Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Designer as Agent of Change

A Vision for Catalyzing Rapid Change

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Abstract

Sustainability is a problem of a magnitude and urgency that compels a fundamental reconsideration of the manner in we approach complex challenges. Traditional means that have brought us here need to make way for new trans-disciplinary paradigms.

The design field has demonstrated an ability to bring about effective transformation in abstract multi-dimensional issues. The paper examines the strengths and weaknesses of the "design complex" and makes a case for a trans-disciplinary approach shaped around design methodologies to meet complex problems such as sustainability.

This paper suggests a mechanism for design to assume a "meta-disciplinary" role, developing heuristics for creating trans-disciplinary systems with the "designer complex" being a core *meme*. In this new form of design, the identity of the designer would shift from "definer of systems" to "agent of change".

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"Our task is not to predict the future; our task is to design a future for a sustainable and acceptable world, and then devote our efforts to bringing that future about. We are not observers of the future; we are actors who, whether we wish to or not, by our actions and our very existence, will determine the future's shape" [Simon 2000, 601]

1. Introduction

As the design field finds itself drawn into larger issues such as social innovation and sustainability, it prompts the question *"What role will Design have in the future in addressing the complex problems facing society and mutual survival?"*

The field of design due to its heterogeneity resists commentary or *operations* that apply evenly. Design is akin to a cosmological phenomenon containing many diverse worlds. Designers assume different roles as specialists in sub-fields such as industrial design or generalists who simply assume different modalities over varying periods of time. In its short history as a recognized field, the design field has undergone several transformations from craft based design, to applied esthetics, to applied (human and social) science, to a more involved science. (Findeli 2001, 7-9) Currently, the field is at an inflexion point where the larger forces are causing a widespread re-examination of traditional value systems within each design sub-culture. Given this tense moment in the history of civilization, with its unique challenges and the core attributes of the design field, it would be appropriate for the design field to assume a new identity with a fundamentally altered set of implications and sphere of influence.

2. A Shift in the Design Field

It is manifest that the design field is in the midst of a paradigm shift. While traditional forms of design, such as product design and furniture design remain in place, the centroid of the design field is in flux, with expanding boundaries creating a move towards much more complex and abstract issues. Accounts from diverse sources in industry indicate that the nature of design briefs, the sphere of project influence, average size of projects, the level of organizational hierarchy among client personnel, the degree to which projects are interdisciplinary, and the number of projects that are directed towards longer-term futures have all undergone rapid change. These indicators are more discernable in leading design companies, which might emblematic of a pervasive trend across the design profession. This trend is also manifest in the types of projects being undertaken in all major academic design programs in the world.

In industry, skills based design is yielding to "design thinking" which is being directed towards a different set of problems such as organizational transformation, defining new markets, designing new experiences, and contributing to corporate strategy. (Beckman and Barry 2007, 25) Due to an increased demand for a differentiation based on innovative offerings, designers are being asked to work on both the problem and the solution sides in increasingly ambiguous problems. In addition, business schools around the world are looking to embed design thinking in their curricula.

3. An Urgent Need for Sytemic and Accelerated Change

"The time scales of modernity have collided with the time scales that governed life on Earth in premodern times. Every year, our industrial systems burn as much fossil fuel as Earth has stored up in a period of nearly a million years. At this rate, we'll use up the planet's fossil fuel reserves within the equivalent of a second in geological time. The acceleration of the speed of human population growth means that in a single human lifetime, the Earth may lose half of its living species, species that took tens of millions of years for evolution to create through the process of speciation." (Thackara 2005, 32)

The 2007, the Intergovernmental Panel on Climate Control, presented a grim picture on global climate change: “warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level.” (Bernsein et al, IPCC, 2007, 30) One of the most critical attributes of these large-scale issues is that they tend to have positive feedback loops and are likely to be growing at exponential rates, creating trends towards widespread instability. It is possible that the forces at play are beyond human intervention and it is too late to thwart dire consequences. However, in the absence of knowledge that it is so, the question that still stares us in the face is “*can we design ourselves out of the predicament we have designed ourselves into?”*

