

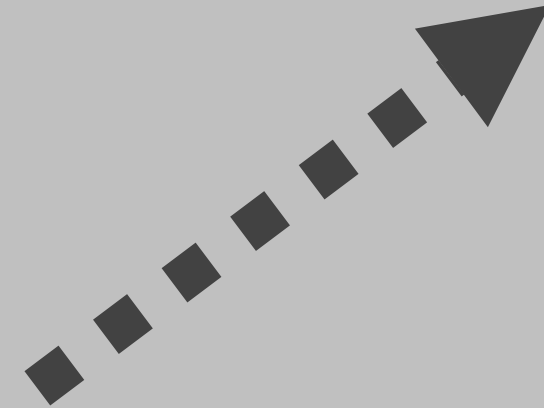
DIFFICULTIES STUDENT ENGINEERS FACE DESIGNING THE FUTURE

MICAH LANDE and LARRY LEIFER
micah@stanford.edu

CENTER FOR DESIGN RESEARCH
STANFORD UNIVERSITY

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× THE FUTURE



**SUSTAIN-
ABILITY**

t

**TIME HORIZON OF
5-20+ YEARS OUT**

EXAMPLE VISION OF THE FUTURE

Back to the Future Part II (1989)
(20 sec)

SAFFO (2008)

reset problem

**FUTURE
THINKING**
question

DYM (2005)

solve problem

**DESIGN
THINKING**
idea



LIFECYCLE

**PRODUCTION
THINKING**

ISHII (2005)



**MATERIAL
SELECTION**

**ENGINEERING
THINKING**

ROBINSON (1998)
CARDELLA (2006)

**SUSTAIN-
ABILITY**

SAFFO (2008)

BREATHROUGH INNOVATION

STEFIK (2004)

FUTURE
THINKING

DYM (2005)

DESIGN
THINKING

INCREMENTAL INNOVATION

PRODUCTION
THINKING

ENGINEERING
THINKING

ISHII (2005)

ROBINSON (1998)
CARDELLA (2006)

SUSTAIN- ABILITY

SAFFO (2008)

DYM (2005)

