IDSA

# INDUSTRIAL DESIGN IN THE MIDDLE

## THE HYBRID SPACE BETWEEN SCIENCE AND CULTURE

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*ABSTRACT: After multiple decades in the College of Engineering, the Industrial Design program at Brigham Young University has been transferred back to the College of Fine Arts into the recently re-formed Department of Design where it will be redefined and repurposed. The time spent in the engineering environment was cause for serious but rewarding reflection. One outcome was clarity in how ID defined itself (in relation to engineering and technology disciplines) in an effort to thrive. This paper will present two models of how disciplines (especially industrial design) can view themselves: The "subset" model, which is often limiting and driven by a particular disciplinary culture; and the "overlap" model based on the appeals of rhetoric – LOGOS, ETHOS, and PATHOS. This model creates a middle space with fewer disciplinary boundaries and identifies ID as one of the disciplines engaged in giving RELEVANCE to the outputs of Engineering and Science.*

*Keywords: Rhetoric, Industrial Design, Mental Model, Cross-Disciplinary*

### 1. INTRODUCTION

After more than 20 years in the College of Engineering, the Industrial Design program at Brigham Young University was transferred back to the College of Fine Arts. Engineering administration acknowledged admiration for the educational success of the industrial design program, recognized the value of design students on engineering teams & research efforts, and celebrated the impact and influence of alumni in industry. The engineering-based environment provided unique opportunities to lead, especially in creativity and innovation efforts (Fry, 2006; Skaggs, Fry, & Wright, 2012). Even though the environment appeared supportive, ID faculty members needed to frequently describe and communicate a *new* conceptual space where industrial design and technology disciplines *coexisted* with a clear and common focus. This was a valuable exercise for faculty and was reflective of the familiar conversation regarding the role of Design/Art curriculum in STEM/STEAM debate (Bequette, 2012).

Eventually, cultural barriers proved too great. Back now in the Department of Design in the College of Fine Arts, efforts to redefine the program have started, the name *industrial design* will be retired, and new ID enrollments have been put on hold.

These two environments revealed fundamentally different ways of viewing ID as a discipline. This paper will present these two models: a *subset* model which emphasizes connections to a particular disciplinary tradition, and an *overlap* model that is more discipline neutral, and opens the door to greater "interdisciplinarity" (Lévy & Guénand, 2003).

This discussion is formulated as a design letter or “an informal platform for sharing…ideas, opinions, and perspectives…in design education” (IDSA, 2022).

## 2. SUBSET MODEL

When the ID Program transferred to the College of Engineering, it became clear that Engineering leadership proudly viewed their discipline as a *subset* of Science and projected that subset model onto the programs in the School of Technology (Manufacturing, Construction Management, Information Technology, Technology Education). To engineering, Technology was, at its core, part of science. And therefore, should be participating in the acquisition and ordering of the knowledge of our physical world in the form of testable explanations and predictions. Engineering perceived itself as the *solution* arm of Science and described Technology as the *implementation* arm of Engineering. This created an unfortunate value hierarchy where some disciplines were considered more important than others. It was also clear that this model was being imposed on the ID program since joining the School of Technology.

Using the subset model, Technology would always be a science, and since the ID program offered a BFA degree, then it would always be an Art, and there would always be a gap where the disciplines could never really come together (Figure 01).

The ID program knew that this was not reflective of the breadth of opportunities available to both designers *and* engineers in the professional world where interdisciplinary integration & synergy were the norm rather than the exception. For the ID program to thrive in the College of Engineering and Technology, there would need to be a different model.