As Manzini pointed out, “what is taking place is actually a structural crisis, and that the global model of development is the true issue under discussion” (Manzini, 1994, 38). This structural crisis needs to be met with change that is rapid and exponential in its magnitude. There is no doubt that time is of extreme essence. But it is difficult to find instances of designed changes that are rapid that withstood the test of time. Methodologies directed towards systemic change need to balance urgency with caution. If we are to attempt to find ways of addressing these issues, the approaches need to have the following characteristics:

- Be designed around an understanding of points of leverage (Meadows 1999, 3-19)
- Be creative, bringing about balance through innovative leverage of meager means.
- Designed for rapid change with built-in propagation mechanisms so that limited resources are directed towards self-sustaining phenomena bringing about change. Exponentially growing threats need to be met with exponentially scaled interventions.
- The mediated phenomena need to adapt to varying conditions: designers need to think in terms of paradigms and platforms rather than solutions.
- The approaches need to be built with control systems that regulate runaway trends and guide it away from undesirable results
- The methodologies need to be integrated and holistic in their function being sensitive to the tertiary effects on the entire ecosystem that it affects

Merely finding novel solutions vis-a-vis complex situations would be less meaningful than finding ways of creating platforms that support shifts in paradigms.

4. Design, a Uniquely Promising Player

Design is being recognized by the world of business for its ability to bring about radically innovative approaches. On one hand “design thinking” has demonstrated efficacy in dealing with abstract undefined problems. On the other, there is an increased recognition that the critical problems facing society such as sustainability are not to be met by the devices of any single field. The philosophies, with which we have conducted business, made decisions, desired growth, consumed resources, and in which various disciplines have acted in good faith all need to be fundamentally restructured if we are to meet the critical nature of the challenges facing us.

Many of the fields in the sciences and humanities are concerned primarily with characterizing phenomena and thus generating resources in the domains of knowledge and understanding that can then be utilized by the fields that *act*. Of the fields that place value in *action,* design is one of the few fields that places an emphasis on “what is the right thing to do” over “how to do things right”. In addition, it is a field at the crossroads of the human condition, technology, business needs, placing value in both the abstract level, and the operational details. As such it is singularly well suited to *generate* trans-disciplinary spaces.

The “Design Complex”

Nigel Cross, referring to The Royal College of Art report of 1979, casts design as a third distinct “*culture*” (Cross 2006, 1), one that has been neglected compared to the other two, namely humanities and the sciences. The structural aspects that render design into a distinct culture also lends it a certain promise in the face of the urgent and critical problems facing civilization.

What makes the designer a promising agent is not a single attribute, but the gestalt of the skills, cognitive processes, design methodologies, attitudes, and structural aspects. I will refer to this as the "design complex". The following are among the attributes are pertinent for casting designers in increasingly strategic roles, and the combination of which make design unique.

(A) Structural attributes that differentiate Design
   a. Designers are primarily concerned about what the future *ought to be*, rather than the defensibility of information borne out by the past. It is a deeply applied field.
   b. It is the designer's mandate to be *creative*. They simultaneously expand the problem space and the solution space. (Cross and Dorst, 2001, 425-437) Design activity begets new design problems allowing the use of "*design to design"*.
   c. Designers *multiplex* between the abstract and the operational, allowing each stratum to gain from the constraints and potential of the other.
   d. Designers create transformations between concept space and knowledge space (Hatcheul and Weil, 2001, 13) and hence have the potential to generate new paradigms, a key point of leverage (Meadows, 1999, 16-18)

(B) Cognitive models that are core to the design field
   a. Design uses *abductive* thinking (March, 1976), the "logic of the possible" in addition to inductive and deductive thinking, the mainstays of other disciplines
   b. Designers practice *eduction*, pulling out hidden insights and latent opportunities from obfuscated scenarios
   c. Design uses *retroductive* thinking, a cognition model that allows the designer to guess at the conditions under which a given phenomenon will emerge.
   d. The iterative method of working involving prototyping is a key derived cognitive model that is a highly effective alternate to pure analysis. This cognitive process possesses an inherent power of weeding out failure modes in *integrated* scenarios. I coin the term *helical cognition* since it is iterative and yet advances the concept state. This mode is particularly well suited to working on complex problems whereby inexpensive iterations allow for development of concepts on multiple fronts integrated within the complexity of the real context.
   e. Designers perform cognitive operations that yield novel configurations, which cannot be arrived at merely as a result of a prescribed process. Designers practice cognitive processes such as imaginal reasoning (Tversky 1969, 255), visio-spatial cognition, representational mediation (Suchman 1988, 325) and symbolic representation enabling "creative leaps" resulting in an increased potential for outcomes that have disproportionate impact compared to the means. (Prahalad, 2006, 2)

