

# **A study of communication in the workplace**

## **-Contents and conditions of face-to-face communication-**

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**Abstract:** The aim of this study is to find out suitable spatial requirements for creative work. In this paper the authors focus on “contents” of communications so that valuable communication for creative workers should be evaluated on the basis of quality rather than quantity. However the studies focusing on the quality of communication have not been insufficient. At first, the authors classified the information that was acquired during conversation in the office and the observation was carried out using the actual office environment and people. Then we organized the relation between communication contents and environmental condition when people talk in the office. The features of creative office were discussed with the analysis of the case study.

## **1. Introduction**

In recent years office workers are often expected to produce “creative work” in order to come up with innovative ideas and new knowledge. Because of the substance of the job is unpredictable as well as the fact that there are many unknown factors, we need to improve the way sophisticated and complex “Knowledge society” functions. Therefore, it is increasingly that the people work as a team and combine jobs. It is generally said that creative workers need to communicate with colleagues actively so the way to produce innovative knowledge using various special experiences and techniques is becoming more important. However, opportunities for face-to-face communication and sharing information in rooms are decreasing. Because Information and Communication Technology (ICT) enables people to work location out side of the office space such as in airports, trains, cafés; in any urban as long as they have mobile phones and PCs. Therefore, a key requirement for the physical office is “workplace for groups” in order to maximize the knowledge productivity of a company. Effective face-to-face conversations between workers in physical environments are becoming more important in this tele-work age. It is necessary to make communication active and smooth in a limited amount of time while people are in the same space.

This study discusses what constitutes an ideal space to support the worker’s good communicate in the office through a case study that involves the actual office environment

and people. In order to find out the suitable environments for the communication we have grasped the situations of conversation that occurred in office.

The authors define the communication that produce an effect or value as good communication. Communication has been evaluated by questionnaires and observation about communication quantity that is the number of the times conversation occurred [1-4]. Nevertheless very few studies have focused on communication contents even though workers are not expected to have a great deal of communication. Companies still expect effective communication.

## 2. Study flow

It is shown the flow of this study in Fig.1. At first, the authors classified face-to-face communication into five indexes by main topics in Table.1. Then we analysed the relation between the five indexes and eight factors that express the situation of the communication. Moreover we organised the situation when people communicate in the office.

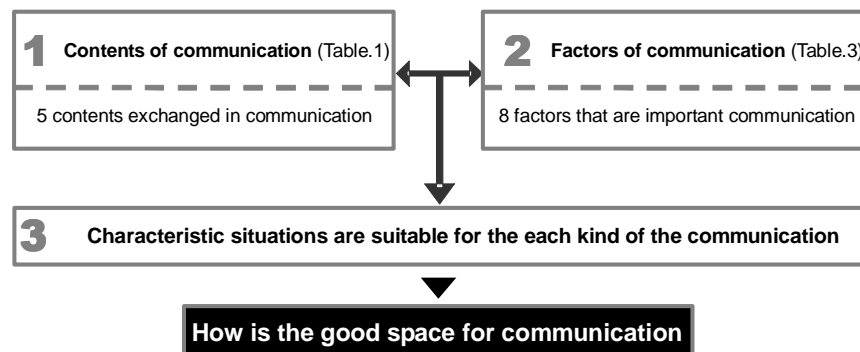


Figure. 1. Flow of this study

Table 1 indicates five communication topics that occurred in the office and traded the new effect or value. The authors classified the main topics of communication into five categories (knowledge / information, experience / know-how, idea, motivation, answer/ new direction / agreement).

Table. 1. Five topics that result from communication exchanges

Index	Topic
1. Knowledge / Information	Insights, intuitions and thoughts that based on substantive understandings
2. Experience / Know-how	Skills, techniques that it is difficult to express.
3. Idea	Conception, thought, imagination
4. Motivation	Feelings that people want to achieve something. Incentive for action.
5. Answer/ New direction / Agreement	To make decisions, to draw a conclusion.

