Group Decision Support Systems

Most complex decisions in organizations are made by groups of people. As complexity of organizational decision making increases, the need for meetings and for working in-groups increases. Such decisions are supported by a technology called group decision support systems (GDSS), whose major missions supporting *group processes.*

Many organizations, private and public, are placing increased emphasis on change in managemnet, use of technology, and introduction of quality improvement programs as means to increase productivity and to better cope with increased competition, customer demands, decreased budgets, and the emergence of global markets. In Manhattan, the management and employees of the Internal Revenue Service (IRS), with the help of the University of Minnesota, implemented a quality improvement program based on participate management (quality teams), which is supported by group decision support system (GDDS).

A major part of any quality improvement program is the *quality team* structure, which is similar to the Japanese *quality cicles* concept. Group, composed of managers and employees, meet as small units (of three to twelve people) to chart out methods for solving problems and for using opportunities to improve quality.

The Problem

Participants in quality teams often come from different fuctional areas or supervisory levels, and bring a variety of perspectives to the team. Although such variety can enrich the meetings, it can slow work as well. In addition, groups are subject to generic phenomena that inhibit the success of teamwork. These phenomena include domination by one or a few members, poor interpersonal communication, and fear to express innovative ideas. To reduce such negative effects, the IRS introduced extensive training and professional facilitation. However, as the number of teams, the budget becomes a problem and it also becomes difficult to find high-quality facilitators.
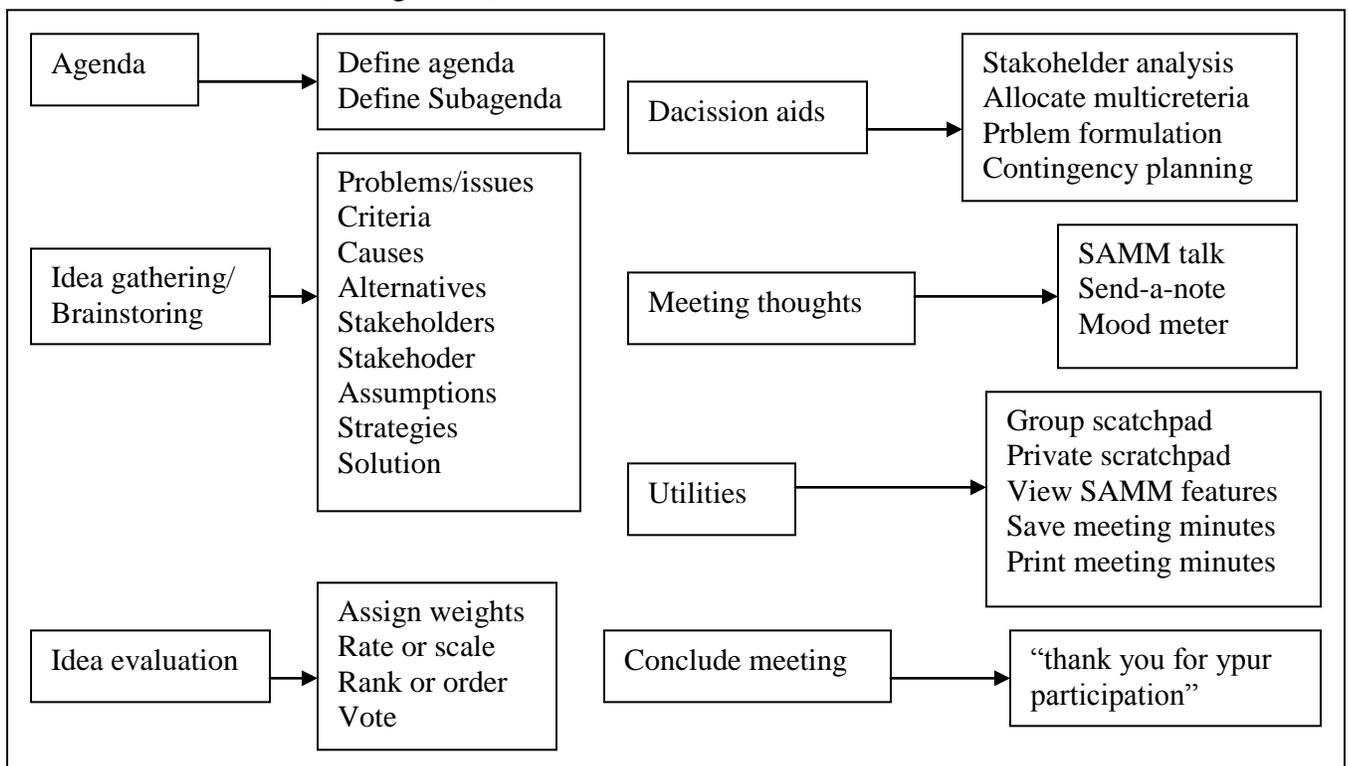
The Solution