functional

SUSTAIN-
ABILITY

LIFECYCLE

MATERIAL
SELECTION

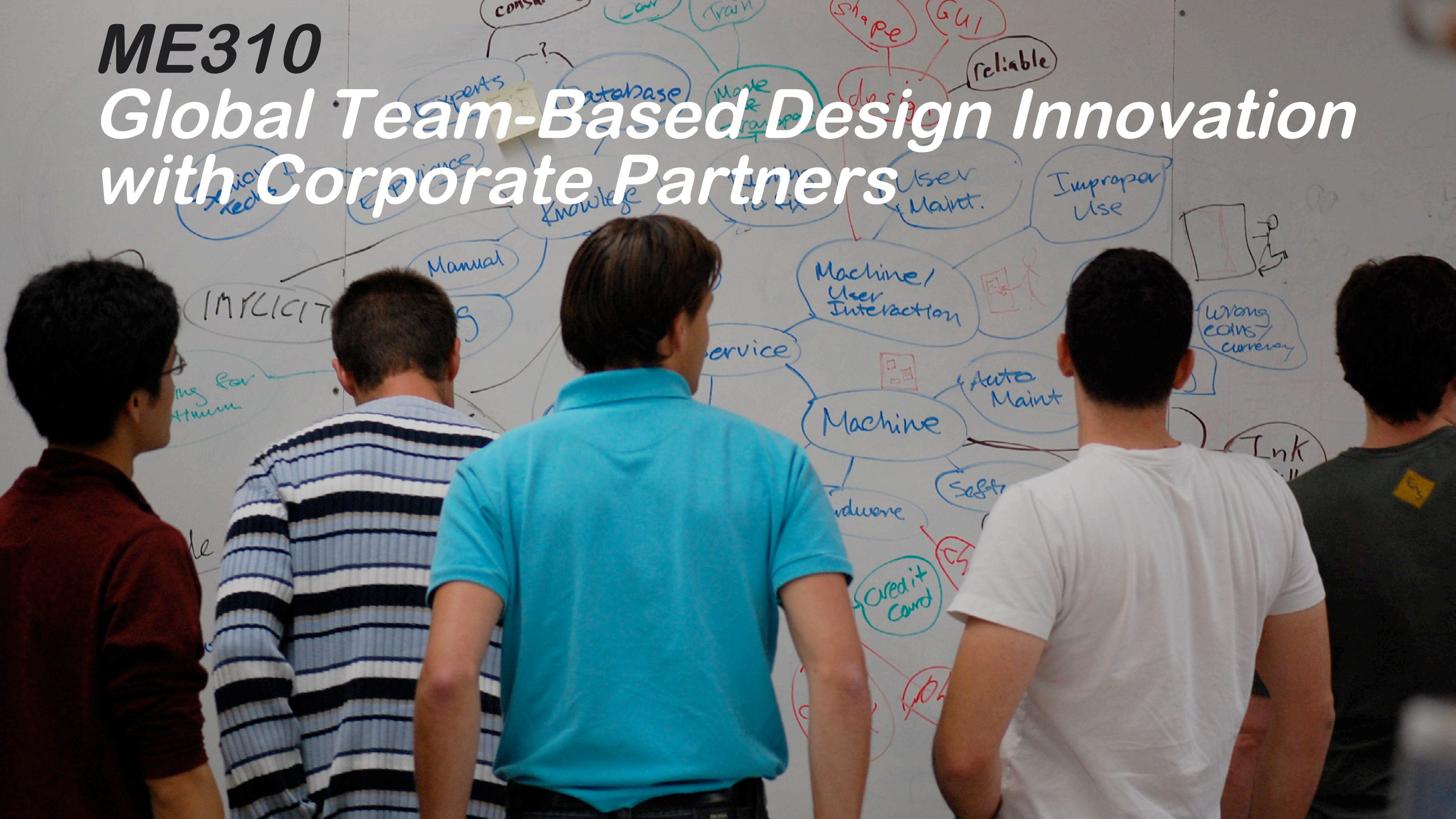
physical

ISHII (2005)

ROBINSON (1993)
CARDELLA (2006)

ME310

**Global Team-Based Design Innovation
with Corporate Partners**



STUDENTS DESIGNING THE FUTURE...

- *CAR CO-PILOT OF 2020*
- *FUTURE OF ELDERLY CARE*
- *VERY HUMAN TECHNOLOGY*
- *MAKE DRIVE ALT FUEL CARS*

SOME DIFFICULTIES STUDENTS REFLECT ON...

6
THEMES

1. LIVING WITH AMBIGUITY

... am still trying to figure out how to maintain the **right balance between** supporting new ideas while also making necessary decisions...

2. UNDERSTANDING THE PROBLEM

... have a lot of ideas, and a sense of where to go, but...
we are **not able to explore all** the routes that we
would like, or at least I would like, to explore...

3. RE-SETTING THE PROBLEM SPACE

... Our team finally received the much needed inputs from [sponsor]. The additional information seemed to **diverge a lot from the initial** requirements given...

4. PARALYSIS OF INACTION

... progress slowed as team members were **waiting** if there's change in course...

... next deadline is around the corner and lot of questions remained unanswered...

5A. TECHNOLOGY AS A PANACEA *FAITH*

... the need for [the component] in the future. This will be a **big aspect of the project**, since [the component] will be the most expensive part of our project so far. They will be a great aid for prototyping...

5B. TECHNOLOGY AS A PANACEA *TECH NOT THERE YET*

The **transcriber would listen** to an audio feed of the driver's voice and... type what was being said when buttons were pressed.

... We affectionately came to call this role “the Wizard,” a reference to the man behind the curtain in The Wizard of Oz, who makes it seem that things are happening when they are **actually being faked**...

6. FUTURE IS BRIGHT AND SHINY

... be so indecisive because I want to pick what's BEST, what's perfect, what everyone will like. My team **reminded me that there isn't just ONE** correct solution like in a multiple choice exam; that's the thing about design...

DISCUSSION POINTS

- ***SUSTAINING OVER TIME***
- ***BALANCE SOCIO-CULTURAL-
TECHNICAL CONCERNS***
- ***IS THE ENGINEER EQUIPPED?***

THANK YOU!

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