## 3. Observation of the actual office situation

### 3.1.1. Outline of case study

People in two of all five sections were selected as subjects in this company. Group A had 29 workers and Group B had 21 workers and their job was to make people comfortable to work in order to increase the efficiency on the company. These fifty workers worked in the same room.

The case study was carried out for 8 hours a day during two days (29th and 30th of Nov. 2006). It was continued for eight hours a day from 9 : 00 a.m.~17 : 00 p.m. A field observation, video and interval shooting, and questionnaire were carried out.

### 3.1.2. Office environment that took as object of this study

It is shown in Fig.2 that we carry out this research. The area of this office space is 881[m<sup>2</sup>]. This office space is composed 1) personal desks and chairs, 2) a meeting space, 3) a smoking room. We divided object room for this case study into four zones; 1) A personal-work zone where a person works at a personal space on his/her own desk and chair. Every desk and chair is laid out in island style in the all sections. 2) An avenue zone that was the widest aisle where it was often busy with workers in this floor and from other floors. There are copy machine and stationeries to share on this zone. 3) A meeting zone had four meeting spaces and five closed meeting rooms. 4) An amenity zone had vending machines, hot water service rooms and notice boards in the entrance. Bath rooms were at the opposite side of this room. People can see the inside of smoking room which was placed near the doors because the wall was made of glass.

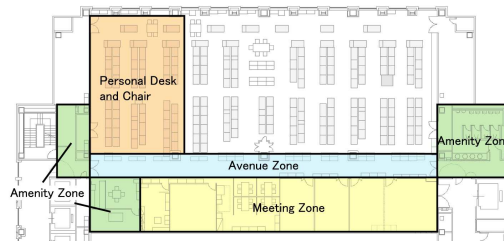


Figure. 2. The case study office

### 3.1.3. Survey method

The authors have recorded all conversations and taken pictures of the scene that took place in this office during the experiment. Video recording and interval shooting were carried out in order to compensate the field research. When a communication was finished, all participants handed in the questionnaires. The people wrote the answers about four indexes that the observer can't expect on the questionnaires. The four indexes are as follows. 1) Trigger that people started the conversation, 2) the main topics, 3) type of the information that was shared during the conversation and 4) information that was obtained and given during communication.

### 3.1.4. Way to count communications

The authors created the data sheets and defined “communication IDs” and “communication scenes” as units to count the number of times communication occurred in the office. It is described in the image of “communication IDs” and “communication scenes” in Fig.3.

#### - Communication IDs

The number of conversations was divided by topics of the conversation. For example, both short conversations at the personal work zone and long meetings at the group work zone were counted as one communication ID, because both have one topic for each.

#### - Communication situations

The number of conversations was separated when either a tool, place or a person was changed. For example, if people start a conversation using PC monitor to share the digital information and then they replace the PC monitor with projector about same topics and with same member, this communication is counted up to two communication scenes due to the change of tools and one communication ID because of the same topic through this conversation.

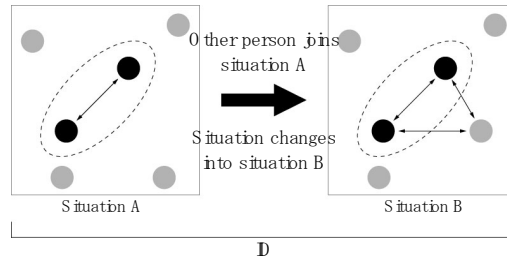


Figure.3. Define of a communication situation and a communication ID

### 3.1.5. Analysis method

The observation data in table.1. that has been gathered are summarized in order to analyze communication and environment.

