A New Era in Data Warehousing at Harvard University, A Strategic Discussion

Session #29436

Your Presenter

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Harvard University

- For 9 years have directed a group responsible for the technical application management of University wide administration systems
- Involved with Data Warehousing for 20 years

Problem Statement

Faced with unprecedented growth in data warehousing demand and continued customer frustration with the time required to develop solutions, Harvard needed to embrace new ways to deliver information to the community

This case study will discuss the challenges Harvard faced and the steps it took to increase customer satisfaction

Approach Taken

- Greater leveraging of transactions systems for reporting
- Removal of the data warehouse technical team from the critical path for reporting and analysis
- Deployment of in-memory business analysis tools
- Acceptance of the use of external resources for strategic work

Harvard Data Warehouse (HDW)

- Originated in 1998 with a nightly mirror of the then new Oracle Financial System
- Has steadily grown in terms of subject areas, overall size and query/report volume
- Currently contains 1.8 TB of data
- Processes more than 1.25 million queries per year
- Has a wide spread in the sophistication of the user community

Early HDW Challenges

- Underfunded data warehouse strategy
- Inability to develop well defined requirements at the time of transaction system implementation
- Poor query response times
- No University wide query tool
- Requests for many report variations with no easy method of delivering them

The Good News

- Strong data warehouse team
- Great user reporting front end from a previous generation data warehouse
- A University query tool had been chosen
- Acknowledgement of the need to have a dedicated data warehouse track as part of ERP projects
- Realization that simply generating more and more reports would not scale

Advancement System

Approach

- Use the transaction system for reporting
- Have a dedicated reporting team track from project inception
- Seek out an alternative to generating reports

Results

- Reporting extensions to the transaction system worked well
- Continued challenges with defining and delivering reports
- First implementation of a data discovery tool had significant challenges
- Ability for users to develop and share queries for accessing advancement information

State of HDW

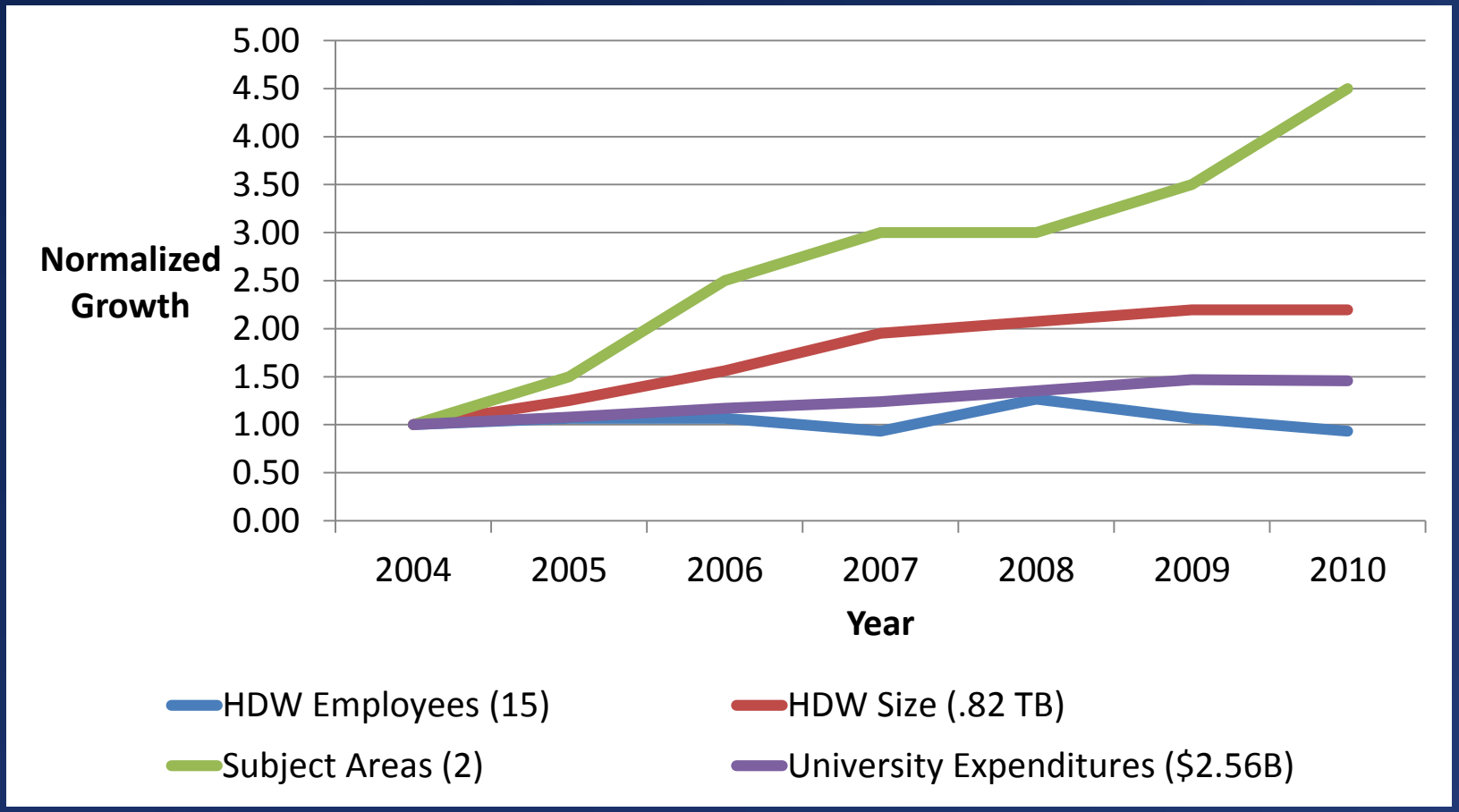
- Success in fulfilling core reporting requirements for PeopleSoft's Absence Management module directly from the ERP system
- Successful first implementation of a ***wholesale*** data mart for PeopleSoft's Absence Management module