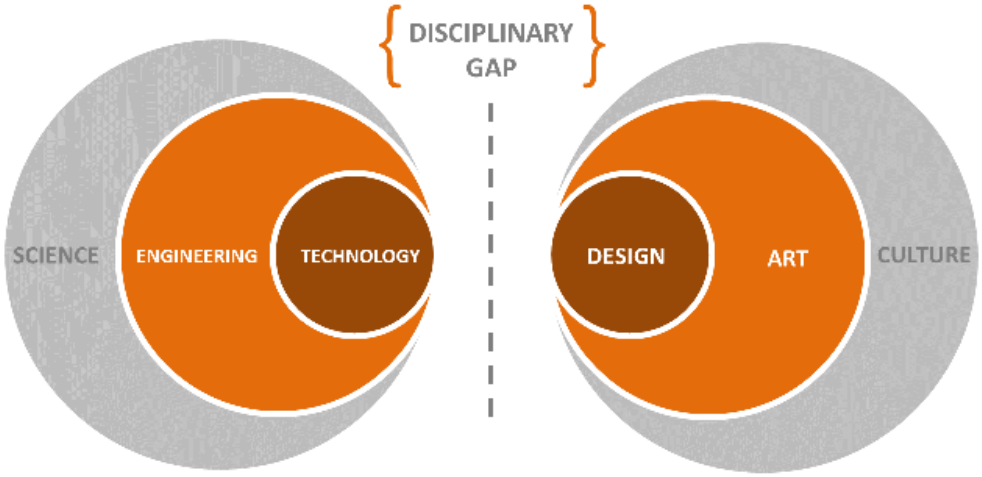


***FIG 01*** *- Subset model*

## 3. A RHETORICAL MODEL FOR DISCUSSION

With the creation of the Stanford d.school in 2004, many disciplines including engineering, design, business, and education were fascinated by the possibilities of exploiting principles of *design thinking* – including College of Engineering leadership at Brigham Young University. On an early version of their

website, the Stanford d.school presented design innovation as the intersection of Technology, Business, and Human Values – with alternate terms being Feasibility, Viability, and Desirability (Stanford, 2005). Because design can be considered a rhetorical argument (Buchanan, 2001), it wasn't difficult to make the connection between the Stanford model of design innovation and concepts of rhetoric taught in freshman English classes across campus (Figure 02).

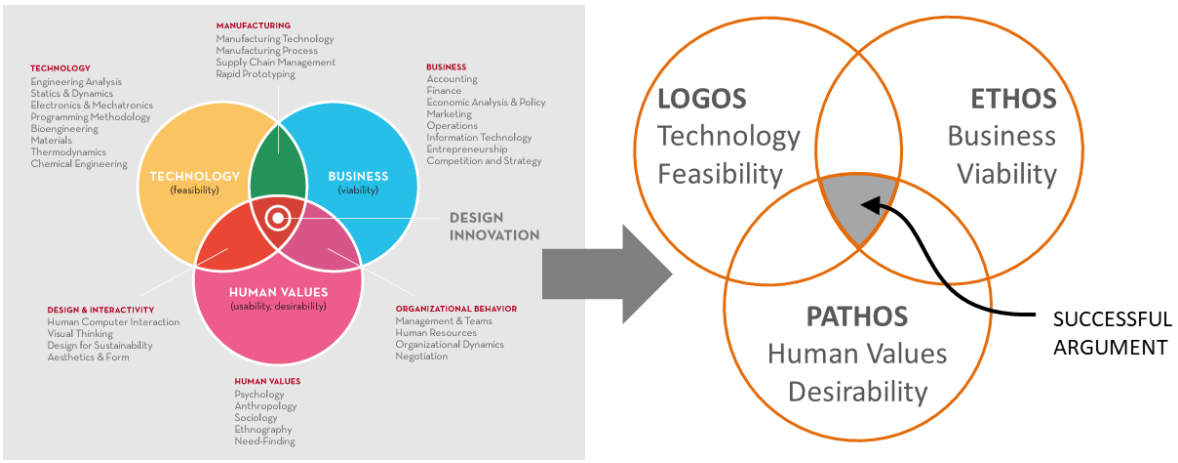


***FIG 02*** *– The Rhetorical Model*

The goal of rhetoric can be simplistically summarized as, *A speaker, sensitive to the contingencies of the moment, crafts words and structures to some particular end* (Burton, 2022). In crafting a compelling argument, rhetoric leverages the three main appeals of LOGOS, ETHOS, and PATHOS (or Logic, Credibility, and Emotion) as reflected in the Stanford diagram.

Applied to product development, one can imagine that before a consumer or user is willing to spend money on a purchase or time in an experience, there is a behind the scenes argument that goes on and incudes questions such as, "Do I really want this?", and "Will this really work?", and even "Do I believe in the brand?" In this rhetorical space then, *A designer, sensitive to the needs of users, manufacturers, etc., crafts products and experiences to meet some particular goal (i.e. decreased cost, better manufacturing, increased market acceptance, improved function, etc.).* At its core, design relies heavily on rhetoric.