Table. 2. Observation sheet

Questionnaire number	ID	When		Photo No.	Who			Where	How to communicate		Contents	Tel	Questionnaire for communication								
		Time communication start	Time communication finish		Continuance	Person in same section	Person in other section		Person on other floor	Number			Place	Tool people use	Position	Name entering	Post	Trigger	Category	Direction	Contents
40	1657	16:09	16:12	0:08	A/B		2	A/B	PC		A is looking into B's PC monitor.	About policy of their project.	A	5	4	1	1	1	1	1	Knowledge/Information 2 Experience/Knowledge 3 Idea 4 Motivation 5 Answer/New direction/Agreement 6 Other 7 Nothing
41	1659	16:11	16:15	0:04	C	D	2	Cabinet	-		They move to meeting corner after talking near the cabinet.	About progress of their DIY project.	C	4	2	1	3			4	
35	1659	-					2					About progress of their project.	E	5	1	1	1			1	
-	1660	16:20	16:26	0:06	F	G	2	F	-	Documents	G talk with F sitting on the chair that is vacant.	About right to access the server.	-	-	-	-	-	-	-	-	

In order to grasp the situations we analysed the data we have gotten by the field observation and questionnaires. There are 2 kinds of data that are contained in the eight factors 1-8 in Table.3. The five factors 1-5 in Table.3 that observers witnessed in field observation were contained in the first data. The three factors 6-8 in Table.3 that examinees wrote down in questionnaires were contained in another data.

Table. 3. Eight factors that are important for communication

factors	contents
1. Time	Time that people keep talking in a conversation.
2. Member	Same section/ Other section/ Other floor/ Same section and Other floor
3. Total of members	How many people participate in the communication
4. Place	Where people talk in the office
5. Position	The attitude adopted when talking
6. Trigger	The reason that the communication start
7. Category of information	What kind of information for the worker
8. Direction of Information	Which he/she exchange the information in the conversation

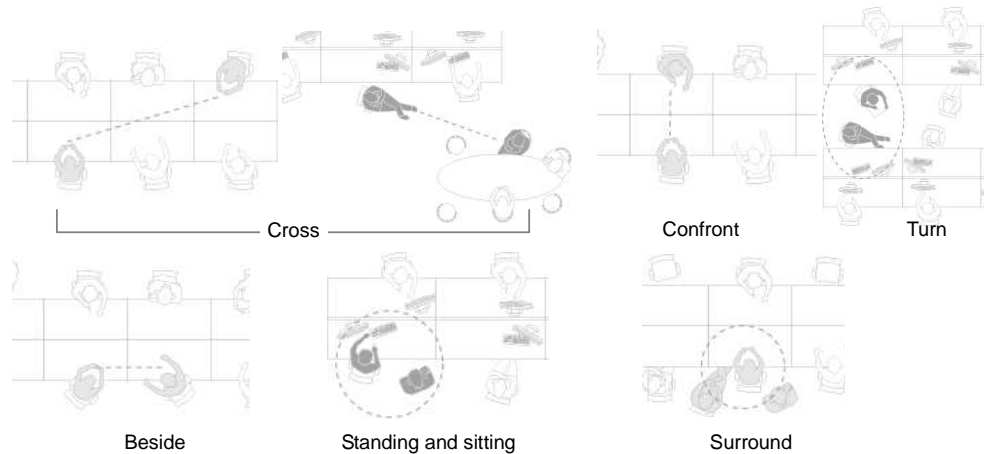


Figure.4 Examples of position when people communicate in office

## 4. Analysis and results

### 4.1. Information that are exchanged between workers

This pie chart in Fig.5 indicates the ratios of five topics that people exchanged between workers in the office. As the diagram indicates, it is clear that “Knowledge / Information” were exchanged through the communication in the office with highest frequency and “Answer, New direction or Agreement” came next. Unfortunately we realise that the other three factors, “Experience / Know-how”, “Idea” and “Motivation”, that were expected as important factors were fewer than 10%.

