

# Using Collaborative Platforms for Decision Support

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**Abstract:** In the group and organizational decisions making processes, not always the participants can meet face to face. A collaborative platform can be an important tool that may facilitate the cooperation and the decision making. The paper presents a set of features specific to collaborative platforms, which support the decision making, with emphasis, by comparison, on phpGroupware and BSCW (Basic Support for Collaborative Work) platforms.

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## 1. INTRODUCTION

Some authors make a clear distinction between **Computer Supported Cooperative Work** (CSCW) and **Group Decision Support Systems** (GDSS) (Dennis et al, 1988), considering that GDSS are “*more focused on task support, whereas CSCW tools provide general communication support*”. On the other hand, the definitions of the two concepts suggest a strong relation between it. Usually the definitions present GDSS as a system that supports a concerted and coordinated group effort towards completing a decision making process. **Groupware** is a technology designed to facilitate (communicate, cooperate, coordinate, solve problems, compete, or negotiate) the work of groups. “CSCW refers to the field of study which examines the design, adoption, and use of groupware” (Brinck, 1998). This perspective shows GDSS under groupware umbrella. In the same time GDSS is a particular type of DSS, focused on groups than individuals. Figure 1 shows the relation between DSS, GDSS and groupware.

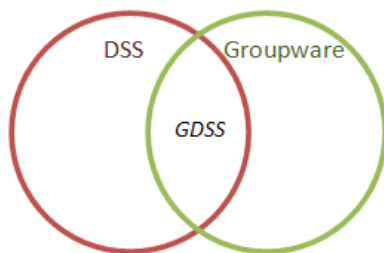


Fig. 2. DSS - GDSS - Groupware relation

### 1.1 DSS and groupware

Steven Alter (1980) believes that the DSS can take different forms and can be used for multiple purposes. According to Power (1997), the Decision Support System is a term that includes many types of systems that support decision making.

Since there is no precise definition of Decision Support Systems, there is no clear line between the standard DSS

characteristics and its possibilities. Based on the ideal set of features of a Decision Support Systems described by Turban, Aronson, and Liang (2005), a comparative study can be made taking into consideration the characteristics of the computer collaborative work platforms:

- *The DSS support the decision maker in semi-structured and unstructured problems.* DSS is an information system that assists decision-managers to solve semi-structured problems. Power (2002) quoted by Filip (2004) defines the DSS as an interactive system designed to help the decision maker to use data, documents and models to identify and solve problems and make decisions. The groupware platforms (further referred to also as *the collaborative platforms*) offer an opportunity to create projects that use data and documents. Decision making activities can be supported by task-lists and discussion groups.
- *The DSS support managers at all levels.* The collaborative platforms do not impose restrictions regarding manager level. The collaborative platforms allow creating different work groups with members of different level of authority (different access rights). The users have access to certain data, according to their level.
- *The DSS support individuals and groups.* The groupware platforms are targeted for the group working. Support for individuals is reduced in this case.
- *The DSS provides support for interdependent or sequential decisions.* Collaborative platforms can be configured to support different types of decisions, including those interdependent and sequential.
- *The DSS maintains intelligence, the project, the selection and implementation.* Turban and Aronson (1998) cited by Filip (2004) show that DSS

interconnect intellectual resources of individuals with computer capabilities to improve the decisions quality. The collaborative platforms, through its features, can support, more or less, all the decisional process stages.

- *It supports a variety of decision-making processes and styles.* Choosing a specific style or decision-making process is the user attribute. It may consider that, on the platform, a variety of decision-making processes can be supported.
- *The DSS should be adaptable and flexible.* Cooperative platforms can be used as a framework for generating specific application, precisely because of their flexibility and adaptability. Usually the collaborative platforms include a range of application modules that can be activated, depending on requirements. Furthermore, besides the main platform package, additional applications can be installed to reach the goal.
- *The DSS should be interactive and easy to use.* Collaborative platforms are easy to use. Interface elements used are intuitive and present common functions that are available in other applications. Due to presence of the communication tools implemented in collaborative platforms, they have a high degree of interactivity.
- *The efficacy must be balanced with efficiency (benefits must exceed costs).* There are commercial platforms but also free platforms (e.g. phpGroupWare). Many commercial platforms use a flexible system of licensing. The costs are in accordance with the needs due to a license system based on the number of users and time of use. Some platforms can be installed on the customer server or there can be used the versions installed at the producer (e.g. For the BSCW platform, the customer can select to buy an installing version or can chose to use a licensing system that involves the use of a BSCW version installed at the producer).
- *The decision makers must have total control.* The collaborative platforms have mainly a passive role in the decision making process, so the control belongs completely to the users. The decision maker has a clear control over the work.
- *Ease of development by end users (changes to meet the needs and changes of environment).* At some level, the platforms can be customized to meet the requirements.
- *Supports modeling and analysis.* Generally, the collaborative platforms include features that can facilitate data analysis and less modeling activities.

