

USING BUSINESS INTELLIGENCE TO ENHANCE JCL ANALYSIS

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About the Presentation

Business Intelligence (BI) is a fast-moving and growing field that focuses on analyzing data from multiple sources to enable informed decision making as well as to support problem identification and resolution.

This presentation discusses how the concepts of BI analytics can apply to our programmatic work products, like a JCL analysis, to provide an enriched environment of model exploration, driver indication, scenario analysis, and result communication. This presentation will showcase how available COTS tools, like Microsoft PowerBI and Tableau, can be used to analyze JCL models and results to rapidly generate effective analysis and visualizations that would normally take hours/days to generate in minutes.

This environment provides new insights to model results that are not typically provided in the canned reports that our cost, schedule, and risk tools generate. Through incorporating BI techniques into our overall analysis framework, analysts can harvest the rich underlying data environment to quickly generate analytics to identify/ express key insights so that we are only bound by our imagination.

About the Presenters

Dan Friedrich is President of MPUG Chicago, and CEO/CTO of Friedrich, Klatt and Associates, a Microsoft Silver Certified Partner named Microsoft's Global Partner of the Year in 2007 for Enterprise Project Management for an Earned Value Data Mart solution.

- His firm's products include:
 - A Microsoft Project Server / Project Online Business Intelligence package that auto-adapts its business Cube to the customer's deployment and comes with over 150 Dashboards
 - A Microsoft Project Pro add-in with a Swiss Army Knife of tools for managing Master Schedules.
- The firm's clients include Fortune 500 firms with some of the largest Project Server implementations, NASA, the Department of Energy, international consulting firms, and many of the largest US defense and aerospace contractors.
- Working with these clients on some of the largest Master Schedules ever created has given him a front-row seat to the real-world challenges and best practices.
- Dan's avocation is comedy sketch writing, directing, and performing, and he is a graduate of the Second City Conservatory and Improv Olympic. His latest show is "If Anyone Was Offended: Campaign 2016."

Darren Elliott has over twenty-five years of experience in financial and cost engineering analysis for mega-projects. For the past 20 years his focus has been on risk analysis and identifying methods and techniques to enhance the overall risk management process, with the past ten years looking at advanced analytics to provide increased insight and effective communication. Mr. Elliott has won multiple awards from NASA, including being selected in 2009 as NASA's Support Contractor of the Year. In 2011, he was awarded best paper at the International Cost Estimating and Analysis Association (ICEAA) for his research on techniques for modeling joint cost and schedule analysis.

About the Presenter (more)



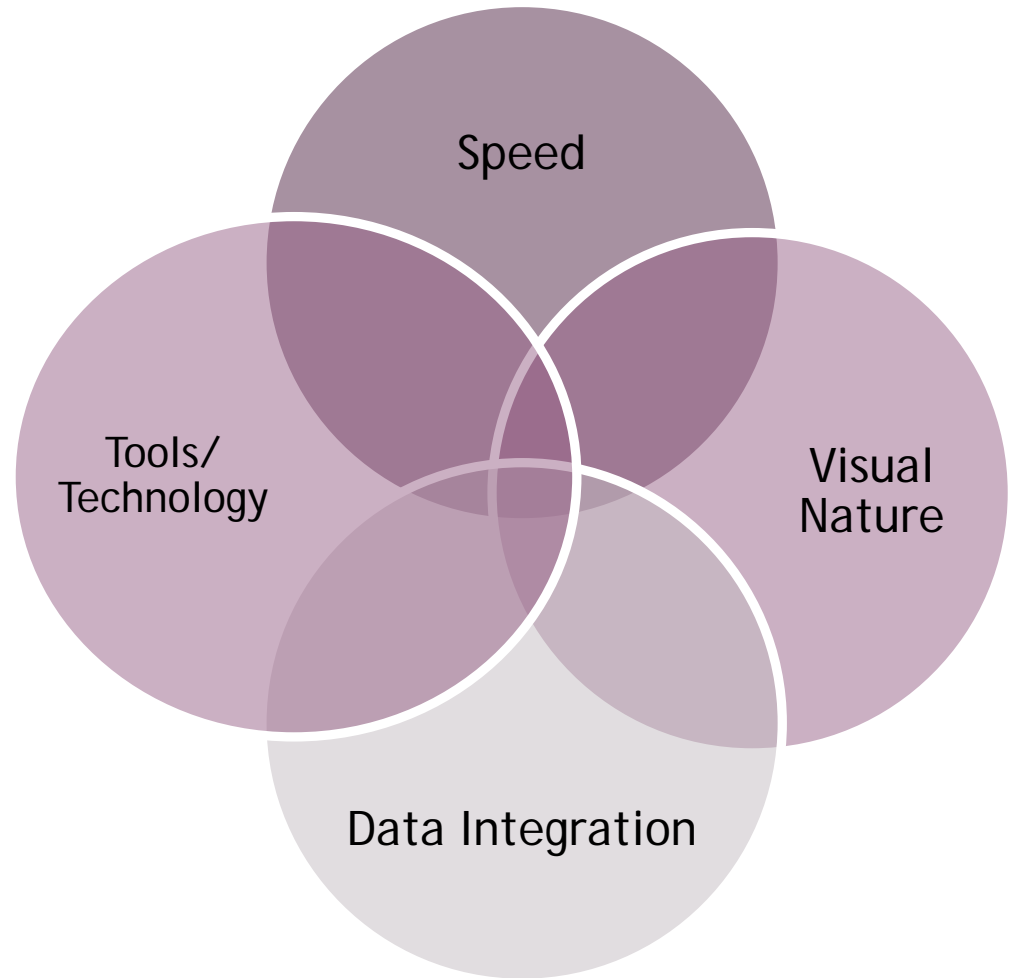
Here Dan is in December during a break from consulting on Master Schedules at the NASA Johnson Space Center, sitting in the Flight Director's chair in the original Apollo Mission Control Center trying to decide whether to press the "Buzzer" or "Launch" buttons. (There's air tubes for sending canisters with messages too - so retro, it's cool, no?)

