National Aeronautics and
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Collaboration Best Practices Today and In The Future

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- **There's a revolution going on in the work place**
  - **New budget pressure, social pressure, workforce diversity, shortage of skilled professionals**
  - **Unforeseen technical challenges invented by the users**
  - **New practices to survive and to create new breakthroughs**
- **Emerging collaboration technology and practices can provide astounding results**
- **"Our" side can win by bridging gaps between enterprise IT practices and emerging technologies**
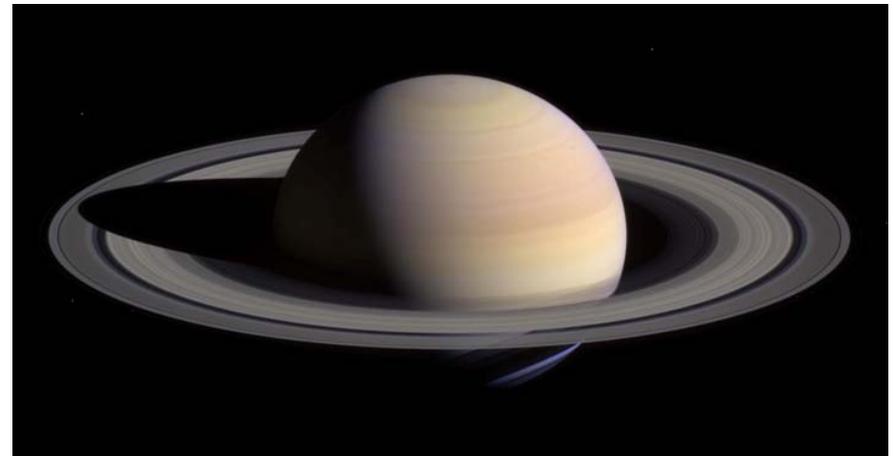
- **JPL provides system management for a team of:**

  - **Project Scientists from around the world and everyone has a voice**

  - **Multiple JPL design teams with some in-house production**

  - **One or more NASA centers doing trade studies / developing instruments**

  - **One or more non-US space agencies also developing instruments**

  - **Industry Partners and vendors assisting with design and production of spacecraft, large assemblies, or components -- this component will grow**

Collaboration Drove Last Year's Model… And Will Drive Next Year's Model Even Faster

- Mars Exploration Rovers success demonstrated collaboration results
- The ante is upped for next year's model (Mars Science Laboratory):
  - Requirement for increased capabilities
  - Much wider international participation
 - Much faster timeframe (< 8 hours)
  - Let's take a closer look…

Human Male
1750 mm (5' 9")
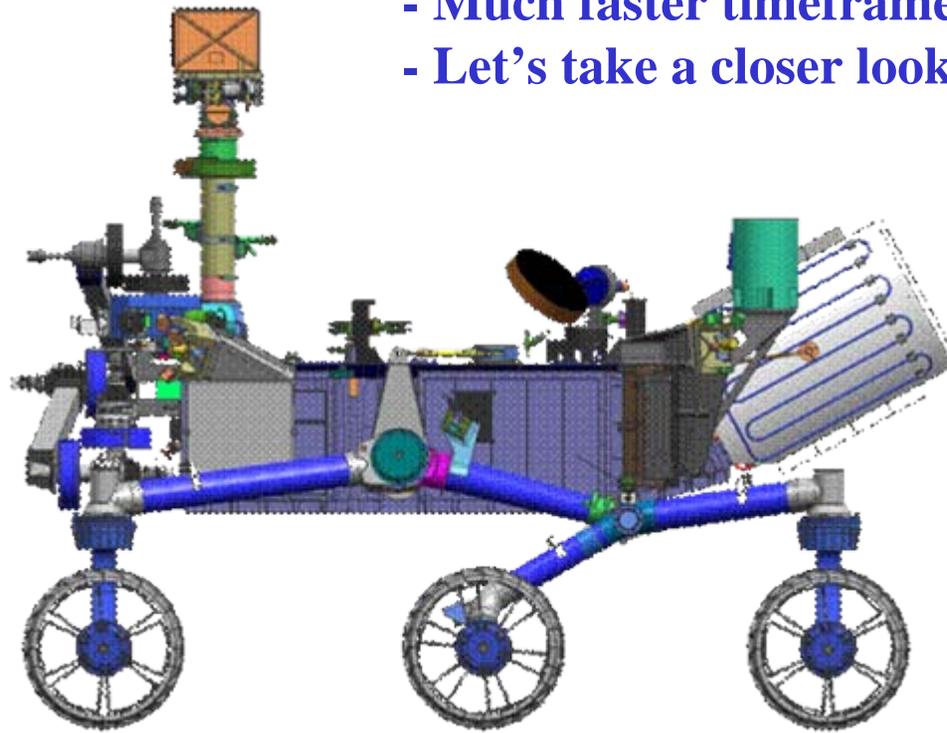
- **Decreased budget -- as Baby Boomers use up retirement funds; there will be less money for space missions**
- **Increased competition in the US for NASA/NOAA from Asia, Europe, and Commercial**
- **Business Continuity risk (e.g. a pandemic , Avian flu, etc.)**
- **Challenge: Improve efficiency and effectiveness of group interaction and information sharing**

