

CSCW in Media and Gaming: *Conceptual Dimensions*

[Seminar Paper] *

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ABSTRACT

Based on a desk research of recent CSCW papers in the field of media and gaming we gathered a collection of conceptual dimensions. This collection aims to illuminate additional aspects of an emerging design idea and eventually helps to avoid mistakes in an early stage. The conceptual dimensions which were extracted in a subjective approach could be classified in the following categories: Participants, General Interaction Design, Communication and Resources. A short generic description of every conceptual dimensions should allow the reader to become aware of the idea which the authors did see.

Categories and Subject Descriptors

H.1.2 [User/Machine Systems]: Human factors; H.5.3 [Group and Organization Interfaces]: Computer-supported cooperative work; H.5.3 [Group and Organization Interfaces]: Collaborative computing; K.6.1 [Project and People Management]: Systems development

General Terms

Design, Human Factors

Keywords

CSCW, Media, Collaborative, Conception, Planning, Designing

1. INTRODUCTION

In this short paper we try to come up with an non-extensive collection of dimensions underlying computer-supported cooperative work (CSCW) systems. The focus is set on CSCW systems used in the fields of media and gaming. We argue

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that this classifications will be helpful in the design process of a new system. At any stage of the process it is possible to look up how the new concept will fit in the proposed dimensions. This will help to develop a more conscious understanding of the system already in planning and can probably help to avoid design failures in the early stages of the design.

We began to study some recent papers matching the presented focus and did extract conceptual dimensions out of all of them. This was done through a purely subjective assessment by the authors. In a second step we extracted common categories over all dimensions. This categories are used to structure the main part of this document:

The participants of a CSCW system build the first category. The dimensions in this category could be used as a starting point for a new design. Afterwards we concentrate on general design aspects. In even more detail we will look into the dimensions of the communication. At the end we want to illuminate the dimensions found in the field of resources.

Every dimension is first summarized in a generic style and in the majority of cases supplemented with an example for illustration.

In the entire document we try to avoid expressions as *work* or *task* to emphasize the focus on media and gaming. Some dimensions will not be valid in every case for all of the three fields.

1.1 Media and Gaming

The fields in CSCW of gaming and media can't be delineated exactly. Though every game which is only in part realized or supported by a computer can be considered as a CSCW sub-field. Further the field of media sums up every kind of interaction through a computer with a picture, sound, video or other medium.

2. CONCEPTUAL DIMENSIONS

2.1 Acquaintance of the other Participants

In almost every collaborative situation it is an important variable how good people know each other. If the participants try to solve a non trivial problem the individual has to take actions with non-predictable outcomes. These risks are more easily taken while interacting with a group of well known people. The individual taking the risk will not worry about what the teammates will think about it after a wrong move.

Especially in CSCW media installations it is often the case that complete strangers begin to interact [5]. The interaction of strangers itself can be the only goal of such an installation.

Further we propose to clearly distinguish in collaborative projects between the knowledge about participants and the knowledge about the real identity of the participants.

Knowledge about other participants

The knowledge about a teammate can originate from everyday experience, not connected with the context of a CSCW system. This is often the case because it is probable that people which know each other already up-front participate using such a system. If it isn't true that people met outside the context of the system the knowledge was generated by previous encounters of the same participants through the system. In this case it is possible to acquire a lot of knowledge about a specific individual without knowing his real identity.

This is often the case in virtual worlds as *World of Warcraft* [4]. There exist a multitude of different situation in which a player can get in touch with an other player which is a complete stranger. These players can then bond up and over time these players acquire a massive knowledge about other players without knowing anything about their real identity. But it is also possible that near relatives play side by side in such virtual worlds.

Real Identity

The second step would be to match the knowledge about an individual to an identity which can be located in the real world. As long as the identity is not available to the other participants your actions have no further consequences outside the context you are interacting.

In an co-located situation like a urban big-screen game [5] the identity of the other participants is revealed at any time. In contrary it is possible that a player has absolutely no knowledge about how the other player will act in a specific situation. And at most time there are people which know each one well, mixed with complete strangers participating in the same game.