B U T

- HDW backlog hit unprecedented levels
- Executive level understanding of the HDW was still limited
- Customer frustration was growing over the amount of time and money required to deliver HDW solutions

With unprecedented pressure on the HDW, in 2007 Huron Consulting Group was brought in to assess the overall state of the HDW

HDW Growth Over Time



Huron Consulting Findings

- Difficult to find similarly profiled organizations that were doing data warehousing well
- HDW architecture in place was never intended to support the current use
- HDW resource growth did not keep pace with the growth in customer needs
- HDW would benefit from having centralized executive ownership and the consolidation of data warehouse resources into one group
- Users had a great interest in analytics

After the Report

- HDW gained a new level of executive understanding and commitment
- Received funding for the first set of HDW improvements
- There was an increased urgency to expand the ability for users to develop and share queries
- HDW was challenged to come up with a pilot project to demonstrate the value of analytics and new delivery models for solutions

The HR Analytics (HRA) Project

A pilot project to validate the value of analytics and test an alternate delivery approach

Evolve an existing Excel based application, **S**ome **N**umbers about **O**ur **W**orkforce (SNOW), into a robust analytics application

- Build an extendible SNOW data model incorporating employee demographics, mobility, and turnover information
- Enable users to interact with the data
- Use an outside firm in a strategic capacity

Phytorion, Inc. was brought in to help create the SNOW data model for Harvard

Project Challenges

- The calculations required to meet the needs of the business were very complex and sophisticated
- HDW's previous experience with external vendors was not stellar
- The functional and technical groups at Harvard were not functioning as a team
- The technical group was initially resistant to different approaches
- The economy collapsed in the early stages of the project

How Phytorion Helped

- Brought strong PeopleSoft, higher education, and data warehousing experience
- Demonstrated relevant technical competency early
- First worked to gain the trust of all parties involved
- Acknowledged strengths of the technical team but was persistent with a best practices approach
- Tailored the project to Harvard's operating culture
- Valued customer success over contract details

The unwavering commitment from Phytorion and the Harvard Executive Sponsors enabled the project team to work through the difficult project challenges