(C) Modalities of operation that are strategic:
   a. Designers conduct *synthesis*, creating configurations of value far greater than that of the components. It is particularly significant given resource sensitive scenarios
   b. Designers are comfortable with ambiguity, and have the attitudinal equipment for working on wicked problems (Buchanan 1995,14)
   c. Designers have the creativity and skills to create and communicate novel visions of the future which could then serve as a beacon for strategic roadmaps
   d. Designers are effective in multi-disciplinary scenarios, catalyzing focus, fostering a culture of creativity, generating a shared vision and vocabulary to allow rich communication between disciplines that are otherwise language-blocked. Designers perform the important activity of story telling.

(D) Attitudinal, stylistic and cultural attributes
   a. The designer is allowed to *opine* and to openly express that they *care.* The design community draws people with passion and emotion.
   b. Designers are proactive and are inclined to act as opposed to simply gaining satisfaction from characterizing phenomena. Design is marked by pragmatism, ingenuity, and an impatience for tangible results. Designers, at heart, are builders.
   c. Designers are empathic and human centered while at the same time being comfortable in scenarios involving technology and business. Design is one of the few fields that have an ability to integrate across psychological, cognitive, technological, social, economic, and business issues along with the ability to implement plans.

d. Designers share their methods and have the ability to transform people from other disciplines into “design-thinkers”, allowing them to tap into their creativity and using methods other than induction and deduction.

While the “designer complex” holds much promise, the increase in the complexity of challenges in the design field has also exposed some limitations in the current tool-sets. The field simply has not had the time to generate methodologies to meet the new challenges it is faced with. This gap presents a significant risk of causing a swing in the pendulum, creating a premature loss of faith in the design field, thus resulting in the real value of the field to remain unrealized. While the value of the “design complex” is perhaps far more profound than is easily recognized, the gaps also create a significant impediment in earning the credibility that is needed among other disciplines without which designers would not be invited to take part in decision-making at the highest levels. New tools need to be developed such as ones to identify leverage points in a large system. The current methodologies serve to meet latent human desires and as such, the methodologies for “Human Centered Design” are at odds with the needs of the larger human condition, and I propose a move away from the term to “Impact Focused Design”.

Key Areas Requiring Growth:

(A) Structural issues:

a. The design field is still in the process of finding a cohesive internal logic, and remains heterogeneous. Not all designers possess the training or breadth to work on multi-dimensional problems. The field lacks adequate labels that demarcate one school of thought from another.
b. Design projects tend to be one-offs. The field lacks the culture of extracting values and developing heuristics with universal applicability. By comparison, other disciplines such as business tend to track their one-off cases and maintain a universally accepted rubric.
c. Design is mostly carried out in the scope of a project rather than expanding on the needs of a sub-discipline. For example, the field of Mechanical Engineering might spawn a new sub-discipline such as bio-mimetic micro-robotics, which subsequently would form its own community and draw from the core practices of Mechanical Engineering. In contrast, design harbors generalists and designers capable of addressing multi-dimensional problems are habitual nomads, getting pulled into a health project on one day and an energy problem the next. An opportunity to create sub-disciplines around recurring problems is often missed.
d. Since design stands at the nexus of multiple disciplines, with the purview growing sharply with each passing year, it is impossible for a designer to be an expert in all the disciplines. And yet, often they find themselves having to make decisions that are best made with the help of a specialist.
e. Design is largely qualitative and resists dealing with numbers. But many of the arguments in important decisions are carried on the backs of numerical arguments. While emphasis on the qualitative gives power to abductive thinking and intuition, it creates a weakened platform for objective decisions.