“Signals always point to something. In this sense, a signal is not a thing but a relationship. Data becomes useful knowledge of something that matters when it builds a bridge between a question and an answer. This connection is the signal.”

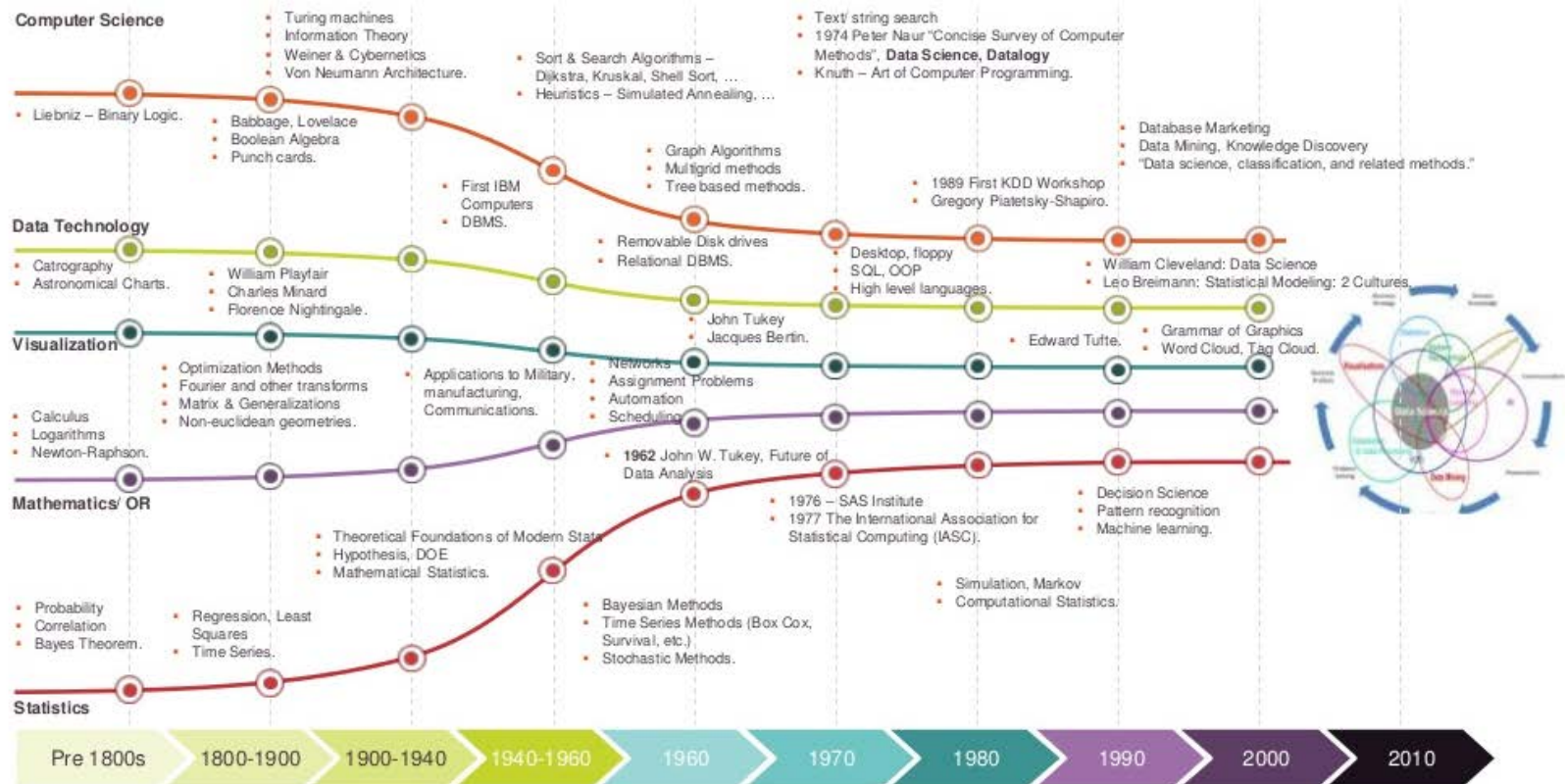
- Stephen Few, *Signal: Understanding What Matters in a World of Noise*

World of Analysis is Changing

- Inclusion and analysis of larger data sets
- Integration of adjunct information to enhance insight
- Use of data visualization to generate insight
- Generation of scenarios to assess and forecast outcomes
- Movement toward rapid and interactive environments to support analysis



