

Identifying Interaction Design Patterns in Cross-Cultural Computer-Supported Collaborative Interaction

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Overview

- ▶ Design Patterns Background
- ▶ Design Patterns Identification
- ▶ Qualitative Research Approaches
- ▶ Research Plan, Setting Data Collection
- ▶ Years 1-3 Design Patterns Identification and Articulation
- ▶ Design Patterns for Intercultural Collaborative Design Learning
- ▶ Cross-Cultural Comparison

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Background: Design Patterns

- ▶ Christopher Alexander (1979)
- ▶ A pattern is a “good solution to a problem in a certain context.”
- ▶ Construction Format Guideline:
 - ▶ **Pattern Title:** Uses an inspiring i.e. metaphorical name. + Ranking (***)
 - ▶ **Picture:** Illustrates the solution with a visual representation.
 - ▶ **Original Context:** Explains the circumstances in which the problem occurs.
 - ▶ **Problem:** Describes the problem in this particular context.
 - ▶ **Forces:** Gives considerations for contradictory needs to solve this problem.
 - ▶ **Solution:** Offers a good solution within this context resolving the before-mentioned forces.
 - ▶ **Consequences:** Describes the situation in which the solution is used.
 - ▶ **Resulting Context:** Refers to other patterns that can also be used in relation to this solution.

Collaboration Design Patterns

- ▶ Martin et al. [Lancaster Group] (1999-...) Patterns of Cooperative Interaction
 - ▶ Artifact as an Audit Trail
- ▶ Schuemmer and Lukosch [PloP] (2002-...) Patterns for Computer-Mediated Interaction
 - ▶ Virtual Me
 - ▶ User Gallery
- ▶ Guy (2003-...)
 - ▶ Facilitator is Key
 - ▶ Email Hyperlink
- ▶ Arvola (2004-...). 5 Interaction design patterns for computers in sociable use. For example:
 - ▶ Combination of Mobile and Stationary Devices
 - ▶ Regulating Prominence

Design Patterns Identification

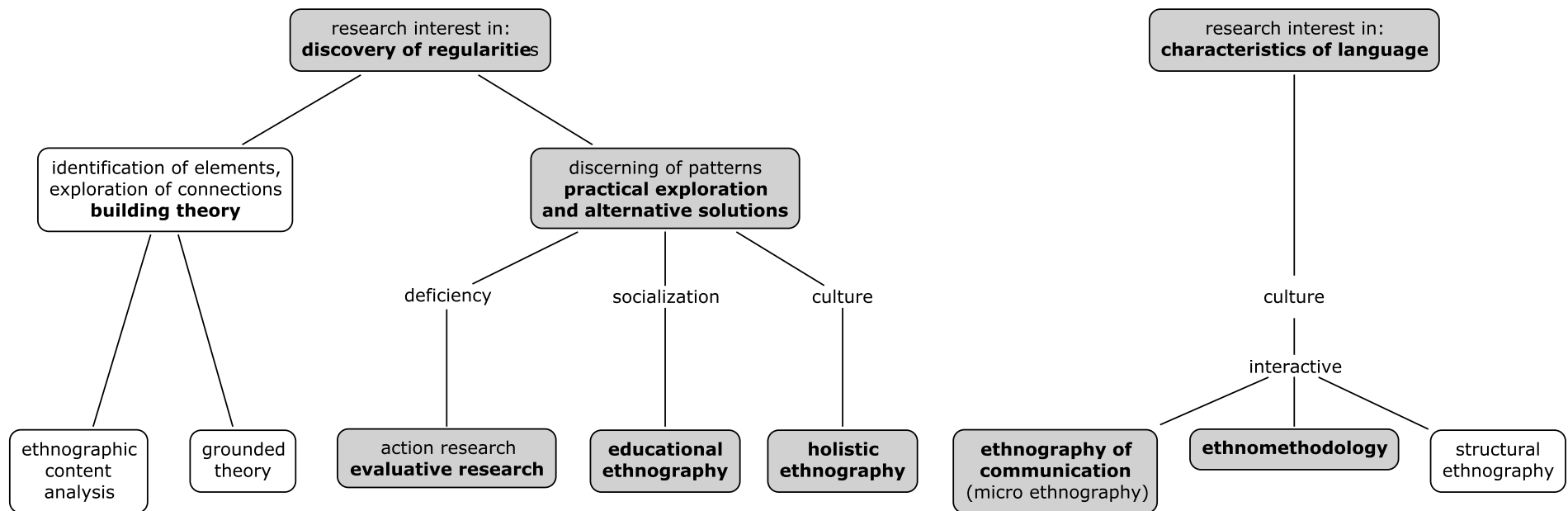
- ▶ How are design patterns identified and articulated?
- ▶ Experience-based
 - ▶ Design solutions that were observed to work well repeatedly in a certain design context and situation
 - ▶ Based on long-term work experience within the professional field
 - ▶ **UCD:** Observe what works, build interactive system, improve iteratively (Schummer and Lukosch)
- ▶ Ethnographically-informed
 - ▶ **Ethnomethodology:** Situated studies of design solutions in computer-supported collaborative interaction (Martin)
 - ▶ **Action Research:** Look for Activity patterns for structuring and reporting field observations to inform designs that improve work in this situation (Martin)
 - ▶ **Activity Theory:** Structure observations by Activity Theory (Guy)

Qualitative Research Approach

- ▶ Ethnographically-informed design patterns identification:

Building Theory

Practical Exploration/Solution



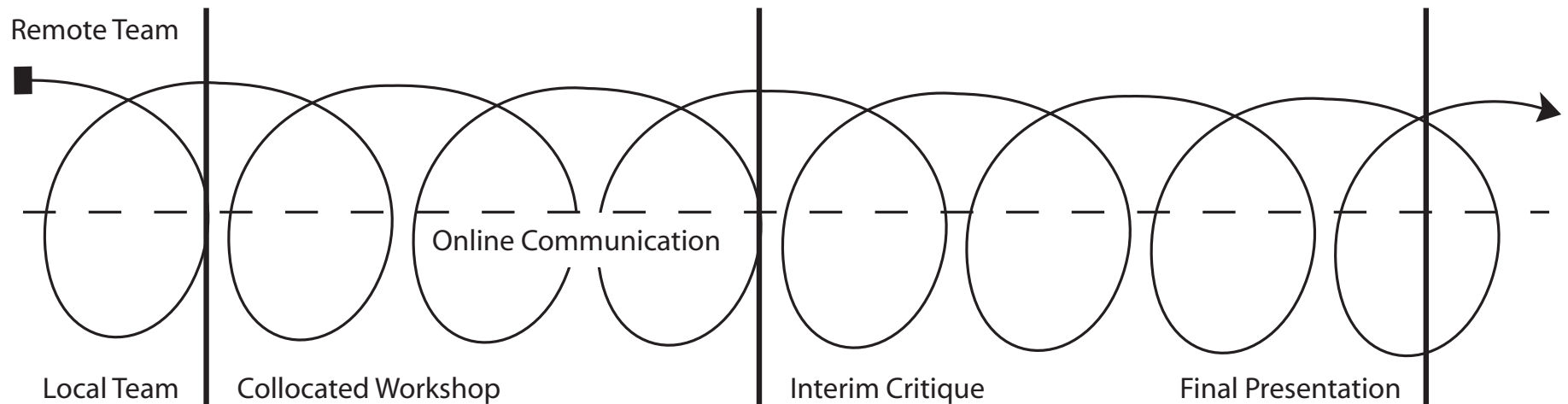
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Question

- ▶ How can design patterns be identified and articulated from the analysis of a situated study of *cross-cultural computer-supported collaborative design learning*?