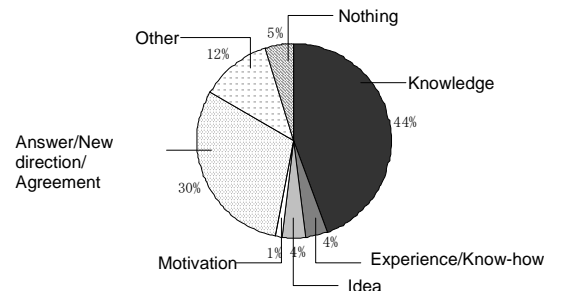


Figure.5. Frequency of information exchange in communication

### 4.2. Definition and the way to calculate “ratios of frequency”

In order to find out the features of the situation when people communicate in the office, the authors compared frequency using the formula in Fig. 6. To be concrete, if this “ratios of frequency” were around 1, it means the index has little features. The larger the values, the higher the frequency. The smaller the data, the lower the frequency. In this study, we set the border and considered the indexes that are more than 1.5 and less than 0.5 to be remarkable.

< Formula for "ratios of frequency" >

$$P = \frac{X_1 \cap A_1}{X_1} \bigg/ \frac{\bar{X}_1 \cap A_1}{\bar{X}_1}$$

P= Ratios of frequency  
 X= Five contents that people exchange in communication (Table.1)  
 A= Eight factors that important for communication (Table.3)

	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>
A <sub>1</sub>					
A <sub>2</sub>					
A <sub>3</sub>					
A <sub>4</sub>					

Figure.6. Way to calculate of frequency

### 4.3. Features of communication that frequency appear

Table.5 shows the ratios of frequency classified by topics in face-to-face communication and eight factors that influence communication. The values that are more than 1.5 are described gray-colored boxes. The following graphs in Fig.7-23 show characteristic situations for every kind of content. Only part of the outstanding situations were picked up and mentioned as follows.

Table. 4. ratios of frequency classified by topics and factors of communication

	Continuation										Number									
	Shorter than 1min	1-5min	5-10min	10-15min	15-30min	30-60min	60-120min	2	3	4	5	6	7	8	9	10				
Knowledge/Information	1.4	0.9	1.1	0.8	1.2	0.5	1.1	1.0	1.0	1.1	4.2	0.0	0.3	0.0	-	-				
Experience/Knowledge	0.3	1.2	1.5	4.0	0.0	1.6	0.0	1.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Idea	0.5	0.9	1.4	5.3	0.0	3.2	4.5	1.1	0.6	4.5	0.0	0.0	0.0	0.0	0.0	0.0				
Motivation	2.4	0.5	1.2	0.0	0.0	0.0	0.0	1.2	0.0	0.0	19.1	0.0	0.0	0.0	0.0	0.0				
Answer/New direction/Agreement	0.5	1.1	1.2	0.5	3.2	3.4	10.1	1.0	0.9	0.2	0.5	-	8.1	-	-	0.0				

	Position								Trigger				Category				Direction	
	Cross	Confront	Beside	Standing and Sitting	Turn	Surround	Scheduled	Be Spoken to	Speak to	Ad hoc	Other	Useful information for one's work directly	Useful information for one's work indirectly	Useful information for one's work in the future	Irrelevant information for one's work	Acquire	Give	Both
Knowledge/Information	0.7	1.1	1.5	0.8	0.5	0.5	1.0	1.1	1.0	0.8	0.8	1.0	1.5	13.1	0.3	0.9	1.1	1.1
Experience/Knowledge	0.0	1.7	1.5	0.4	1.3	0.7	0.8	0.8	1.0	1.7	0.0	0.8	1.6	3.7	0.7	1.0	0.9	1.4
Idea	0.0	1.3	1.5	0.7	1.2	1.4	2.2	0.9	0.5	1.7	4.4	0.9	1.2	0.0	1.4	0.7	0.8	2.7
Motivation	0.0	1.4	1.7	0.2	8.6	0.0	0.0	0.3	0.5	4.5	0.0	0.4	1.3	5.8	5.0	0.7	1.0	2.2
Answer/New direction/Agreement	2.7	1.0	0.6	1.2	0.5	2.3	2.4	1.0	1.2	0.4	0.3	1.3	0.5	0.3	0.1	1.1	0.9	0.9

