University Perspective

BPPAC Meeting at Fermilab
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CMS Trigger Project Manager
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Topics:
Organization
University Role
Management

This talk is available on:
## Subsystem

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<td>Endcap Muon</td>
<td>UC-Davis, UC-Los Angeles, UC-Riverside, Carnegie Mellon, FNAL, Florida, Northeastern, Ohio State, Purdue, Rice, Wisconsin</td>
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<tr>
<td>Hadron Calorimeter</td>
<td>Boston, Fairfield, FNAL, Florida State, Illinois - Chicago, Iowa, Iowa State, Maryland, Minnesota, Mississippi, Nebraska, Northwestern, Notre Dame, Purdue, Rochester</td>
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<td>Trigger</td>
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<td>Data Acquisition</td>
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<td>EM Calorimeter</td>
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<td>Forward Pixels</td>
<td>UC-Davis, FNAL, Johns Hopkins, Mississippi, Northwestern, Purdue, Rutgers</td>
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<td>Silicon Tracker</td>
<td>UC-Santa Barbara, FNAL, Kansas, Kansas State, Northwestern, Rochester, Illinois - Chicago</td>
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Scientific Effort on US CMS

- Base US LHC scientific effort expected to grow x2
- Base Program Support is Critical (Travel, COLA)

University Program is growing
US Management & CMS Management

- CMS Project Managers are members of “Steering Committee” that is chaired by and advises Spokesperson, Michel Della Negra.
- US-CMS Level-2 Managers report to CMS Level-1 Project Manager, Dan Green, who is also the Hadronic Calorimeter Project Manager & sits on the Steering Committee.
- Two US-CMS Level-2 Managers (who are University Faculty) are also CMS Project Managers & sit on the Steering Committee.
- Other US-CMS Level-2 Managers (both University Faculty & Lab Scientists) report to their respective CMS Project Managers.

How does this work?

- It works well because the US-CMS Level-1 Project Manager synchronizes US-CMS and CMS activities through the Steering Committee decision-making process with the Spokesperson.
- It would not work if the US PM were to act unilaterally.
US is Well-Represented, with Appropriate Level of Leadership
International Risks

Schedule integration amongst international partners
  • Impact of actions in international project outside control of US project

Changing specifications
  • Need to make decisions early to keep R&D and redesign costs down, limit schedule slip
  • Not generally as high a priority as in the US

Culture of Personnel Costing
  • European Institutes generally do not cost labor and generally do not know the cost well nor as carefully consider labor cost implications of decisions

Culture of Contingency
  • European planning generally does not include contingency and regards the US contingency as a bank to finance their shortfalls
Choice of Tasks

Vertical Integration: unified subprojects
  - Reduces international interfaces
  - Allows management of tasks within the US, reducing need to integrate international partners

Choose exciting/challenging projects
  - Continued development of field in US
  - Attract top postdocs, students, engineers

Choose projects doable at a University
  - Electronics, sensors, instrumentation
  - Leverage Faculty & University program resources

Plan Maintenance & Operations, Upgrades
  - Projects should have a future that allows continued development of talent, training of students & postdocs
University Mechanical Projects: U. Wisconsin Endcap Disks
University Electronics Projects: Wisconsin Calorimeter Trigger

18 Crate 160 MHz system processing $4 \times 10^{12}$ bits/sec

- Pattern logic identifies electron, jet, tau, muon candidates
Project Office

Host lab provision of Project Office is essential
- Assistance with project tracking, management tools
- Unified interface to funding agencies
- Structure for Reviews
- Feedback on performance -- asking questions
- Single point of contact for tracking down expenditures

Host Lab should not be owner but a collaborator
- Project should be organized as a consortium of Universities & Labs with a base of operations at a Lab
- Parts of the project should be clearly associated with and credited to individual Universities & Labs.
University Management

Statements of Work

- Single Yearly document that lays out funding is useful

Salaries in Grant Supplements

- Planning for people is long term
- University administrations view as awarded grants
- Much easier for handling salaries than MPO

Materials & Supplies in Memorandum Purchase Orders

- Allows more direct control by Project Office
- Single MPO with sections better than multiple MPOs.
- Reporting of % complete vs. billing can cause problems

Overhead

- Both Lab pass-through & University charges need to be carefully worked out in advance.
University Management

How does a University Faculty Member act as a US-CMS Level-2 Manager when the funding & contracts flow through a National Lab?

- Level-2 University Faculty Manager makes decisions
- Implements them in a Microsoft Project File
- Submits this to the Fermilab Project Office
- Fermilab PO derives Statements of Work from the Project File and sends them to the Level-2 University Faculty Manager for approval.
- These statements of work are used to generate letters to DOE for University Grant Supplements
Computing

Opportunity for major University Role if there are large computing needs:

• Calculations
• Modeling

Collaborate at Universities with Computer Science Colleagues

• NSF & DOE have funding for such collaborations
• Examples: Wisconsin HEP-Condor Collaboration and Larger LHC-Grid HEP-Computer Science Collaborations

Develop Computational & Collaborative tools to enable competitive US analysis of results
Embrace Contingency!

- You will need it. Be generous (better to ask now), particularly if the cost is capped.
- Develop a uniform scheme but apply it at the lowest WBS level. Its determination will help in the project planning.

Erosion of University Base Resources

- University base program engineering & technical personnel supportable by the project end up supported by the project and not by the base program.
- Loss of University independence, creativity, flexibility.