Setting

- ▶ Undergraduate university design studio subject in collaborative design education
- ▶ Over 3 years 5-6 week course
- ▶ Organized by the School of Design at the Hong Kong Polytechnic University taught in collaboration with partner universities
- ▶ 2-4 second year Hong Kong students and 1-3 international partners from Korea, Taiwan, Austria, and the USA
- ▶ **Course outline:**



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Computer Support for Collaboration

http://www.polyu.edu.hk/~onlyconnect/products/

1Xtra polyu personal databases News konferencen journals online research cooperations pattern

toolkits 03

Only Connect Collaboration Project Product Design Hong Kong - Korea

HappyMeal01 HappyMeal02 HappyMeal03 HappyMeal04 HappyMeal05 HappyMeal06
Toolkits01 Toolkits02 Toolkits03 Toolkits04 Toolkits05 Toolkits06

tuesday, december 07, 2004

Update

Hello everyone, here is the update of our process, 1st the case for the tool kit is finalized thus in the CAD machine physically modeling, 2nd the contact number stamp is on its way to the FDM processing ie pre-modeling stage, 3rd the sample of the glow stick is done, 4th the badges are waiting to be produce, 5th leather will be added to the 'body' clip and lastly the flash movie for the presentation. We have worked daily with night shift to hurry the project due to the fact that the previous ideas were banded so many times and in addition having 6 other projects and presentations to finish up all in the same week, therefore having to do everything in just two weeks before the presentation, is a miracle that we can make it this far. We were exhasuted right to the toe because literally no sleep for three nights. Anyway I would like to thank everyone especially Emily and Coco who work so hard to come up with such a cool idea. Is not yet the end, 3 more days and nights to go, lets turn on our turbo, supercharge and NOS to pump this baby up to the finish line!!

posted by Peter MK Pang @ 9:18 AM 0 comments

thursday, december 02, 2004

oh....

amilie... i thought 'only connect' ftp because peter used the word 'ftp' we call my ftp as 'webhard' ^^
i uploaded my ftp our sketches and modeling
u can download from that or just click this link below
:http://www.webhard.co.kr/page/messenger/messenger_download.php?lang=kor&sender=1292dmZ/OA==&receiver=WkcJUKpTWkACSw==&key=XUcPVJDUQ==&key2=WUZTBhASX0BGFW

important dates

- 05.11.-09.11 Korean students work in Hong Kong
- 19.11. Interim checkpoint
- 07.12.-10.12. Final networked presentation

project info center

You last visited on 17:34 Dec 02, 04
The time now is 19:17 Dec 08, 04
All times are GMT + 8 Hours

Boston 6:17 Hong Kong 19:17 London 11:17 Seoul 20:17 Tokyo 20:17 Vienna 12:17

Who is Online: [schadewitz](#)

Forum	Topics	Posts	Last Post
Public Community			
Announcement forum Public announcements.	9	21	16:05 Dec 04, 03 sdcathhu
Public forum All public discussion.	18	76	0:57 Nov 29, 03 sdcathhu
Team Forum			
Team 01 [Profile] IDAS + POLYU Digital Media + Vis Com	46	121	18:48 Dec 05, 03 jaesun
Team 02 [Profile] IDAS + POLYU Digital Media + Vis Com	63	195	21:48 Dec 02, 03 agnes
Team 03 [Profile] IDAS + POLYU Digital Media + Vis Com	57	135	4:09 Dec 06, 03 KIM, JI YOUNG
Team 04 [Profile] IDAS + POLYU Digital Media + Vis Com	45	65	9:45 Dec 02, 03 silu4
Team 05 [Profile] IDAS + POLYU Digital Media + Vis Com	24	121	1:19 Dec 01, 03 Jasmine
Team 06 [Profile] IDAS + POLYU Digital Media + Vis Com	0	0	No Posts
Team 07 [Profile] SMFA + POLYU Digital Media + Vis Com	20	69	18:48 Dec 03, 03 Issac

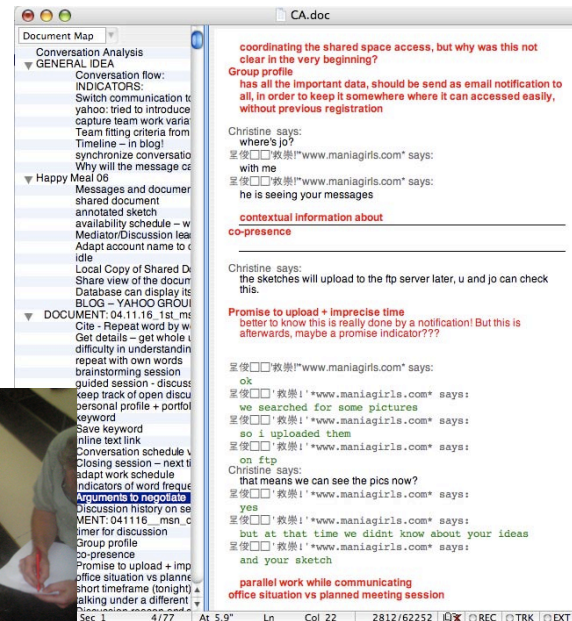
- ▶ MSN or ICQ chat systems.
- ▶ Server Space and File Sharing Software
- ▶ Video-chat software for university-organized joined presentation

- ▶ Project Website Blog or Yahoo Groups
- ▶ Email
- ▶ Shared Documents

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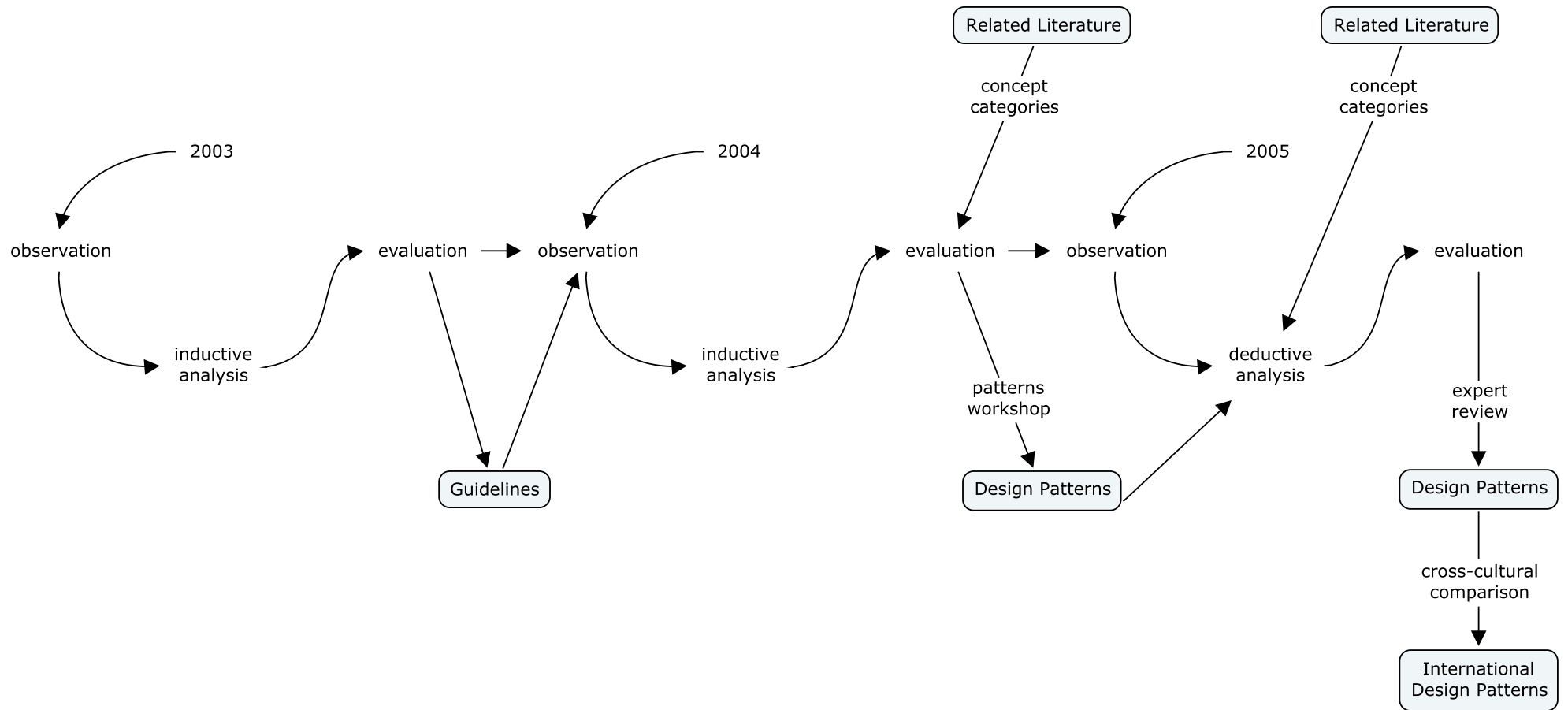
Data Types

- ▶ Observations and Contextual Interviews
- ▶ Expert Interviews
- ▶ Log Files of Conversations
- ▶ Design Representations
- ▶ Design Pattern Workshops



