

Improving Technical Knowledge Through Study Groups

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The Study Group Concept

The study group (SG) concept is a relatively simple one that offers significant benefits for you, your peers and your company as a whole. The idea is to form a group of six to ten people, pick a book, define a reading schedule and meet once a week to discuss what you've read. Study groups provide enough structure to help you read and digest books and other information better than you would on your own. Yet, SGs don't require as much time or involve as much pressure as a formal class. It's a way of fostering your own professional development and keep up with new technology. As Warren Keuffel points out, you can't always count on your company to provide the training that you want or need:

"Engineers should recognize that professional and team development is by nature, and often by organizational default, an activity for which individual engineers need to take responsibility. If you're the kind of engineer who expects your company to train you with whatever skills you require for well-rounded professional growth, you may be unpleasantly surprised when the time comes to shop those skills around to other shops."[1]

Your company inherently benefits from software practitioners improving their skills through study groups. However, an ongoing study group program is required for your company to realize significant short-term and long-term benefits. A study group program is similar to a training program. It provides an infrastructure that makes it possible for a large number of people to participate in study groups on a regular basis. When widespread acceptance of study groups occurs, the following benefits are likely to result:

- improved morale
- better skills applied on projects
- technology insertion and dissemination
- an environment where continuous learning and improvement are the norm.

In addition, the infrastructure that a study group program provides makes it easier for an individual to form a study group on the topic of his or her choice. This is due in part to peer pressure that results from hearing about all the reading and learning that other software practitioners are doing. A study group program also encourages management support. Once

upper and middle management see that software practitioners are taking the initiative to continuously learn and improve, the company is likely to support study groups in ways that makes study groups more cost-effective for the participants. Support may include funding for books, providing lunch for study group meetings or allowing study groups to meet on company time.

This has been the case at Raytheon E-Systems Falls Church Operations (REFC). Over two hundred software practitioners (roughly half of all software practitioners) regularly participate in study groups and have done so since 1994. Figure 1 summarizes our experience in terms of the number of participants per round of study groups. The term *round of study groups* is used because we typically start several study groups at the same time. Table 1 lists the topics that we've studied and how many people participated in study groups on each since 1994. The company supports study groups by providing lunch for study group meetings and paying for the books. The books are company property, but the study group members can use books as their own as long as they are with the company. The meeting time and individual reading are done on the participant's own time. The company spent \$19,400 on books and \$23,700 for study group lunches in 1996. However, the biggest cost of study groups is the participant's time. Software practitioners at REFC invested approximately 8,800 hours of their own time on study groups in 1996.¹

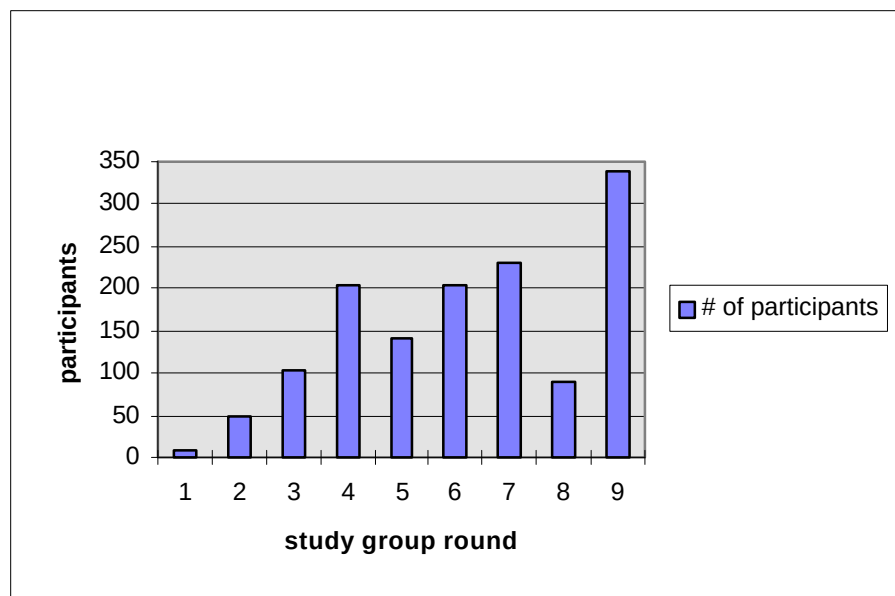


Figure 1. Growth of Study Groups

While many people have contributed to establishing a study group program at REFC, I introduced study groups and led the development of an ongoing study group program. Someone like you will have to do the same in your organization in order to establish a study group program. This paper describes our experience with study groups for the purpose of