2.2 General Interaction Design

Mode of Interaction in Games

Keep in mind that the following use of *cooperative*, *collaborative*, and *competitive* used in this conceptual dimension have a slightly different meaning as in the CSCW field in

general. First proposed by Zagal et al. [8] there is a continuous dimension between a competitive gameplay and a collaborative one. Ancient games show nearly all a competitive nature where every win of one participant is a direct loss for the others. At the other end of this dimensions we find the purely collaborative game where the group wins or loses together. In the case that the rule set of game is build out of a combination of an individual goal and a group goal we speak of cooperative game.

An interesting fact is that the coming together to play a game is a collaborative act itself. So strictly speaking there is no CSCW system which is purely competitive.

Anyway it is often the case that players, as example in co-located console games [7], show a collaborative behavior even in games designed to be mostly competitive.

Overall Pace of a System

The next important design variable is the speed in which succeeding actions are designed in a CSCW system. Every participant will have an individual range of pace at which he experiences pleasure to participate. The change of the pace, controlled by the group or by the system can become a major design factor of the system.

Juhlin and Weilenmann [2] did analyze a group of recreational hunters to gather design requirements for possible future CSCW systems in the area of collaborative leisure and pervasive games. An important aspect was the temporal organization of the whole hunt which allows every participant to enjoy the activity.

It is not necessary that all participating users experience the same pace at the same time. But it can be argued that a synchronized overall pace will support the concept of *Shared Awareness* [7] in the group.

Concentration vs. Relaxation

The pace as introduced above can be controlled by designing phases with different levels of concentration and respectively relaxation. Often the more intense these phases are the more pleasure will be experienced afterwards in the phase of relaxation.

In games we see often a fast change between this two poles of this dimension. In console games the time were the scores are presented help to relax and discuss before the next round of the game [7]. Also outside the CSCW domain recreational activities have defined phases of relaxation [2].

A phase of relaxation from the imminent action of solving a goal can be at the same time also a possibility to shift the focus on other activities like social interaction. [1]

Modalities

It is not possible to discuss the dimension of the different modalities (like text, images, sound or video) in a complete manner at this place. In co-located settings the use of a lot of modalities can disturb the interaction between the participants. If the participants are remote the opposite becomes true. More modalities let the users interact often easier and more naturally.



Figure 1: The left picture (taken from [4]) depicts a scene out of a purely virtual world where the real identities of the participants often are unclear. In contrast the right picture (taken from [5]) shows an urban big-screen game where the participants real identity is obviously known to everybody.

In general the designers should put special attention to this dimension if they adopt more than one modality in a CSCW system. We propose to distinguish between single-modality [5],[6] and multi-modality [4],[7] systems.

Rule Enforcement

In systems which are based on a set of rules an instance which carries out the rule enforcement is necessary. This can be done through the participants themselves like in classic board games. A CSCW system allows to automatically take care of the rules and sometimes these systems are designed to do this without further reflection of the impact. Especially in games the rule enforcement through the participants can be an important factor of the design. E.g. it can give children the possibility to learn in a protected environment the importance of rules which are present in the every day life.

On the other hand can a rule enforcement done by the system explicitly be used to focus on an other factor. In a CSCW system designed for children with a social interaction disorder (Asperger's Syndrom) the rule enforcement by the system was less questioned by the kids as if adults were in charge [6]. This allowed the kids to concentrate on the interaction with the other children necessary to solve the problem. So they can first learn basic social interaction patterns without the added complexity of obeying in rules.

2.3 Communication

Every CSCW system depends on the communication in between participants by definition. In the working world it is the common goal to optimize the communication as good as possible with the available technologies. In the field of gaming it is often the case that the communication itself is the central topic of the system or the design of communication is used as a challenge in the game design [7].