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Research Plan



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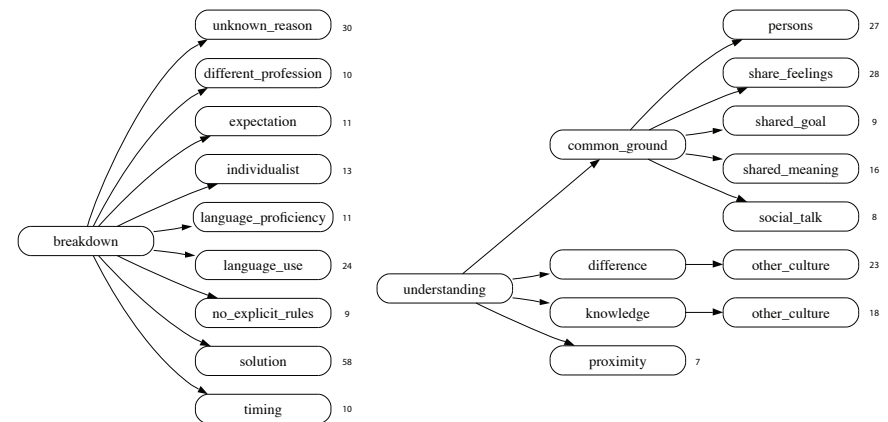
First Year

Categories: from Observations and Contextual Interviews

- **Technology:** Message Structure, Chat, Presence Indicators, Connection Center, Picture Sharing, White board, Video Conference, Community Space
- **Team Management:** Time, Task, Assignments, Lectures and Tutorials, Misunderstandings, Social Interaction

Categories from Expert Interviews

- Understanding
- Breakdown
- Awareness
- Communication
- Coordination
- Tools

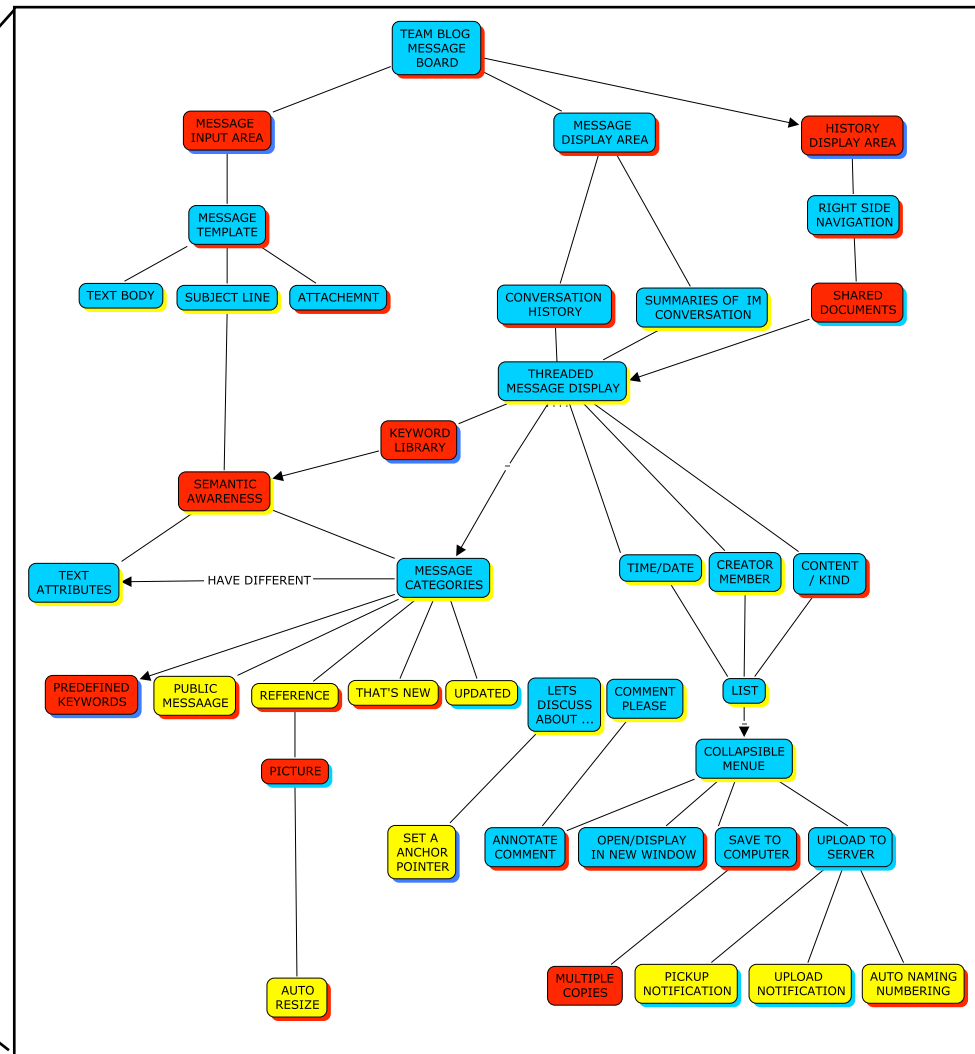
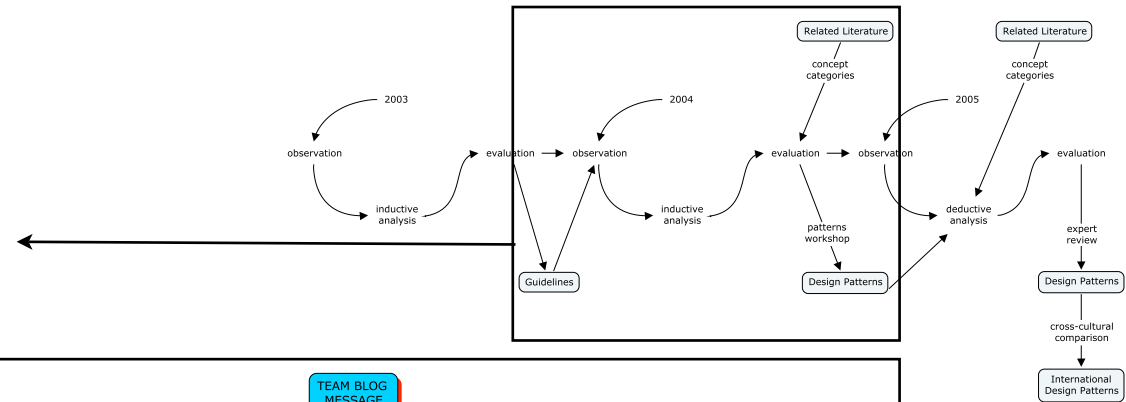
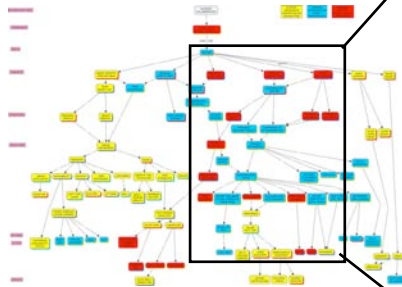


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Second Year

Categories: from Observations and Conversation Analysis

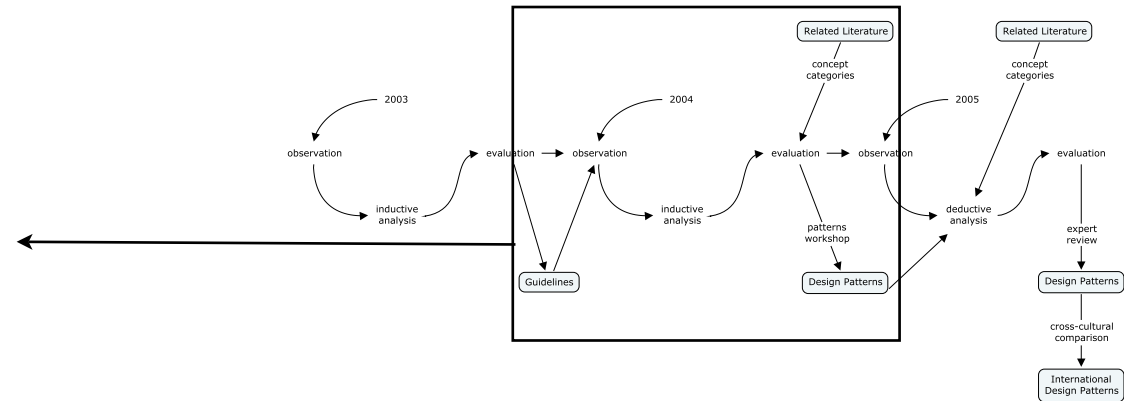
Guide: Categories from year one
Goal: Holistic Understanding



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Second Year

Results: 13 Intermediate Design Patterns



2 Blended Collaboration: This solution suggests blending local and remote teamwork activities into one collaborative process.

3 Community Workshop: This pattern builds on the previous pattern, recommending the installation a colocated community workshop to start the project, and establish trust among participants through a mix of social and task-related communication.