The Evolution of Data Analysis

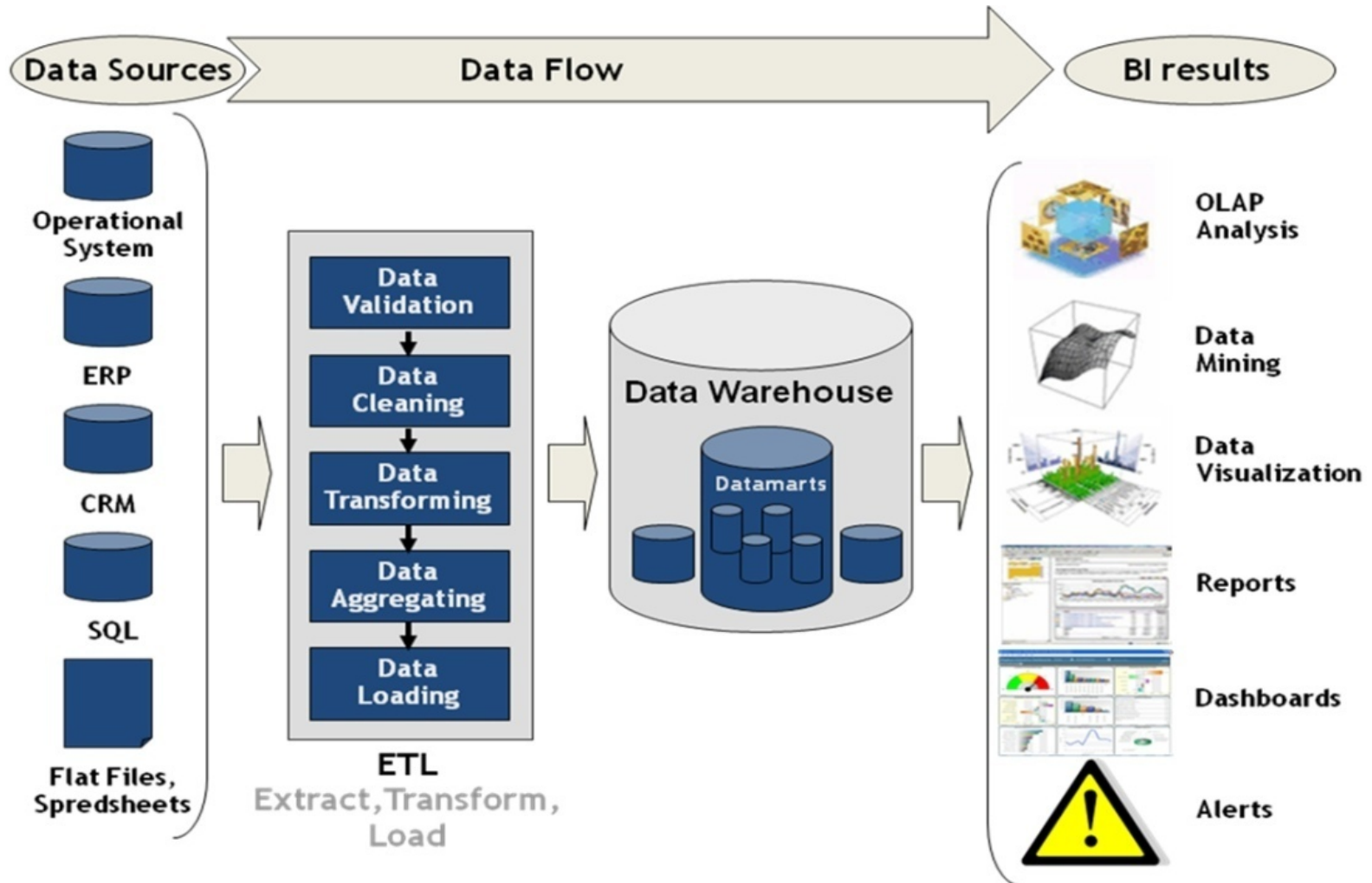


Big Data & Analytics
 Impact of Big Data on Analytics | Mamatha Upadhyaya
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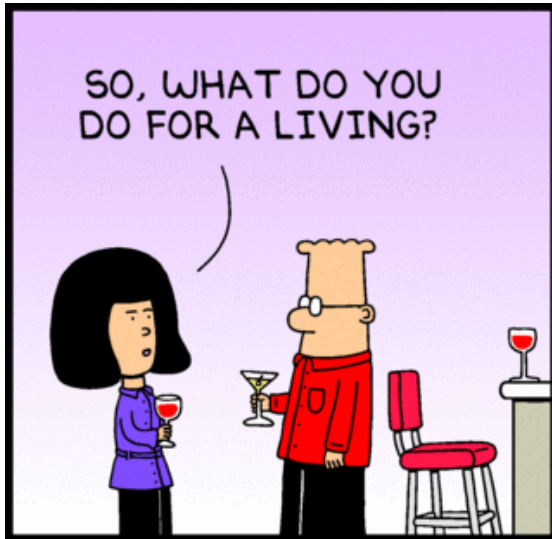
Business Intelligence (BI) & Analytics

- Business intelligence (BI) is a term used to encompass the processes, methods, measurements and systems businesses use to more easily view, analyze and understand information to help decision-makers make more informed and better decisions to guide the business.
- BI software and software-as-a-service (SaaS) solutions are designed to retrieve, analyze, transform data and making it simpler to aggregate, view, and slice-and-dice the data to identify trends/issues and uncover new insights.
- BI solutions are built on a unified data architecture, so everyone involved in the process gets a single, real-time view of the data. BI tools applications generally read data that have been previously stored, often, though not necessarily, in a data warehouse or data mart
- Analytics relates to the exploration of historical data from many source systems through statistical analysis, quantitative analysis, data mining, and predictive modeling to identify trends and understand the information that can drive business change and support sustained successful business practices.