- *Provide access to data.* Any collaboration platform provides users access to loaded data. Users have the ability to share resources with certain users, groups of users, or with all users. The access to data may be logged.
- *Independent application, integrated and web-based.* Usually the collaborative platforms are independent applications, that works in conjunction with other applications (e.g. web server, email server, etc.). The web interfaces allow users to access the collaborative platform independently of the client operating system. The web programming technologies used provide a high compatibility with existing web browsers.

## 1.2 GDSS and groupware

In 1988, Johansen introduced the CSCW matrix (Fig. 2), which was created based on the types of the office meetings: same time – same place, same time – different place, different time – same place and different time – different place (Pfeifer et al, 1995). The groupware platforms are designed to support one or more of this meetings types.

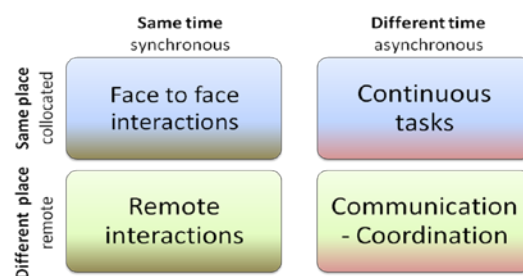


Fig. 2. CSCW matrix

GDSS, usually, frames in the first category: same time – same place (Pfeifer et al, 1995). But this fact is only because the synchronous work is the most studied case in the group decision making context.

Between groupware and GDSS are similarities and differences (Yen and al., 1998). Several similarities are presented in the following: (a) both technologies support groups and team working on a common task; (b) both are designed to increase the group productivity by providing simultaneous communication channels; (c) both systems use group interface; (d) physical location of the group members is not a problem.

Despite the similarities, the two technologies have unique features: (a) GDSS is focused on supporting groups with individuals on similar level of authority, unlike groupware that support different levels of users. In this case, a groupware system may be the first selection for an organizational decision making process; (b) groupware refers a broad range of systems, each of it being designed to

improve group productivity in different ways. GDSS is focused on the decision making process improvement; (c) groupware is focused on the overall group interface and GDSS on the dialog management; (d) GDSS are often apply on large group that are not always cooperative. Groupware assist both small and large groups; (e) GDSS are used mainly for same time – same place meetings; groupware are used also for synchronous and asynchronous meetings, collocated and remote meetings.

## 2. DECISION SUPPORT WITH BSCW AND PHPGROUPWARE PLATFORMS

### 2.1 BSCW platform

The BSCW Shared Workspace System (<http://www.bscw.de/english/product.html>) is a group collaboration platform that allows the creation of documents, appointments, contacts, tasks and notes within shared workspaces. Using only a web browser, without having to install additional software, the users can access the data anytime, from anywhere in the world. The BSCW platform ensures that complex workflows can be coordinated with minimal effort.

The group can be easily created. BSCW through a flexible role concept provides the managers to define access rights for individual group members.

A shared workspace can contain various data such as documents, pictures, and URL links to other Web pages or FTP sites, threaded discussions, member contact information and more. The contents of each workspace are represented as information objects arranged in a folder hierarchy. Members can transfer (upload) information from their machines to the workspace and set access rights to control the visibility of this information or the operations which can be performed for others.

BSCW provides multiple features. The main BSCW features are: document versioning (manage different document versions) transferring (a variety of document transfer mechanisms) and locking (the others access rights can be temporarily denied), discussion forums (threaded forums), annotations and ratings, event notifications (customized email notifications and daily reports), customized access rights (by user and data), search facilities, archive functions, sending documents (directly from the workspace), online surveys (the survey results can be presented in visual form with graphs), contact lists (the contact list can be shared), mobile access (PDAs and SmartPhones), integrated HTML editor (directly in the BSCW document management facility), appointment and reminder service (personal time management tool), interfaces (interfaces to link BSCW to external systems such as conferencing platforms, conversion services interfaces), individual user interfaces (interface tailoring according to the needs).

Even the BSCW developers do not make reference to “decision support”, Sauter (<http://www.umsl.edu/~sauterv/DSS/book/gdss.html>) lists BSCW as a GDSS platform.

### 2.2 phpGroupWare platform

phpGroupWare is a “fully featured, web based messaging, collaboration and enterprise management platform” (<http://www.phpgroupware.org/>).

phpGroupWare is provided with a range of modules (more than 50 applications) that can be selected and installed according to requirements. Some of the most powerful features offered include: contacts management, email, shared web – based calendar, todo – lists, address book, web content and document management and sharing, project management, issues tracking. The calendar supports repeating events. The email system supports inline graphics and file attachments.

phpGroupWare is open source and free to use software - which means the software can be modified to suit specific needs. phpGroupWare allows users to build and deploy their own web based applications quickly and easily and supports multiple database backends, permissions and access controls, user interface generation and multiple languages. phpGroupWare is flexible and scalable. It is suitable for small groups and also for large groups. phpGroupWare currently supports over 20 languages.

