

Aerospace Systems Concepts and Analysis Methods Development - Peer Review

MDO Applications - Overview

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MDO Applications: Outline

- Overview (Barthelemy)
- Software Development (Salas)
- LCAP (Walsh)
- HSCT4 (Townsend)

Lunch break

- RACRSS (Weston and Dunn)
- ELVIS (Korte)
- Spreadsheet Tools (Rogers)
- Team Dynamics (Zang)

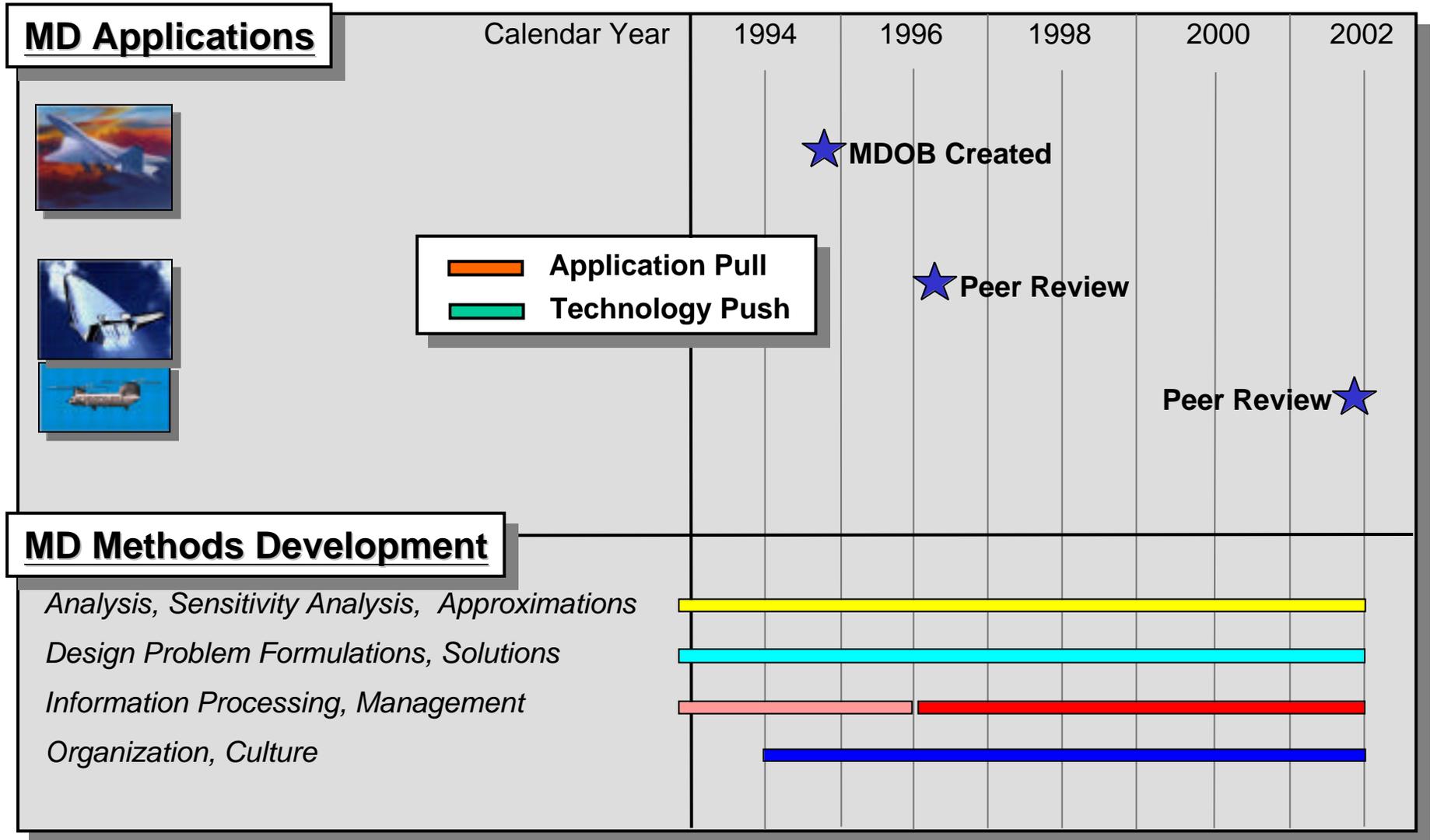
MDO Applications: General Comments

- Collaborative exercises with other LaRC Organizations
- MDOB may/may not lead application, depends on circumstances
- Represent ~1/3 MDOB's workforce, year-in, year-out