4 Community Portal: The design solution in this pattern advises to setting up a virtual community portal to strengthen the relation of the members in the newly established virtual team and the entire learning community.

5 Local Team: This pattern introduces the concept of a local team and suggests how such a team might be set up.

6 Team Blog Page: This pattern builds on the above-mentioned solution and suggests show to represent a local team online within the community portal.

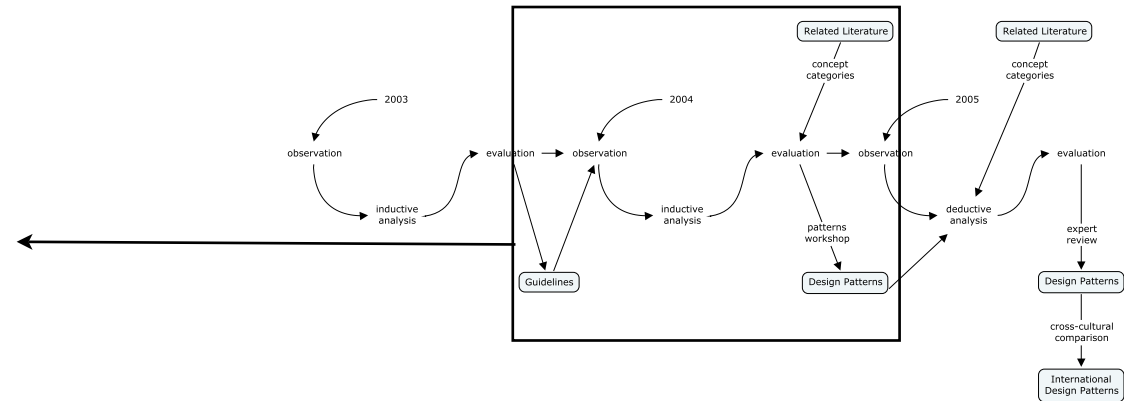
...

13 Awareness Indicator: This design pattern suggests conveying information about past activities, present states and possible future events involving members and objects used in the project.

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Second Year

Evaluated with Designers in Design Pattern Workshops



► Positive

- Context descriptions
- Interrelations among patterns (could be more)
- Diagram helpful but does not have to be hierarchical
- Patterns could be used in multiple phases of the design process
- Support communication among stakeholders

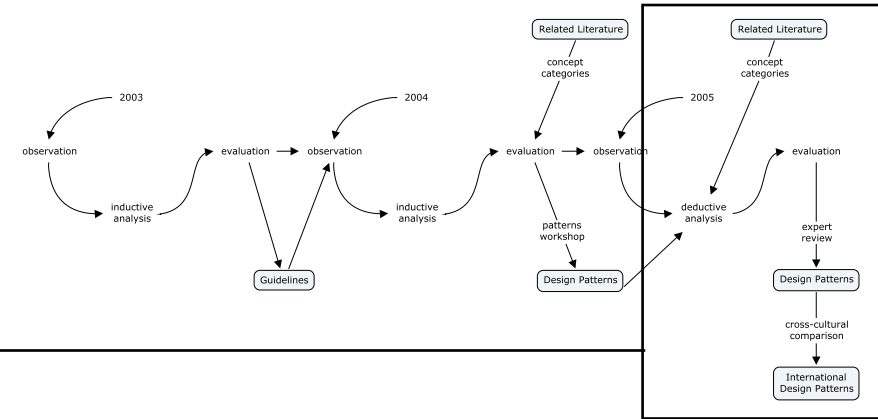
► Negative

- should be aimed at the interaction principle not at the artifact used to implement this solution i.e. e-mail pattern - why is it useful in intercultural contexts?
- more culturally sensitive descriptions needed and in which cultural context it could be used and in which not
- where is culture? for which culture? why this solution?

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Third Year

Recoded and analyzed data
from one year in-depth
using theoretically
informed coding scheme



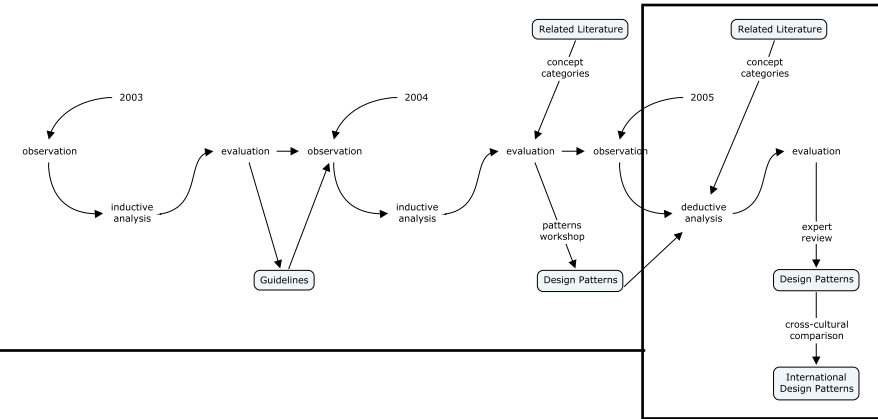
Intercultural Communication: (Clark 1993, Gudykunst 1993, Ostwald 1995, Scollon and Scollon 2001)

- ▶ **Breakdowns:** Miscommunications and Breakdowns in communication of culturally diverse interlocutors
- ▶ **Dealing with Breakdowns:** Approaching miscommunication through becoming aware, communicate consciously, facilitation,...
- ▶ **Gain Common Ground:** Reducing or avoiding misunderstanding by gaining shared understanding

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Third Year

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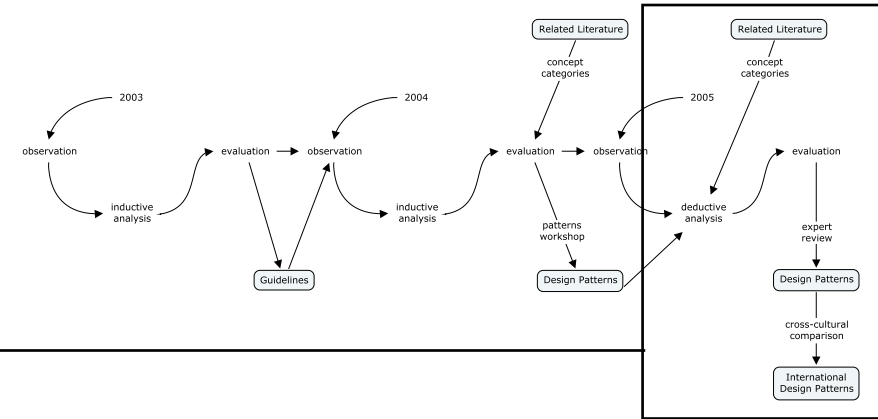
Collaboration Support Mechanisms: (Erickson 2000, Preece 2002)

- ▶ **Awareness:** Distributed collaborators need to be aware what others are doing.
- ▶ **Communication:** Conversational mechanism such as communication flow or dealing with breakdowns need to be supported.
- ▶ **Coordination:** Collaborative team and individual work needs to be coordinated.
- ▶ **Content Management:** Collaboration artifacts need to be stored and shared.
- ▶ **Instruction:** In learning contexts, students need to be instructed and facilitated through tutorials and lectures.
- ▶ **Implementation:** Especially in design work, ideas need to be implemented in tangible artifacts.

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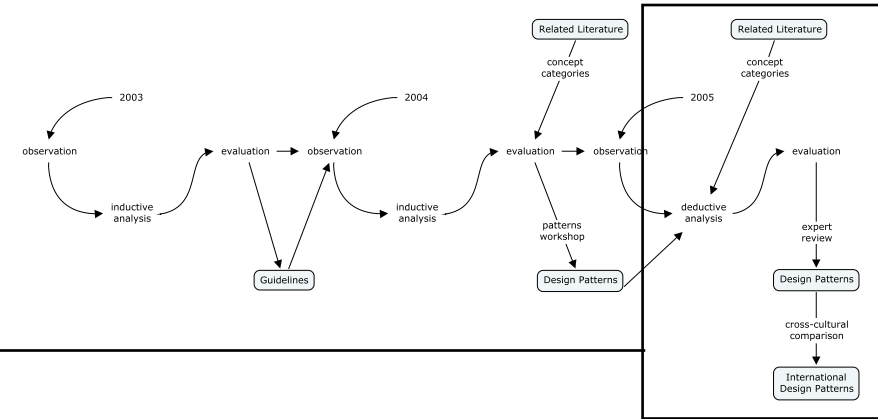
Cultural Value Dimensions:

- ▶ **Activity Orientation:** Trompanaars' Ascription vs Achievement (1994), Kluckhons Activity Orientation (1950), Condon and Yousefs' Supernatural Orientation (1985) and Schwartz's Achievement Value (2001)
- ▶ **Authority Concept:** Victor's Authority Conception the Power Distance dimension suggested by Hofstede (1997) and Family value proposed by Condon and Yousef (1985), Power and Conformity suggested by Schwartz (2001)
- ▶ **Community Aspect:** relations among individuals in a community Kluckhon (1950), Hofstede (1997), Condon and Yousef (1985), Victor (1992)
- ▶ **Contextual Communication:** High and ow Contextual Communication by Hall (1959) and Victor (1992).