¹ This estimate assumes that 75% of the number of people who joined study groups actually participated and that each participant spent 2 hours per week reading and one hour per week in a study group meeting.

helping you consider how study groups might work for you. The first section describes the steps that we went through to develop a study group program and how our study group program currently works. While every organization is different, our experience can serve as a template for getting started. The next section provides lessons learned about how to run a study group. The last section describes lessons learned about how to introduce study groups and lead the development of a study group program.

Table 1. Study Group Topics

Topic	Number of Participants
HTML	181
Digital Signal Processing	139
Java	130
TCP/IP	125
Software Engineering	80
Object-Oriented Design	74
C++	61
World Wide Web	61
Ham Operator's License	57
Unix Administration	56
Firewalls	48
Personal Development	44
Unix Internals	40
Perl	32
Electronics	26
C Programming	23
Network Administration	22
CORBA	22
Database Design	20
IDMS Programming	18
Linux	16
ATM	15
Intronet	12
ISO 9000	10
Software Testing & Metrics	9
CODARTS	9
UML	7
Software Reuse	7
TCL & Tk	7
Verilog Language	7
Software Requirements	6
User Interface Design	5

STUDY GROUPS AT REFC

The origin of study groups

I learned about study groups through two forums on Compuserve -- the CASE forum and the SDFORUM forum. Compuserve forums are similar to Internet newsgroups in that people post messages and hold discussions online. Both forums regularly hold online study groups. An online study group is like an in-person study group except that participants communicate by posting messages in the forum. I participated in several online study groups before introducing study groups at REFC. However, I didn't consider introducing study groups at REFC until I read an article entitled "Pull Together!" by Warren Keuffel and Rich Cohen [2]. It discusses the benefits of running study groups in a business environment and provides some guidelines for getting started. After reading the article, I decided to try study groups at REFC.

The first study group

I started the first study group in October 1994 by broadcasting an e-mail inviting people to join me for a study group. Twelve people responded out of over three hundred software developers, eight of which actually participated in the first study group. We read and discussed "The Practical Guide to Structured Systems Design" by Meilir Page-Jones. We read twenty to thirty pages per week. The study group ran from October 1994 through February 1995. However, we only met fourteen weeks skipping a few weeks for holidays. For the majority of the fourteen weeks, about six people actually attended the meetings.

The first round of study groups

After the first study group, I broadcast another e-mail invitation to study "Object-Modeling Technique" by James Rumbaugh. This time, I received twenty-two responses. More than ten people is usually too many for a single study group; so, I split the group into two study groups. I had suggested the Rumbaugh book partly because I had a better chance of people joining the study group since object-oriented design is a hot topic. However, I had studied the book before in a class, and I wasn't particularly interested in studying it again. What I really wanted to study was Software Engineering: A Practitioner's Approach by Roger Pressman. Before the Rumbaugh study groups started, I broadcast another invitation to join a study group on Roger Pressman's book and received 32 responses. We ended up with two study groups on Rumbaugh and three study groups studying the Pressman book. The Pressman book is over eight hundred pages long. We decided to study only section III (software design) so that we could finish the study group in ten weeks. I asked a person in each group to be the study group coordinator. I was a coordinator for one of the Pressman study groups. I wasn't directly involved in the other study groups once they got started. These study groups started in March 1995 and ended in May and June of that year.

Forming a working group

After the 1st round of study groups, a major change took place that led to the development of an ongoing study group program. The Software Study Group Support Group (SSGSG) was formed as a technical working group under the Software Engineering Process Group (SEPG). The SSGSG consists of seven software practitioners, including myself, who

want to see study groups continue at REFC. Our charter is to “foster software related study groups.” The SSGSG defined the current study group program and continues to manage and improve the study group program.

