data
  - Data by location: agency studies on data ingest and retention
  - Applications by location: agency analysis of existing and upcoming systems for transformation activities
  - Special spaces by location: new campus provisioning and SME assessments of other locations

ISP Cost Model

Benefits

ISP Cost Model Benefits

- IT infrastructure has traditionally had a hard time showing direct link to mission
  - The ISP Cost Model provides that link through the consumers of the infrastructure
- Provides a clear basis of estimate for funding requests, making justification easier
  - Helps defend when cuts are mandated; infrastructure provider can pass cuts to consumers (*assuming infrastructure is lean*)
- Cost modeling forces definition and documentation of the baseline
- Model facilitates
  - Quick turnaround estimates for strategic planning
  - Enterprise wide analysis with strong basis – historically, analysis was primarily at program level
  - Vendor evaluations

ISP Cost Model

Closing and Questions