Results

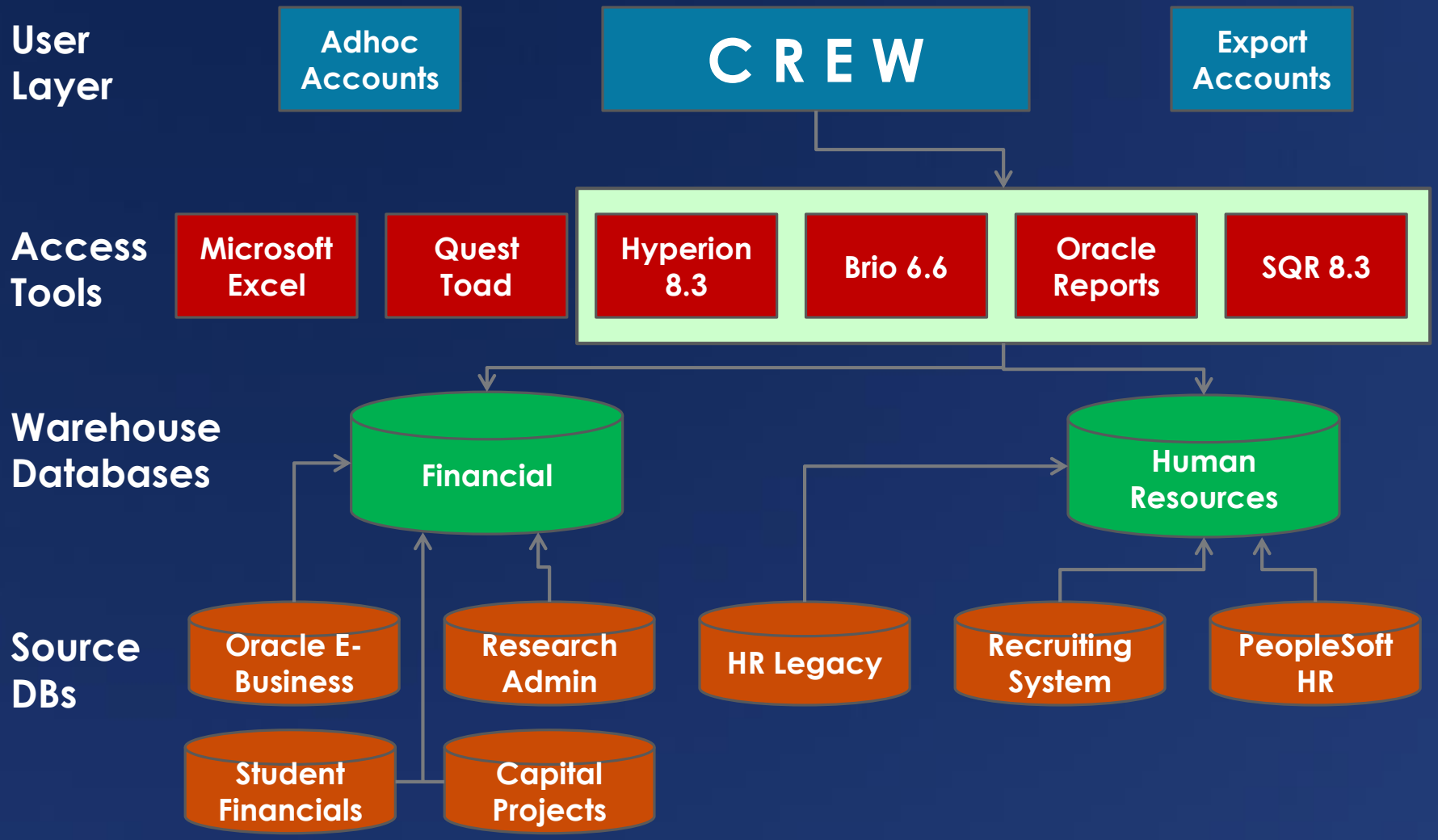
- The partnership between Phytorion, Inc., and Harvard successfully delivered a data model on time and on budget
- HDW learned how to work successfully with an outside firm
- Phytorion was subsequently engaged to expand the SNOW data model by adding employee costing
- The Harvard functional team built a user layer using Qlikview

There is a session, SNOWing Crimson, on Tuesday at 4:30pm in Room 106 that discusses the project in detail