Forming a working group was a key step in developing a study group program. If a study group program was going to be established, we needed a working group to be the driving force behind it and to take responsibility for making it a success. Until this point, I didn't have any plans to establish a division wide study group program. In fact, I was not the one that instigated the formation of the working group. Bruce Dautrich, who is the director of software development and a member of the SEPG, encouraged me to form the working group. Bruce had the foresight to see that study groups were useful and that we needed a working group to support study groups if study groups were going to continue.

Current Study Group Program

The major aspects of our current study group program are as follows:

- the SSGSG periodically initiates a round of study groups
- the process of organizing and running a study group
- use of the World Wide Web (WWW) to automate the administrative work of running a study group as well as to disseminate information about study groups.

Each of these items is described in the following subsections.

Initiating a round of study groups

Until January of 1997, the SSGSG initiated a round of study groups two to three times per year. We recently developed a standard study group schedule consisting of two rounds of study groups per year (see Figure 2). This makes it easier for software practitioners and for those of us in the SSGSG to plan for the next round of study groups. While the SSGSG initiates a round of study groups twice a year, anyone can start a study group at anytime. However, most study groups so far have been formed in response to an invitation from the SSGSG. Thus, periodically initiating a round of study groups appears to be important for maintaining high participation in study groups.

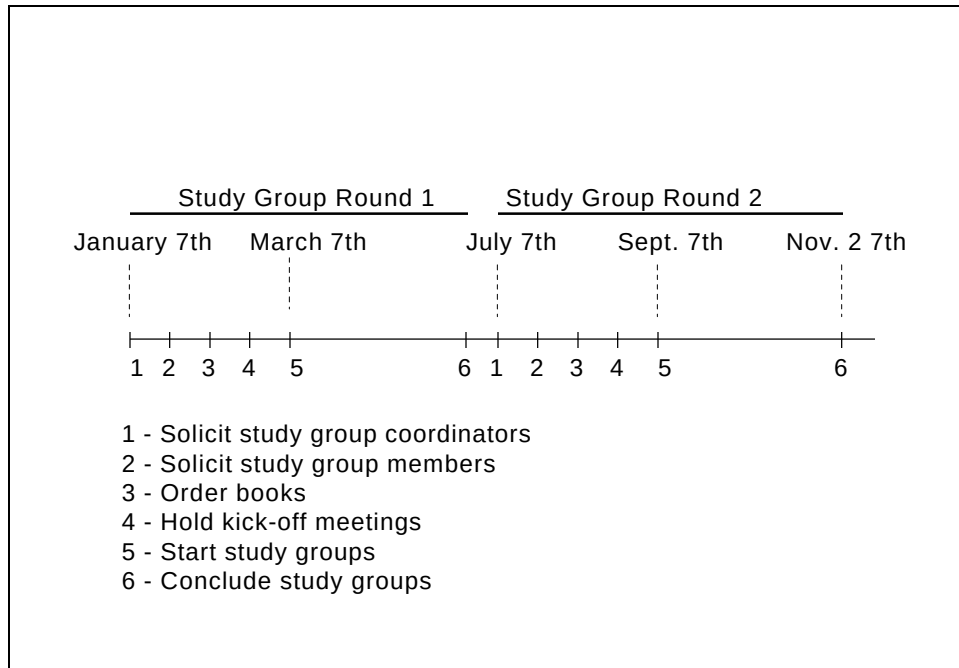


Figure 2. Study Group Schedule

We standardized on two rounds of study groups per year because our past experience indicated that a round of study groups takes approximately five months even though the duration of a study group is typically 8 - 10 weeks. Table 2 summarizes why this is. Basically, it's due to planning that has to be done before the study groups actually start. More details on the steps involved in organizing and running a round of study groups are provided in the next section.

Table 2. Why a Round of Study Groups takes 5 months

Solicit study group coordinators	2 weeks
Solicit study group members	2 weeks
Planning • Order books • Split into multiple study groups if necessary • Define reading schedule & meeting format • Hold kick-off meeting • Hold coordinator training session	4 weeks
Study group	8 - 10 weeks

Study Group Process

Figure 3 illustrates the process of forming and running a round of study groups. Each phase in the process is described in the following subsections.

