Collaborative Product Development
Interdisciplinary Team Work
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POV - Point of View

- 25+ years of consulting and corporate product design, development, management, and innovation training

- Involved in the planning, research, design and development of over 900 products and systems

- 10 years of teaching industrial design and new product development

- 2+ years of teaching interdisciplinary product development and innovation - Industrial design/engineering/business
collaborate - verb, from the Latin, collaborare, to work together

Two or more parties working jointly on an activity, especially in order to produce or create something.

Lessons Learned
It begins at the top...

- Vision
- Empowerment
- Creativity
- Innovation
- Effective collaboration
Create a method to the madness... process a customized road map to team success...
Process

- **Recognition**
  Recognize the existence of a problem or a business opportunity...

- **Analysis**
  Analyzing and researching a problem in order to develop a strategy for its solution...

- **Definition**
  Defining what characteristics a product must have in order to solve the problem: benefits - features - preliminary specifications...

- **Exploration**
  Exploring numerous possible options for achieving the defined objectives...
Process

- **Selection**
  Evaluating the options and selecting the single most appropriate one to be pursued…

- **Refinement**
  Perfecting the selected option through testing, prototyping, and attention to every detail…

- **Specification**
  Verification and specification of manufacturing and assembly related details…

- **Implementation**
  Data, procurement, tooling, set up for manufacturing, marketing and distribution plan…

- **Introduction**
  Introducing the new product to the marketplace…
Immersion

take the plunge… lose the safety net…

“…boldly go where no man person has gone before…”

- Capt. James T. Kirk, USS Enterprise
Motley Fool Credo

- Rule makers

- Rule breakers
Create a Buzz...

- try winging it…

- look at your world as possibilities, not limitations…
- don’t be afraid to ask *dumb* questions…
- inspiration by *observation*…
“Fail your way to success.”
- Tom Kelly, IDEO
Collaboration and trust

- Do you care about me?
- Can I trust you?
- Are you committed to the success of our team?
Team Building

a scenario to consider...
Effective teams are like a snowball, rolling downhill…
Team Dynamics

Number **ONE** Issue.

...while these problems are few in number, their impact on teams is disproportionately **LARGE**.

Good team dynamics is **critical** to team success.
Team Development and Performance

An evolutionary model for effective collaborative interdisciplinary product development
Tuckman Theory of Team Evolution and Performance

assumes

- Teams go through a maturation or life cycle type of process.
- The dynamic that creates change in this theory is independence-interdependence.
- The 4 life cycle stages are not necessarily of the same duration or intensity.
- The team performs better when it has more group cohesiveness.
Tuckman’s 5 Stage Theory of Group Development

Forming
- Individual Issues: “How do I fit in?”
- Group Issues: “Why are we here?”

Norming
- Individual Issues: “What’s my role here?”
- Group Issues: “Why are we fighting over who is in charge and who does what?”

Storming
- Individual Issues: “What do the others expect of me?”
- Group Issues: “Can we agree on roles and work as a team?”

Performing
- Individual Issues: “How can I best perform my role?”
- Group Issues: “Can we do the job properly?”

Adjourning
- “What’s next?”
Forming

- Team members tend to be anxious about their roles, who is in charge, and the team’s goals.
- Mutual trust is low.
- There is a good deal of holding back and feeling out due to uncertainty.
- A leader/s eventually emerges to provide leadership and direction.
- Later problems may force a leadership change.
Norming

- A respected team member challenges the team to resolve its power struggles so something can be accomplished.

- The issues are resolved through unemotional, matter-of-fact group discussion.

- A feeling of team spirit emerges as members find their proper roles.

- Group cohesiveness, the *we feeling*, emerges and binds members together.
Storming

- Testing occurs in this stage.
- Individuals test the leader’s leadership.
- Individuals try to determine how they fit into the team’s power structure.
- Subgroups may take shape in larger teams.
- Subtle forms of rebellion, such as procrastination can emerge.
- Some groups stall in this stage because power politics erupt into open rebellion.
Performing

- Team members focus on solving the team’s problems.
- Members get their work done without hampering others.
- The team climate is one of open communication, strong cooperation and helping behavior.
- Conflicts and boundary issues are handled constructively and efficiently.
Adjourning

- When the assignment is completed, it’s time for the team to disband.
- Team members may feel a sense of loss at the same time as they regain their independence.
- **Rituals to celebrate the end** can ease the transition back to independence.
The Result

- As the team **matures**, its members give up progressively more of their independence to the team and become more **interdependent** and **trusting** of one another.

- The result is a **high performing** team with **cohesiveness** and members with a **personal commitment** to the goals of the team.

- The team achieves more than the individual members could acting alone.
Personalities

4 personality types that surfaced with problems within the teams:

- The Second Guesser
- The Perfectionist
- The Specialist
- The Remover
Cultural Differences

- National/regional/ethnic
- Discipline specific
Testimonials
“To me personally, it was an experience of a lifetime because I learned every discipline has its own style and method of working and ethics that they follow. I am sure I will be a better and more productive team-man in my future career.”

“I now feel more confident about what I do (as a result of taking the IPD course) and working with industrial designers and engineers is no longer a big question mark for me… I now know the challenges and how to minimize the conflicts and be part of the solution.”

“I learned to appreciate everyone’s input in all areas of the [product development] process. Different minds working together in different ways allowed for very unique ideas to generate. I learned to appreciate and respect each individual’s viewpoint.”
Student Team Work Product

Examples from Whirlpool Project
data collection shows a strong consumer interest in the positive effects of color on body and mind.
lightemittingshowerhead

coloredsteambath

colorcapsule

nopaintwalls
CONCEPT TESTING

- modular light to add more variety to a room
- adds specialness to walls or color to walls without having to paint
- modules adapt to a base unit allowing consumer to add more light at their leisure
- tips shown were floor meets the wall
- applications could include home, office, restaurant, etc.

spashe module

- free standing stationary shower capsule
- steam/sauna room
- aromatherapy treatments
- therapeutic color & light lamps
- height adjustable seat doubles as storage bin
- audio capabilities

capsule

- translucent light emitting inner well creates use of low beneficial effects of color and light on body and mind
- ergonomic seat & cushion with neck and back support (massaging cushion optional)
- variable jets provide hydro massage for the major muscle groups
- water jet

radiance

lumispa
six adjustable jets provide hydro-massage for the major muscle groups

lumiSpa
multiple modules connect to a base unit allowing consumers to add more light at their leisure

substitutes as a baseboard

Splashlyte
light and color emitting showerhead
easily installed in existing showers
can be used as a handheld sprayer
stimulates the five senses
therapeutic color & light lamps
adjustable pressure steam valves
aromatherapy treatments
audio capabilities

capsule5
• Multi-purpose shower system

• Stimulates the five senses

• Shower steam bath color therapy aromatherapy music
Course Goal

Introduce students to the other disciplines’ vocabulary, skill sets, time requirements, methodologies, sensitivities, concerns, and temperaments.
Conclusions
Empower interdisciplinary product development teams, allow them to create an enlightened democracy, provide the appropriate training and facilities (delegated space/War Room), trust in the process, don’t be afraid to wing it, and unleash the creativity of the team.
Team Morale

- When team members feel special, they’ll perform well beyond expectations.

- Hierarchy is the enemy of a well functioning team.

- Like high performing athletes, collaborative teams must engage in cross-training with other disciplines.

- Seek the delicate balance between choreography and inspiration.
“The future has already arrived, it’s just not widely distributed.”

- William Gibson, cyberspace novelist
thank you