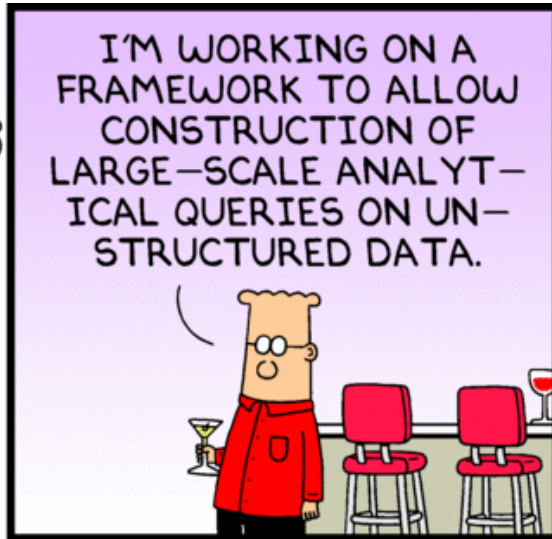
General BI Framework



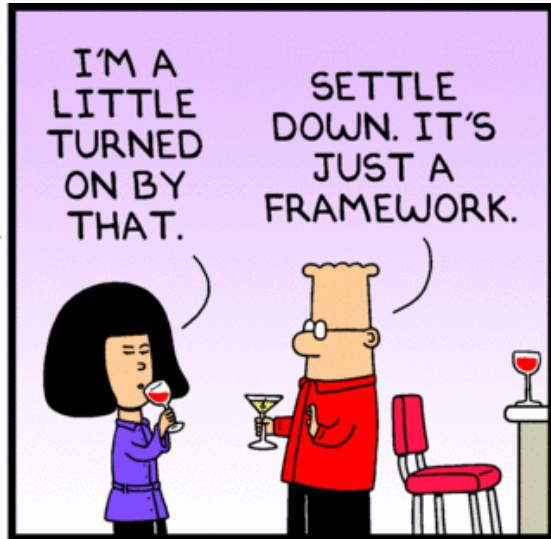
Graphic from "Supply Chain Management - New Perspectives", ISBN 978-953-307-633-1, Published: August 29, 2011, Chapter 28 - Intelligent Value Chain Networks: Business Intelligence and Other ICT Tools and Technologies in Supply/Demand Chains, By Evelin Vatovec Krmac



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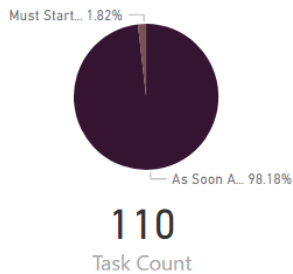


JCL Analysis Currently Limited

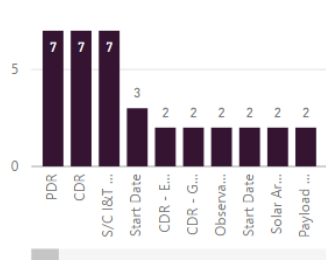
- **JCL tools are powerful with built-in analytics, however there are limitations**
 - Analysis constrained to available reports
 - Custom analysis requires underlying data and restructuring of information
- **Applying BI concepts greatly expands JCL capability**
 - Generation of new reports / metrics to assess drivers
 - Ability to link logic network with risk results
 - Support rapid interrogation and scenario comparison
 - Enables conditional analysis
 - ...

Example 1 - Insight into JCL Model Topology

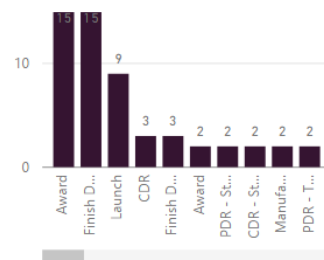
Task Count by Task Constraint Type Name



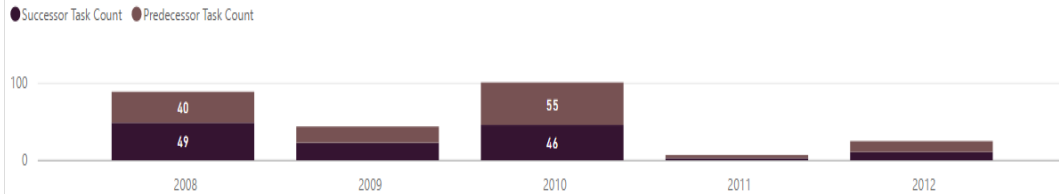
Predecessor Task Count by Task



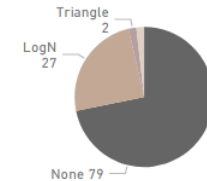
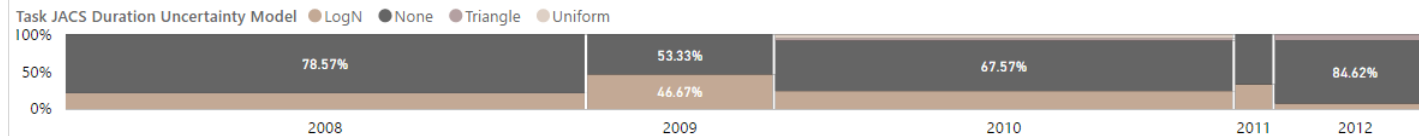
Successor Task Count by Task



Successor Task Count and Predecessor Task Count by Task Start Year



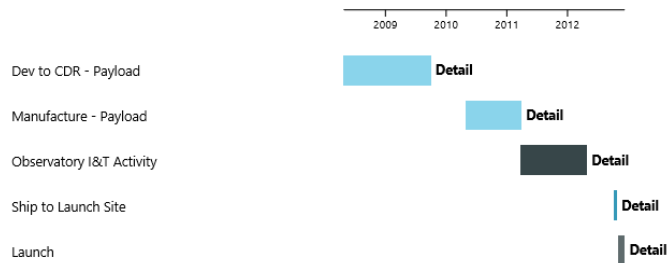
Task Count and Task Count by Task Start Year and Task JACS Duration Uncertainty Model



