

Meaning of ‘Individuals Diversity’ for Information-System-Design-as-Organization-Design, and Significance of ‘Web-based’ as Design Solution

Hideaki Miyashita

Department of Education

Hokkaido University of Education, Iwamizawa 068-8642, Japan

E-mail: m@iwa.hokkyodai.ac.jp

Abstract — As to information system, “if we build it, they will come” does not work. Its result is wasting money. But, in reality, it is being repeated. The point of the problem is that the methodology of design is seriously lacked there.

Information system design is much more than information system design. It is an organization design — design of organization shift. It is to conform the information system and the members’ diversity to each other. And the point is the activation/release of individuals diversity, because (1) individuals diversity is the moment of organization shift and (2) activating/releasing individuals diversity is the manner of organizational ‘well-being’.

The ‘web-based’ is a potent means/solution for activating/releasing individuals diversity. It should be asserted because we are still far from using the most of the power of ‘web-based’.

Key words: *information system design, organization design, diversity of individuals, release of diversity, well-being*

0. Introduction

We know well that the stance of “if we build it, they will come” does not work, at least as to information system. But, in reality, it is being repeated. There huge money is wasted. Why does it happen? It is deeply rooted in such a culture as bureaucracy, or such a way of looking at people as mechanical/lifeless “filling”.

Thus, in order that we break with wasting money for useless/needless information system, a fundamental tradition-shift is required. I think the methodology is what is most lacked. From this viewpoint, I consider, in this monograph, the method of information system design.

Information system design is much more than information system design. It is an organization design — design of organization shift. The content of the design is :

1. understanding (both probable and improbable) members’ disposition/experience with scoping diversity of individuals, and
2. conforming the system and the members’ diversity to each other, together with activating/releasing the diversity.

And the point is ‘individuals diversity’ because

- individuals diversity is the moment of organization shift,
- activating/releasing individuals diversity is the manner of organizational ‘well-being’.

Thus, I inquire into information system design from the standpoint of “individuals-diversity-oriented information system design”.

And I try to make the method concrete by referring to my case of developing instruction/learning system — my professional practice of course/class design at teacher training course.

Finally, in this sequence, I propose the ‘web-based’ as a potent means/solution for activating/releasing individuals diversity.

The monograph is structured of (1) basic consideration on information system design [§2], (2) reference to my practice of instruction/learning system design [§3], and (3) discussion on the method of information system design [§4].

1. Research scheme/strategy

Here, before entering the subject, I brief my research scheme/strategy to give a perspective of this monograph to the readers.

A. Subject (Objective)

1. By viewing

- (1) information system design as organization design, and
- (2) organization design as design of organization shift, and
- (3) ‘individuals diversity’ as moment of organization shift,

2. do the followings :

- (1) specify the reason why, and the manner how, conforming the information system and the members’ diversity to each other is the prime requisite for information system to work, and
- (2) propose the significance of the ‘web-based’ as element of information-system-design-as-organization-design.

B. Flow of research

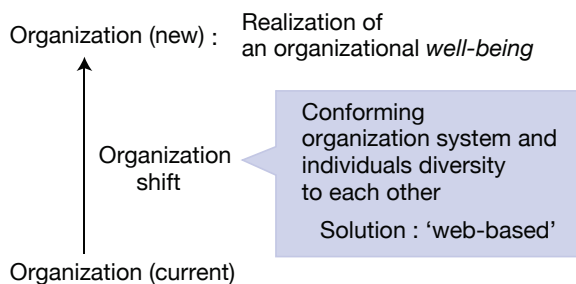
1. Consideration on the meaning of ‘individuals diversity’ for organization design. (Information system design is organization design !)

2. Reflection on my practice of design at my professional field

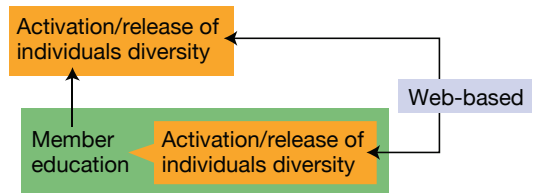
- (1) Design of web-based-contrivances-strengthened regular instruction (mathematics education) at teacher training course (Cf. [3])
- (2) Administration of campus information system, including developing web-based applications (such as online syllabus system)
3. Propose a basic scheme and solution for information-system-design-as-organization-design.

C. Insight (Hypothesis)

1. Information system design is organization design.
The design is generally the action of *shifting the present (the given)*. And “*the present (the given)*” is organization/community in the case of organization design.
2. Organization shift is usually aimed at as ‘organization development’. — Objective : an organizational *well-being*.
3. The secret of organization shift is the diversity of constituents — *the diversity of individuals is the moment of organization shift*.
Diversity of individuals is the prerequisite (the point where we start out).
The meaning of the diversity of individuals implies the meaning/direction/method of organization design and, specifically, information system design.
4. Diversity of individuals is also the definite condition of organizational *well-being*.
Organization design is the design of ‘*activation/release of individuals diversity*’.
5. This “activation/release” is not spontaneous. It is requisite to conform the organization system and the members’ diverse disposition to each other. (“Member” is read “member/user” in the case of information system design.)
In particular, organization design, especially information system design, includes member education course design.
6. One of the most promising solution for *conforming organization system and individuals diversity to each other* with ‘*activation/release of individuals diversity*’ is the ‘web-based’ — we have the following organization design scheme :



‘*Conforming organization system and individuals diversity to each other*’ includes member education. Here, the member education is of ‘*activation/release of individuals diversity*’, too. — ‘*Activation/release of individuals diversity*’ and ‘web-based’ are metastructured :



7. It holds for information system design as a special case of ‘organization-design’.
8. This proposition is important because we are still far from making the most of ‘web-based’ in regards to the issue of ‘diversity of individuals’.