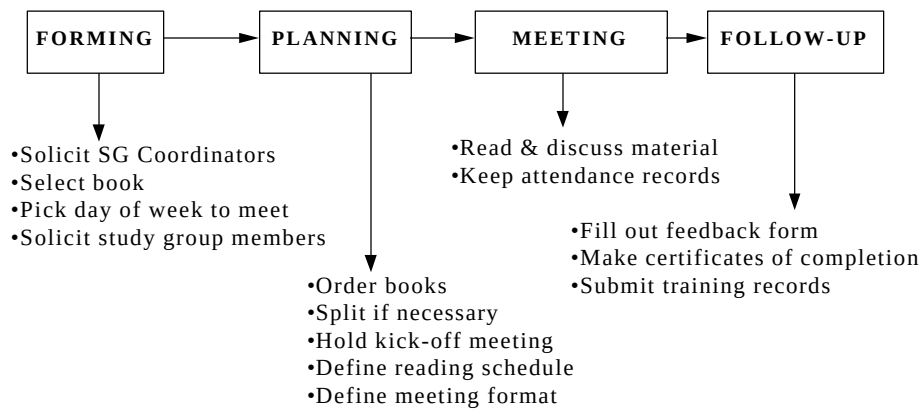


Figure 3. Study Group Process

Phase I; Forming

The SSGSG initiates a round of study groups by broadcasting an e-mail and voice mail invitation inviting people to organize a study group on the topic of their choice. We refer to the person that organizes a study group as a *study group coordinator*. Thus, this invitation is referred to as a *request for coordinators*. Between ten and twenty people usually respond. People can respond by phone, e-mail or by filling out a form on the SSGSG home page. After broadcasting the request for coordinators, we wait two weeks for responses. We broadcast a reminder a few days before the cut-off date. We usually receive several responses immediately after broadcasting the reminder.

We assign an SSGSG member to be the SSGSG *contact* for each SG coordinator. As SSGSG chairperson, I assign SSGSG members in a round robin fashion so that each of us is the contact for the same number of coordinators. When an SSGSG contact is assigned, that SSGSG member has an action item to contact the coordinator and let the coordinator know that he or she will be the SSGSG contact for the coordinator. The SSGSG contact should also ask the coordinator to let the study group members know that they can call the SSGSG contact if any issues come up during the study group that the SSGSG might be able to help with. The SSGSG contact doesn't have any other specific obligations after initially contacting the coordinator. However, the coordinator can call on the contact if any issues come up and they often do.

We ask each coordinator to provide us with the following information:

- what book he or she plans to study
- the day of the week on which the study group will meet
- a brief description of his or her plans for the study group.

The SSGSG puts this information together to make an invitation to join a study group. We then broadcast the invitation to solicit study group members. We allow two weeks for people to sign-up for one or more study groups. Again, we broadcast a reminder a few days before the cut-off date, and several people sign-up immediately after the reminder is sent.

Phase II; Planning

Once study group sign-up is closed, the individual coordinators order books through the company library. If too many people sign up for a study group, the original coordinator splits the group into multiple study groups and asks one or more individuals who signed up to be a coordinator for one of the new study groups. Whether or not a study group splits into multiple groups is up to the original coordinator. Six to ten people is typically a good size for a study group. It's often difficult to have a good discussion if there are too many or too few participants. An SSGSG contact is assigned to each of these new coordinators as well, with the action item to contact the coordinator so that the coordinator knows that the SSGSG contact is there if any issues come up.

Once study groups have formed and split into multiple study groups if necessary, each coordinator optionally holds a kick-off meeting for his or her study group. The kick-off meeting can be held before the books arrive. The purpose of this meeting is for the members to meet each other and to discuss logistics such as reading schedule, duration (i.e. number of weeks) and meeting format.

The SSGSG holds a coordinator training session during this phase. This has evolved from a lunch time get together between the SSGSG members and the coordinators, which we referred to as a coordinator luncheon, to a more structured training session. In fact, we are about to hold the first coordinator training session of the form that I'm about to describe. The training is a 1.5 hour lunch time session with lunch provided by the company. The format is a panel discussion. Three experienced coordinators each give a fifteen minute presentation followed by a panel discussion. The three coordinators are the panelists. The panel fields questions from the audience. We also have a moderator to keep the discussion moving. I expect this to be a fun and effective way to share lessons learned for the purpose of helping new coordinators.