Multiple disciplines would like to assume ownership of this center space of design innovation or product development. However, the rhetoric-based structure presents it as an overlapping, shared, interdisciplinary activity. If any of the three *appeals* are missing, the effort and results would, more than likely, be weaker. This structural condition of *overlap* was preferred as a starting point over the *disciplinary gap* prevalent in the previously described subset model.

## 4. THE OVERLAP MODEL

The BFA-granting ID program needed to be seen as a valuable strategic partner in the College of Engineering. The other programs in the School of Technology had also been de-valued, and ID seemed to be entirely outside of the science-based academic space created by the *subset* model. Could a rhetoric-based model emphasizing areas of disciplinary overlap be used to describe a vibrant and

valuable space that the College could leverage as a place of unique opportunity? Setting aside the Stanford d.school incarnation of the model, and taking a fresh look at the spaces created by the three appeals of LOGOS, PATHOS, and ETHOS, what new opportunities emerge?

4.1 LOGOS

One familiar label for this circle is Science, or the systematic activity to acquire and order knowledge of our physical world in the form of testable explanations and predictions. Here, we define, deduce, investigate, experiment, document, archive, and strive for repeatability. This circle represents WHAT we know. This is where we ask, "What is possible?"

4.2 PATHOS

This is where we emotionally react in efforts to coax meaning from what we see and experience in the world. Emotions are strong motivators and lead some to express themselves through the language, visual, and performing arts. This is where culture is created – i.e., the expressions of the human condition through creative works that stimulate and engage the senses, intellect, and emotions. This circle represents WHO we are. This is where we ask, "What do we desire?"

4.3 ETHOS

In this space, collective VALUE is ascribed to a thing or an idea. Here, other forces come to bear in validation of discoveries and expressive acts. This circle represents the VALUE that we ascribe to something.

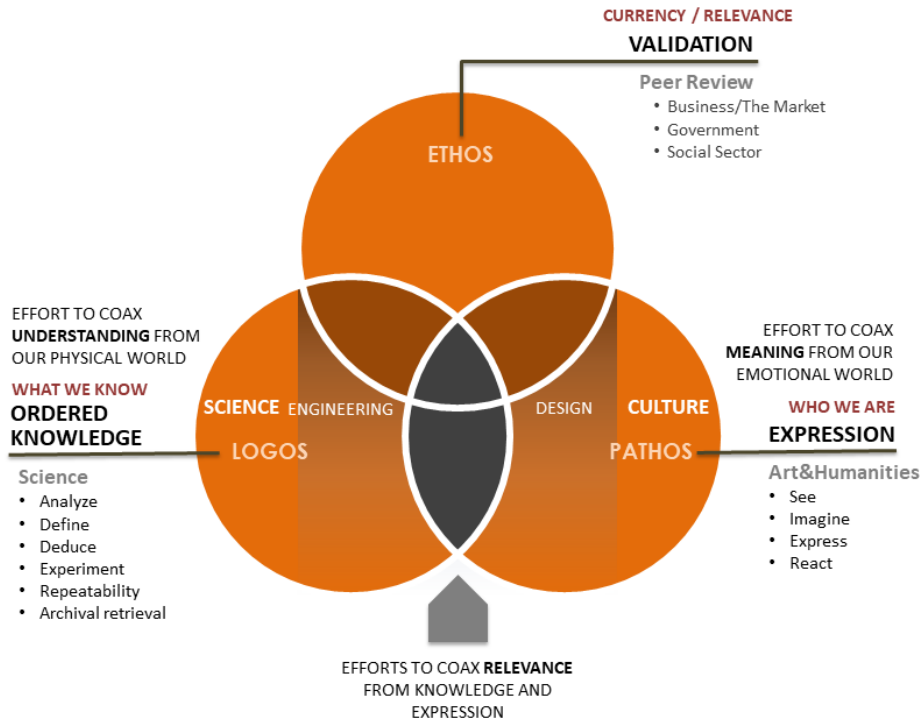


***FIG 03*** *– the Influence of "Practicality"*

Visually, one can imagine that the ETHOS or Validation space casts a shadow of influence on both the ORDERED KNOWLEDGE and EXPRESSION spaces (FIG 03). The influence of peers/society drives a shift in disciplinary priorities. Science transforms into Engineering as it is asked to use scientific principles to solve problems **relevant** to the larger group. Art transforms into Design as it is asked to use artistic principles to solve problems **relevant** to the larger group.
The overlap of WHO WE ARE and WHAT WE KNOW is where abstract scientific & cultural concepts are made RELEVANT through useful application – where things are appreciated and deemed valuable by the larger group.