Amount of Communication Channels

An design aspect of CSCW systems is the manifold of interaction channels you provide. This decision is less important in co-located settings. A simple rule of thumb is that more

Dimension	Media	Gaming
Aquintance of Participants		
Knowledge [5]	●	●
Real Identity [4][5]	○	●
General Interaction Design		
Mode of Interaction [7][8]		●
Overall Pace [2][7]	●	●
Concentration / Relaxation [1][2][7]	●	●
Modalities [4][5][6][7]		●
Rule Enforcement [6]		●
Communication		
Number of Channels [4][7]	●	●
Group Size [1]	○	●
Importance of Interaction [4]	○	●
Specific Language [3]	●	●
Motivation of Interaction [1]		●
Resources		
Shared vs. Isolated [1][4]	●	○

(○ in part applicable, ● applicable)

Table 1: An overview of all conceptual dimensions. In addition every dimensions is rated by their applicability in the fields media and gaming.

different communication channels need more time to learn the appropriate interaction with them.

An impressive example of the highly sophisticated use of multiple different channels was discussed by Nardi and Harris [4] for *World of Warcraft*. The players use different channels to interact with the others as individuals (friends) or in groups like guilds, knots or people which are virtual located around the player.

Size of a Group

In the mentioned example the different groups can vary in size from knots of two people up to guilds with hundreds

of members. The targeted size of a group will influence the design of the communication channel as also the targeted use of it.

In a synchronous communication with an individual both communication partners are able to keep track of the actual topic of the discussion by themselves. In contrast to an open discussion with hundreds of people where it is helpful to support the participants with techniques to structure their discussions.

In virtual worlds we have the possibility to speak to everybody in a defined room at the same time. This can end in a conflicts of interests of the different groups in the same room [1].

Importance of Interaction

An interaction can range from a random habit like greeting up to for the context important discussions with a clearly visible and sustainable outcome. On this dimension each occurrence of interaction has a different importance. The amount of time the interaction takes is one variable which can create importance to an event. But also the different gestures of interaction are important.

In *World of Warcraft* there are different actions on this dimension. Less weight has a small favor like being "buffed" which means to be a recipient of beneficial spell. More important interactions would be a "kill assist" where a player is saved from a imminent death [4].

Context Specific Language

Quite often in the domain of games and media the participants have a highly specific and to the context specific vocabulary [3]. For a first-time user it is an entry barrier to a system. On the other hand can such a specific language help to build up group coherence.

The example in the sub chapter above showed the two examples "buffed" and "kill assist" which have a clear delimited meaning in the context of *World of Warcraft*. The advantage of this example is that there is only one specific language to this context. In opposite to interdisciplinary CSCW teams which are shared by artists, information technology specialists and psychologists we find a multiple specific languages which can collide. In this situation it is useful to have other tools to express ideas besides the use of language [3].

Motivation of Interaction

Further there is a dimension about the motivation of an interaction. Most CSCW systems expose a clear goal to the participants. This allows to distinguish between interactions which have the intention to achieve the goal from random interactions without any link to the context. In between this poles is a range of interactions which try indirectly to solve the goal at hand but also to socialize with other participants.

Games can instrumentalize the interaction between players. This is the case if the players have to communicate (e.g. to share objects of the game) to advance in the game [1].

2.4 Resources

Shared vs. Isolated

Once more this is a dimension where in the working world would be argued the better the resources are shared by the system the better the outcome of the result. But in the field of media and gaming the isolation of resources to a specific player can be a voluntarily introduced element to the system.

Resources can also be isolated not through a rule of the system but through not knowing that such a resource exists. It is one of the main aspects in virtual online games to gather more information about the game itself which allows the player to participate in more activities [4],[1].

3. CONCLUSIONS

All proposed dimensions were shaped based on the papers which are cited in this document. To gather the most diverse dimension we did choose a variety of documents with different applications in art, media and gaming. We proposed dimensions which can help designing a CSCW system. The rather small sample of analyzed documents doesn't allow us to make any generalizations in the field of CSCW. By increasing the amount of analyzed documents it would be easily possible to generate even more distinguishable dimensions.

Anyway we think that the knowledge of this dimensions combined with your already gathered experience in this field can help to understand your next CSCW project in a more conscious manner.

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