	Place										Member								
	Personal-work Zone			Meeting Zone			Avenue Zone			Amenity Zone				Other floor		In same section		In other section	
	person's desk	around person's work	Around printer	Meeting table	Meeting corner	Meeting room	Aisle	Around cabinet	Utility	Smoking room	Rest space	Vending machines/ boiler room	Bath room	Other floor	In same section	In other section	On the other floor	In other section and on other floor	
Knowledge/Information	1.1	1.2	1.1	0.2	1.3	0.8	2.1	0.4	-	0.5	0.0	1.1	0.0	0.4	1.0	1.2	0.7	0.4	
Experience/Knowledge	1.0	1.3	0.0	0.0	0.0	1.8	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.9	0.7	0.0	
Idea	1.0	0.0	0.0	1.4	2.2	1.7	1.6	1.1	0.0	1.8	0.0	0.0	0.0	0.0	0.0	1.1	0.7	0.0	22.4
Motivation	1.0	0.0	0.0	0.0	0.0	0.0	5.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.2	0.6	0.0	
Answer/New direction/Agreement	1.0	1.2	1.0	1.4	1.7	12.3	0.3	1.3	0.0	0.6	0.0	0.0	0.0	0.8	0.9	1.0	1.7	2.0	

#### 4.3.1. Knowledge/ Information

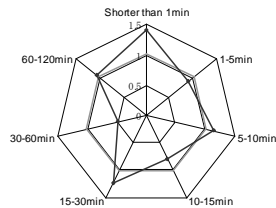


Figure.7. Conversation length

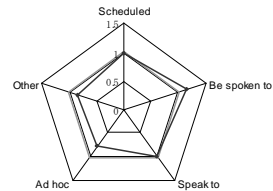


Figure.8. Tendency of triggers

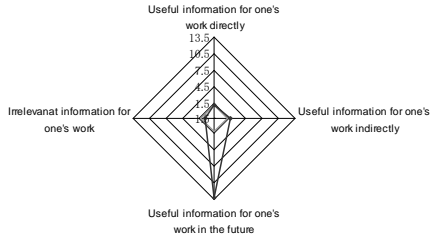


Figure.9. Character of information categories

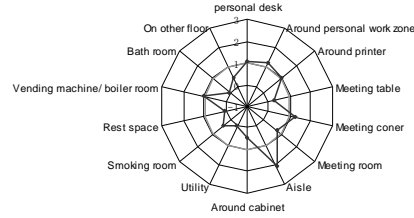


Figure.10. Places

Regarding the communication that people exchange “Knowledge / Information”, it showed tendencies to occur in personal-work zone (Fig.10.), to talk in a group with 2-4 people who work on the same floor, to do during comparatively short time (Fig.7.). We can realise in Fig.9 the information that seemed to relate in the future got higher point remarkably than other three categories. The communication exchanged knowledge or information is most important communication because of the fact this index occupied 44% of total communication.

### 4.3.2. Experience/ Know-how

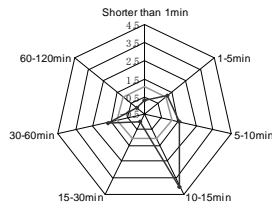


Figure.11. Tendency of conversation length

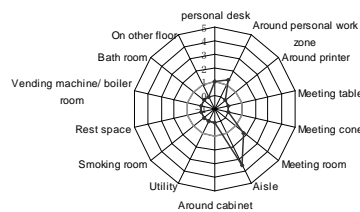


Figure.12. Result of places

With regard to when experience or know-how are exchanged, it seemed that the tendency to talk during comparatively long time (Fig.11) and to do on aisles or around personal desks and chairs (Fig.12).