Percent Change 2003-2010
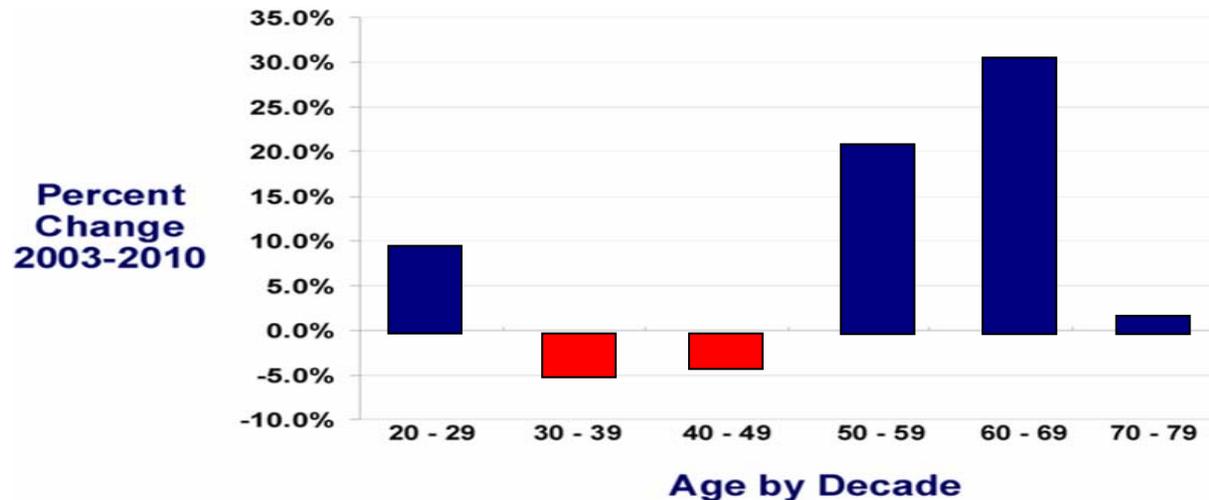
- Age data from John Seely Brown

Successful collaboration must address 4 dimensions*

1. **Time**
    - **Asynchronous (How do we get out of "living in the In-box") vs.**
    - **Synchronous (We're having a conversation)**
2. **Location**
    - **Collocated →In same company → in same country → In same world → In the same Universe**
3. **Culture**
    - **Science vs. Engineering vs. IT vs. Finance vs. …**
    - **International differences**
4. **Age**
    - **Baby Boomer generation will retire soon Difficulties in transferring the knowledge to the new generation**
    - **Rapid changes in collaboration practices creates communication challenges**
    - **New generation with new work patterns**

Idea from Tom Graf

Best Practices Today

- Hunt and gather mentality vs. **collaborative workspace**
- Communication vs. **Collaboration**
- Serial Editing vs**. Group Authoring**
- Enterprise/IT driven innovation vs**. Emergence of Web 2.0**
- Discover and react vs. **plan and adopt**
- **Too many point solutions but we must make better use of what exists today**
  - **Ready-to-run collaboration environment supported by IT**
  - **Support mobile computing**
  - **Support more effective virtual meetings**
  - **Improve in many small ways and communicate changes to users**