D. Inquiry/Research

1. Confirm that the moment of organization shift is the diversity of individuals, by revealing the structure/mechanism of organization shift.
2. Invoke the knowledge/thought of democracy, or its philosophical partner, pragmatism.
3. Suggest that science/engineering of organization design, especially information system design, is regarded as a science/engineering of democracy.
4. Research (demonstration)
 - (1) Field : Design of regular instruction at teacher training course, which is my profession. Design of campus information system/applications user education, which is my role/service as administrator of campus information system.
 - (2) Standpoint: What I practice is ‘organization shift’.
 - (3) Vital point (essence, main feature) of the design: Management of apparently conflicting structure of ‘individuals (diverse) v.s. discipline (uniformly authorized)’
 - (4) Solution :Web-based
Proposition: Confirm/specify my design method which is applied to my professional practice.

E. Conclusion (Outcome)

A basic scheme of *information-system-design-as-organization-design* is proposed. It asserts the importance of the notion of ‘Individuals diversity’ in the sense that : *conforming the information system and individuals diversity to each other is the exact content of the design*. Specifically,

1. Information system design is organization design.
2. Design is an enterprise of shifting the given to some ‘well-being’.
3. The issue of ‘individuals diversity’ is essential at organization design, because the diversity of individuals is the moment of organization shift.
Designers ought to turn their concern toward the diversity rather than the commonness of individuals.
4. “Activating diversity of individuals” strategy is not the same as “one-on-one” strategy.
Its basic idea is “making/serving a field/space where diversity of individuals is activated/released”.

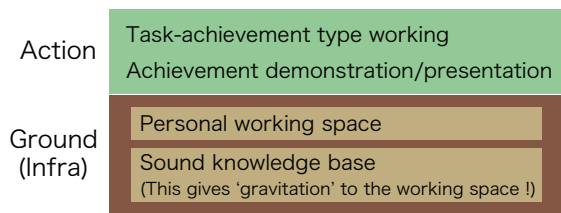
Thus, the organization design is the design of “field/space where diversity of individuals is well-activated/released”.

5. Well designed member education is requisite for the activation/release of individuals diversity to take place.

This education itself is conditioned by activation/release of individuals diversity.

6. Today, ‘web-based’ is a basic solution to ‘activation/release of individuals diversity’, and therefore to organization shift, information system shift, and member/user education.

7. Concrete measure of ‘web-based’ (assured by my professional practice) — Elements/modules of the ‘web-based’ at information-system-design-as-organization-design which is individuals-diversity-centered and member-education-critical :



2. Basic Consideration on Information System Design

2.1 Information System Design as Organization Design

By viewing information system design as organization design, we become to understand the scope of information system design. Indeed, it reaches the concept of organizational=personal ‘well-being’.

2.1.1 Ends of information system

2.1.1.1 Organizational=personal development

In general, the organization development is primarily for the members’ development. Otherwise, in what sense can we say “development” about organization ? If we seems to be working for the sake of organization, the organization surely mal-working. We must start correcting the manner organization functions.

The culture is made of individual’s will/awareness/attitude and organizational tradition/standard/policy. They intensify to each other. When it becomes required to shift the culture, the shift must be done at the both sides of individuals and organizational tradition.

Thus, introducing an information system requires, if not members’ support and cooperation, definite meaning toward members. The condition that members are ought to be demanded their support and cooperation is that the information system is for organizational=personal development. Members’ disapproval/not-cooperative is reasonable if the information system is not concord with members’ personal development.

The information system designer must see the larger picture in order to vision an effective system. One of the prime picture

is of constituents’ personal development.

What is the goal of this personal development? I say it is a “well-being” — the meaning of “well-being” varies individual by individual.

Here, our priority is the quality of ‘personal development’, not the convenience about cost or spec of the system. The fundamental challenge for organizational information system is to contribute to the invention and design of cultures in which staff can express themselves and engage in personally meaningful activities.

In this sense, any organizational information system is based on making members’ information communication easy, quality and effective (enlargement of members’ power for information communication).

In reality, it is common for us to do a job without thinking of its true meaning, or the true reason why we must do it. It is easy for us to accustom ourselves to working for the ‘apparent’ organization development. We rarely stop to ask : “What is this ‘apparent’ organization development, for us and the organization itself?”. Thus, critics point that ‘urgent’ and ‘important’ are different. Or, the difference between ‘short-sighted’ and ‘far-sighted’ is emphasized.

The information system designer considers the meaning of a system from the standpoint of “organization development for personal development”. S/he takes precautions against using such words as “effective” or “efficient” without reflecting their essential meaning in a given situation. S/he stops to ask : “What is this organization development for ? What is my working as a information system designer for?”

The contribution of information system to the organization =personal development is basically of the following scheme : The information system helps us at (1) quality production and (2) improvement of our experience, by bringing us in (3) efficiency.

2.1.1.2 Improvement of user experience

The content of “success” of an information system is the good/positive experiences of targeted users. Ends of system design are some types of user experience. In this sense, ‘personal’ dimension is more important than the technological.

Thus, for a system installation, the system designer give a first priority to looking for value at the individual level, instead of attempting to demonstrate organization-wide value. The key issue for designer is to notice/consider/understand ‘personal’ dimension.

The term “user experience” refers to a stance that places the end-user at the focal point of design in general, in particular information system design. It stands on the regret that “if we build it, they will come”-approach does not work.

The concept of “user experience” is near to “user-centered”. But, here “user-centered” should be understood in this way : User’s needs/preference is not what is present now but is on the

way of development toward a future - the designer contributes this development. Here the difficulty is to find an appropriate place between opposite poles of “pandering to popular tastes” and “designer’s self-satisfaction”. Indeed, the designers (diverse themselves about fields, such as developer, usability professional, designer, information architect) have their personal preferences (subjectivity) for types of user experience.

