# Reflections on Design: Process for Change
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A speech given at the **Tenjin Barca Festival** in Osaka, Japan on July 23, 1993

Good morning. In the few minutes that I have, I would like to share with you some thoughts about the design process. As a speaker on an occasion like this, I feel that I can only tell you what you already know, but, perhaps, I can present some views differently enough that they may be thought-provoking.
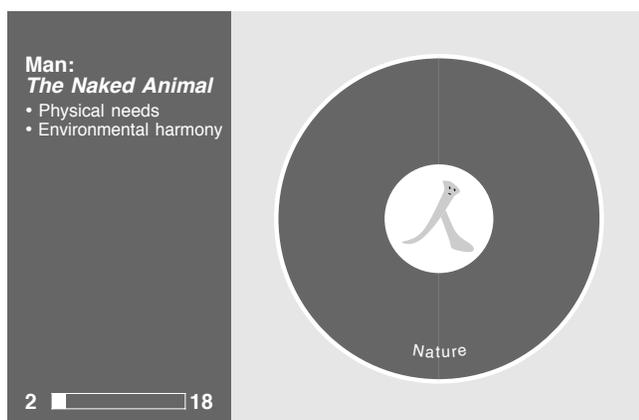
What I want to do is reflect upon how we, as designers, do what we do.
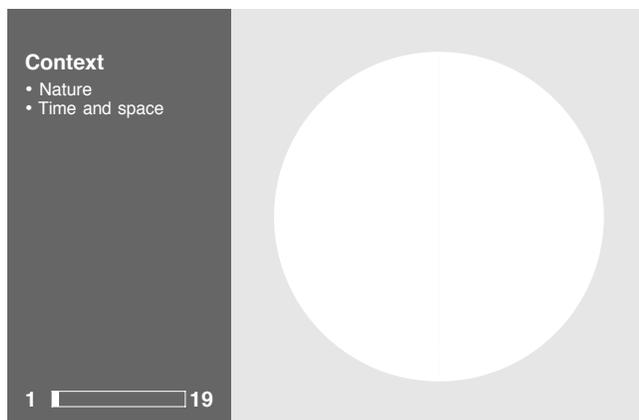
Let me start by thinking about the place of design (Fig. 1).

Nature existed and evolved for millions of years without people. It is the ultimate context for what we do.

As an evolved species, mankind is peculiarly unprepared to exist in the natural world (Fig. 2). Unless our most basic physical needs are met, we will die. And unless we can find ways to live in harmony with our environment, we will not be able to meet our physical needs.

Context
• Nature
• Time and space

1 ▭▭ 19

Man:
The Naked Animal
• Physical needs
• Environmental harmony

Nature

2 ▭▭ 18

Man:
The Social Animal
• Social needs
• Civil harmony
• Physical needs
• Environmental harmony

Society

Nature

3 ▭ 1 7

But the environment for man is more than nature. Because we are social animals, we also must satisfy social needs and find ways to exist in social harmony (Fig. 3). Our true environment is both social and natural.

To be successful in an often very hostile environment, we have been gifted above other animals with two almost magical extensions: tools and language (Fig. 4).

Extensions:
Means to create
• Protection
• Insulation
• Interaction
• Transformation

Society

Language

Nature

4 ▭ 1 6

The ability to make sophisticated tools allows us to construct marvelous artifacts – from the simplest forms of body protection to the most complex vehicles and environmental structures (Fig. 5).

The ability to use language allows us to communicate and to construct institutions to mediate our social intercourse.

These form the interfaces between us and the natural and social environments.

Products:
Elements to enable
• Protection
• Insulation
• Interaction
• Transformation