Phase III; Meeting

Once planning is complete and the books arrive, each group proceeds at its own pace. Study groups typically meet once a week from 11:30 to 1 for eight to ten weeks. Participants should plan to spend between one and three hours reading each week, and come to the meeting with at least one question or comment about what they read.

Several study groups have found it useful to recruit a *topic expert*. A topic expert is someone who is knowledgeable in an area that is being studied in a study group and acts as a

consultant to the study group. Here's some comments from study group feedback results that indicate how useful it is to have a topic expert:

"Always spend at least one of the study group weeks bringing in experts in the subject, or viewing related subject material either via videotape or presentation. I found the presentation by Mark and Tracey in this study group was a good practical example of using what we were discussing and learning."

"Study Groups really need at least one person in the group who has some knowledge of the topic. Otherwise, the group can spend a lot of time floundering around."

"We got Rational Software involved in the study group and that has made it quite enjoyable. With Ed Eykolt and Hank Jiles doing the presentations for our group and helping us out with Rational Rose's use in analyzing some of our C++ code made the study group very valuable. E-mail interchanges with Grady Booch and Jim Rumbaugh were also exciting. I would recommend that other groups consider bringing in subject matter experts (even in-house experts) to help with difficult concepts and/or the latest technologies."

"Study groups suffer from a lack of expertise in the subject area. The book is the group's only expert, and unfortunately it is mute when asked a question."

"I think that study groups are much more effective if they include someone who has some knowledge of the subject. Sometimes study groups can turn into the blind leading the blind."

"Broadcast a message to solicit for "experts" to bring in occasionally. The group I was in this time already had a number of experts, but I've heard about other groups that could have used some help."

A study group may ask a topic expert to come to a study group meeting to answer questions and provide additional insight. Better yet, some study groups manage to have a topic expert join the study group.

Phase IV; Follow-Up

At the end of a study group, the members fill out a feedback form on the SSGSG home page. In addition, the coordinator submits information to the training department for training records and requests certificates of completion for the study group members who have completed the study group. Completing a study group is defined as attending at least 75% of the study group meetings. However, the study group coordinator can make exceptions to this rule.

Use of the World Wide Web

The SSGSG has taken advantage of the world wide web to automate the administrative work of running study groups as well as to disseminate information about study groups. We've found the WWW to be very helpful in this respect. In fact, there's been talk of adapting what we've done to automate the administrative work of the division's overall training program.

One of the members of the SSGSG, Chuck Eby, has developed the SSGSG home page on his own time and his own initiative using HTML and Perl. Here's a list of some of the most notable features:

- online sign-up to be a study group coordinator
- online sign-up to join a study group
- display information about the current study groups
- display information and statistics about past study groups
- submit study group feedback forms online
- view graphs that are automatically created from feedback results
- view comments on books from past study groups
- view study group guidelines.

These features allow the SSGSG to provide services that we wouldn't be able to provide otherwise. Online sign-up makes it much easier for us to keep track of study groups. Statistics such as how many people are currently in study groups and what they are studying would be hard to keep up to date if people didn't sign-up online. Responses to open ended questions on feedback forms are automatically grouped together, which makes it easy for the SSGSG to analyze the results. Comments on how well the study group members liked a book are grouped together and a search feature is provided to allow someone who is considering starting a study group to easily access comments on a given book from all past study groups that used the book.

The latest feature is the ability to maintain attendance records online, and to request certificates of completion online at the end of the study group. Besides making it easier for study group coordinators, this allows the SSGSG to keep better records. We will be able to track how many people sign up for study groups compared to how many people complete study groups.

The SSGSG Home Page is not accessible outside of REFC. However, we would be glad to send you a copy of the software. Contact Chuck Eby (ceby@fallschurch.esys.com) if you'd like a copy.

RUNNING A STUDY GROUP

This section presents lessons learned about running a study group. The following topics are covered:

- Splitting into multiple study groups
- Making decisions in a group
- Two types of study groups
- Producing tangible outputs
- Productive study group meetings.

Splitting into multiple study groups

When splitting a study group into multiple groups and recruiting new coordinators, asking for volunteers doesn't work very well. The participants feel uncomfortable about signing up for something that no one else seems willing to do. The method that has worked best for me is for the original coordinator to contact each person individually. The coordinator should explain the situation and ask the individual if he or she would consider being a coordinator for one of the new study groups.