User experience is described/analyzed in terms of (1) user’s trait (needs, motivation, inclination, capacity, resilience, etc.), (2) user’s action/performance over the system (job content, quality of work life, etc.), and (3) user’s satisfaction (job satisfaction, etc.).

And as the “user experience”-concerned characteristics of the information communication system (particularly the web-based one), we may use the followings and suchlike : (1) usability (about operation), (2) functionality, (3) contents.

2.1.2 Tuning organization culture toward information

Information system design as organization design includes tuning organization culture toward information.

2.1.2.1 Break off conservative tradition, or invoking incentive

Organizational conservative tradition (at both organization management and organization members) is one of the major obstructions for information system designers to proceed information initiatives.

The issue in this case is evoking incentive. People is glad to accept responsibility if they believe/find it would benefit them. They take control of managing information on their own if they understand it brings cost/time/labor-saving or quality-promoting. So drawing pictures of these benefits is one of those the information system designer do with high priority.

2.1.2.2 Break off “If we build it, they will come.”

“If we build it, they will come” is still a common sight at information system initiatives in organization. Though most information systems are vastly money-eating, persons in charge take this risky “if-then” without a well-thought-out plan based on sufficient investigation, simulation and test. Of course, they believe that they made a “well-thought-out plan”. But the result shows it was not the case.

“If we build it, they will come” is another typical tradition, alongside of conservative tradition. The way of reforming this tradition is simple. It is just to do what lacks there, that is sufficient investigation, simulation and test.

Indeed, “omitting thinking of real people” would be the foremost implication of “if we build it, they will come.” There people are looked at as mechanical/lifeless “filling”. And also a standardization of people is contrived there, - contrary to the stance of “diversity of individuals”.

2.2 Organization Design and Diversity of Individuals

Organization design is the design of organization shift, and individuals diversity is the moment of organization shift. Indeed, diversity of individuals is the definite condition of organizational well-being, and organization design is the design of ‘activation/release of individuals diversity’.

2.2.1 Organization Design as Organization Shift with Individuals Diversity

Most generally, the meaning of design is shifting the present/given. In particular, organization design is the action of planning/causing/achieving organization shift. The objective of organization shift is reaching an organizational ‘well-being’ in some sense. We may consider a dialectic structure at the process of ‘organization design’ :

Organizational inconvenience becomes evident

-> Movement for gaining convenience (activation of organizational constituents)

-> Reach a convenience - activation of organizational constituents calm down.

Here “activation of organizational constituents” takes form of ‘diversity of individuals’. — The shift of the organization(A) to the organization(B) is :

There (A) takes place an organizational activation in the form that diversity of individuals becomes evident/activated, activation proceeds, and the organization enters a new stage (B).

2.2.2 Diversity of Individuals

2.2.2.1 Diversity of Individuals as Moment of Organization Shift

(1) Moment

The organization is supported by the diversity of individuals.

Organization consists of a variety of individuals from the start. Indeed, the diversity of individuals is a moment of the organization activation (especially, ‘shift’).

Organization kinetics stands on diversity of individuals. — An organization is a well-formed entity of diverse movements of diverse constituents, such as a water wave which diverse movement of water particles form.

(2) Alive

The diversity of individuals is a condition for the organization to be alive. Indeed, “*continually driven to become diverse*” is the meaning of “*life*” (in contrast to “*still*”). (See **Fig.2.2a.**)

What drives the organization to develop is its constituents’ diversity. Viability/resilience of organization consists in the diversity of individuals. (See **Fig.2.2b.**)

(3) Well-being

Diversity of individuals is the state the organization functions well. Organization development/well-being is based on diversity of individuals. That *diversity of individuals is fully and*

Fig.2.2a. Organization tends to progress toward diversity
— when diversity gets less, it creates diversity :

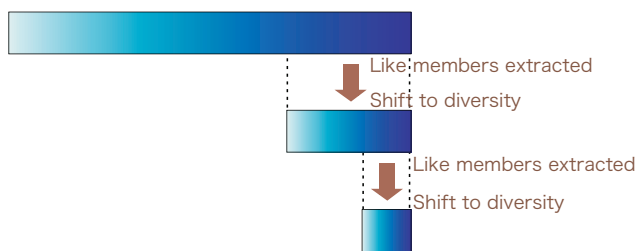
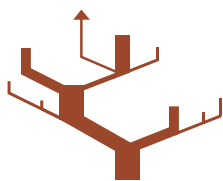


Fig.2.2b. “Resilience” on the analogy of biodiversity
— some variety survives while the remains perish :



well activated is the state the organization is most viable. Or, conversely, if the diversity seems to be constrained in the organization, the organization is surely going wrong direction.

2.2.2.2 Philosophical/Pragmatic/Political View on Diversity of Individuals

The “diversity of individuals” is an old subject for the philosophy ([1], [5]). Indeed, it is the dogma/premise of the philosophical pragmatism or democracy. (Pragmatism and democracy are, respectively, philosophical and political counterpart of the other.) Its standpoint is : “*diversity of individuals*” is, as a moment of the community/organization, definitely present before everything.

I regard democracy as a pragmatism toward “diversity”. Indeed, it gives pragmatic meaning to the diversity of individuals. It considers : (1) A community /organization is better conditioned to be able than an individual because of its multi-viewing/thinking/acting by diverse individuals; (2) Thus, a community is able to the extent they use diversity well; (3) If the diversity seems to be constrained in the community, the community is surely going wrong direction.

Here we may admit that “resilience”, mentioned previously, is an element of “*community/organization is better conditioned*”.

2.2.3 Elements of Organization Design

2.2.3.1 Objective : Organizational Well-being (Organization Development)

The aim of organization design is to reach an organizational well-being. Indeed, organization shift is practiced as “organization development” (if it is not a case of makeshift). Pragmatic meaning of “organization shift” is “organization development”.

