

Collaborative Engineering

Project Team



- ◆ Collaborative Team
- ◆ Team Building Stages
- ◆ Leader and Team Members
- ◆ Conflicts and Resolution

OrthoCAD Lab, I.I.T. Bombay

Collaborative Team

- **Team:** Group of individuals working in harmony to achieve a common objective which as individuals they could not have been able to achieve.
- **Characteristics:**
 - Members: multi-disciplinary, competent, goal-driven
 - Team leader: wide experience, well respected, ability to motivate
 - No traditional barriers between departments
 - Single physical location or networking
 - Top management support



Team Building Stages

- **Forming:** Team's purpose, member's roles, acceptance of roles, authority and process of functioning.
- **Storming:** Initial agreements and role allocations are challenged and re-established.
- **Norming:** Formal & informal relationships get established, openness and cooperation observed.
- **Performing:** Trust, openness and healthy conflict emerge as team reaches a level of maturity.



Team Leader – Role

- **Articulate:** Define overall goal & constraints, delegate tasks
- **Facilitate:** Resources, logistics, meetings, monitoring
- **Coach:** Motivate, inspire, train, recognize accomplishments
- **Resolve:** Manage conflicts and dysfunctional behavior
- **Coordinate:** External agencies, escalating to top management.
- **Encourage:**
 - ✓ Creativity, calculated risk-taking
 - ✓ Objective decisions, by consensus
 - ✓ Early reporting of faults and issues



Team Members

- **By Discipline:**
 - Industrial Designer
 - Design Engineer
 - Manufacturing Engineer
 - Materials Engineer
 - Quality Engineer
- **By Training and Interest:**
 - Specialist: Expert knowledge in a particular field
 - Achiever: Takes action to achieve the set targets
 - Challenger: Questions the assumptions of the team



De Bono's Six Thinking Hats

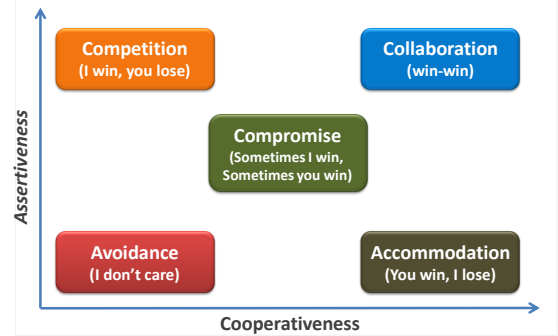
- **White=Information:** What are the facts?
- **Red=Emotions:** Instinctive gut reaction (no justification)
- **Black=Bad Points Judgment:** identifying flaws or barriers
- **Yellow=Good Points Judgment:** identifying benefits
- **Green=Creativity:** provocation and investigation
- **Blue=Thinking:** thinking about thinking

Conflicts and Resolution

- **Constructive Conflicts:** Increases involvement, builds cohesiveness, leads to solution
- **Destructive Conflicts:** Diverts energy, divides the team, no decision
- **Resolving Conflicts:**
 - ✓ Explore the reasons for the disagreement
 - ✓ Logically agree on the most appropriate solution
 - ✓ After identifying the best solution, implement it !

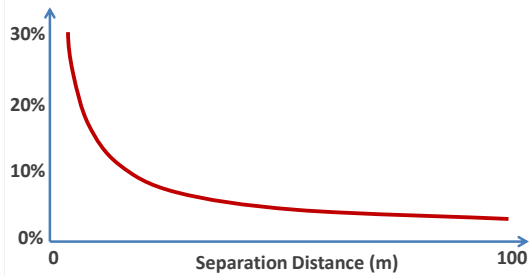


Ensuring Collaboration



Ensuring Collaboration

Probability of Communication
(at least once a week)



SUMMARY

- Product development projects: multi-disciplinary teams
- Multiple roles / multi-tasking for each member
- Role of team leader most critical in achieving success
- Constructive criticism to be encouraged
- Conflicts to be resolved by root cause analysis
- Healthy competition, collaboration, communication.