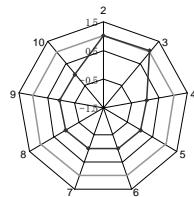


Figure.13. F number of participants

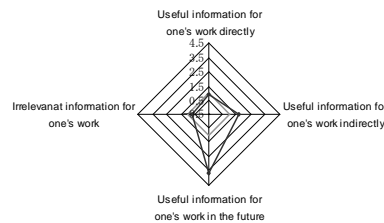


Figure.14 Information categories

Moreover, it is clear that few workers (Fig.13) who are sitting in the next seats or confront with tend to start communication ad hock.

In terms of the category of job in Figure.14, “Experience / Know-how” were often evaluated as the information that seemed to affect the future of one’s job.

### 4.3.3. Idea

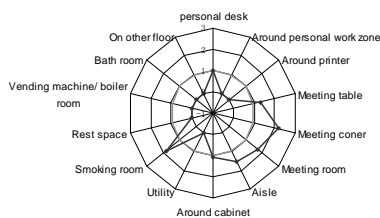


Figure.15. Character of places

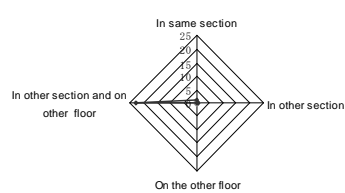


Figure.16. Result of worker's categories (right)

In case of “Ideas” that people exchange in conversation, we can find the tendency in Fig.15 and 17 that meeting spaces, meeting rooms and meeting tables caused a communication that was scheduled beforehand such as an arrangement or staff meeting. It is clear that this communication were often formed by participants from different sections in comparatively long time in Fig.16.

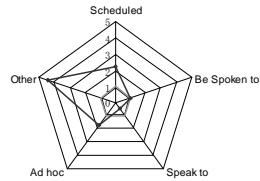


Figure.17. Tendency of triggers

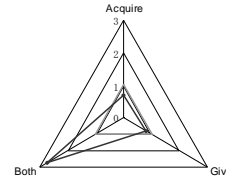


Figure.18. Result of information direction (right)

The Fig.17 shows that this communication occurred ad hock and scheduled. However, ideas were often expected to be caused ad hock because we can notice that Fig.18 shows that almost idea was exchanged by workers to each other. Moreover, it was only ideas that had high ratio to communicate in the smoking room. An interesting point to emphasize is that some communications began when workers who were around him/her moved. It is anticipated that usually working closely can let people who was around him/her know their circumstance, which caused communication and they can exchange idea as a result. It seemed that the island layout caused people to share information and communicate.

#### 4.3.4. Motivation

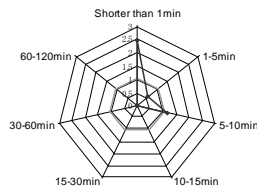


Figure.19. Conversation length

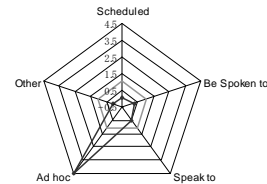


Figure.20. Tendency of triggers (right)

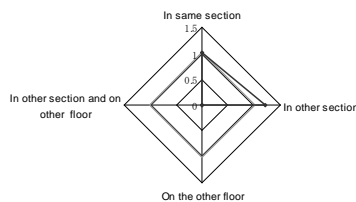


Figure.21. Result of worker's categories

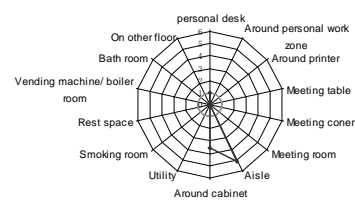


Figure.22. Inclination of places (right)

Motivations occurred on main aisle ad hock by people who work in same room during short conversations (Fig.19-22). Furthermore these communications showed that people exchanged motivation interactively. On the occasion that it occurred around personal desk, we could frequently find that two people who are sitting closely started to talk ad hoc. In this case the contents often had nothing to do with his/her work directly (Fig.21-22).