Here we consider “development” and “well-being” as such in concord with individuals’. The organization development is for the members’ development. That an organization is being well means its members are being well. Otherwise, in what sense can we say *development* or *well-being* about organization ?

The content of “well-being” varies organization by organization, individual by individual.

2.2.3.2 Identifying and Activating/Releasing Individuals Diversity

Diversity of individuals, as a whole, forms the culture/tradition of organization, or the disposition of organization. The organization designer (organizer), heading for a new organization, coordinates members’ diverse individualities. The designer tries to identify/specify the individuals diversity. For example,

A. Production

Here the diversity of consumers-as-individuals is objectified. The product designer expects some type of consumer’s response. At marketing and product development, the designer tries to find common response and to correspond to it, or to find diverse responses and to correspond to them (-> variation, customizing, small-lot production).

B. School education

Here the diversity of students-as-individuals is objectified.

And then s/he designs the ways of coordinating/controlling/balancing different individualities — encouraging, inspiring, reinforcing, cooling, keeping calmed, bending particular individualities, etc.

With hindsight, what the organization designer achieved is to make such a contrivance/course as leads an ‘integration’ of members’ diverse individualities, which itself is a content of the organizational shift. In this sense, the organization designer is the course designer.

2.2.3.3 Education

The ‘individuals-diversity-oriented’ is the stance of trusting in individual. Here “trusting in individual” is not unconditional. That the individuals are able enough to be trusted in is the premise of ‘individuals-diversity-oriented’. Thus, education is regarded as most important there. Organization design includes the design of education course.

The education is also made ‘individuals-diversity-oriented’. — Cyclic structure!

Remark : Individuals-diversity-oriented, liberalism, and democracy mean the same subject — each is implied by the others. And education is requisite for them to be targeted. It is exactly what Dewey described in [1]. — He proposed the important role education plays in the survival of democracy, and the importance of democratic thought and action in the improvement of education.

2.3 Individuals-Diversity-Oriented Information System Design

I have described the standpoint where information system design is viewed as organization design, which is the design of organization shift, and the diversity of individuals, as the moment of organization shift. Now I introduce the concept of “individuals-diversity-oriented information system design” and propose that the ‘web-based’ is a most reliable solution to ‘individuals-diversity-oriented’.

2.3.1 Individuals-Diversity-Oriented

2.3.1.1 Diversity-oriented: Diversity as prerequisite

For the information system designer, as an organization designer, the diversity of individuals is a prerequisite. Indeed, s/he encounters the confrontation of different skewness of individuals. The designer should respect this diversity, thinking that each skewness has a reason. System design is of diverse-user-experience-based.

The design of information system satisfying this prerequisites depends on case (usage, aim/goal, user, contents, etc.). But still the point is to realize, at design and implementation, the ‘autonomy’ of users, in such form as members’ self-service. It includes enabling individuals to take control of their work-related information, which a sort of self-service web applications would put into .

‘Diversity’ is not necessarily about personal traits. It includes diversity of situations where each individual is placed, or conditions which each individual is inclined to choose. In this case, the subjects of ‘self-service systems’ is such as flexibility enough to encompass a wide variety of access channels and delivery modes (e.g. types of PC, OS, Web-browser).

And, the skewness of designer her/him-self is also the prime key issue s/he should reflect. The designer has her/his own perceptions of how ‘good’ or ‘bad’ a system is, which is skewed by her/his personal backgrounds and specialties within given fields.

2.3.1.2 Issue of ‘usability’ in regard to diversity

‘Usability’ is referred mainly with respect to user interface of information system, for example, design of Web site. It is defined in ISO 9241 (<http://www.iso.org/>) as follows :

“Usability is a measure of the effectiveness, efficiency and satisfaction with which specified users can achieve specified goals in a particular environment.”

The inquiry of usability takes course of (1) reducing personnel requirements and (2) reducing training requirements. But, in fact, ‘usability’ concerns to all of information type, information design, user interface design and diversity of individuals.

The point is that human factors must be considered from both sides of common features and diversity. For example, “hesitant users (contrasted to frequent users)” is a problem to be ap-

proached in this way. — Distinction between can’t and won’t becomes essential.

2.3.2 Web-based information communication

2.3.2.1 Reasons of Web-based

The Web is displacing traditional sources of information and interaction. It transfers historically paper-based tasks to online applications.

Information sharing over the Web is universal in the sense that receiver need not bother with file types, end machine types, and application preparation at receiver’s side. Indeed, information/knowledge sharing is the main usage of web-documents. The strong point of web contents is that they are (1) freely updated as required, (2) qualified by means of web-multimedia technology.

“Web-based information communication” is like “preparing a book”. Here “prepare” means “wait”. If we want that a book functions, we need announce its presence. It is the reason why e-mail remains an indispensable communication media — e-mail is of prompt (‘push’) type of communication. We use e-mail to announce that some web-based information is prepared at some place. Thus it is important to realize nice combination of e-mail (‘push’-media) and web-page (‘wait’-media).

The Web automates routine inquires. Benefits are brought to both the organization (cut down on support personnel) and users (control and verify the data being entered). And server side coding plus database-driven brings out such contrivances as interactivity and user adaptive page generation.

2.3.2.2 Adaptive Web site

‘Adaptive Web site’, particularly, ‘personalized website’, is a requisite contrivance at, for example, university course site (my case). (Note: Personalization site fails if it is at discretion of such users as don’t have a compelling reason to personalize.)

“Adaptive” means “customize content and interface to each user individually”. — Cf. In the case of traditional, “static” Web sites, the way to target diverse users is aiming at generalized types of user (but what follows the generalization is that each individual does not quite fit to the site).

The main technology which brings in “adaptive Web site” is server-side coding with database driven.