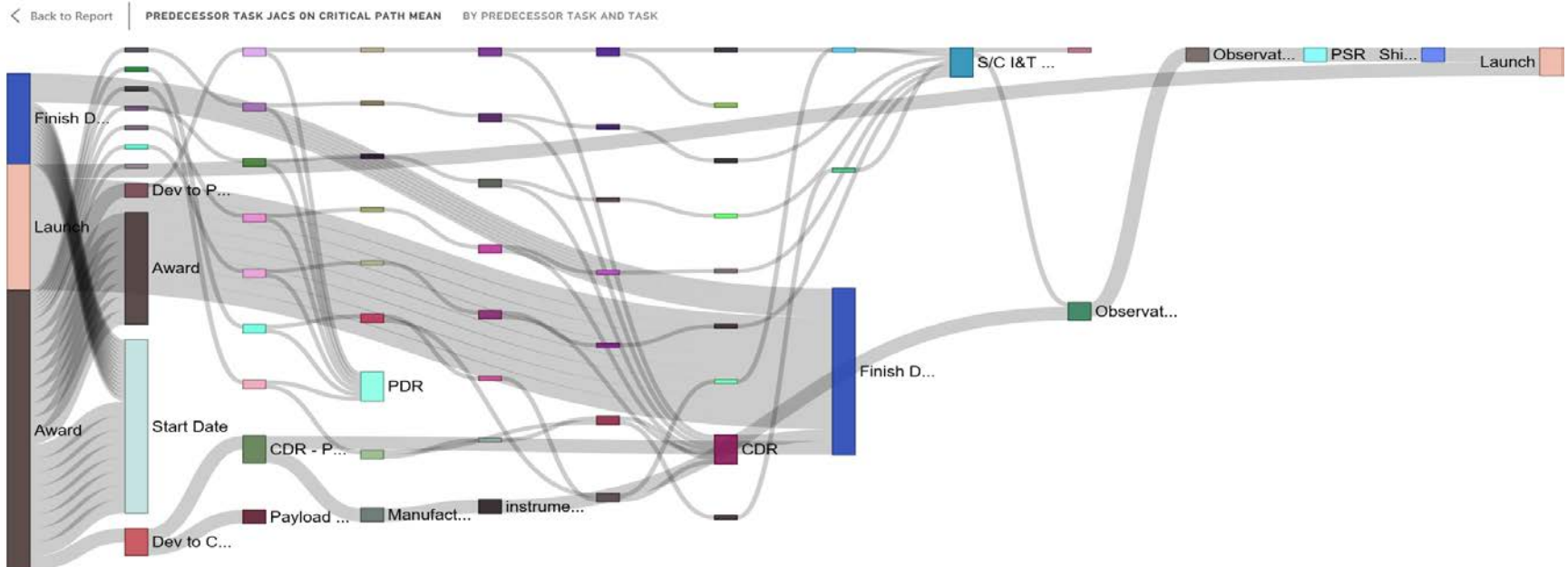
- Generates quick metrics on schedule structure, uncertainty placement, and schedule information (duration, constraints, etc) to understand model and to identify where issues may exist
- Enables ability to quickly filter on a specific analysis area (e.g., what is on critical path, what is payload)
- Ability to add metrics/reports and customize through COTS technology
- Provides temporal insight

Example 2- Visualizing the Critical Path

Task Duration In Days Average and Task Percent Completed Average by Task Area, Task, Task Start Date Timeline and Task Schedule Role



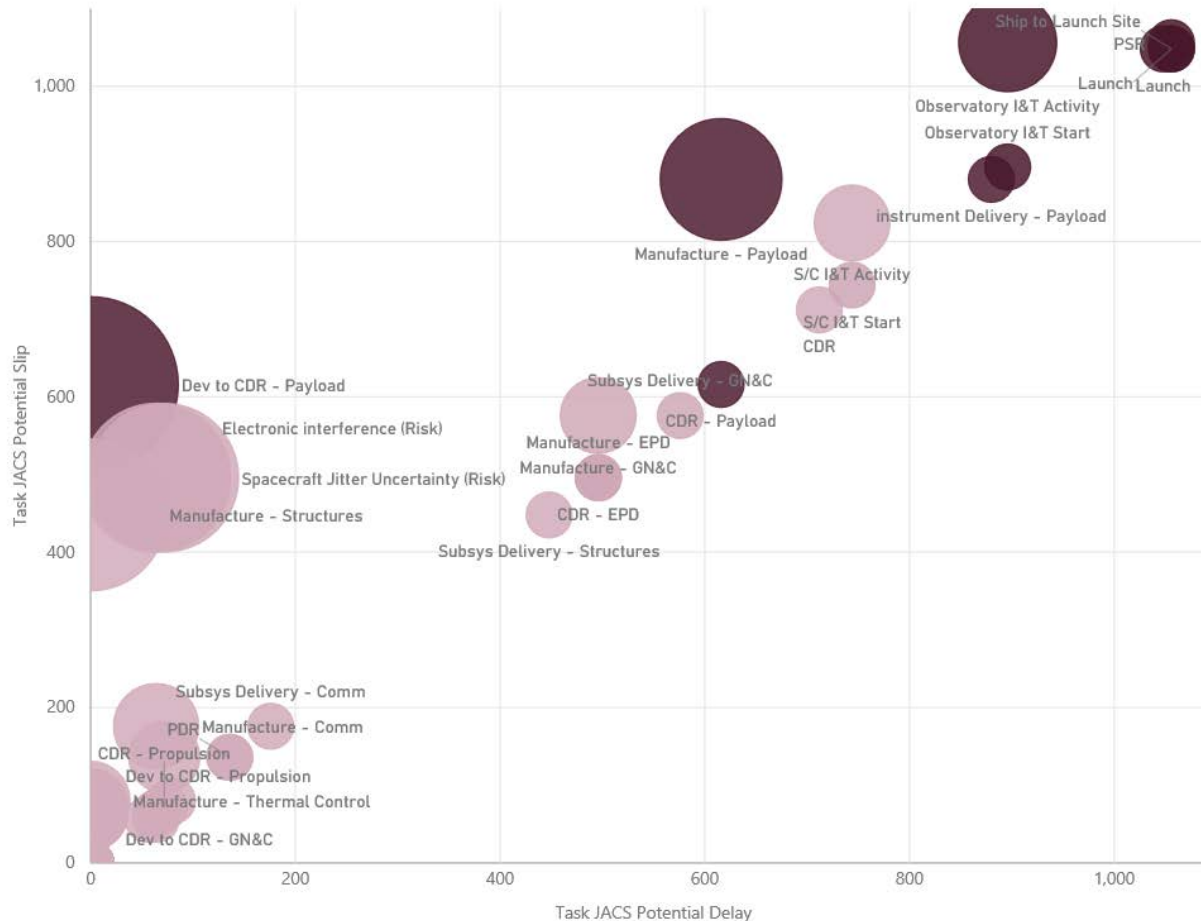
- Visualize the deterministic critical path (either as a flow or a Gantt)
- Visualize the probabilistic critical path, their criticality, and overrun potential
- Quickly filter data based on a specific analysis area (e.g., what is on critical path)



