AP209 Modular Edition 2 Development Proposal

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Overview

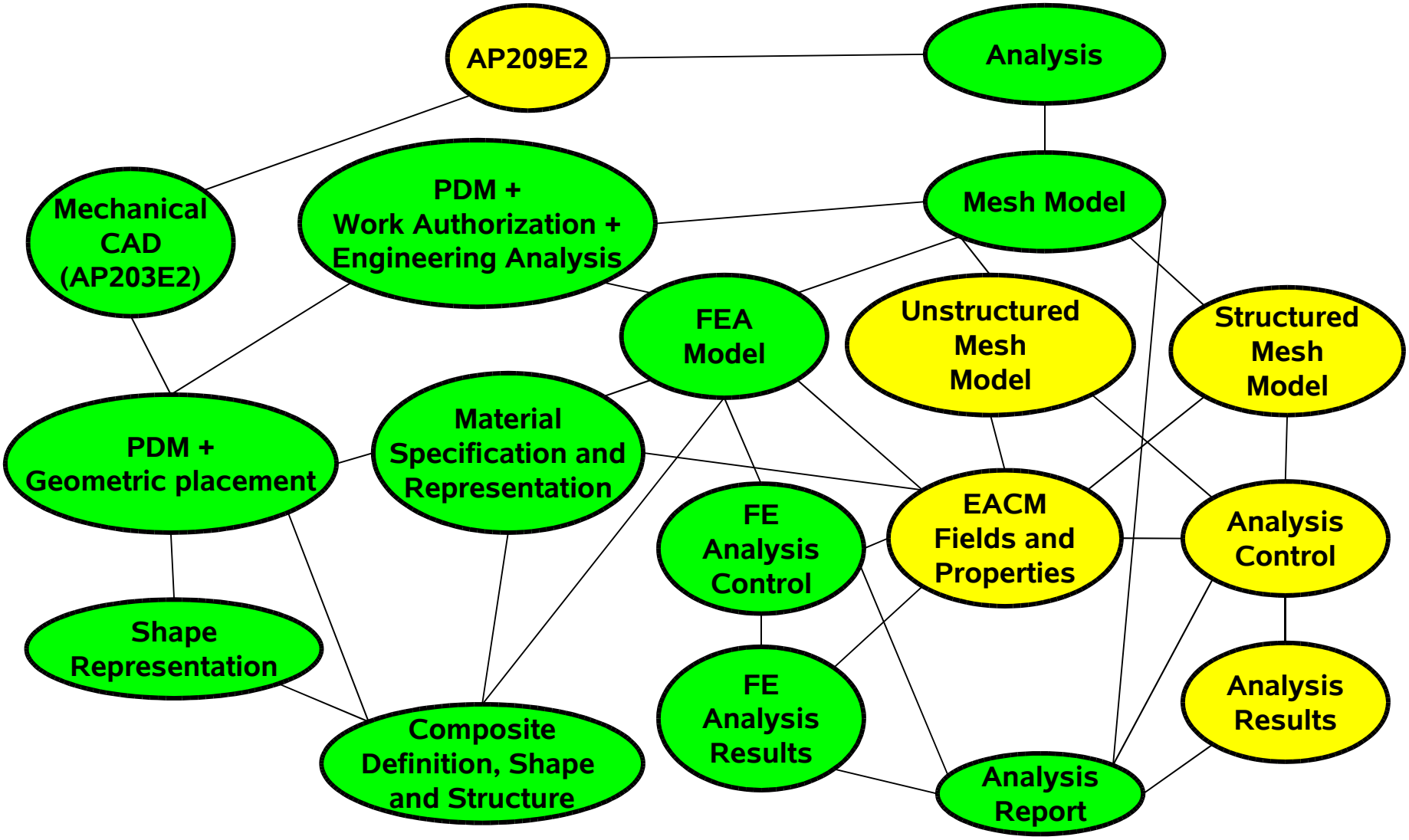
- Modularization Approach
- High Level AP209E2 Composition
- Applicable Recent Integrated Resource Developments
- Required Integrated Resource Updates
- First Order Estimate of Modularization Tasks

Modularizaton Approach

- *Primary Objective*
  - Modify existing modules (203E2, PDM)
  - Create Materials, and Composites modules from AP209E1
  - Create FEA modules from AP209E1
  - Create EACM Fields modules from IRs
  - Create Implementation and AP modules

- *Stretch Objective*
  - Create Structured/Unstructured Grids and Analyses from IRs
    - Fluid Dynamics and Heat Transfer are initial goals
  - Create Nonlinear Analyses by enhancing IRs and Modules

High Level AP209E2 Composition



Applicable Recent Integrated Resource Developments

- Parts 50 and 51provide the mathematical basis for the definition and representation of fields and expressions
  - Including external binary format representation
- Parts 52 and 53 provide the remaining basis for structured and unstructured meshes
  - Part 110 adds further detail for Fluid Dynamics
- Part 107 provides the linkage between existing Part 104 – based FEA and the above

Part 50: Mathematical constructs
Part 51: Mathematical description
Part 52: Mesh based topology
Part 53: Numerical analysis
Part 104: Finite element analysis
Part 107: FEA definition relationships
Part 110: Mesh based computational fluid dynamics

Required Integrated Resource Updates

- Extending and/or generalizing Part 104 and AP209
  - Extend existing field representations to represent nonlinear field components
  - Add specialized nonlinear element types
  - Add nonlinear boundary conditions and loads
- The general structured and unstructured grids and analysis capabilities of STEP would need no further update as they now adequately cover nonlinear analyses

First Order Estimate of Modularization Tasks

Primary Objective	
Modify existing modules	64
Composites modules	336
FEA modules	252
EACM Fields modules	186
Implementation and AP modules	82
Total	**920 hours**
Stretch Objective	
Structured/Unstructured Grids and Analyses	200
Nonlinear Analyses	150
Previous Total	920
Total	**1270 hours**

- **There also needs to be some time estimated for the DIS and IS publication of Parts 52, 53, 107, and 110 (and maybe an update for 104).**