2.3.2.3 Server side coding, database driven

Adaptive/personalized website use database applications with Web interfaces equipped. It is constructed as “database driven Website using server-side coding”.

Database driven Website becomes common, benefiting from PHP (a server-side scripting language), PostgreSQL (a relational database management system) and suchlike open source software. (SQL, Structured Query Language, means the standard language for interacting with relational databases.)

Indeed, this technique is requisite in maintenance of a content-driven site where constantly updated contents are managed. The point is : achieving complete separation between frame design (site design) and the contents so that one can work with each without disturbing the other.

As an application, one can create a content management system targeting those writers who are untrained in HTML, file system of the Web server and FTP. It allows the writers to post contents themselves. commonly use Web interfaces.

2.3.3 Elements of individuals-diversity-oriented information system design

2.3.3.1 Determining user-experience-as-goal

Thinking-actually helps the designer to avoid “if we build it they will come” mistake.

The goal of an installation of information system must be considered/determined in the form of user experience. That is, who use, why they use, where they use, how they use, how they benefit from the system, and so on. Being easy, necessary, favorable, profitable to use are examined by this stance. And according to this sense, the designer must consider actual people as ‘users’, avoiding to regard/treat people as labor (how much) or functions (what).

The designer simulates whether ‘that person’ would use the system (and how). S/he counts who and who would use it (and how), who would be uncomfortable working on the system, etc. If it seems that intended users don’t come and therefore the system does not pay off, the designer stops launching the system. In order that the designer reaches defining a clear and meaningful set of user experiences, first, s/he must understand targeted individual users. Thus, s/he practice

- minute investigation into people’s actual tasks and potential need/want/requirement
- distinction between need and want
- distinction between what’s required and what’s desired
- understanding that one person’s necessity is another’s extravagance

and so on. In parallel, s/he tries to identify tasks that can potentially be completed using the system, determining the needs that the system could address.

2.3.3.2 System preferences/condition/requirement

By understanding expected user experience, the designer then enters the phase of determining the ends/preferences/territory/target of system. It is a trade-off process among requirement satisfaction, users’ abilities and cost.

What I regard as the primary/basic conditions about information system are the followings:

- Multi-vender environment
- Organization website for information/knowledge-sharing
- One-stop-shop style

User’s portal

- Seamless file flow in the form of email-attachment or over the web

We may use (1) usability (about operation), (2) functionality, (3) contents and suchlike as the “user experience”-concerned characteristics of the information communication system (particularly the web-based one).

2.3.3.3 Starting practical, making the system pay off

It often takes place that university introduce expensive but useless systems. They naively have a big vision of an information system as a huge capacity to accept all the initiatives.

The point of this failure is : The person in charge takes a “if we build it, people will come” approach, in favor of a big system, omitting thinking what people really need and the fact that the big system is hard for people to go through it all to find exactly what they need and can do.

Thus, the solution is :

1. Start with practical initiative/system we can make pay off, which would be of small-scale.
2. Upon those successes, one level at a time, gradually develop the system.

2.3.3.4 Minute planning, desktop simulation, test

All too often, projects start before thought has been put into the project’s purpose, its desired results, and ways of evaluation. They are not accustomed yet to take the standpoint of “user experience” and to do fine/strict/minute/thorough preparation — thinking before acting : clearly stating the objective/scope of the project (what the project does and does not cover), specifying users (diverse individuals), planning, desktop-simulating and testing.

Besides this, they tends to plan huge initiative, while setting a deadline at a short distance. Thus, as a matter of course, planning, desktop simulation and test become perfunctory. This result is : they buy the useless, or they fail to make their initiative (which is exorbitant at scale !) included in the budget.

This serves as an example of how not to behave. What must be done for realizing a system which pay off is : (1) taking a “users (diverse individuals) experience”-based stance, (2) doing minute preparation, and (3) starting small/practical.

2.3.3.5 Instruction of system literacy

What completes the installation of an information system is the user induction with user training. The system designer must be a good trainer. There are many knacks of instruction which benefit her/him. Q&A contrivances, such as IT help desk, may be required.

What is mostly instructed is : what/how is “effective use” of the system, that is, the meaning of the system (in contrast to operation manual). Indeed, users must learn what enables them to work with some types of information.

2.3.3.6 Evaluation of the system

The system, or the design of system, should be evaluated.

When we make “evaluation” a subject, we enter the research field of “value engineering”.

We consider as follows and each depends on cases : what is appropriate to be made an item of evaluation, what the criteria of each item is, how each item is evaluated (measured), how the facets of user experience are illustrated in diagram, etc.

In the case of Web-based information communication system, the followings and suchlike are typically used as indices : ‘efficiency/effectiveness/productivity’, ‘usability (easy to use/operate)’, ‘functionality’, ‘content’, ‘user satisfaction’.

3. Case of Instruction/Learning System Design at University — Practical Research : Developing Teacher Training Course by Organization Design Strategy

Now, as a confirmation of the method of information system design I have described, I introduce my practice of developing/using an instruction/learning system, together with course/class design, at teacher training course.

The point is : Information system design is regarded as design of organization shift where individuals diversity is fully activated/released — indeed, successful development of course/class at school is exactly such an organization shift.

3.1 Speciality of University as Organization

3.1.1 Creation of culture/world

When we consider the design of information system at university, it is required to think of the speciality of university as organization.

The prime role of university is the creation of culture, which includes, for example, showing possible ways of presence of world by demonstrating theoretical implications. People are generous in watching over the challenges at university, or it is the challenge that people ask university. — In this sense, university [faculty] should be thought different from company [business person] in regard to social role. At least, the university is more than an organization of education service.

3.1.2 Diversity-oriented

The organization is for its constituents. Especially, the organization development is for the personal development of the members. This is a definite principle of organization. And this principle must be accomplished at university organization.