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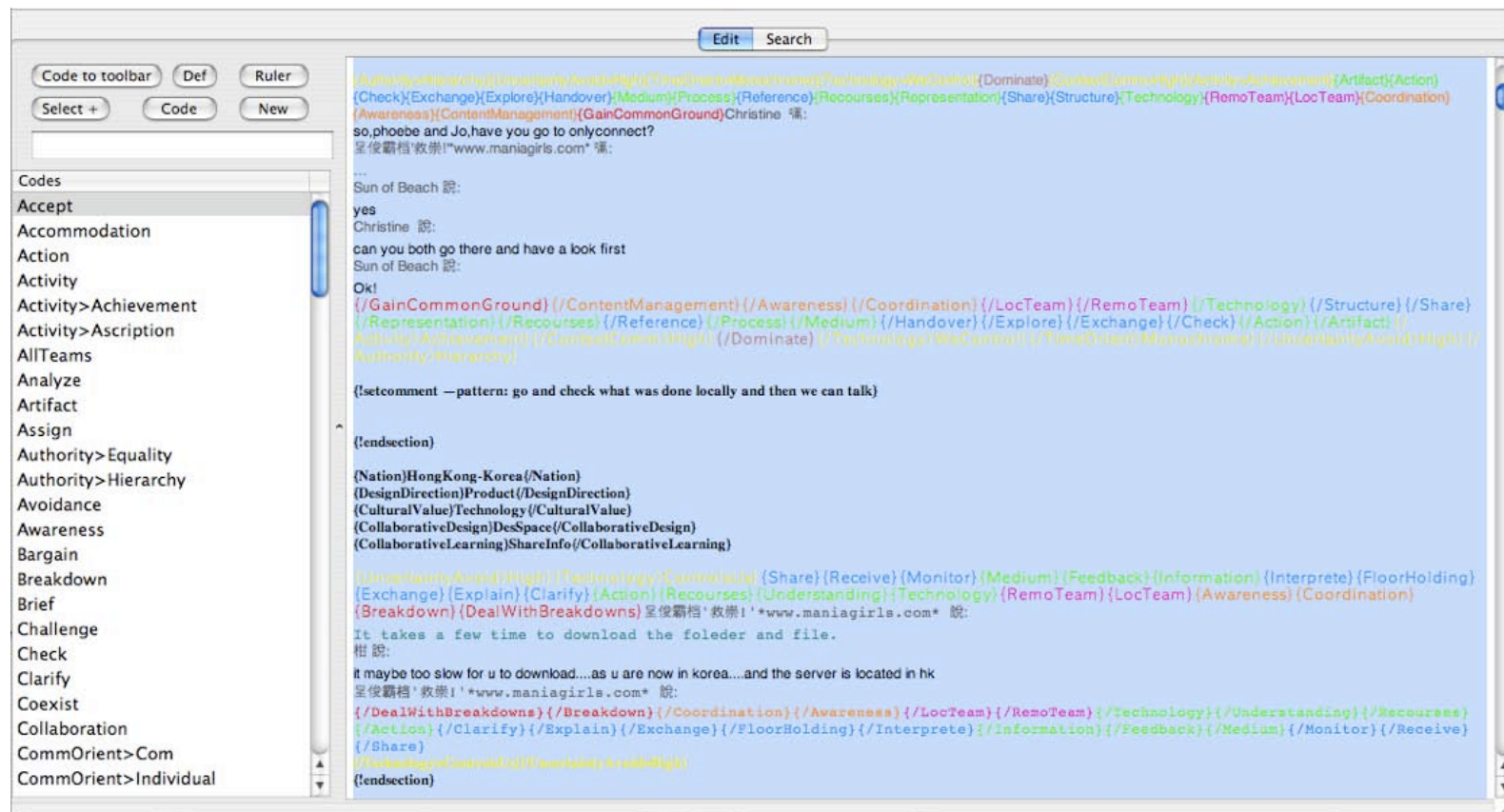
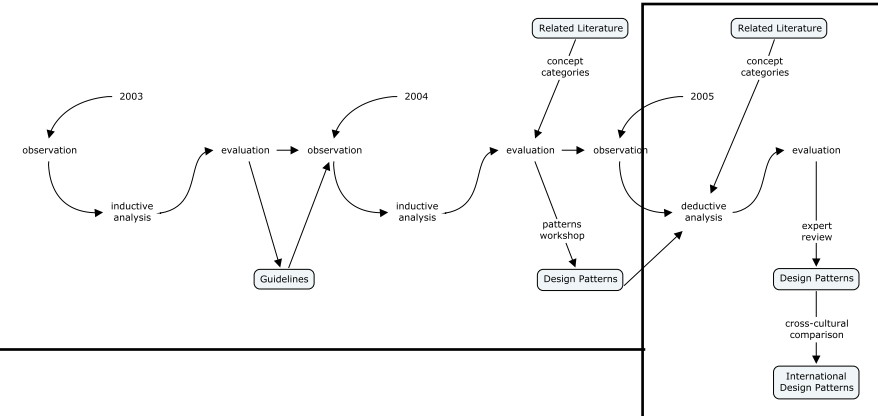
Cultural Value Dimensions:

- ▶ **The Standards and Principles:** Trompenaars dimension of Particular vs. Universal Principles (1994), and Schwarz's Universalism, Benevolence and Conformity dimensions (2001).
- ▶ **Technology Orientation:** Experience of Technology (controlling versus being controlled) by Victor (1992), and Man's Relation to Nature by Kluckhohn (1950)
- ▶ **Time Orientation Orientation:** Long or Short Term, Monochronic or Polychronic Time by Hall (1959), Hofstede (1997), Trompenaars (1994), Condon and Yousef (1985)
- ▶ **The Uncertainty Avoidance:** Low or High Uncertainty Avoidance by Hofstede (1997)