Making decisions in a study group

New study group coordinators often try to make all decisions in a democratic fashion, i.e. by soliciting opinions and then voting. While no one wants to come across as a dictator, it often works better for the coordinator to suggest a course of action and then adjust the approach according to feedback from the study group members. For example, it often works best for the coordinator to suggest approaches to the following issues:

- the reading schedule, i.e. how much and what to read each week
- the duration of the study group
- select a book
- how many study groups to split into
- meeting format.

Making these decisions as a group is time consuming. In my experience, study group members are often glad for the coordinator to decide these things. Study group members are often amenable to anything that improves the effectiveness of a study group without putting pressure on the study group members. The study group members are ready to start the study group and making these decisions as a group slows down the process.

Two types of study groups

Study groups tend to fall into two categories depending on the topic being studied. Study groups on topics such as project management, software requirements and software design focus on exploring different points of view. Study groups on more technical topics such as HTML, C++ and digital signal processing tend to focus more on doing exercises and use the book as a reference. As a result, the dynamics of each type of study group are somewhat different. For example, an exercise oriented study group may work well with more

than eight or ten participants because there isn't as much to discuss. Either you understand it or you don't. The benefit of the study group is in helping each other understand the technology. Over eight or ten people in a discussion oriented study group is less likely to work because it's hard to have a good discussion with this large of a group.

Producing tangible outputs

My experience has been that study group members are often eager to produce outputs, but it's easier said than done. At the beginning of almost every study group I've been in, we've decided that we would like to produce some sort of output such as a bullet list of key points, suggestions to management, a presentation or a white paper. However, we've had limited success in doing so. One of the reasons that outputs are not produced is that there isn't enough time to work on outputs while studying the book. Once the study group is over, there isn't much incentive to work on outputs. While producing a bullet list of key points seems straight forward and shouldn't require much effort outside of the regular study group meetings, we haven't had much success in this area either. It's my opinion that producing a list of key points hasn't worked because:

- There's no clear benefit to making a list of key points
- It's hard to stop the flow of the meeting to collect key points.

I still believe that there is a lot of potential for producing tangible outputs that would benefit the study group members and the company as a whole. I also think that it requires developing techniques for running a study group that provide enough structure to allow this to happen without adding a lot of overhead to the study group.

Effective study group meetings

We've found that some structure to the meeting format is often useful. Like any meeting, it's easy for a study group meeting to get off-track and be a waste of time. All meetings should have an agenda even if it's as simple as "discuss chapter 6." Several study groups have defined roles similar to the roles in software inspections. Warren Keuffel wrote an article in the February 1997 edition of Software Development Magazine about how software inspections and study groups could complement each other [3]. The Inspection techniques improve the effectiveness of the study group, and the study group participants get an opportunity to learn about Inspection techniques in a low pressure environment.

I have developed a method that works well for discussion oriented study groups. The key is to define roles so that different members take responsibility for certain aspects of the meeting and to provide a framework that helps keep the meeting on track. The framework is simply to agree up front that the focus of the meeting will be *on identifying and recording key points*. A key point is a relatively short, often cryptic statement that summarizes what you learned from the reading. Focusing on key points helps keep the meeting on track and serves as a reference to help the members retain what they learn. We have company internal Internet newsgroups where we post our list of key points after each meeting. This allows us to share our key points with others. The key points may or may not make sense to people who are not in the study group. That's OK. People can ask the study group members for more information if they are interested. A list of key points from a one hour study group meeting

may be relatively short (between 3 and 10 items). That's OK too. It's better to having a few meaningful statements than a long list that no one cares to read.

The roles that are involved are: discussion leader, recorder, and timekeeper. A different study group member takes each role each week. The SG coordinator defines a schedule for who plays which role when and gets agreement on it during the kick-off meeting.

The discussion leader is similar to what's referred to as the *presenter* or *reader* in software Inspection methods. The discussion leader defines an agenda and reviews the agenda with the group at the beginning of the meeting to get agreement on it. Throughout the meeting, the leader keeps the meeting moving and ensures that everyone knows where we are relative to the agenda.