The staff of university acknowledge their own role and personal progress/development according to the concept of university. University stands as a place where creation happens. And something new is plausible to happen among diverse individuals rather than homogeneous solidarity. Thus, diversity of individuals is respected at university. This spirit is at the base of the

organizational culture of university. — Especially, individuals are given autonomy in the development of their expertise.

Accordingly, the meaning of ‘usability of information system’ should be somewhat different at university from company.

It is said that “in organization, it is consistency that must be the key driving factor, rather than innovation”. Here consistency is regarded as a condition of usability. And it is advocated to focus on doing things in a format that can “easily/quickly” be used by staff. But, consistency is basically for routine works. And “easily/quickly” is barely attained under some small scope of working styles.

In the case of university, what we should consider is the dependency of ‘consistency’ on individual. We are to put diversity before consistency. And here, such words as “free format”, “loose guideline” would be the key words.

In reality, the information system designer determines the critical areas that must look and work the same. It is the area where conformity should be promoted and enforced. But in all other areas, members should be allowed or encouraged to do their own (unique/original) thing.

3.1.3 Loose organization

University is notorious for being loosely/poorly organized compared with business corporation.

Let us see how loose/poor organization at university is criticized (cited from http://www.gerrymcgovern.com/nt/2004/nt_2004_09_20_university_websites_less_is_more.htm) :

- What is an organization if it is not organized? “A university.”
- Many university websites are poorly organized, and filled with out-of-date content that has been directly published from print.
- Delivering a better service to students and staff faces challenges because of decentralized management structures and concepts such as academic freedom.
- Many universities are more like loose associations than coherent organizations.
- Often, staff give more loyalty to a particular school or department than to the overall university.
- There can also be a strong rivalry between the university administration and the lecturing staff, with the lecturers and professors keen to protect their academic freedom.
- The result is that there are multiple websites for any one university, many taking a very different approach to design.
- Out-of-date, poorly written content is rife because there are no standards, no measures, and few staff resources.
- Much of the Web is beginning to move towards standard layout and design because that’s what people want. People like a navigation that is familiar, they like to know that the “Home” link will be in the same position on every page they visit. People like content that is well written, up-to-date, and accurate. Universities, on the other hand, are growing

websites like mushrooms, and have an amazing capacity to publish large quantities of irrelevant and confusing content.

But, I remark that the same criticism can be read as favorable comment. Every gain is paired with loss. Each of ‘same approach’, ‘standardization’, ‘coherency’, ‘usability’, ‘up-to-date’, etc. accompanies its own loss, from the viewpoint of culture. Indeed, here I dare to insist that being loosely/poorly organized is what university is required, because of its organizational special role/position/meaning - that is, creation of culture.

3.2 Stance toward Instruction/Learning System Design

Instruction/learning system design includes/implies the course/class design. It considers a course for activating and leading individuals diversity (§ 3.4). It is an organization design, aiming at diverse personal development.

What is the relation between “activating” and “leading”? By what means is the balance between diversity and coherence is made? Generally, it is the objective of the organization. And my case is : *Students’ diverse personal development is realized together with their sound understanding of learning subjects and mastering teaching skills.*

Thus, briefly, the stance and content of my design action is leading diverse self-realization of individuals with founding it upon sound study life.

3.3 Situations individuals diversity becomes evident

Diversity of individuals is a usual issue at organization. Especially, we invariably become faced with it when we engage in an organization shift. And there are various types of situation.

In order to confirm the variety, let us glance at typical situations in the case of course/class design (Tab.3.3).

3.4 Instruction/Learning System for Individuals-Diversity-Oriented Course/Class

I have been developing an instruction/learning method for releasing students’ individualities and realizing their diverse personal development. Briefly, it is of task-achievement style. Every task assigned to students (teacher training course) includes (1) class script and teaching objects making, and (2) presentation of achievement.

3.4.1 Tuning of Diversity Releasing

The principle of my course/class design is the release of individuals diversity. Release is paired with constraint. The instruction includes the control/lead for releasing diversity. The prime contrivances for the control are :

- Preparing sound-subject-based learning materials.
- Assignment of task and goal to students.
- Evaluation of students’ achievement in progress.

The extent of diversity to be released depends on goal, contents, phase and subjects of learning. For example, learning

Tab.3.3. Individuals diversity at course/class activities

Subject	Situation	Phase/aspect	
Faculty	Teaching	Course/class design	Educational stance Instruction method Structure/frame building Specifying 'quality' of course/class Planning course/class implementation
		Course/class implementation	Subject understanding/evaluation Learning objects making Instruction performance Task/charge allocation to students Evaluation of students' works
		Management of students	Organizing, coordination Leadership, superintendence Care Strategical management
	Others	
Student	Learning	Planning: student-life, learning Motivation, Positivity, Self-reliance Habit of study, Endurance, perseverance Understanding Knowing how to learn	
	Others	

includes phase of ‘obedient acceptance’ : following discipline/model (imitating, copying) and exercising. It is not the case where the extent of diversity is set high. — Setting up the standard for those is a subject of course design.

3.4.2 Web-based

The contrivances for enabling the release of individuals diversity are constructed ‘web-based’ :

A. Space where diversity releases

In order to release the diversity, required is a space where the release is realized. It is a place where individuality is apparent and contrasted one another. It is made in the following way :

- Web site for students’ learning activity and achievement display
- Students’ presentation of achievement (outcome of working)

B. Instruction/class

I produce the release of individuals diversity by introducing self-controlled learning activity. And the contrivance for producing self-controlled learning activity is task-achieving (problem-solving) style of learning.

C. Arrangement of learning subjects

In order to produce task-achieving (problem-solving) style of leaning, the learning subjects of a course are arranged so that the course is self-contained with respect the contents. But, in this case, it becomes required to place a great deal of weight on student’s self-teaching. I make it possible by con-

structuring a web-based student's self-teaching milieu.