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Third Year

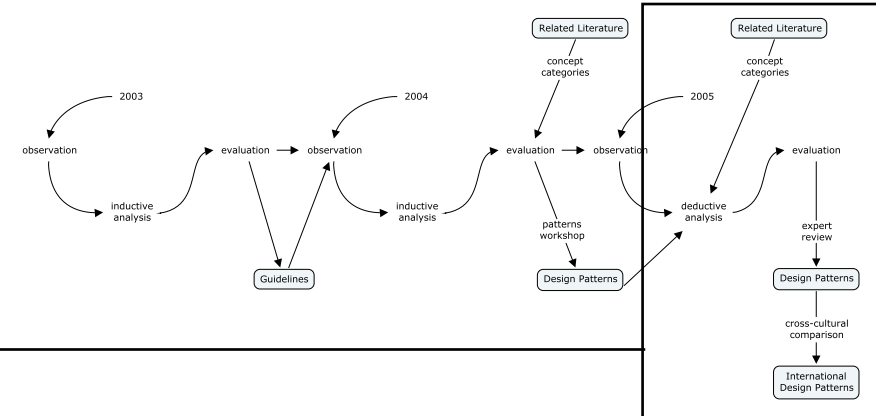
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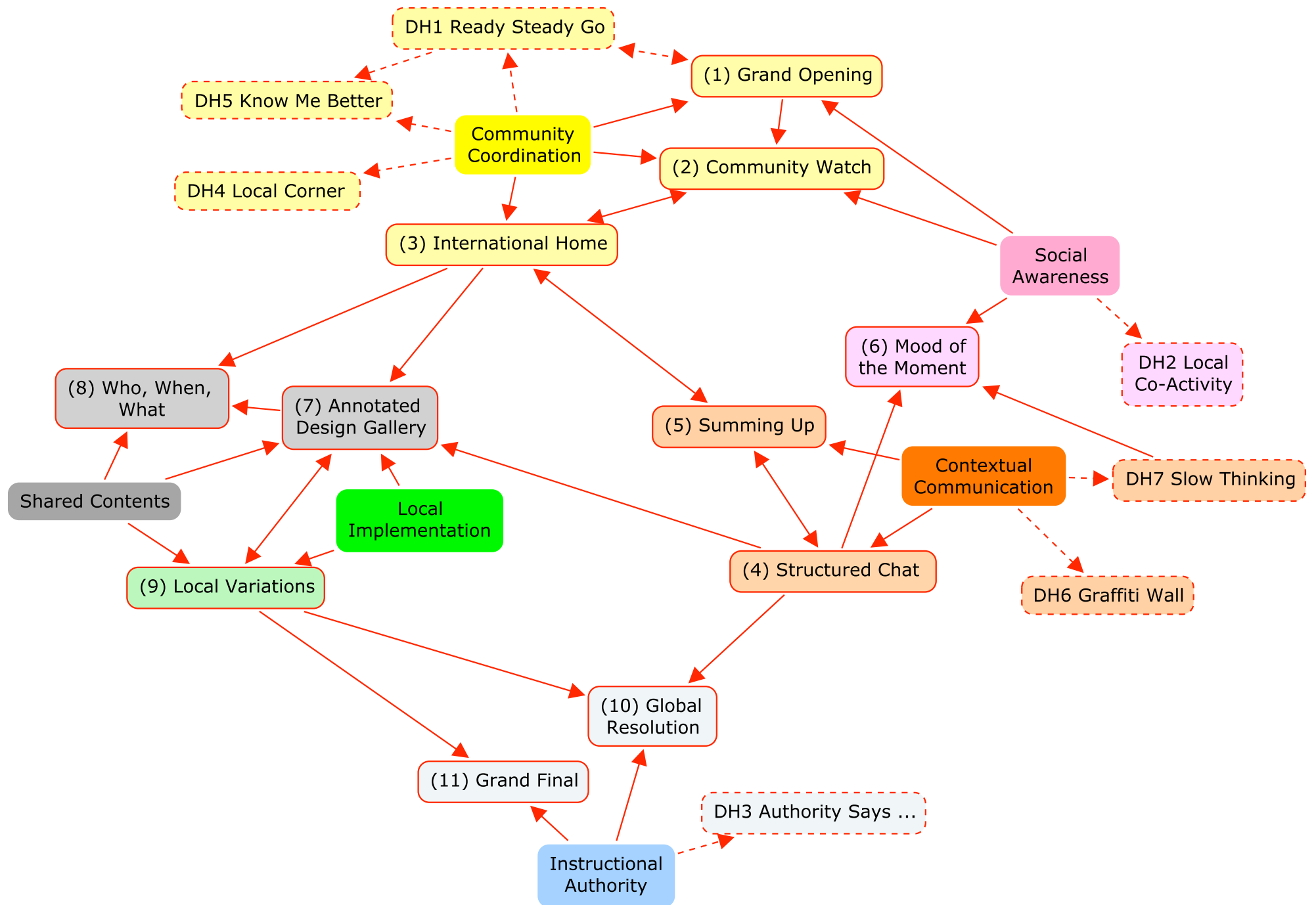
Third Year

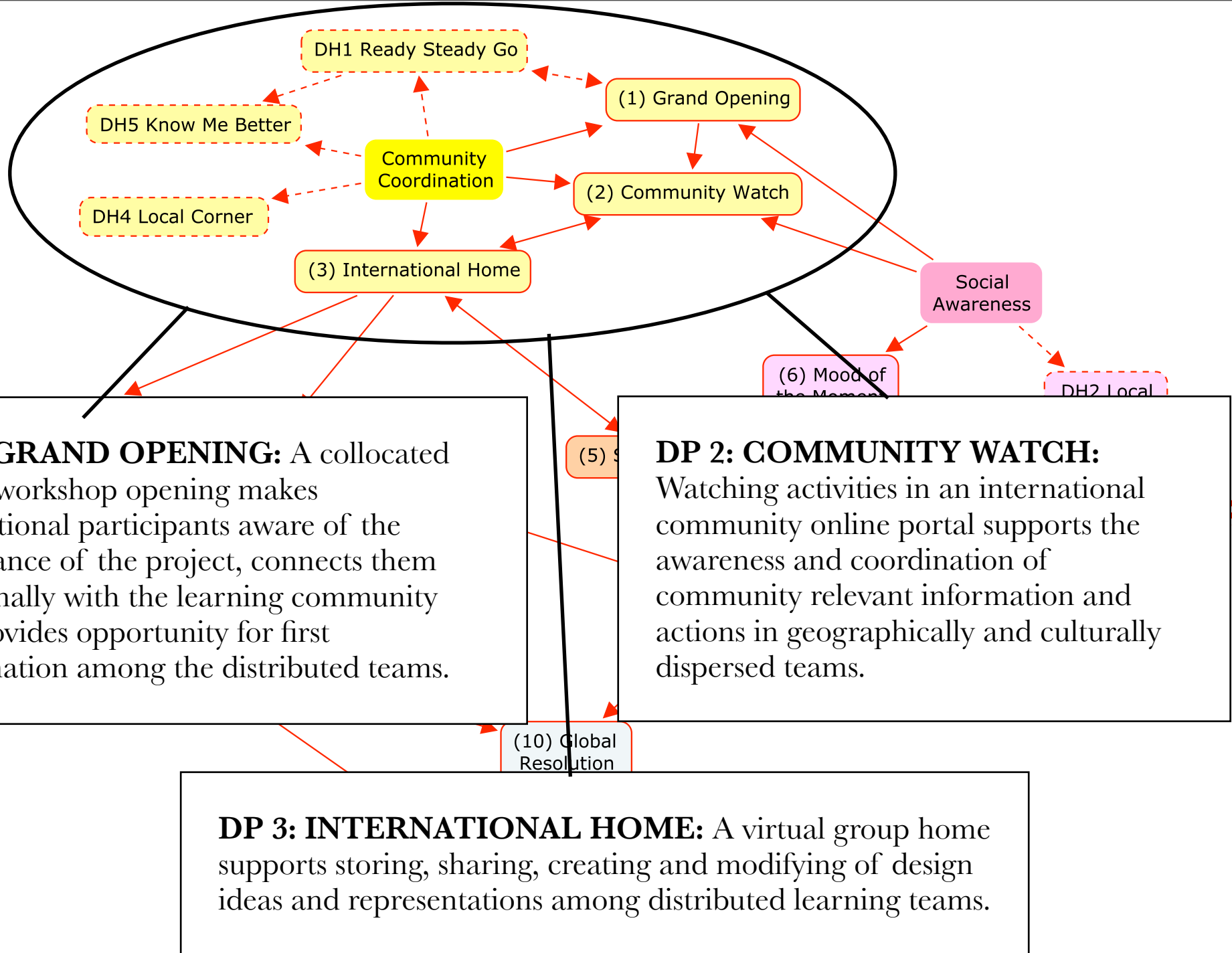
Co-coding Frequencies
used to discover relations
among coded observations



Confirm	ContentManagement		ContextCom	ContextComm>L	Coordination	Criticize	DealWithBrea	Code frequer	Decide
218	459	GainCommonGrou	334	407	448	32	263	746	109
153	332	Breakdown	318	313	400	60	460	607	112
159	333	DealWithBreakdown	281	315	390	46	0	576	111
245	489	Awareness	414	444	521	45	395	843	122
216	398	Coordination	319	384	0	46	390	734	131
199	0	ContentManageme	313	394	398	45	333	683	127
142	332	Implementation	242	254	292	40	216	467	86
116	226	Communication	236	227	236	33	235	447	68
194	377	CommOrient>Com	291	329	414	32	329	636	127
191	386	UncertaintyAvoid>H	269	366	416	31	316	626	103
194	394	ContextComm>Low	248	0	384	42	315	613	109
157	313	ContextComm>Hig	0	248	319	41	281	541	82
143	316	Activity>Achieveme	209	260	330	34	245	482	91
108	259	Activity>Ascription	169	185	235	29	194	390	77
116	279	Standard>Particular	180	225	220	36	197	377	78
95	220	TimeOrient>Long	160	178	250	27	185	355	56
78	201	CommOrient>Indiv	135	155	217	25	166	313	59
84	188	UncertaintyAvoid>L	180	121	193	23	146	302	54
90	218	Standard>Universal	135	160	163	28	157	291	49
70	154	TimeOrient>Monocl	93	147	194	8	123	260	59
78	172	Authority>Hierarchy	103	148	168	28	142	257	62
56	141	TimeOrient>Polychi	137	132	184	20	135	255	42
62	146	Authority>Equality	91	102	157	14	116	228	51
59	126	Technology>WeCor	134	113	162	9	127	227	26
62	133	TimeOrient>Short	82	118	155	12	123	211	42
52	102	Relation>Affective	96	90	111	14	104	199	22
34	64	Relation>Neutral	43	72	73	13	65	109	15
28	49	Technology>Contro	70	52	75	5	72	106	11