Adopt Quick, High Payoff Best Practices Today to Plan for Best Practices of Tomorrow

- **Program Portals and Roles-based Collaboration and Security**

- **Wikis to drive innovation and cooperation**

- **Enterprise 2.0**

- **Social Software - watch and adopt
  (XML, blogs, wikis, folksonomies, podcasts, social-network analysis, tagging, tag clouds)**

- **Need to emphasize governance, architecture, and integration…
  without stifling innovation**

- **Web 2.0 → Web x.y**
- **Enterprise 2.0 will be the expected**
- **Continuing rapid changes will be adopted more easily if it can be fit into the Enterprise Architecture**
  - **Speeds discovery process**
  - **Helps stakeholder decision process**
  - **Facilitates adoption process**
- **Look at the habits of the coming generation to predict the future**
- **Collaboration support during entire life cycle of a Space Project**
  - **Virtual Brainstorming Sessions**
  - **Virtual design reviews**
  - **Ongoing status reporting and engineering support**
  - **Virtual test reviews**

It's already here:

- **HBR: marketing to Avatars**
- **Warton: Second Life as platform for training / simulation / exercises**
- **Masie: Extreme learning (Wikis, gaming, pod casts, …)**
- **Teaches measured risk taking, multi-tasking, leadership, strategy**


- Meeting in Second Life

1. Tidy Up the (Enterprise) House – Determine and document:

- Underlying support structures (e.g. networks, storage, O/S, etc)
- Directory structure as basis for access to everything
- Identity Management, Single Sign-On, security strategy
- Database management systems
- Policies on portals, content management, messaging, email, calendaring, etc.
- Governance of Enterprise IT
- Create/document the "As Is" and "To Be" Enterprise Architecture
- Keep it high level as it will change rapidly
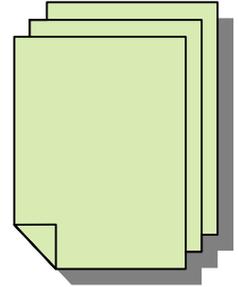
→ **Allows us to rapidly take advantage of innovative point solutions in an organized manner**
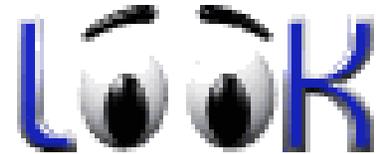
2. Watch the major vendors

- They will experiment with new, small point-solutions (e.g. Google's calendaring and spreadsheet-enabled Wikis)
- Social Software is now driving innovation more than the enterprise
- "Collaboration in Context" is accelerating (e.g. Microsoft's Vista, Exchange, Office will enable new collaboration interface that hides complexities of each tool)
- They will bring in successful tools into the operating system or operating environment (e.g. Microsoft's treatment of Wikis and Sharepoint, IBM's opening of Lotus Notes , Oracle's Super Platform, etc.)
- Fewer point-solutions will reduce training, cost, and integration costs (get work done instead of managing too many tools)

➔ **Allows us to react strategically while changing OUR Enterprise Architecture**

3. Experiment with innovative tools/ideas

- **Program Portals for rapid, in-context enablement and end-to-end lifecycle management**
- **Wikis for quick team creation, brainstorming, document creation, user-supported help desks, collaboration with partners, project plan and project status/documentation, etc.**
- **Bring in IT Security personnel now to help enable collaboration**
- **Other promising developments: Web Services, AJAX, Social Software (Web 2.0) developments, immersive multi-player games, role-based collaboration, Enterprise 2.0**
- **Embrace collaborative workspaces**

➔ **Evaluating each new tool against the Enterprise Architecture allows us to integrate successful experiments into the EA… Experiment in Context**

4. Adopt experimental successes into the Enterprise Architecture and work processes

- Communicate the changes as thought-through changes to YOUR Enterprise Architecture
- Prepare to accommodate a diverse workforce: Part timers, subcontractors, telecommuters, remote partners, all with access to an effective, secure, collaborative workspace
- Learn to collaborate effectively with different cultures

➔ **Don't panic, there is time to evaluate and adopt innovations… but establish innovation watch programs**

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