The web-based learning system is :

- for students, both a learning site and a private working (task-achieving) site — there students become self-reliant and able to release their individuality;
- for faculty, it is both an instruction site and a course/students management system.

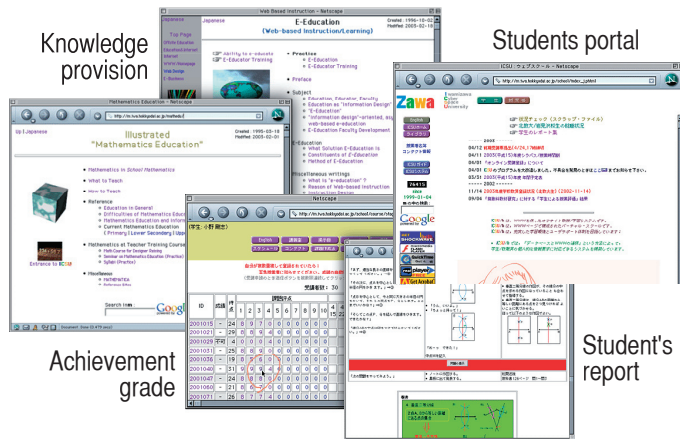


Fig.3.4.3a. Instruction/learning unit of task-centered class :

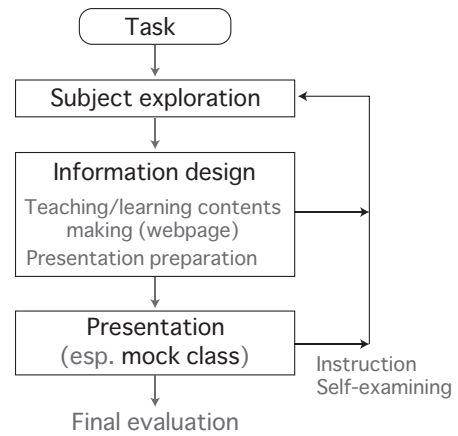
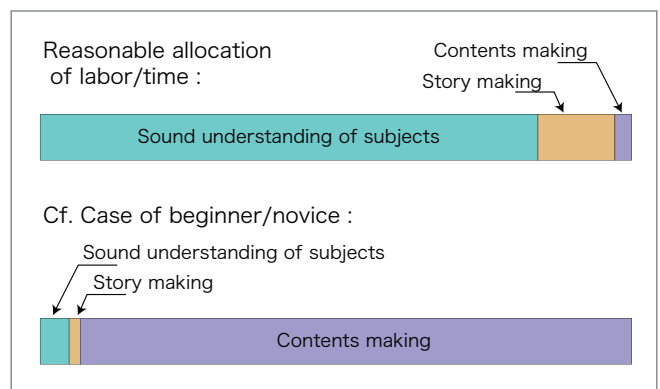


Fig.3.4.3b. Instruction/learning unit of task-centered class :



3.4.3 Task-achievement style of learning

Classes are designed so that task-achievement is centered. Students are of teacher training course. Tasks assigned to them are typically teaching-script making, teaching objects making, teaching performance design, and presentation of the product. Both contents making and presentation are web-based : students make reports in the form of webpage and make presentation on them.

The basic style of class is as follows : Given a theme, students must, first, understand its essence/meaning. They do this by using web-based learning system (self-teaching system). They can learn “webpage-making” too, in the same way. Next, they are to make story and objects to be presented. (See Fig.3.4.3a.)

The contents making literacy which students should raise are about HTML, FTP, and Flash (Macromedia). There are cases where group-workings are assigned.

What we emphasize most to students is sound understanding of subjects. Students tend to regard ‘understanding subject’ trivial — particularly, in the case the learning is of practical and problem-solving type. But, in fact, making students aware/learn the ‘depth’ of subjects is one of those which teachers are intentionally to tackle. Thus, I use the illustration : Fig.3.4.3b.

3.4.4 Achievement presentation

Students are to complete their task by achievement presentation. It is the place each confirms how s/he is able to achieve ‘self-realization’. Each compares her/his self-realization with the others’. S/he confirms her/his own self-realization in perspective of ‘individuals diversity’, awaring/recognizing and be-

ing respectful to ‘diverse others’.

It is the reason why achievement presentation is placed as one of the main contrivances in my course/class design. — Not to mention that being able to make achievement presentation is a basic ability to be cultivated at school.

3.4.5 Evaluation of students’ achievements

Evaluation becomes complex and difficult when we take “diverse individualities of students” into account — without saying that every evaluation of ‘quality’ is affected by instructor’s individuality itself. Still, evaluation is most important. The instructor is not allowed to evade responsibility by excusing “diversity” (using it as “relativity”).

Points of evaluation are as follows :

- Effective work procedure
- Degree of understanding subjects (meaning/essence)
- Quality of information design (logic/structure/expression) :
 - Web-based contents making
 - design of presentation
- Media literacy for information design
 - Use of e-means
- Presentation skills/techniques (performance)

3.5 Evaluation of Instruction/Learning System Design

The design of instruction/learning system is evaluated by the extent it realizes the desired course/class design. I evaluate my design method, expecting its validity is verified.

Items of evaluation (here, restricted to those which closely related to ‘organization design’, that is, strictly-subjects-proper abilities omitted) are as follows :

Subject	Items evaluated	
Release students' individuals diversity	Diversity observed at students	Taste, sense Methodical, precise Learning ability
	Class atmosphere for accepting diversity	Acknowledge/accept/enjoy /respect diversity
Lead students' personal development	Inquiry /learning ability	Get perspective of subjects Sense quality of materials about subjects (Fundamental of 'understanding subjects' !) Conscious of higher stand-point/view toward subjects Lead regular learning
	Presentation ability	Performance Communication skill Story construction, scenario making
	Media literacy (computer /network)	Digital/web contents making Digital presentation
	Task achievement ability	Active posture toward task achievement (problem-solving) Severe to task achievement Meet the deadline Get results
	Trait for self-realization /improvement	Independency Endurance
	Cooperation at collective behavior	Cooperation Sense of responsibility

Note : Diversity of individuals is what *naturally* appears at personal motivation, action, results, etc. It is not, by itself, an objective of education. What organization designers do about ‘diversity of individuals’ is just activating/releasing it, not hindering.