Example 3- Identifying True Drivers to the Schedule

< Back to Report

ACROSS: TASK JACS POTENTIAL DELAY, DOWN: TASK JACS POTENTIAL SLIP, SIZE: TAS...

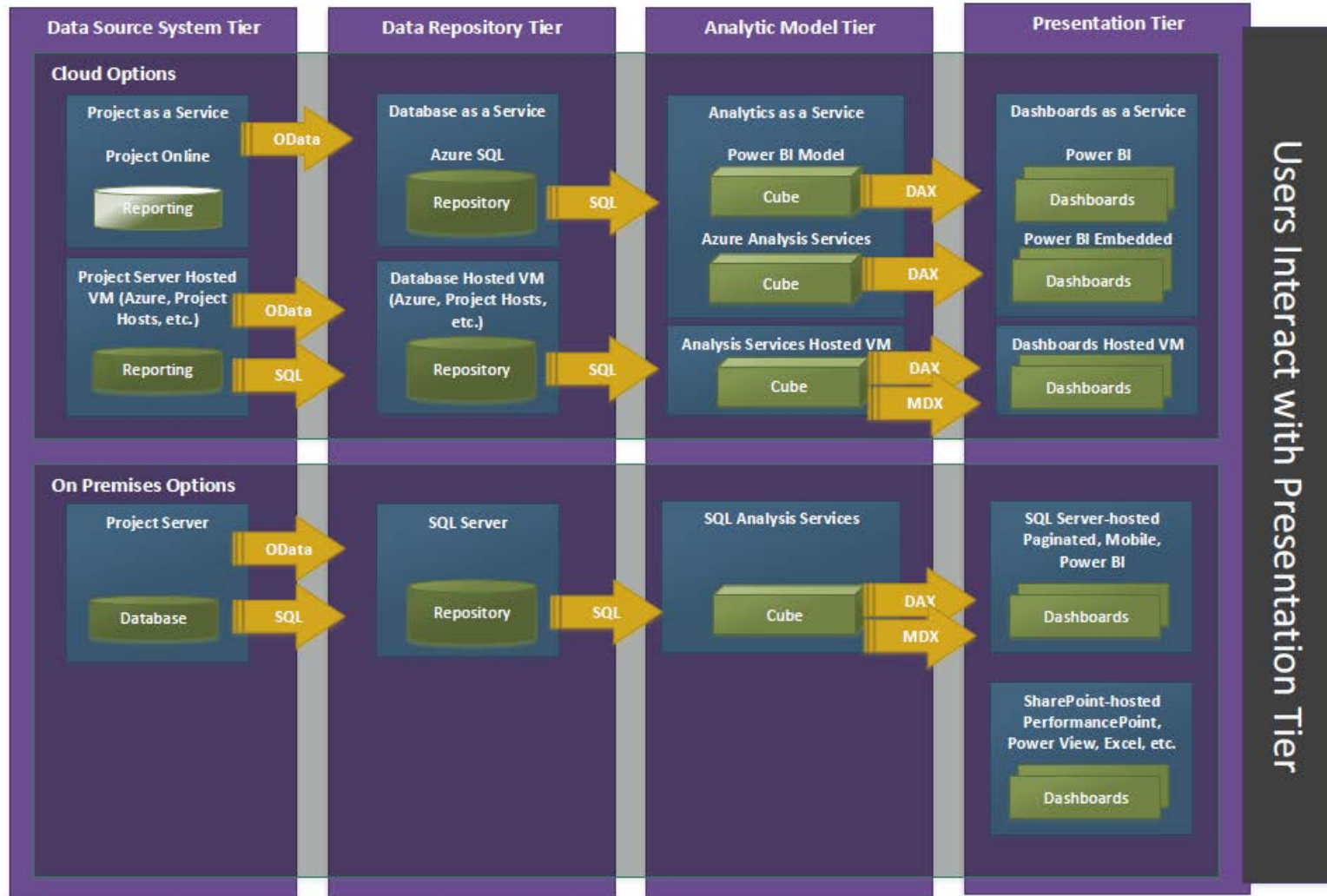


- Visualize overall impact of trade between start delays and finish slips
- Quantify the magnitude that an activity drives the schedule
- Indicate the frequency a task is on the critical path