Society

Institutions
Language

Tools

Nature

5 ▭ 15

Design is the creation process through which we employ tools and language to invent artifacts and institutions (Fig. 6). As society has evolved, so has design. And it continues to evolve in complexity and capability as we learn and improve our design technology.
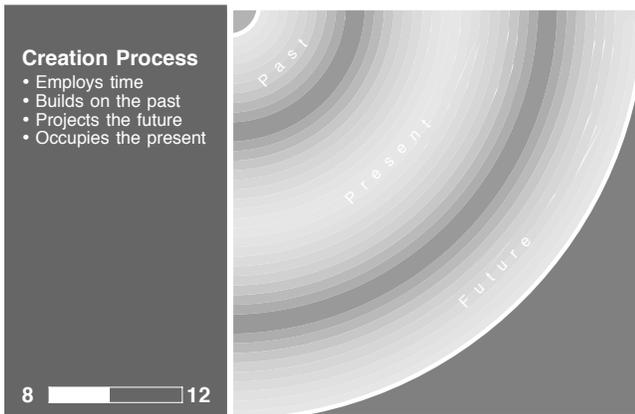
Creation Process
• Research
• Discovery
• Problem solving
• Invention
• Development

Society

Institutions
Design
Language

Tools

Artifacts

Nature

6 ▭ 14

Creation Process
- Research
- Discovery
- Problem solving
- Invention
- Development

Society
Institutions
Design Language
Tools
Design
Artifacts
Nature

7   13

Creation Process
- Employs time
- Builds on the past
- Projects the future
- Occupies the present

Past
Present
Future

8   12

Creation Process
- Employs time
- Builds on the past
- Projects the future
- Occupies the present
- Part analytic,
  part synthetic

Analytic
Past
Present
Future
Synthetic

9   11

Form Making
- Direct action
- Application of pattern
- Simple; not complex

Analytic   Synthetic

Making → **Product**

Context   *Artifact/Institution*
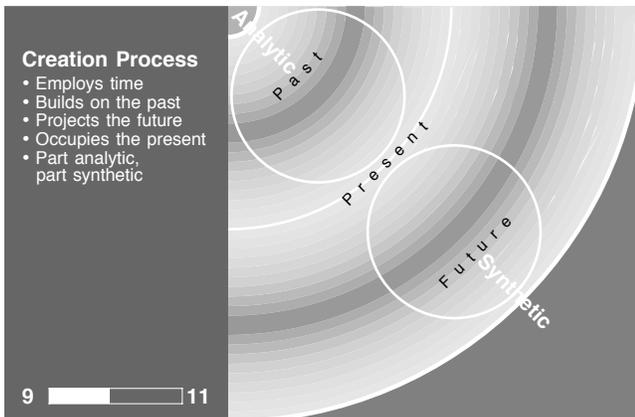
Past   Present   Future
Matsuri

10   10

I would like us to focus our attention on design as a process of creation (Fig. 7).

Design is a time-dependent process (Fig. 8). It builds on the past, improving on previous ideas. It projects to the future, anticipating inevitable change. But it occupies the present; like matsuri, it exists between past and future.

Design is also a structured process (Fig. 9). While its phases are not locked in rigid progression, it nearly always begins with analytic processes of search and under-standing, and ends with synthetic processes of experimentation and invention.
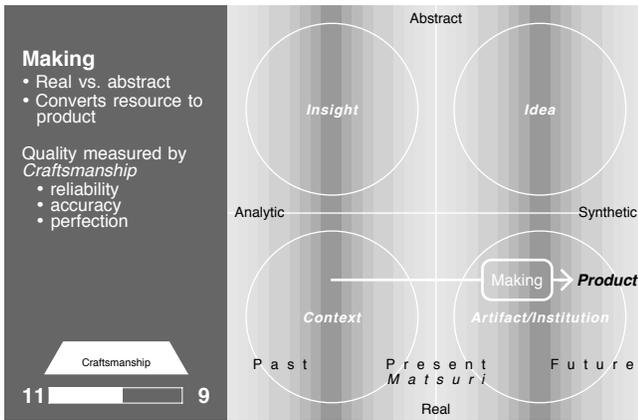
When the diagram is straightened out, it is easier to see a left analytic region and a right synthetic region. In the left region, the domain of analytic focus is the *context* of the design problem, spanning aspects of past and present. In the right region, the domain of synthetic focus is the *artifacts and institutions* to be designed.
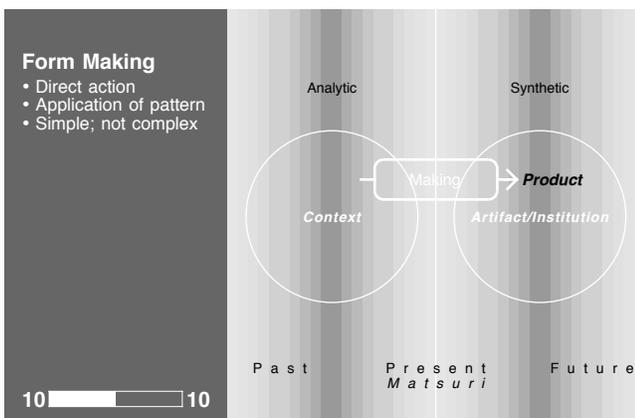
The simplest and oldest way of creating is "form making", the direct translation of contextual understanding to artifact or institution (Fig. 10).