(B) Cultural issues:

a. Design tends to rely on its creativity and often overlooks existing knowledge.
b. The culture of abductive and retroductive thinking places a higher value on novelty, ingenuity and effect, rather than defensibility, or the theoretical basis for action. This falls foul of the scientific community whose cultural emphasis lies in objectivity, repeatability, and the use of data to defend claims.
c. There exists an absence of a clear rubric for evaluation of quality. Quality tends to be ascribed in a manner that lacks consistency across the design field. Rigor is a personal choice rather than being forced by the inherent quality of the field. For example, it is possible to be far less rigorous in designing a new K-12 education system through design methodologies than designing a shell concrete dam using earthquake-engineering methodologies.
d. Designers tend not to be systematic about documenting their work. The inadequacy of data in the field prevents evaluation of the field by outside agencies or by themselves at a later point in time.

e. Designers design, they tend not to write. And much of the writing is carried out by observers of design and design theorists rather than by designers. This creates a gulf between design practitioners and design theorists, not unlike Art and Art History. Designed objects, while rich vessels for semiotics, falls far short of supporting communication that can enable the discourse needed to expand a field.

(C) Inadequate toolsets:

a. Design lacks the adequate research methods to query large-scale trends and phenomena. Qualitative tools such as ethnographic research are effective for identifying latent needs and uncovering incisive insights that inspire design but the same tools are not as effective in identifying system wide needs. An emphasis on ethnography often puts the value on human desire rather than the health of the systems that sustain humans.
b. Design lacks the tool-sets for mediating selection of solutions among a large array of possible concepts in complex multi-stakeholder scenarios when counter-intuitive optimization or conflict resolution is called for.
c. Designers do not possess adequate tools to assess large-scale implications of a proposed concept. Fields such as development economics are far better suited for such evaluations. Standard tools such as prototyping sometimes have limited scalability e.g. the effects of a new freeway system on a community cannot be probed through prototyping, however, with better documenting conditions, we might find that a given project might serve as a prototype for another.
d. Designers tend to identify points of leverage by intuition rather than by identifying the category of leverage, for instance the gain on a positive feedback loop. Often, points of leverage are counter-intuitive.
e. Designers often fail to express the value of their outcomes to another field when there has not been the opportunity to create common vocabulary. For example, for years the design field resisted the comparatively simple and potentially lucrative argument for a Return On Investment analysis on design activity, and to this date, fails to sell its wares to uninitiated businesses in the language of business.

(D) Lack of adequate mechanisms for advancement:

a. Design needs to build platforms for increased credibility. Peer-reviewed design journals are scarce, and the readership among designers is limited. There is a need for platforms that have means of maintaining credibility and yet suited to the designer's modalities of authoring and the type of content prevalent in design.
b. Academic institutions offer inadequate mechanisms for advancement in this field. There are too few world-class universities that offer PhD programs in Design, thus creating a very small cadre of people who are working to advance the field. It is not surprising that many of the recent advancements in methodologies that have been adopted widely have come from leading design firms.
c. Designers in PhD programs, in order to conduct doctoral level work, often turn into "designologists" rather than remaining designers. Of the various categories of research work connected to design, namely research *of* design, research *for* design, research *through* design, and research *with* design, (Frayling 1991) the latter two have been neglected and need to be expanded in academic practice.
d. Designers have demonstrated an ability to be catalysts in fostering a multi-disciplinary culture, and yet there has been little thought given to developing heuristics for trans-disciplinary configurations, with methodologies for each class of complex problem.

5. A Meta-Discipline

Design is uniquely positioned to engage in complex multi-dimensional problems, and yet to do so effectively, there are many areas it needs to buttress itself in through collaborations with other fields. But in filling the gaps in its own methodologies, the bigger opportunity is for design to find ways of systematizing and expanding the nature of collaborations with other disciplines.