## 5. FROM VISUAL TO WORD-BASED DESCRIPTIONS

Beyond a visual diagram, words are provide the structure to clarify and communicate, across cultural boundaries, this unique, vibrant, current space of the overlap of scientific discoveries and human culture under the influence of societal validation. The rough transformation from a visual form to verbal of the overlap between Science and Art is shown in FIG 04.

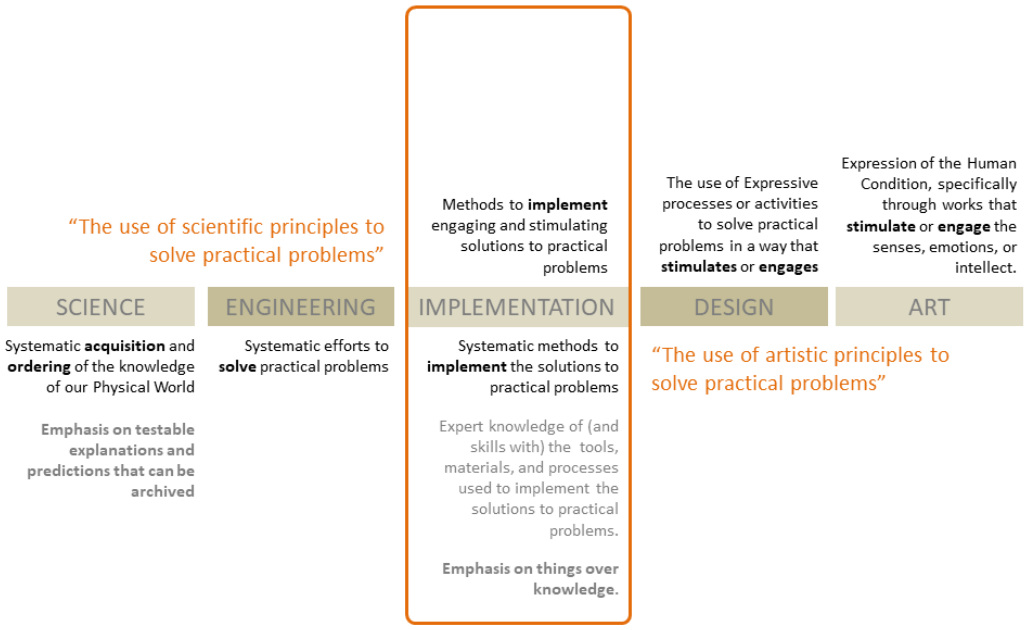


***FIG 04*** *– Pulling Concepts to the Middle*

Ordered Knowledge is rooted in systematic and archival discovery. This influences its approach to solving practical problems and the tools, materials, and processes it uses for implementation. The Expression side is rooted in engaging the senses to elicit an emotional response. This influences its approach to solving practical problems and its tools, materials, and process it uses for implementation. Societal validation imposes a need for currency and relevance on the efforts of both Ordered Knowledge and Cultural Expression – i.e., it brings their efforts closer to the middle.
Focusing on an industrial designer, the following could be stated about the overlapping place in the middle: *In this space of implementation, an Industrial Designer engages the current knowledge of tools,*

*materials, processes, and people to implement solutions to practical problems, relevant to our human condition, with the intent of helping us to work, live, and be better.* (FIG 05)