As our civilizations have matured, our un-derstanding of creation and production processes have deepened (Fig. 11). Today, we need another axis in our diagram to describe them. The new axis distinguishes the abstract from the real, establishing the abstract as the realm in which the specifica-tion for an artifact or institution is created. "Making", today, is most often a real, synthetic process of production, divorced from both analytic and abstract require-ments.

No matter how we create forms, however, we evaluate their quality. On the left of the slide, I have begun a model for evaluating quality. At the level of "making", manufactur-ing, or construction, we evaluate quality as craftsmanship.

Making
• Real vs. abstract
• Converts resource to product

Quality measured by
Craftsmanship
• reliability
• accuracy
• perfection

Craftsmanship

11 [ ] 9

Abstract

Insight   *Idea*

Analytic   Synthetic

Making → *Product*

Context   *Artifact/Institution*

P a s t   P r e s e n t   F u t u r e
M a t s u r i

Real

Designing
Separates specification from production

Quality measured by
Details
• performance
• human factors
• cultural fit

Details
Craftsmanship

12 [ ] 8

Abstract

Insight   *Idea*

Designing

Analytic   Synthetic

Specification Making → *Product*

Context   *Artifact/Institution*

P a s t   P r e s e n t   F u t u r e
M a t s u r i

Real

Planning
Separates conception from specification

Quality measured by
Concept
• wholeness
• thoroughness
• innovativeness

Concept
Details
Craftsmanship

13 [ ] 7

Abstract

Insight Planning *Idea*

Concept
Designing

Analytic   Synthetic

Specification Making → *Product*

Context   *Artifact/Institution*

P a s t   P r e s e n t   F u t u r e
M a t s u r i

Real

Metaplanning
Separates definition from conception

Quality measured by
Integrity
• appropriateness
• cohesiveness
• support for values

Societal Integrity
Product Integrity
Concept
Details
Craftsmanship

14 [ ] 6

Abstract

Metaplanning

Insight Planning *Idea*

Concept
Designing

Analytic   Synthetic

Specification Making → *Product*

Context   *Artifact/Institution*

P a s t   P r e s e n t   F u t u r e
M a t s u r i

Real

The appearance of the design specialist separated the act of specifying an artifact or institution from the act of producing it. Designing is in the realm of the abstract (Fig. 12). When we design, we extract insight from the facts and observations of context, convert insights to ideas and give them form through a specification passed to the making process.