GDSS is a new technology that could support the various activities carried out by the members of the group, the leader, and the facilitator (see Table 9.1). GDSS offers teams the potential to reduce their effort in applying quality improvement methods by providing autometed means to enter, record, and operate on team member's ideas during face-to-face meetings. Specifically, support is provided to idea generation (brainstroming), GDSS helps to reduce many of the negative phenomena of teamwork (e.g., fear to express ideas). Finally, the technology provides extensive documentation on team meetings and decision procedures.

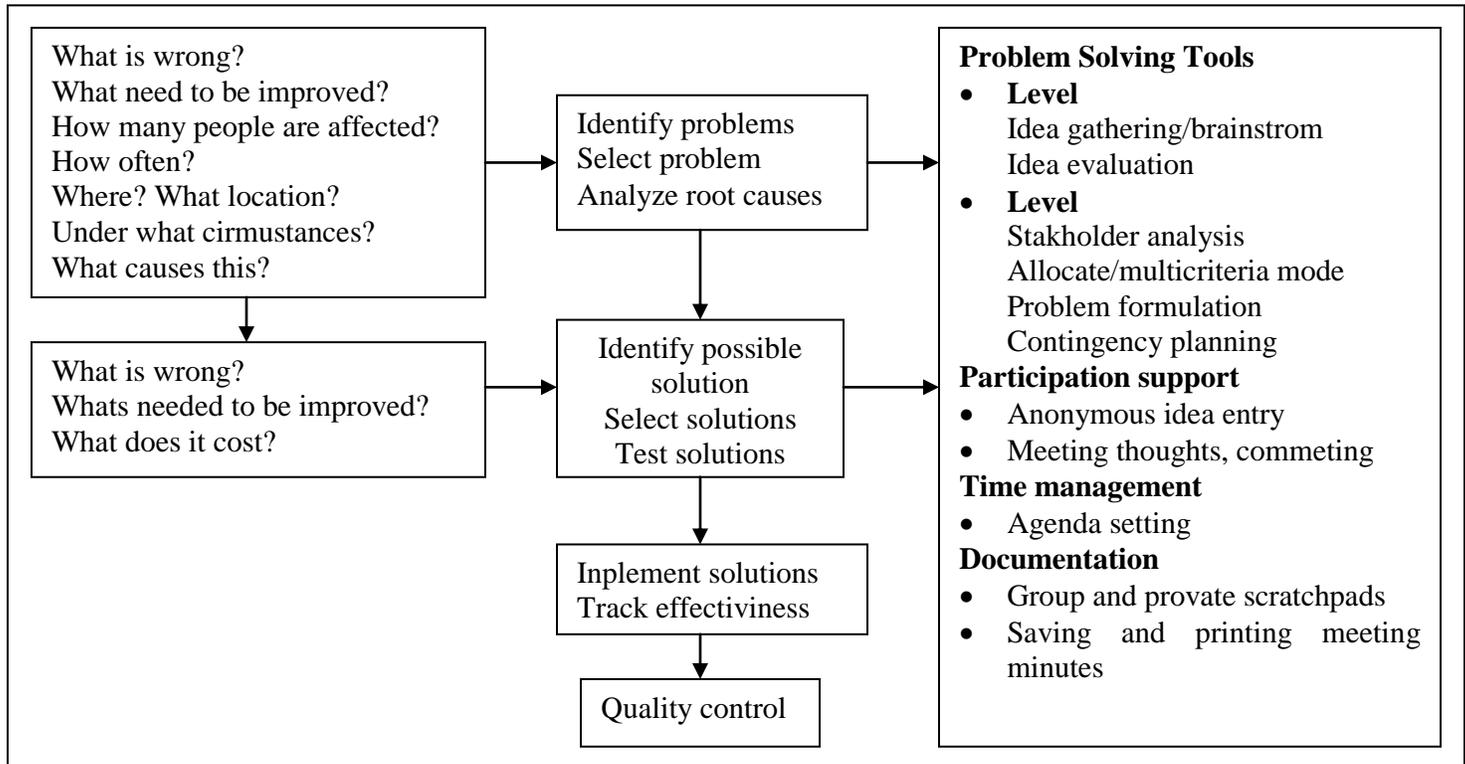**TABLE 9.1** The Decision Support Needs of the Quality Teams