4. Discussion

Here I point to and discuss some issues which this monograph treats rather lightly and therefore my future research should advance the inquiry.

4.1 Meaning of Organizational=Personal Well-being

In proposing the subject of ‘individuals diversity oriented information-system-design-as-organization-design’, I contrast it to the way “organization” is discussed in business managerial theory where such words as “compete”, “survive”, “conquer” become keywords (Cf. [2]).

I propose the concept of ‘well-being’ of organization as objective or meaning of organization (that is, what is beyond “compete”, “survive”, “conquer”, etc.). It is not proposed as a condition for the well-being of organization constituents, but the well-being of constituents itself.

Here I take a kind of teleological stance toward ‘organization’ or ‘diversity of individuals’ — that is, “organization (diversity of individuals) as moment/process to well-being”.

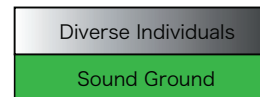
4.2 Relation between Diversity and Soundness

Diversity of individuals is definite, though might be oppressed. It is no use for the organizer (e.g. teacher) to be afraid that education/instruction would kill individuality.

Indeed, materials/situation must be given to make diversity appear — no diversity over nothing/empty. In the case of course/class design (as organization design), sound learning subjects are the most important materials where students’ diverse individualities becomes present, released and activated.

In fact, diversity of individuals is just a if-then condition. The better ‘if’ content (that is, the given) is, the better ‘then’ content (that is, quality of diversity) is. I know by experience that the most important at course/class design is ‘making students learn basics steadily’.

The issue of the relation between diversity of individuals and soundness of the ground should not be misunderstood as balancing diversity with commonness.



4.3 Evaluation of Information System Design

It is difficult, by the nature of the subject, to make my approach to the information system design a ‘scientific’ one. Indeed, I practice course/class design mostly relying on experience-based intuition, or rules of thumb, especially about managing diverse individuals.

Experienced organizers have their own rules of thumb for coordinating/controlling diverse individuals. But the importance is the sharing of their knowledge. Here a science/engineering of ‘information system design’, especially ‘individuals diversity oriented information-system-design-as-organization-design’, becomes required.

Thus, I make it one of my research subjects to prepare a kind of “diversity evaluation scale”, in perspective of scientific/engi-

neering approach to the information system design.

4.4 Organizing Web-based Content Authors

Information system design as organization design is to prepare/realize an adequate ground/opportunity where the diversity of individuals becomes present/released/activated. I propose that today's one of the most promising solution is the 'web-based' and that we are still far from making the most of it.

In [3] and [4], I described about the construction of web-based instruction/learning system. Here I refer to the issue of organizing content authors. Content authors are one of the most important, if not the most important, contributors to the realization/activation of organization information system.

In order to organize/help content authors, a sort of systems called content management systems (CMS) is developed/produced. But it does not seem to become a solution. It is usually pointed out that CMS is made functionally-full-equipped and, therefore, becomes cumbersome to use; content authors would battle with CMS; it results in a shift of focus from creating content to learning how to master the CMS. But the real problem about CMS is that individuals diversity is neglected there. It is so restrictive that people do not get used to it, and leave it.

Thus, I claim that it is better for content authors to start mastering basic skills of web architecture creation and web contents making/management, acknowledging them as requisite media literacy. And I am very optimistic about this shift of 'web-based content authors'. Indeed, at least, young generation whom web-literacy-training programs are imposed at schools will come up to our expectation.

5. Conclusion

Designing and installing an information system is a challenge. It easily fails if we omit thinking before acting. Of course, everyone knows that thinking must be put before acting, and that "If we build it, they will come" is not the case. But s/he fails in practice. The reason why it happens is that they miss the content of thinking. Specifically, the methodology of information system design is lacking.

I propose the followings as the prime components of the methodology, or what should be thought out by designers:

1. ends of information system expressed by the words of organizational=personal "well-being" and its contents, that is "user experience",
2. speciality of the organization — role/position/objectives and culture/tradition,
3. meaning and situation of individuals diversity,
4. advantageous features of the system.

And, in this monograph, I focused on the meaning of individuals diversity for the information system design and solutions to the release of individuals diversity.

The point is that the designer must do more than informa-

tion system design. Information system design is an organization design, as design of organization shift. Then, because the diversity of individuals is the moment of organization or organizational well-being, the activation/release of the diversity becomes the main issue. Especially, designer turns her/his concern toward the diversity rather than the commonness of individuals.

'Activating/releasing diversity of individuals' strategy is not the same as "one-on-one" strategy. Its basic idea is 'making/serving a field/space where diversity of individuals is activated/released'. Thus, the information system design is the design of 'field/space where diversity of individuals is well-activated/released'.

Introducing these as conceptual framework for practicing information system design, I propose measures and method of information system design, which I confirmed through my professional practice of 'organization design', that is, course/class design at teacher training course.

The elements of the information system design (as design of 'activation/release of individuals diversity'), powered by today's technology, are as follows :

Elements/modules of 'activation/release of individuals diversity'		Solution
Action	Task-achievement type working (self-promotion) Achievement presentation (self-realization)	(Quality and Efficiency) Web-based
Ground (Infra)	Personal working space Sound knowledge base (This gives 'gravitation' to the working space !)	

We are still far from making the most of the technology, especially, 'web-based'. Intensive researches are expected in this field.

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