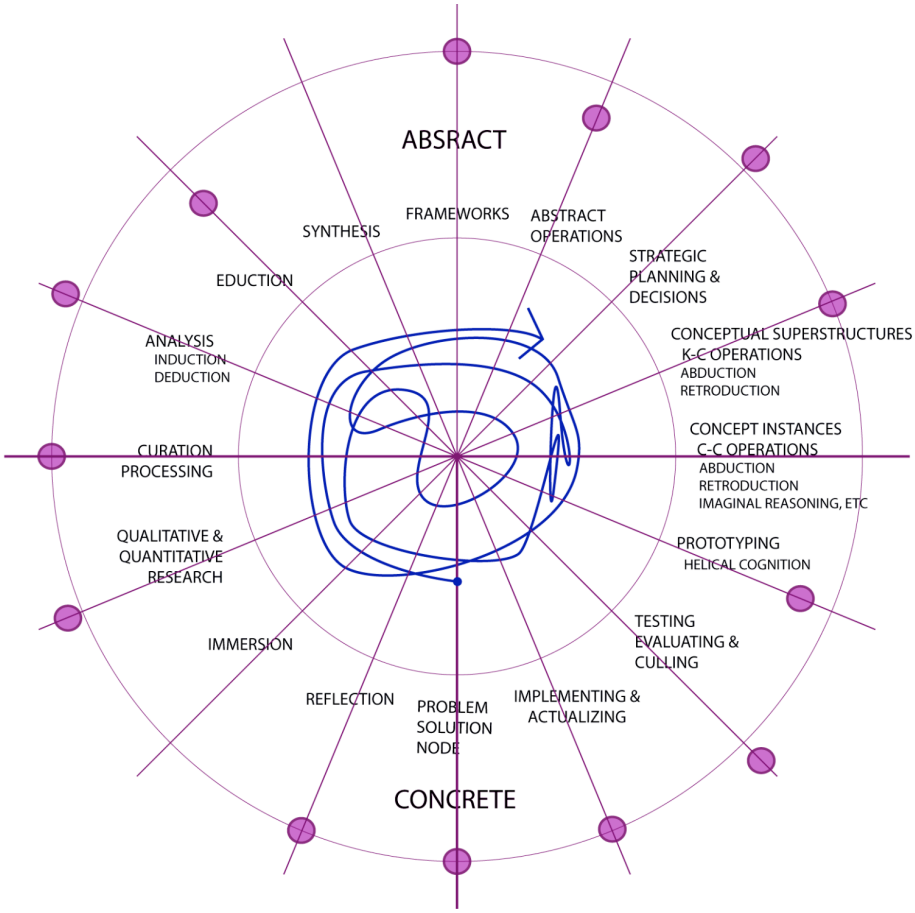

Fig. 1: The various modalities in the design process. The dots represent areas of possible collaboration.

Figure 1 depicts some of the modalities that the design process traverses in alternating between the problem domain and the solution domain, in both cases pulsating with phases of expansion and convergence. This process does not move necessarily in an orderly cyclical fashion, and there are jumps taken between modalities, often with a rapid multiplexing between modes and between the abstract and the operational. The dots on the figure indicate strategic collaborations that would expand the field. The dots on the outside of the larger circle denote an expansion of large amplitude along a particular modality. For example, the dot on the analysis modality suggests collaboration with deeply analytical fields such as applied physics, systems analysis, or engineering research. On the other hand, the dot on the conceptual superstructure line might involve artists, science fiction authors, filmmakers, and visionaries.

A trans-disciplinary system integrates methodologies contained within discrete disciplines, sharing epistemologies and boundaries of practices within a common framework with a relevance to the special overall context and goals. Given that a trans-discipline creates a culture of its own, it can be seen as a vessel for a meta-level cognition. (Hutchins 1995, 354) The strategic and choreographed combination of discipline suggests a methodology for the creation of trans-disciplinary systems with pertinence to the specific class of problem. I will refer to this system of crafting trans-disciplines as “meta-discipline” (Figure 2). Meta-disciplinary methodologies are ones concerned with the creation of optimal trans-disciplinary systems that define boundary conditions, information exchange mechanisms, heuristics, a common syntax, shared epistemologies, temporal engagement patterns, handover protocols, and areas of discrete action, and above all, the rules and core values of the new discipline.