### 4.3.5. Answer/ New direction/ Agreement

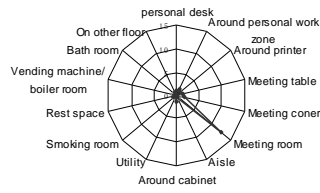


Figure.23. Tendency of places

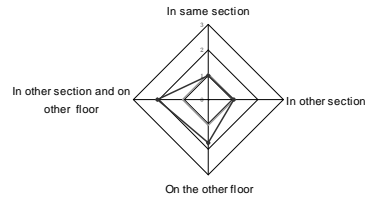


Figure.24. Result of worker's categories (right)

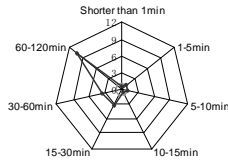


Figure.25. Tendency of conversation length

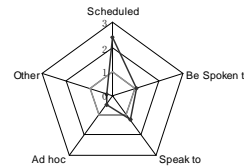


Figure.26. Tendency of triggers (right)

As for communication that people traded during question and answer discussions, they had tended to be occurred in meeting rooms between workers belong to different sections (Fig. 23 and 24). In addition to this tendency, we can often find out comparatively long time and scheduled conversation (Fig. 25 and 26). Moreover, effective information for one's job directly occupied about 90%, it is higher ratio than all five contents that in communication. Therefore, it is clear that answer, new direction or agreement was regard as the effective information for one's job directly.

## 5. Features of communication

In addition to the analysis mentioned above, we summarized every characteristic situation and topics when people communicate in office in Table 4. We defined the spa of high frequency as "special situations".

Table.5 Summary of general features of communication situation

Knowledge / Information	Idea
Avenue Zone	Meeting table/ Meeting room/ Meeting corner/ Smoking room
Members on same floor	Workers who work on both different and same floor
5 people	4 people
Comparatively short time	10-15min or longer than 30min
Beside	Scheduled and ad hoc
Experience / Know-how	Motivation
Avenue Zone (aisle)	Avenue Zone (aisle/cabinet)
Workers sitting closely in Personal work Zone	Only workers who work in same room
Only small group (2-3 people)	2 people
10-15min	Shorter than 5min
Ad hoc	Beside
	Ad hoc
Answer / New direction / Agreement	
Meeting room/ Meeting corner	
Communication including workers who work other floors	
7 people, large group	
Long time (15-120min)	
Surround	

## 6. Conclusion

The authors focused on the topics of conversation take place in the office and propose a way to evaluate qualities of communication that regarding the communication that produce new knowledge or idea as valuable communication. Consequently the communication style

in office environments between workers became clear. Below is a table (Table.7) showing special situation.

Table.6. Characteristic situation classified by 5 topics and 8 factors

	Knowledge / Information	Experience / Know-how	Idea	Motivation	Answer / New direction / Agreement
Time	-	10-15min	Rather long	Shorter than 1min	Long time
Member	-	-	Other section / other floor	Same floor	Other floor
Number of people	5 people	2-3 people	4 people	2 people	7 people
Place	Avenue Zone	Avenue Zone	Meeting Zone / Avenue Zone	Avenue Zone	Meeting Zone
Position	Beside	Confront	Beside	Beside / Turn	Cross / Enclose
Trigger	-	Ad hoc	Scheduled / Ad hoc	Ad hoc	Scheduled
Category	Useful in the future	Useful in the future	-	Useful in the future /	Useful directly

Generally speaking as for the tendency of place the communication occurred on “Main aisle” in the office recurrent. Moreover, concerning trigger the communication that people start “ad hock” is high frequency. These seemed to become important view points in order to design space to support these topics and factors affecting good communications.

All the consequences and consideration of this study are based on a case study carried out in a section. Therefore, from now on we will perform observations at different offices and workers to confirm the results of this study. We also need to determine a way to analyse and observe more carefully.

## 7. References

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