Quality Team Roles and Responsibilities	Decision Support Needs
Members: Identify problem Generate and avaluate ideas Develop and implement solutions Leader : Plants meetings Coordinates team progress Facilitator: Promotes use of problem-solving techniques Encourages consensus building Server as a liaison between team and quality Streering committee	Access to group problem –solving Techniques Methods for encouranging open participation by all members Efficient use of team meeting time (for example, agenda management) Documentation of team decision-making processes and outputs

Implementation

GDSS started as research projects in some universities. Special laboratories were built durig the late 1980a in several universities, including the University of Minnesota. Thr IRS case started in 1988. At that time there was no commercially available hardware and software on the market. Therefore, it was necessary to bring the participating team members so the GDSS facility at the University of Minnesota. (Called SAMM for Software – aided Meeting Management [see figure 9.1]; the details of some of the seven modules of this or similar software will be described later.) Team leaders and members were trained to use the software, and were shown how to enhance the quality improvement process by using several features of SAMM (see figure 9.2).

Agenda	→	Define agenda Define Subagenda		Dacission aids	→	Stakohelder analysis Allocate multicreteria Prblem formulation Contingency planning
Idea gathering/ Brainstoring	→	Problems/issues Criteria Causes Alternatives Stakeholders Stakehoder Assumptions Strategies Solution		Meeting thoughts	→	SAMM talk Send-a-note Mood meter
				Utilities	→	Group scatchpad Private scratchpad View SAMM features Save meeting minutes Print meeting minutes
Idea evaluation	→	Assign weights Rate or scale Rank or order Vote		Conclude meeting	→	"thank you for ypur participation"

What is wrong?
What need to be improved?
How many people are affected?
How often?
Where? What location?
Under what cirmustances?
What causes this?
	Identify problems
	Select problem
	Analyze root causes
		Problem Solving Tools
		• **Level**
		  Idea gathering/brainstrom
		  Idea evaluation
		• **Level**
		  Stakholder analysis
		  Allocate/multicriteria mode
		  Problem formulation
		  Contingency planning

What is wrong? Whats needed to be improved? What does it cost?	Identify possible solution Select solutions Test solutions	**Participation support** • Anonymous idea entry • Meeting thoughts, commeting **Time management** • Agenda setting **Documentation** • Group and provate scratchpads • Saving and printing meeting minutes
	Inplement solutions Track effectiviness	
	Quality control	

Figure 9.2   enhancement of the Quality Improvement Process by Using SAMM. Reprinted by premission of G. DeSanctis et al [12]. Copyright 1991 the Institute of Management Sciences.

Fundamentals of GDSS

The case of the quality improvement teams introduces some of the features of group decision making ang GDSS. Specifically :

1. *Groups.* The term "group" (or work group) refers to two or more (usually up to about twenty-five) individuals whose mission is to perform some task and who act as one unit. The group can be permanent or temporary. The group can be in one location or in several location, and it can meet concurrently or atdifferent times. A group can be a committee, a review panel, a task force, an executive board, a team, or a permanent unit.

2. *The Naturew of Group Decision Making.* Although most business organizations are hierarchical, decision making is usually a shared process. Face-to-face meetings among group of managers are an essential element of reaching a consensus. The group may be involved in a decision or in a decision-related task like creating a short list of acceptable alternatives or deciding by the following activities and processes:

- Meetings are a joint activity, engaged in by a group of people, usually of equal or near equal status, typically involving five to twenty-five individuals.
- The outcome ofm the meeting depends partly on the knowledge, opinions, and judgmentsof its participant.
- The outcome of the meeting also depends on the composition of the groups and on the decision-making process by the group.
- Differences in opinion are settled either by the ranking person present or, more often, by negotiation or arbitration.

| DM_1 | DM_1 | DM_1 | DM_1 | DM_1 |

| DM_1 | Organization decision-maiking process | DM_1 |

| DM_1 | DM_1 | DM_1 | DM_1 |

Dialog Generation and Mangement System (DGMS)

Model Base Management System(MBMS)

Database Management System (DBMS)

Dialog generation tools

Model base tools

Database tools