Quality produced in the designing process is measured in the details of the product. These are aspects of its performance, human factors and cultural fit. The business community is now beginning to realize how important these forms of quality are to the success of products.
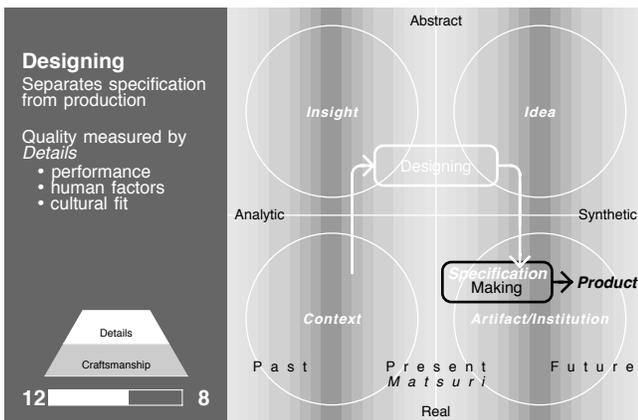
Modern thinking adds another layer to the creation process – planning or, as it is sometimes called, design planning (Fig. 13). Planning separates the creation of concepts from the creation of details, so that concepts can be developed more thoroughly at a higher level of abstraction. Planning is done most effectively by multi-discipline teams, led by designers trained in planning methodology.
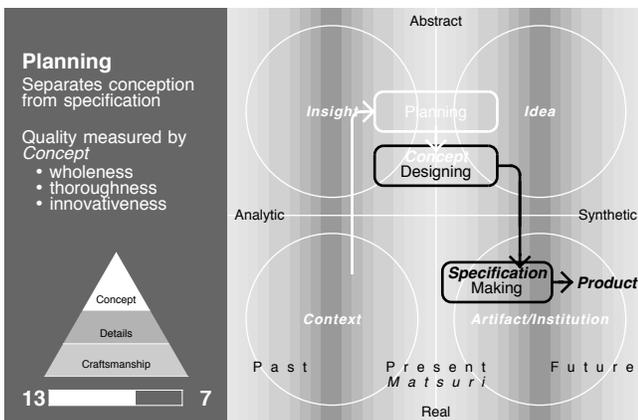
The quality of planning is measured in the concept. A good concept exhibits significant holistic and innovative characteristics, and is qualitatively superior to conventional products.
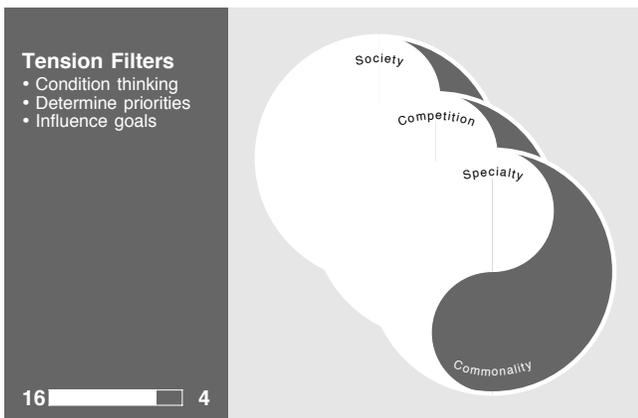
More a subject of research today than an established phase of the creation process, metaplanning operates at the highest level of abstraction (Fig. 14). It separates the definition of the project from the planning and designing processes. Metaplanning focuses attention on resources, methods and the issues to be addressed in a project.
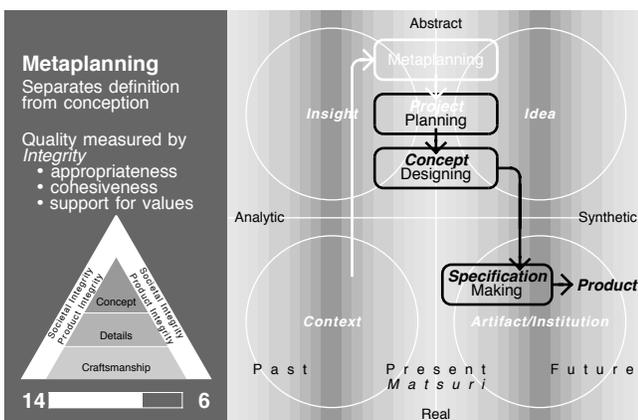
Because the purview of metaplanning is broad, its effect on quality can be pervasive. Quality resulting from action at this level can be measured in the integrity of a product: its appropriateness, cohesiveness and support for values, both of the organization for which it was created and the society in which it is to be used.

Quality Pyramid
• Evaluation model
• Process model

Concept
Details
Craftsmanship

15 ▭ 5
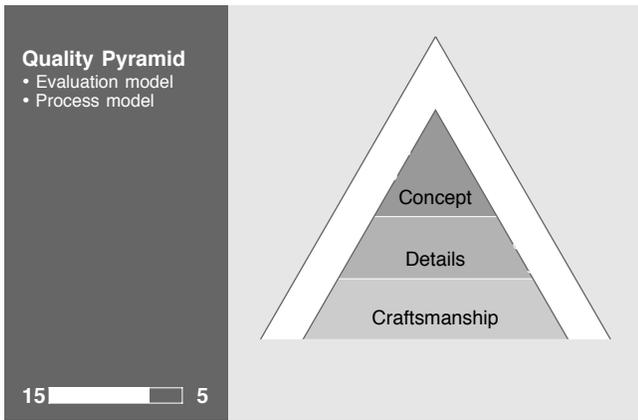
The model for measuring quality is what I call the Quality Pyramid (Fig. 15). It is both a model for thinking about quality beyond craftsmanship, and a model that reflects the sophistication possible in the creation process. Each phase of the creation process finds its place in the harmony of the model.