- Opportunities to solve center/agency relevant problems
- Applications are proving grounds for MD methods
- Applications provide requirements for later MD developments

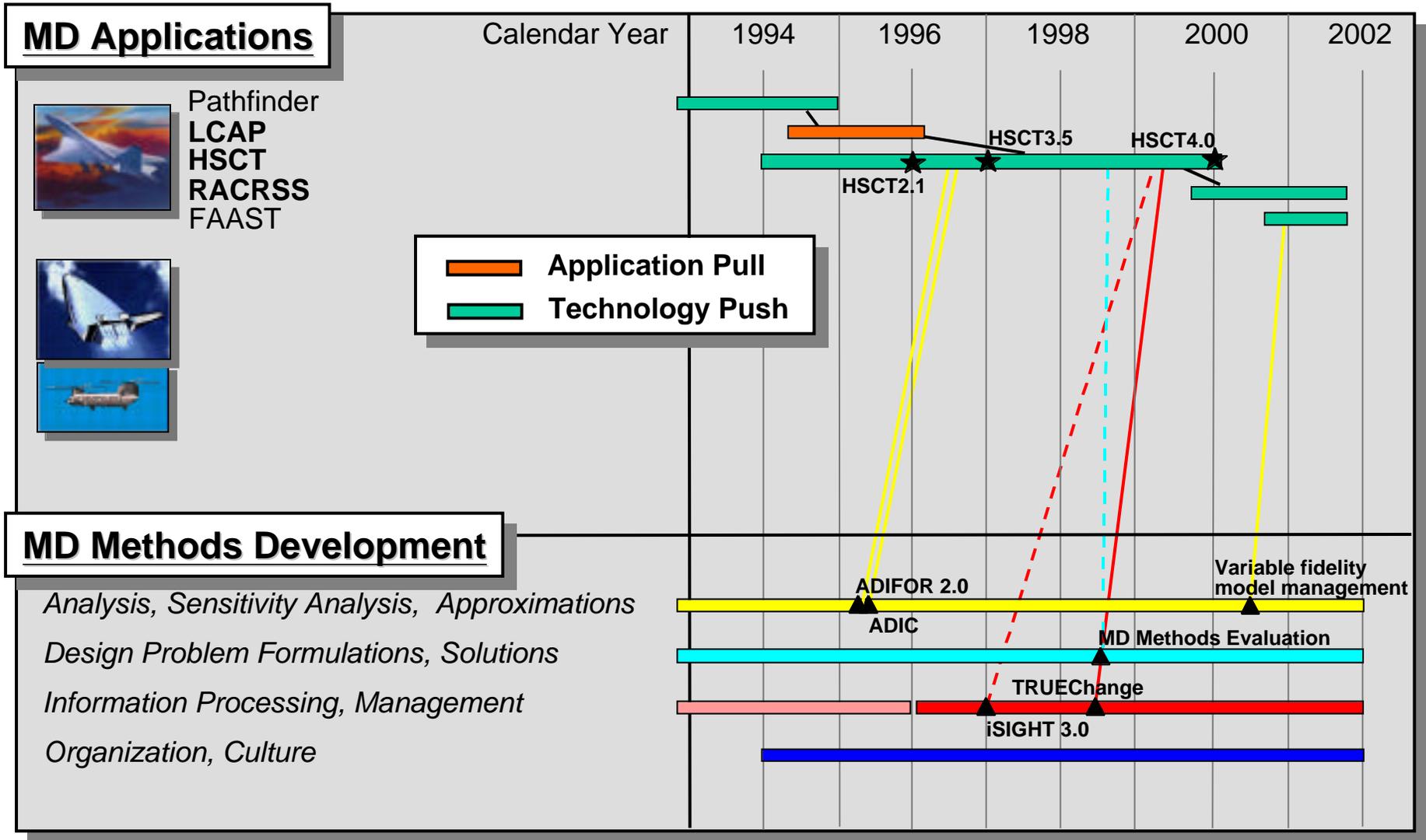
- Level of MD sophistication depends on application type
 - Technology push: application is showcase for methods
 - > *Higher risk (lower TRL) MD methods are demonstrated*
 - Application pull: application requires specific MD solution, on-time
 - > *Lower risk (higher TRL) MD methods are used*