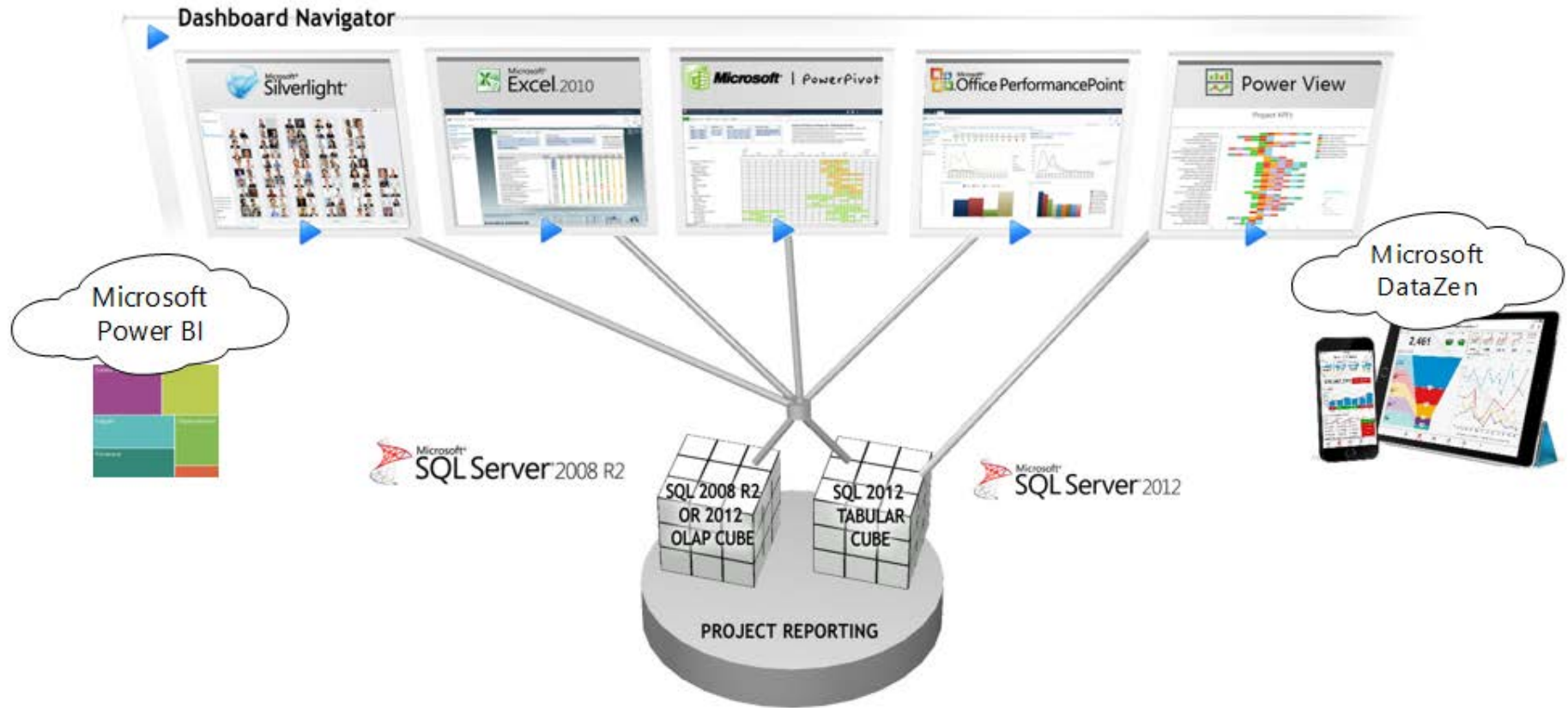
JCL and BI Technology Approach

- **Leverage current COTS technology**
 - Microsoft BI framework (SQL Server, Power BI)
 - Microsoft Project Server
 - FK&A Project Data Foundation and Dashboard Pack
- **Apply using data easily available from a JCL Model**
 - Selected JACS due to wide availability of data in existing files
 - Modeling information and summary results stored in MS Project File
 - Separate file contains all simulation results, as well as schedule structure information
 - Eliminated need to have JACS to use the BI solution, just needed the project file and a JACS-generated result file