Tension Filters
• Condition thinking
• Determine priorities
• Influence goals

Society
Competition
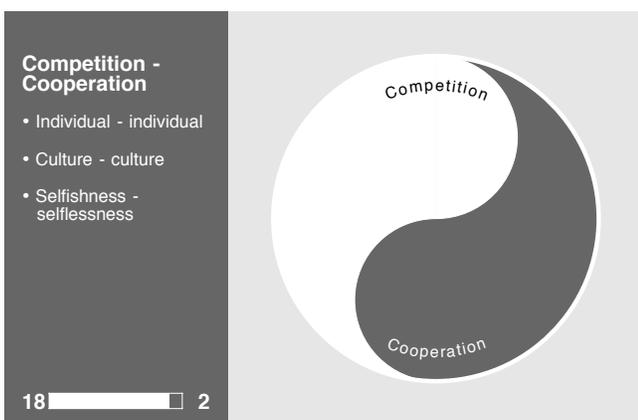Specialty
Commonality

16 ▭ 4

The sometimes-contrasting requirements of nature and society are not the only requirements creating tensions for design. Designers today face questions of value that will influence our approach to the future. I call them "tensions" and cast them as polarities or "spectrum" issues because thinking in this way is easy to grasp and apply (Fig. 16).

These "tensions" act as filters on our thinking; controls on our use of the design process, particularly at the metaplanning and planning levels. I will introduce three as food for our thinking about responsible design for the future.

Self - Society
• Individual - group
• Personal rights - responsibility to society

Society
Self

17 ▭ 3

The first tension is between self and society (Fig. 17). As world populations inexorably increase, our environment continues to degrade, and the gap widens between the world's wealthy and poor, we must seriously consider how our efforts contribute to individuals' views of themselves and society. It is important for individuals to value and improve themselves, but it is equally important for individuals to value and improve society.

Competition - Cooperation
• Individual - individual
• Culture - culture
• Selfishness - selflessness

Competition
Cooperation

18 ▭ 2

As our nations build the new global economy, we will hear over and over again the importance of successful competition. Less frequently heard, but perhaps much more important, will be the importance of cooperation (Fig. 18). We must ask ourselves how we can contribute to finding balance between these two powerful ideas. Design can have subtle influence at many levels – from children's toys and games to national policies.

Specialty - Commonality

- Stand out - blend in
- Mass - custom
- Homogeneity - heterogeneity

19 ▭ 1

Specialty

Commonality

Opportunity and Responsibility

Society needs design

Design needs maturity
- Research
- Education
- Communication

20 ▭ 0

Specialty

Concept

Details

Craftsmanship

Commonality

Electronic media are homogenizing our cultures. While it is comforting to find familiar artifacts and institutions as we travel, it is dismaying to watch the delightful differences of old and wonderful cultures disappear. We gain significantly through communication and the creation of commonalities, but we must find ways to recognize and celebrate the things that make our cultures special (Fig. 19).

Design in its various professional forms is entering a time of great attention. There will be both excitement and anxiety under the spotlight.
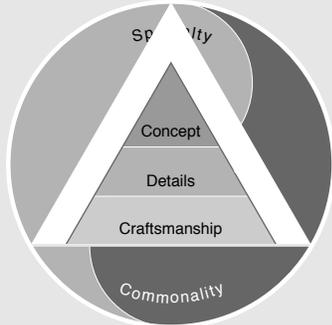
Society needs design – and it is discovering that.

But design needs maturity. We are ill-prepared for the attention coming our way. If we are to assume the responsibility we have so often requested, we must devote serious effort to building the reservoir of knowledge necessary to assume it (Fig. 20).

It is time for the design disciplines to grow up; time to commit human and financial resources to institutions for design. We need centers for research, better educational curricula and a range of channels for sharing knowledge. We must build rapidly what other disciplines have built before us.

If we do so, I am confident that the next century will a golden one for design.