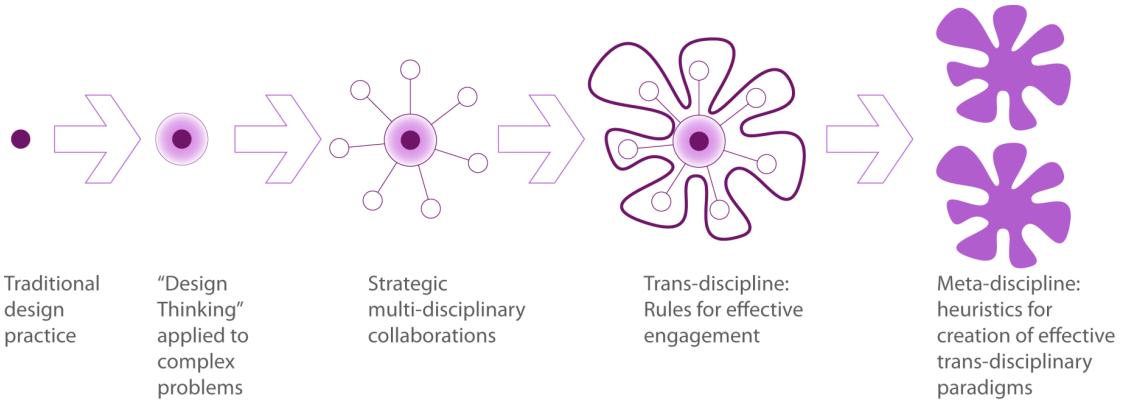

Fig. 2: The stages of progression from core design practice to Meta-discipline.

Figure 2 depicts how core design practice became more generalized in applying "design thinking" to problems not traditionally considered within the purview of design. We are beginning to see multi-disciplinary collaborations take place across institutions and academic programs. Systematization of the rules of engagement between sets of discipline yields a trans-discipline. The process of creating trans-disciplinary paradigms attuned to a given class of problems would constitute a meta-disciplinary practice.

Another way to look at this is through the use of a sports metaphor. If the objective in the game of soccer is to win by scoring as many goals while blocking all possible goals, then it makes sense for the ball to be passed to the player who is in a better position and with the skills to generate the best play. And while one player is in possession of the ball, the others move to positions that allow for optimal passing. The roles and skills of the players are different but sometimes interchangeable. Sometimes a play involves a pre-planned sequence, and at others a combination of finely honed skills and improvised moves. And everyone on the field agrees to play by the rules of soccer rather than lacrosse, but in special conditions like penalty kick-offs, the game assumes a certain different flavor. With soccer as a metaphor, a trans-disciplinary system exists in the context of a class of problems. The interplay of the different disciplines is to be choreographed such that the key strength of each discipline is leveraged, and the opportunities for gestalt phenomena and emergent synergies are maximized. For instance, if the strength of development economics is in evaluation of large scale implications of a given option, and that of design in generating an array of creative options in response to a certain goal, then it makes sense to sequence the engagement of the fields such that the designers generate creative options, and the economist evaluates their potential large impact at a large scale. Rather than a discrete handover, if the process involves a deep collaboration, then the insights from the economist would inform the design, and vice versa.

In trying to create multi-disciplinary initiatives, we still find it hard to escape the philosophies of fields that were formed around the study of simple or "discipline-bounded" phenomena, As Hayek put it in 1964,

> "What we must get rid of is the naïve belief that the world must be so organized that it is possible to direct observation to discover simple regularities between all phenomena, and that this is a necessary presupposition for the application of scientific method. What we have by now discovered about the organization of many complex structure should be sufficient to teach us that there is no reason to expect this, and that if we want to get ahead in these fields our aims will have to be somewhat different from aims in the fields of simple phenomena" (Hayek 1964, 349)

Complexity requires that we rethink the way we approach problems. In the words of Herbert Simon,

> "We have learned very well that many of the systems that we are trying to deal with in our contemporary science and engineering are very complex indeed. They are so complex that it is not obvious that the powerful tricks and procedures that served us for four centuries or more in the development of modern science and engineering will enable us to understand and deal with them.."(Simon, 2000, 601)

While it might be philosophically befitting to think of the designer operating in a more rhizomatic paradigm (Deleuze and Guattari, 1987), acting as agents *within* a multi-stakeholder ecosystem, it is also appropriate to put design in the center of the action, and look at its potential in catalyzing trans-disciplinary systems to solve complex problems.

Currently, despite the number of multi-disciplinary teams coming together to work on complex problems, the process often involves exploring the *intersection set* of the view points rather than the *super-set* of possibilities for the unique combination. The rules of engagement seem to rely on finding a "common ground" which might limit the extent of the collaboration. While it accounts for some ground gained in empathy, shared epistemologies and vocabularies, the meetings often fall into a negotiation between the value systems of the different fields. In academia, another problem that arises is that of credibility within each domain. A truly trans-disciplinary endeavor stands outside of the rubric of any of the member disciplines and as such casts "projections" on the plane of each discipline, rather than being evaluated *in terms of* the core values of each discipline.