MDO Applications: a Chronology

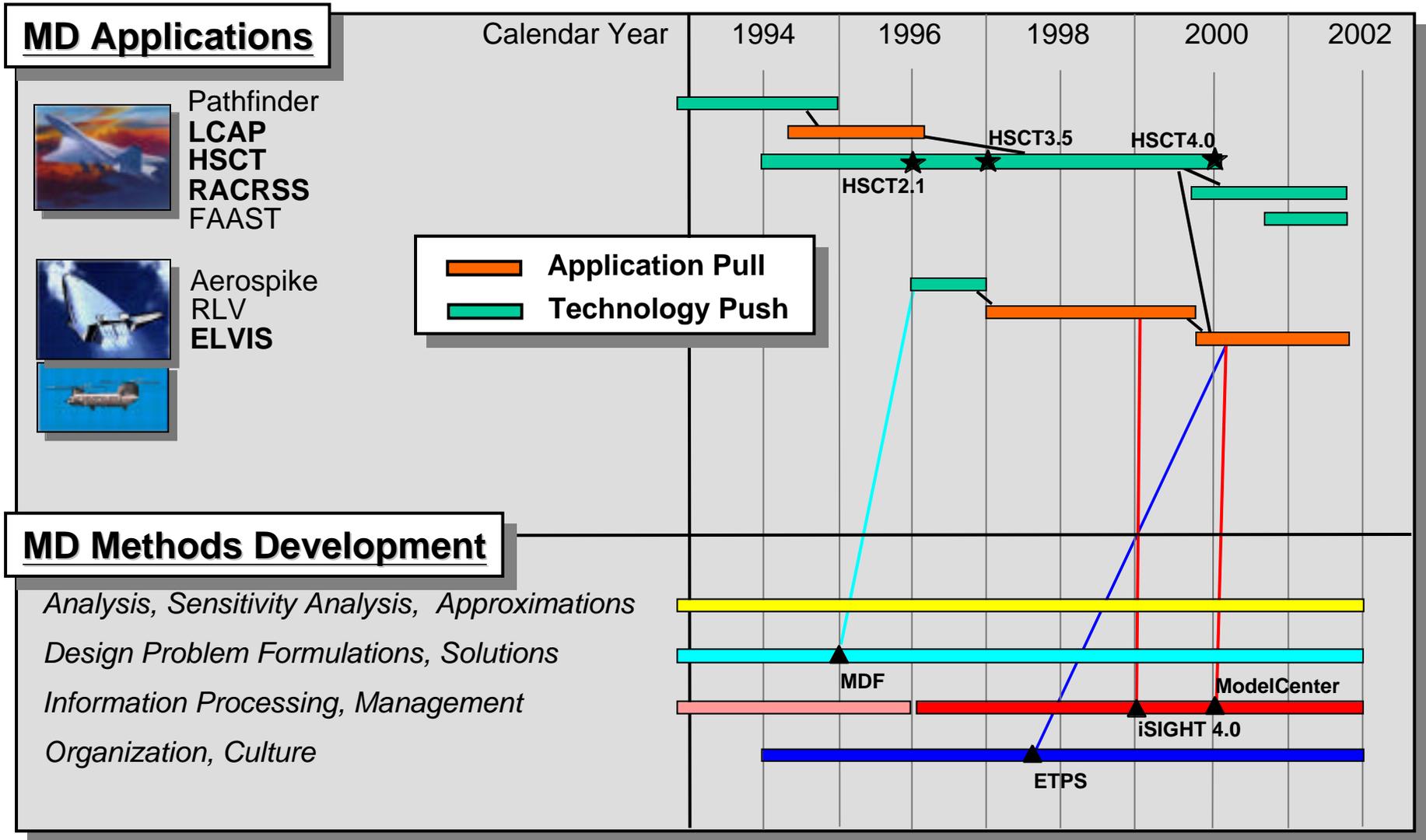


 Application Pull
 Technology Push

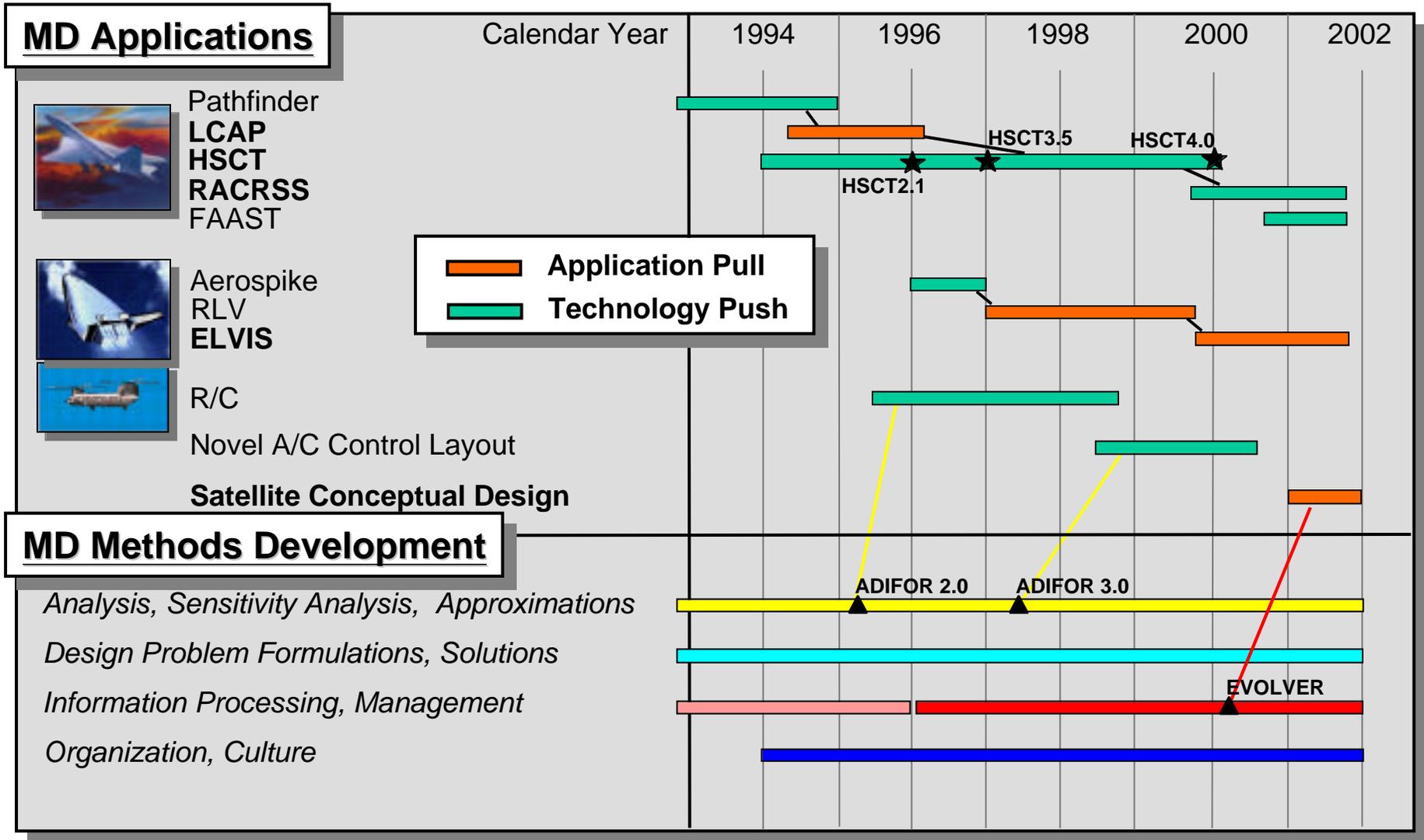
MDO Applications: a Chronology



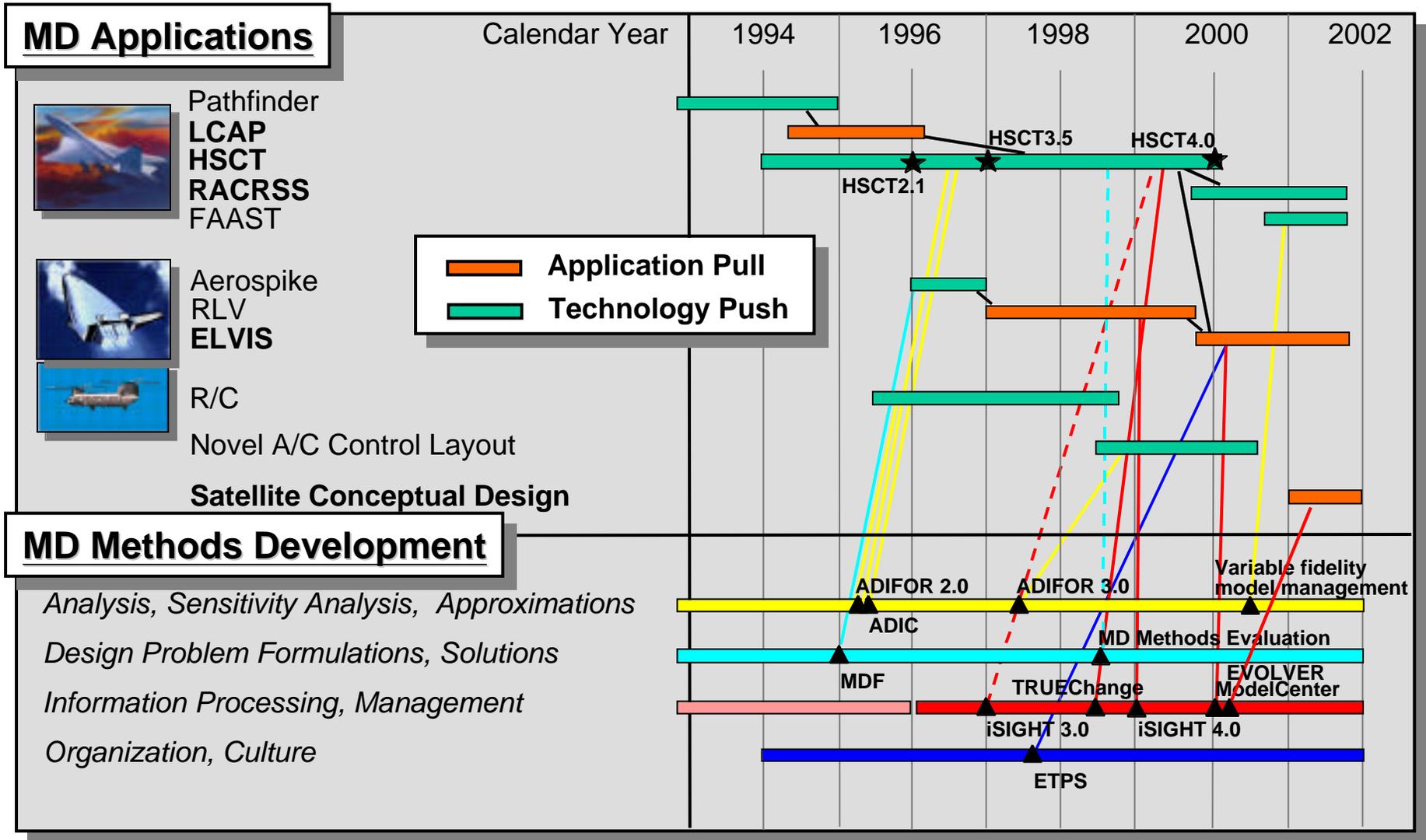
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Application Lessons

- Post-96 peer review move towards higher fidelity models
 - reorganization within ASCA encourages considering more disciplines, but lower fidelity models
- Sponsoring program specifies
 - Application vehicle of interest
 - Duration of exercise
 - Level of MD innovation possible
- Last 5 years of MDOB applications have brought about larger problem scale
 - › Required added discipline in:
 - Software development
 - Project Management

Software Development

- Use established software engineering practices to implement project
 - Requirements definition, flow-down, tracking
 - Disciplined software design and implementation
 - Configuration control
 - Systematic verification and validation
- Use off-the-shelf software implementation tools
- Train the entire team in software engineering practices and tools, insist on application, including contractor support.
- Provide sufficient resources to carry out software engineering activities, account for time.
- Expect initial drop in productivity from application of software engineering practices.

Project Management

- Use PM tools and techniques selectively
 - Define realistic schedule and track
 - Allocate project resources and track
 - Synchronize and centralize project documentation, control configuration
- Sequence implementation carefully
 - Define scope and priorities
 - Understand information flow
 - Plan incremental implementation
 - Prototype to verify design
 - Keep customer in the loop
- Build a multidisciplinary team
 - Formalize team leadership/structure, roles and responsibilities
 - Dedicate team membership, get line organization buy in
 - Provide control of resources to team lead
 - Foster and support intra-team communication

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