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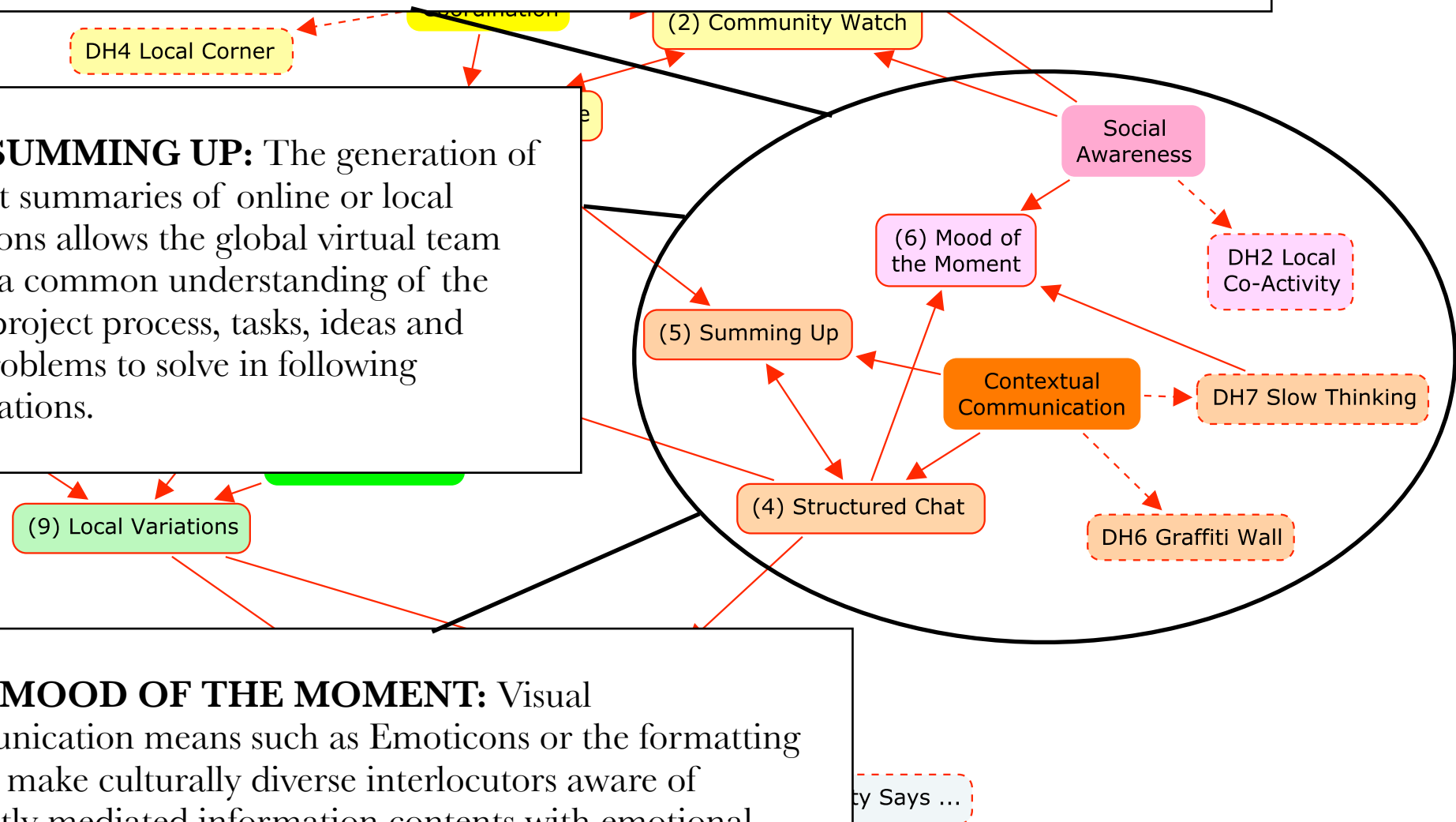


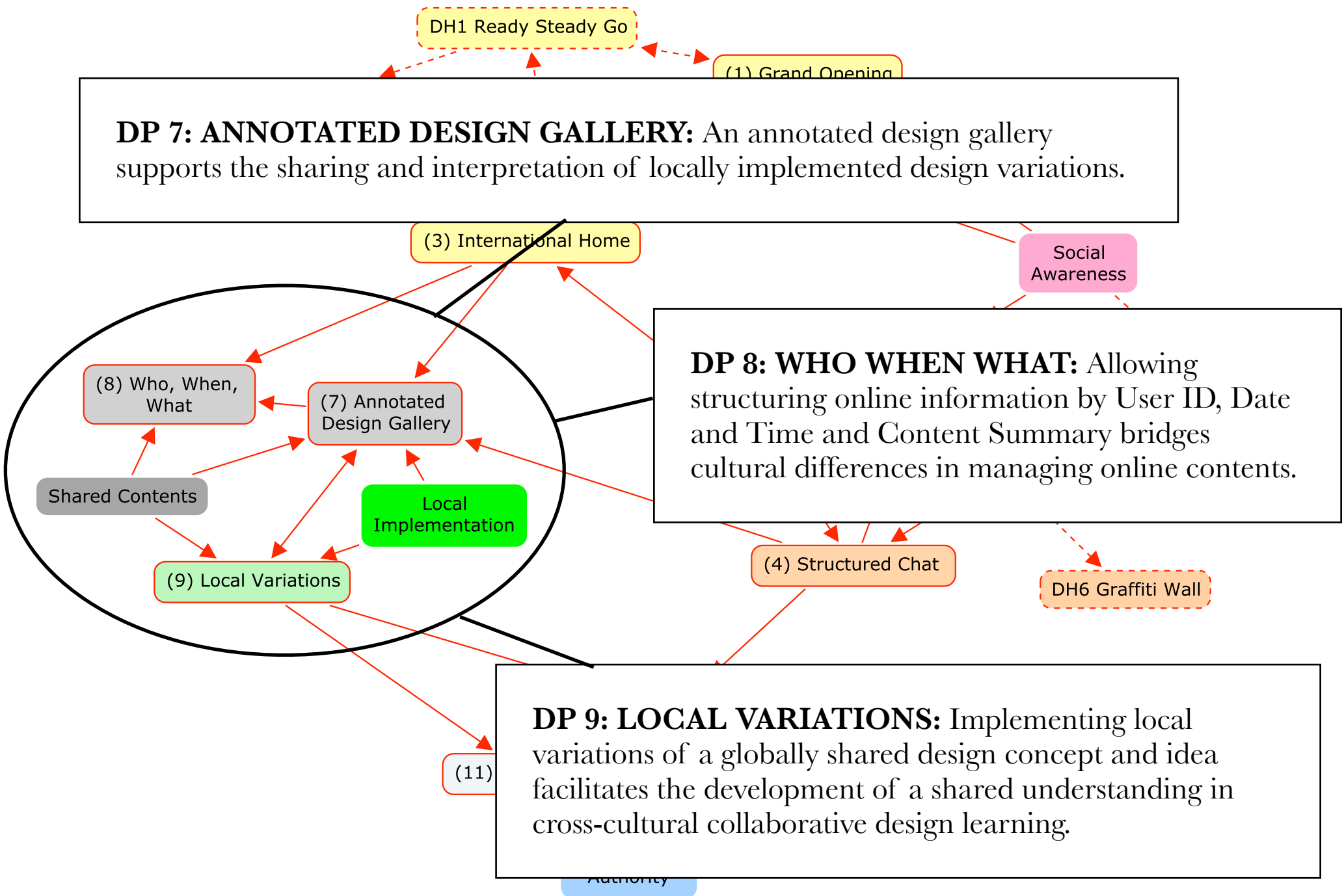
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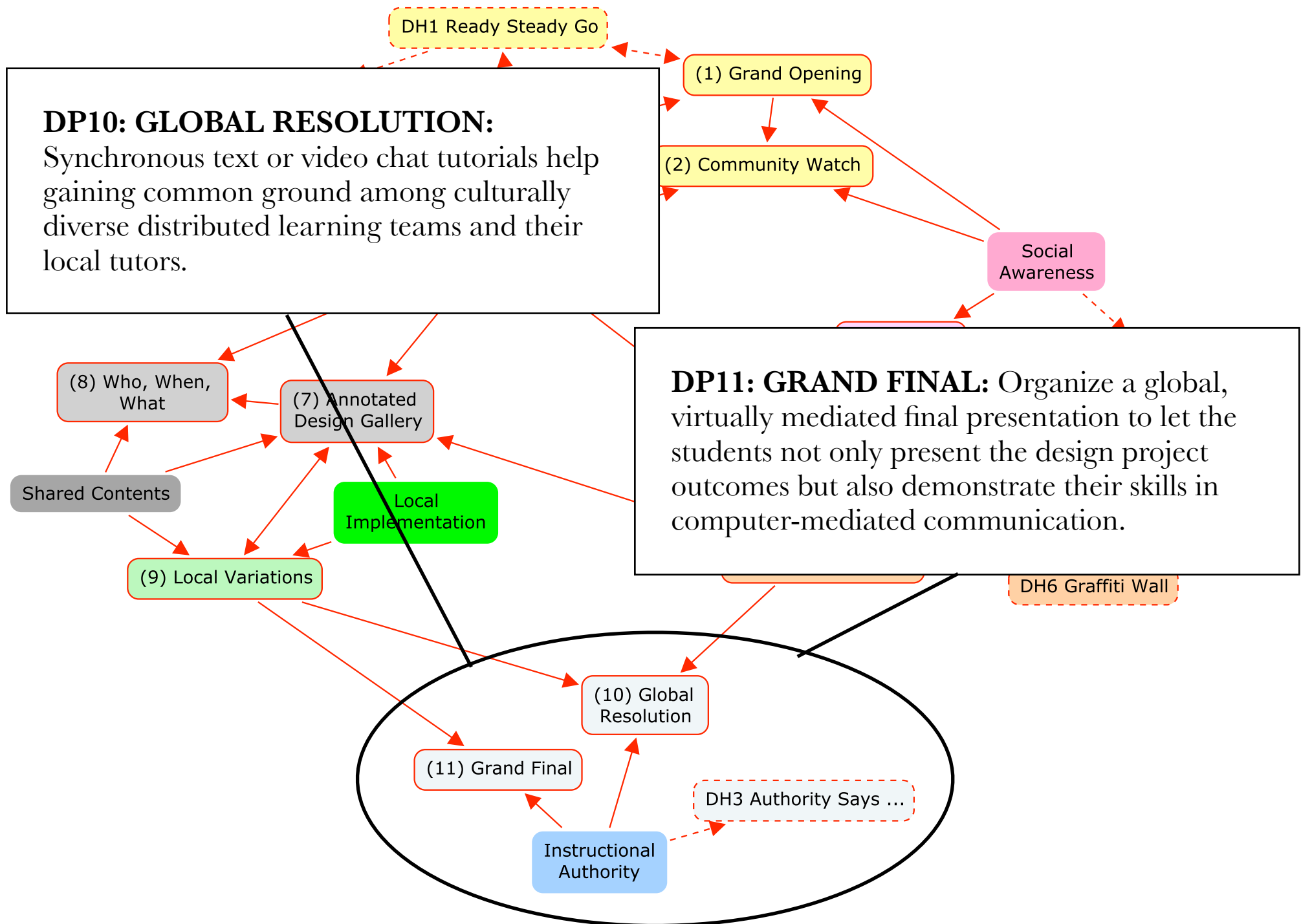
DP 4: STRUCTURED CHAT: A structured synchronous computer-mediated discussions keeps the discussion of culturally diverse collaborators focused.