### 2.3 Decision making support

According to Filip (2008) a typical and complete GDSS aims to support the main decisional activities, as follows:

- **Generating ideas** that may serve to the decisional problem approach. The “idea” concept could refer to an action plan, a range of identified or designed decisional alternatives, an evaluation criteria and so on. The ideas generation can be assisted by the GDSS through: (a) *electronic brainstorming* - the participants anonymously introduce into the system their own ideas related to the topic. At the end of the session, which it is recommended to last 30-40 minutes, the system generates a report with the proposed ideas, (b) *topic commenter* – each participant has access to the topics list. He can view all the comments and he can add his owns, (c) *group outliner* – serves to the topics presentation in a shape of a tree or a multilevel list, where the participants can associate, orderly, their comments.

- **Organizing ideas** by grouping them in several central key ideas. This activity (45-90 minutes) reduces with 20 times the ideas number. A GDSS can support (a) *ideas categorization* – by creating a certain number of ideas category (the most important or the most general ones) where there are collected the participants contributions, (b) *issue analysis* – helps the participants to identify the most important occurrences in the generated ideas list.

- **Prioritising** assess the importance of the key ideas. A GDSS can assist this activity by: (a) *voting tools* – a voting method is selected and at the end of the voting process, a results report is created, (b) *on-line questionnaire* – the GDSS moderator creates a set of questions and analyse the participants online answers, (c) *group dictionary* – helps to

interactive create definitions for the elements used in the decisional process.

- **Developing policy** - the participants creates and adopts decisional plans and politics. A GDSS may help in (a) *policy formulation* – the participants can work together on documents related to politics and missions, starting from a first version of the document, elaborated by the group moderator, and creating successive versions until the common consensus, (b) *stake-holder analysis* – the plans and politics implications are systematically evaluated.

The collaborative platforms in general and the previously presented platforms in particular can assist several of the decision making process activities. Table 1, created based on the platforms vendors descriptions and authors experience using it, presents which of these activities may be supported through BSCW and phpGroupWare platforms:

**Table 1. Decisional activities supported by BSCW and phpGroupWare platforms**

Main decisional activities	Decisional activities	BSCW	phpGroupWare
Generating ideas	Brainstorming	No	No
	Topic commenter	Yes	Yes
	Group outliner	Yes	Yes
Organizing ideas	Ideas categorization	Yes	Yes
	Issue analysis	Yes	Yes
Prioritizing	Voting tools	Yes	Yes
	On-line questionnaires	Yes	Yes
	Group dictionary	No	No
Developing policies	Policy formulation	Yes	Yes
	Stake - holder analysis	Yes	Yes

Table 1 shows that BSCW and phpGroupWare platforms can assist all the main activities of a decisional process. It can be observed that both platforms cannot support the same activities: brainstorming and group dictionary. It must be mentioned that, even neither BSCW nor phpGroupWare includes a dedicated tool for a group dictionary, it can be substituted with a shared document. This document can contain the definitions of the elements used in the decisional process.

Based on the table, it can be concluded that a general purpose collaborative platform can be used, instead of a GDSS, to support a group decisional process. The general collaborative platforms features can substitute many of the dedicated decisional tools, specific to GDSS.

Of course, a detailed analysis may indicate that dedicated GDSS could be more efficient, for the most part of the decisional processes, than a collaboration platform, as BSCW or phpGroupWare.

### 3. CONCLUSIONS

Collaborative platforms in general (BSCW and phpGroupWare in particular) meet certain characteristics, which allow them to assist in group decision making. However, they cannot be called DSS because they are not specifically created for decisions making and do not meet all the features of a GDSS (modelling techniques, targeting a special type of problems etc.).

The GDSS and the collaborative platforms in general have similarities and also differences. Both can help in decision making process but it cannot be sustained that a general purpose collaborative platform has the same efficiency as a dedicated system (GDSS).

### REFERENCES

- Alter, S., (2002), A work system view of dss in its fourth decade, *Eighth Americas Conference on Information Systems*, pp. 150-156;
- Brinck, T. (1998), *Groupware: Introduction*, <http://www.usabilityfirst.com/groupware/intro.txt>, verified in Feb 2009;
- Dennis, A.R., George, J.F., Jessup, L.M., Nunamaker Jr., J.F., and Vogel, D.R. (1998), Information Technology to Support Electronic Meetings, *MIS Quarterly* (12:4), pp. 591-624;
- Filip, F.G. (2004), *Sisteme Suport pentru Decizii*, Technical Publishing House, Bucharest, Romania;
- Filip, F.G. (2008), Decision support and control for large-scale complex systems, *Annual Reviews in Control*, No. 32, pp. 61-70;
- Pfeifer, J., Koo, K., Yin, P., (1995), *Electronic Meetings - CSCW & GDSS*, <http://ksi.cpsc.ucalgary.ca/courses/547-95/yin/groupware.html>, verified in Feb 2009;
- Power, D.J. (2002), Decision Support Systems: Concepts and Resources for Managers, *Quorum Books*, Westport, Connecticut;
- Yen, D.C., Gong, B., Wen, H.J., Chen, H.G. (1998), Collaborative Computing: Groupware and Group Decision Support Systems, *Decision Sciences Institute Proceedings*, No. 2, 592-594.