A trans-disciplinary outcome might be truly remarkable in effect and yet fall short of gaining credibility because it does not adequately push the boundary within each of the member disciplines. As such the credibility of a trans-disciplinary outcome needs to be measured within the rubric created for itself as a new discipline, or be pieced together by combining the viewpoints of each discipline, much as the geometry of a three-dimensional object can be inferred from multiple projections. Academic systems currently fail to provide adequate mechanisms for trans-disciplinary endeavors to gain credibility unless the work is exemplary within each member discipline. At a pragmatic level, universities tend to be compartmentalized, and a truly multi-disciplinary doctoral student finds it difficult to locate a patron who would fund them, without also having their study artificially skewed by the requirements of the department of their primary affiliation.

6. Agent of Change: A New Designer in a New Design Paradigm

The design field is uniquely positioned to be one of the key players bringing about change. The key attributes of the design field makes it a strong candidate in working on challenges such as sustainability, but this expanded role for the design field implies a fundamental shift in the designer's identity.

The identity of the designer is currently that as an "identifier of needs and definer of systems" (human, technological, business). The core values in design are practicality, ingenuity, empathy, and a concern for appropriateness (Cross 2006, 2). Without a radical modification in core values, it would be a subtle yet important shift if the identity of the designer were to be altered from being an "identifier of needs and definer of systems" to "agent of appropriate change" or "a catalyst for systemic transformation". A transformation of the identity would shift the inbuilt fetishism from the "elegance" of one's work, to the "impact" it generates. Albeit a subtle move, it spells a profound difference in the choice of tools and approaches, especially for those in the design field who aim to be thought-leaders and are willing to engage in trans-disciplinary work involving systemic change. Such a shift in identity would cause and be a result of fundamental changes to curricular structures, as well as in processes in design practice.

7. Meta-disciplinary Mechanisms

A mechanism that would allow for prototyping meta-disciplinary activity, and draw the right type profile of individuals to participate is not easily found. Academic departments tend to be insular and resist change. Laboratories that have a focus on a given domain build their processes around the needs of the domain. The problem lies in being broad enough to allow for meta-level questions, and yet be focused such that there are clear objectives. Such a mechanism must be designed to encourage sporadic and opportunistic membership, and yet serve as a mainstay for sustained work. It needs to be designed to redesign itself and morph to new structures as the understanding of meta-disciplinary work grows. It needs to be able to house multiple trans-disciplines so as to develop the meta-disciplinary practice. And it needs to work within real world constraints of resources and problem domains.

At Stanford University, we have been working on a formation of such an entity with an inherently meta-disciplinary structure. We have named it “The Design for Change Lab” (Figure 3) and its mission is to “Develop trans-disciplinary approaches to drive rapid change and large scale impact”. The Lab’s meta-disciplinary structure is aimed at expanding the design field, exploring means of bringing about rapid and large-scale change vis-a-vis critical problems. It is also forms a natural platform that would attract experts from different fields unified through common goals.

The Design for Change Lab provides opportunities for students and experts from diverse disciplines to engage in work with an *integrative* perspective. Part of the meta-disciplinary approach would not only be to configure the involvement of different disciplines, but also explore collaboration between different types of agencies. Rather than a specific domain, the ethos of this lab is structured around a set of values and principles.

The Design for Change Lab creates a novel precedence by combining the following values:

a. **Meta-Disciplinary**: A continual aim to define trans-disciplinary systems in response to a particular nomenclature of a complex problem. Integrating and configuring processes from different fields such as design, behavioral sciences, engineering, systems analysis, cognitive psychology, and economics to deliver a larger set of tools and processes. For instance, disciplines such as sociology that primarily *characterize* phenomena might now be asked to help craft tools that proactively create seeding functions of emergent behavior.
b. **Strategic combinations of players:** Creating unique configurations between groups such as universities, industry, individual experts, institutions, digital communities, venture capital, government bodies, non-profit organizations and social entrepreneurs to generate an integrated strategy. This combination allows research into *new methodologies and heuristics* for collaboration between disparate entities for effective deployment of ideas.
c. **Filter for large-scale impact:** Requiring projects to be directed towards those contexts and geographies, where scale, impact, and rate of change are critical parameters. However limited the scope of a single project, it is asked to be emblematic of a larger class of problem that is critical, allowing for extraction of value that is universal or transferable.
d. **Global Network:** Working as a node of an international network with active collaborations around the world will help including cultural issues and focus on projects of global relevance.
e. **Triangulation:** Work on multiple objectives at the same time in order to explore meaningful cross-pollination. The three main vectors i) Sustainability ii) Integrative Technology Futures iii) Dynamics of Change to afford a broad platform for trans-disciplinary work.

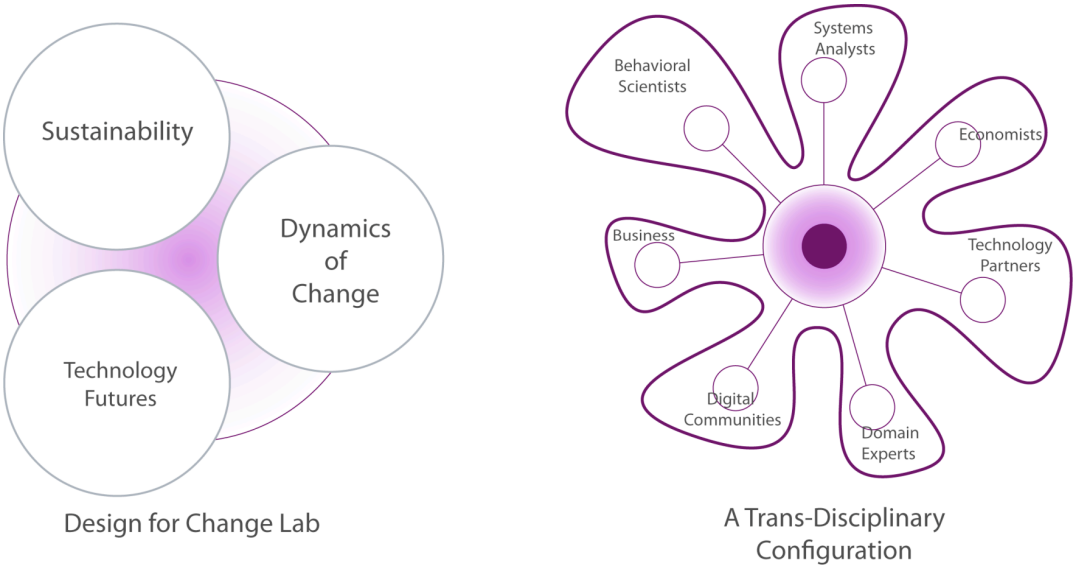

Fig. 3: The structure of the Design for Change Lab, and a proposed trans-disciplinary system.

The work in the lab will be organized along three vectors each of which might form a separate trans-discipline but the boundaries between them are meant to be porous:

a) **Sustainability**: Issues of global importance such as energy, water resources, climate change, and strategic initiatives involving environmental impact.

b) **Integrative Technology Futures**: Technology is one of the major frame-changers in society, and yet tends to not be directed with cogency of vision. Projects to carry out research on integrative technology configurations driven by long-term vision.

c) **Dynamics of Change:** Research on seeding functions of emergent behavior and the methodologies to catalyze and manage rapid change.

The creation of an aspirational, explorative meta-disciplinary entity such as the Design for Change lab will no doubt be challenging. It will have to attract the collaborative involvement of the right profile of people representing diverse disciplines, agencies, and roles. Apart from being a part of an international network, we feel that the being embedded in the Stanford Design Program and Stanford's "d.school", being located in Stanford University with its increasing openness to multi-disciplinary collaborations, on-campus multi-disciplinary institutes such as the Precourt Institute for Energy Efficiency, Woods Institute for the Environment, the proximity to other universities such as University of California Berkeley along with it's institutes, the entrepreneurial energy of Silicon valley along with its profusion of high technology companies, the increasing number of clean-tech companies in the area, and the proximity to design companies creates an rich setting for a node of such a meta-disciplinary endeavor.

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