DP 5: SUMMING UP: The generation of frequent summaries of online or local discussions allows the global virtual team to gain a common understanding of the design project process, tasks, ideas and open problems to solve in following conversations.

DP 6: MOOD OF THE MOMENT: Visual communication means such as Emoticons or the formatting of text make culturally diverse interlocutors aware of implicitly mediated information contents with emotional value.







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DP2: "COMMUNITY WATCH" **



Thumbnail

Watching activities in an international community online portal support the awareness and coordination of community relevant information and actions in geographically and culturally dispersed teams.

Cultural Context

Supports Collective Community and Hierarchical Authority Cultures, Bridges High and Low Contextual Communication Cultures

Context

You established a collocated design learning community using the GRAND OPENING design workshop.

Breakdown

Unfortunately, not all international community members could attend the collocated workshop. The visiting international students will have to return to their home country. Awareness about progress in other global virtual teams and activities in the international community would either rely on local inter-team communication or would be lost once the visitors return to their home country.

Problem

How do you support awareness of and active involvement in community activities?

Forces

In a short-term design project, students rarely take time to individually and actively maintain an international online community. However, teams with a collective community orientation tend to consult the community's views and actions in order to remain in harmony with the community goals and rules. Participants like to watch what other community members do. Moreover, hierarchical cultures expect the authorities to maintain environments in which information about community matters are constantly updated and distributed. If such environment is limited to local ways of distributing information, the feeling of an international community cannot arise or be maintained. Therefore, awareness of online community activities, design project requirements, learning assessment criteria and announcements of news or changes in

community issues made by the authorities are valuable information for global virtual teams that should be accessible by everyone anytime.

Solution

Make global teams aware of community relevant information and coordinate community activities through a public accessible online community portal that also allows entry to the individual group homes.

In this public space, design briefs, lecture materials and curricula are made available to all members of the design learning community. The participating universities and design streams are described and represented in this place. A global announcements communication channel is used to publicize changes in curricula or milestones anticipated in the project. In order to facilitate the acceptance and regular use of such a community space, all team traffic is direct through this entrance hall. Allow the access of INTERNATIONAL HOMES of teams via the community space. This not only allows access to the team's space but also stimulates to monitor what neighbouring teams are doing and allows for comparison of the design learning progress.

Why

Collective community cultures develop a shared understanding of the design scope over time by continuously interpreting information provided in the community environment like design briefs, announcements, changes in activity, or other teams' progress. In collective community cultures, monitoring other teams helps dealing with breakdowns in the design and learning process of one's own team. The perception of the performance of other teams is basis to evaluate one's own performance. Design processes can be compared. This also helps high uncertainty avoidance cultures to gain awareness and confidence in accepting a diversity of design and learning processes utilized in the community.

The community hall balances cultural dimensions in which team members might differ. Small amounts of information and hints that raise awareness are balanced with direct messages from instructors, design briefs and lecture materials online. While, community members, who prefer low contextual, direct and neutral communication interpret explicit messages to build a shared understanding, high contextual and affective communicating cultures feel the emergence of a learning atmosphere that encourages further interaction in the online community.

Due to an hierarchical orientation, students feel safe and embedded in a community when the authority (group of instructors) demonstrates that every aspect in question is taken care of and changes are announced when relevant to the community, so that every team can pursue their work. Moreover, ascription cultures feel a dedication to the project and the wish for a good collaboration, which is more rewarding to them than the achievement of a perfect final product or good grading.

Resulting Context

Use the pattern READY STEADY GO to introduce this online community to the participants in early stages of the project. Allow each team can access their INTERNATIONAL HOME via this community portal.

Cross-cultural Comparison

Comparative Method: Truth Tables (Ragin 1992)

- ▶ Row 1: Hong Kong Korean teams watched community activities online
- ▶ Row 2 and 4: online community coordination was of little concern for teams of mixed collective community, hierarchical authority and individual community, equal authority oriented cultures.
- ▶ Row 2: successful coordination of community online but in a different way

Community Watch	Culture Context	Context	Breakdown	Problem	Forces	Solution	Consequence	Resulting Context	Community Coordination
HK-K	1	1	1	1	1	1	1	1	1
HK-Aus	0	1	0	0	0	0	0	0	0
HK-T	1	1	1	0	0	0	0	0	1
HK-USA	0	1	0	0	0	0	0	0	0

- ▶ Coordination was nearly exclusively handled though daily synchronous communication among Hong Kong and Taiwanese student
- ▶ Students were all present in the design studio, local teams chatted with other remote teams
- ▶ social network coordination

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Conclusions

- ▶ Context-dependent identification and articulation of design patterns
- ▶ Qualitative and comparative analysis of cross-cultural computer-supported collaboration viable
- ▶ Holistic understanding valuable but also need to know the differences among various intercultural collaboration contexts
- ▶ Identification: Situated study using ethnographically informed inductive and deductive analysis and mapping methods
- ▶ Articulation:
 - ▶ Deductive analysis: achieve a persistent textual description and structure a design pattern
 - ▶ Comparative analysis to evaluate validity of patterns across contexts

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