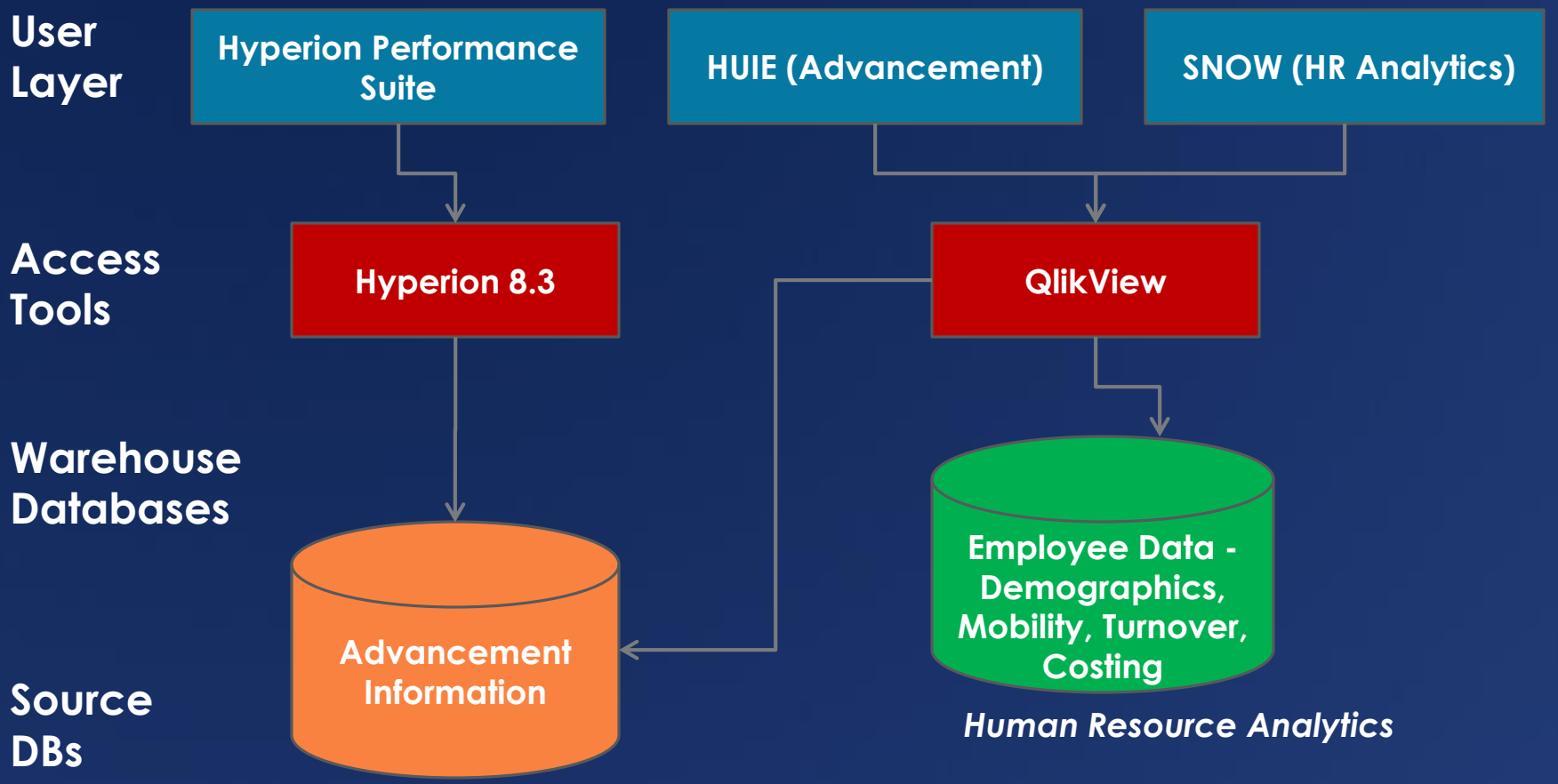
HDW Today

- Nine Subject Areas – Alumni Affairs, Budgeting, Capital Projects, Finance, Human Resource, HR Analytics, Recruiting, Research Administration, Student Financials
- Usage continues to increase
- Importance of the HDW continues to grow
- HDW continues to play an integral role in the running of the University and the preparation of its financial statements
- HDW continues to expand user query creation and sharing capabilities
- Tools migration to OBIEE+ is in process
- Using the transaction system for reporting and creating a wholesale data mart for version 1 system implementations is an accepted approach

Current State of HDW - Core



Current State of HDW cont.