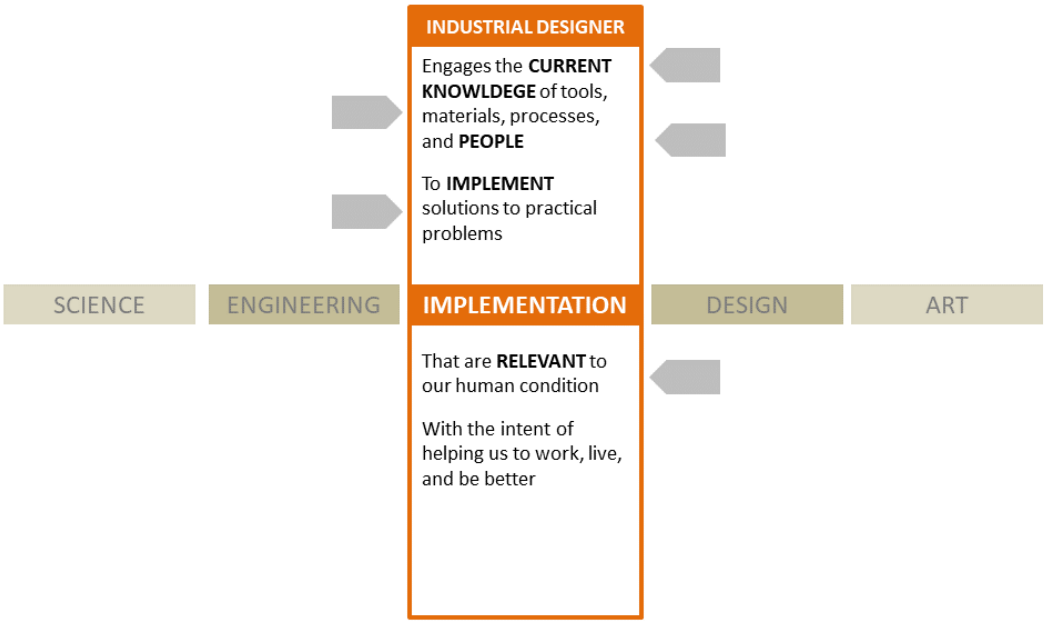


***FIG 05*** *Overlap description*

Industrial Designers draw heavily from the influences of BOTH Expression AND Ordered Knowledge and are keenly aware of the influence of external review in defining Value.

## 6. CONCLUSION: A SPACE FOR INDUSTRIAL DESIGN IN THE MIDDLE

Donald Norman tells us that "as long as things work…we can manage" but "when we come upon a *novel* situation…we need a deeper understanding, a *good* model." (Norman, 1989 emphasis added)

The subset model offers consistency, focus, and clear expectations within a small range of philosophic variability. When everyone is fairly aligned, everything *works*. In an environment where this model is active, norms and expectations are often driven by a dominant disciplinary point of view. With Industrial Design housed in a College of Art, one can expect strong cultural underpinnings that include emotive expression and exhibition as a form of scholarship. When Industrial design is housed in a College of Engineering, one can expect discovery, experimentation, and archival publications as part of the link back to scientific culture.

At Brigham Young University, difficulties with the expression-based model in the College of Fine Arts led the ID program to move to the School of Technology WITH the encouragement of the College of Engineering leadership. There was the hope that this would provide an interdisciplinary environment more reflective of the breadth of the industrial design profession.

With the first change in college leadership, it was obvious that the science-driven subset model (with its implicit expectations) did not work in the "novel situation" of having a BFA-granting ID program in the College of Engineering. Additionally, the science-centric model was problematic for other programs in the School that also lived at the overlap of a technical specialty and the messiness of people and

behavior - Technology Education, Construction & Facilities Management, Manufacturing, and Information Technology.

A model describing the *overlap* of "What we know" and "Who we are" under the influence of "What we value" proved effective for communicating and describing an in-between or *middle* space of practicality, relevancy, and currency. It highlighted an important set of values beyond the acquisition and archival ordering of knowledge and provided a unique place in the College of Engineering where concepts like innovation, creativity, and leadership were natural and appropriate. The overlap model facilitated discussions around issues of curriculum, teaching styles, appropriate class sizes, and even acceptable scholarship/creative work venues. This was a space in the middle.

With a third change in college leadership, the Science-centric subset model strongly re-emerged, and the School of Technology was disbanded. Not just ID, but multiple technology-based programs have had to go through difficult transformations.

Models are important. Rather than existing invisibly in the background, it is important to make them visual AND verbal. In this way, they can be used to understand, evaluate, and hopefully modify inherent biases in a way that can produce more of these middle spaces.

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