Implemented Solution within the FK&A BI Environment

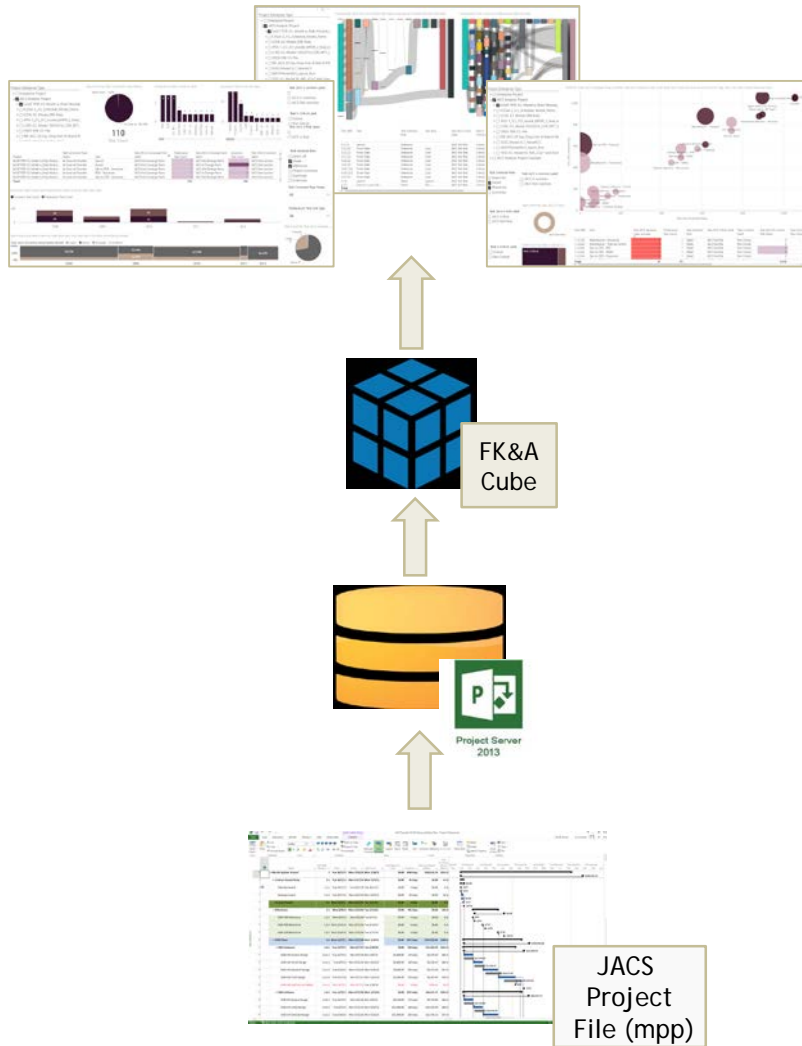


FK&A Environment Enables Multiple COTS Visualization Avenues

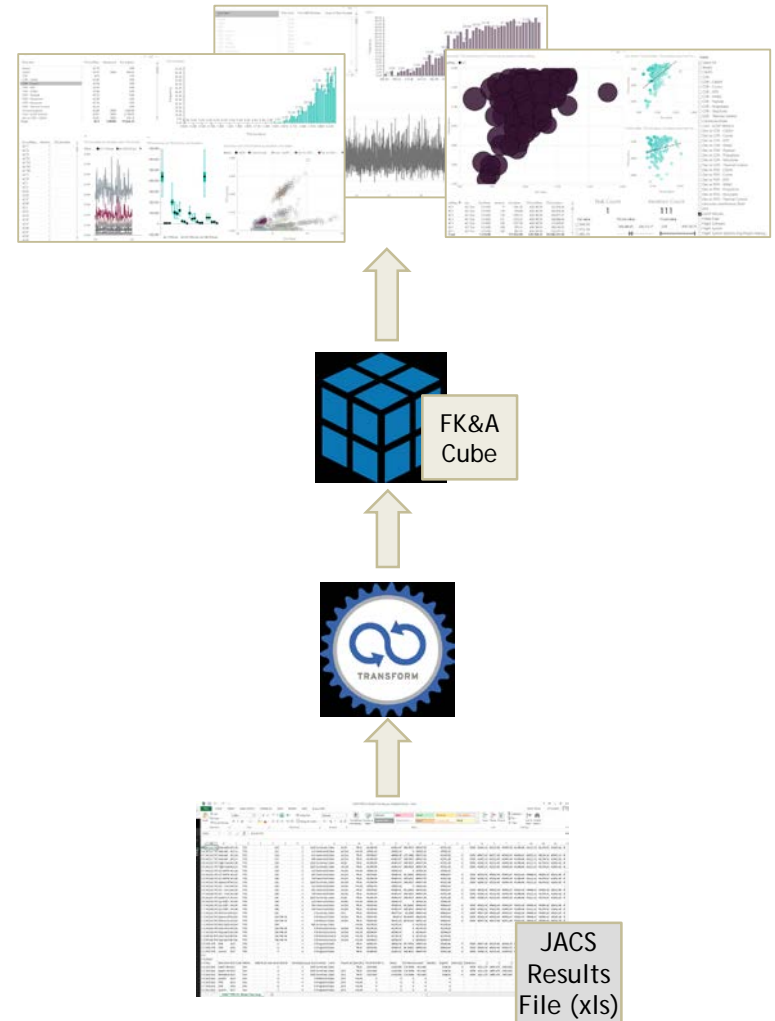


Implemented Two Different Paths to Access/Use JACS Information

Project Server File



JACS Text File



Summary

- BI Technologies have rapidly advanced over the past several years
- BI Concepts can be applied to work products and processes currently employed by major organizations like NASA
- BI Implementation can be done in a manner that allows enterprise and portfolio capability
- Applying agile BI concepts greatly expands JCL insights via underlying automation

Q&A

Discussion

Thank You

About FK&A [Friedrich, Klatt and Associates](#) (FK&A) specializes in Enterprise Project Management (EPM), Business Intelligence (BI), and Portal repeatable solutions leveraging Microsoft products and .NET.

FK&A products and services help EPM customers scan, repair, split, merge, consolidate, and visualize Master Schedules; extend Project's Issues and Risks to fit their business processes and automate workflows; audit timesheet processes; integrate external time entry, ERP, and other systems; and leverage Project Server's repository, with data marts, cubes, Dashboards, and reports, as the FK&A Project Data Foundation and Dashboard Pack does.

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