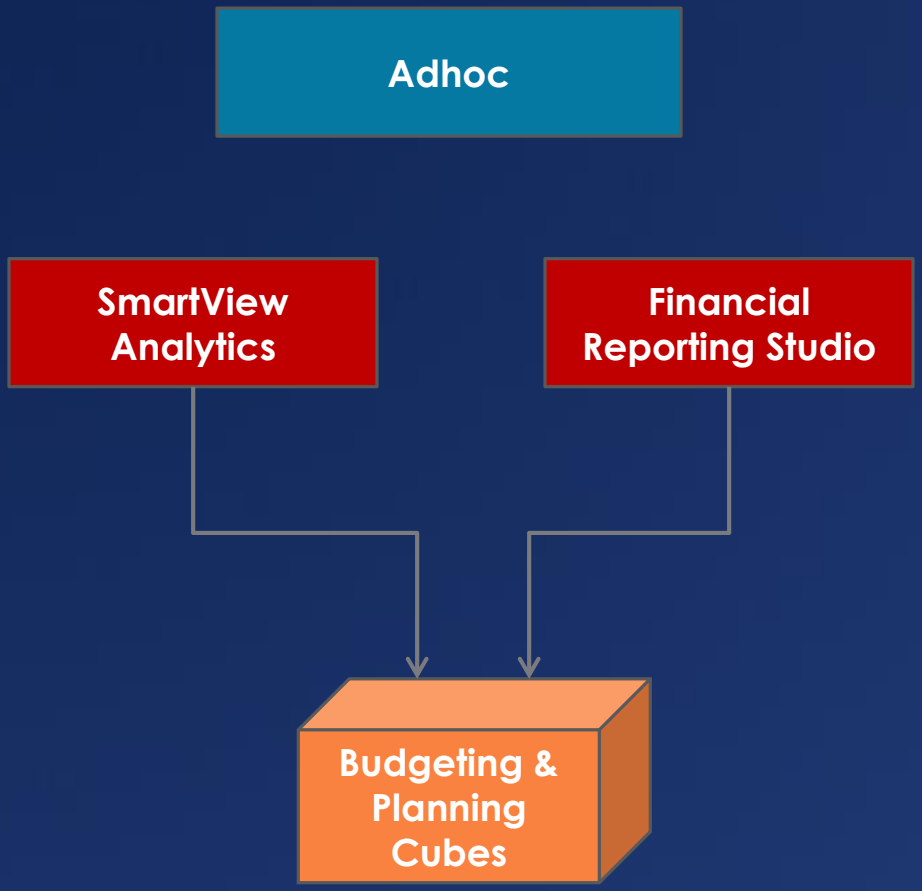
Current State of HDW cont.

User Layer

Access Tools

Warehouse Databases

Source DBs



Progression of Reporting Models

- Mirror of nightly transaction system database (S1)
- Optimize performance of the transaction system mirror (S1)
- Procure pre-defined data model (S2)
- Develop custom data models (S2, S3, S5)
- Implement extensions to the transaction database for reporting (S4)
- Use transaction system for reporting, supplement with wholesale data mart (S6, S8)

Observations about Data Warehousing

- Getting sufficient executive attention and understanding can be difficult
- Articulation of the value proposition for business intelligence is not easy
- Use of ERP implementation methodologies are typically not optimal for data warehousing
- Different types of data warehousing projects benefit from different project management processes
- Technology is often blamed for data and process issues

Recommendations

- Be persistent, opportunistic and as incremental as possible
- Seek out and educate executive sponsors
- Develop a process for evaluating the technical, organizational and data challenges of proposed initiatives
- Encourage staff to grow both their functional and technical competency
- Support and leverage user experimentation
- Participate in peer groups

Questions?

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