The recorder's job is to record key points and distribute them after the meeting. The key points should be recorded verbatim. The recorder inherently plays the role of moderator to some extent. The recorder can help keep the meeting on track by challenging people to summarize a point into 10 words or less. It's appropriate for the recorder to do this since the group agreed to the goal of collecting key points. In fact, the other members may be disappointed if this doesn't happen since they have agreed and in a sense committed to this goal -- members will want to achieve what they set out to do.

The timekeeper's job is to notify the group when it's time to start the meeting and when it's time to stop. If the agenda has been defined with specific time limits, then the timekeeper will notify the group when each time limit is reached. However, the timekeeper should not try to make the group stick to the time limits. That's the discussion leader's job, and there will be cases when it doesn't make sense to stick to the time limits. The timekeeper's job is simply to make the group aware of when a planned time limit has been reached.

ESTABLISHING A STUDY GROUP PROGRAM

This section presents lessons learned about introducing and leading the development of a study group program. Establishing a study group program is important for the long-term success of study groups in an organization. A prerequisite for doing so is that an enthusiastic champion takes responsibility for making it happen. If you are considering introducing study groups at your organization, then you are a likely candidate for this role. This has been my role although I didn't realize it when I started the first study group. The lessons learned presented here will help you decide if this role is right for you and how to get started.

How to get management support

The most important thing that you can do to get management support for study groups is to be an enthusiastic, determined champion for study groups. Gilb and Graham, in the book *Software Inspections*, report that the 3M Company has the following rule:

*A 'good' idea without a champion -- 'not approved'.
An idea with a self-appointed enthusiastic champion -- 'give it a try'.
(p. 204)[4]*

When I started the first study group, I did not plan on soliciting management support. In fact, I didn't see a need for management support. I assumed that we would meet on our own time, buy our own lunch and buy our own books. Fortunately, I received management support without trying.

Several managers have supported study groups one way or another. However, one manager in particular has taken the time and energy to get and maintain management support for study groups from the beginning. I refer to this person as the *management champion*. Our management champion is a person at the director level named Bruce Dautrich. When I started the first study group, Bruce called me and told me that he thought this was a great idea and offered to provide lunch and books for the study group. Bruce instigated the formation of the SSGSG. Bruce has also encouraged upper and middle management to support study groups. The positive perspective on study groups from upper and middle management is important because it helps establish study groups as a legitimate form of learning and encourages people to participate in study groups.

Getting and maintaining management support has been much easier than I could have imagined. The key was finding a management champion who would take responsibility for getting and keeping management support, and all I had to do to find a management champion was demonstrate initiative, enthusiasm and determination.

Making a commitment

It's important to consider closely how much commitment and responsibility you are assuming when you introduce study groups and as the study group program develops. When I started the first study group, I did not have plans to develop a study group program and help others form their own study groups. I'm glad that I did. However, I've often underestimated the time and energy that it would take as well as the stress involved. It's not necessarily an overwhelming burden and it's been rewarding in many ways. However, I wish that I would

have understood what I was getting into at every step of the way so that I could plan for it better.

Once you introduce study groups, you will soon feel responsible for the success of the overall study group program. This leads to additional time commitments for helping others form and run their own study groups and developing an infrastructure to support study groups. Once you've introduced study groups and gotten some level of management support (e.g. funding for books and lunches), you will feel that your peers as well as management are watching to see what you can achieve. You may feel at times that you are too busy or it's too much responsibility and you want to get out of being the champion. However, that's hard to do because others have already made a commitment to something that you started.

On the other hand, you will be given quite a bit of the credit for establishing a study group program which benefits your peers as well as the company and you will learn important management and leadership skills. The key is to learn to recognize when you are taking on more commitment and responsibility so that you can better plan for it.

Leading a working group

The SSGSG has been the driving force behind our study group program. A working group similar to the SSGSG will likely be an important part of establishing a study group program in any organization. If you are the one that introduces study groups, you are a prime candidate to lead this working group. Here's some of the techniques that I found to be effective for running a working group:

1. Assign action items (i.e. ask someone to do something, if they agree then the action item has been assigned). Keep track of the status of the action item until it is complete. One way to do this is to ask for each person to report the status of his or her action items during a working group meeting. E-mail may work too. This also means that you have to keep a list of action items, who they are assigned to and the current status of each.
2. Work on things that at least a couple people in the group are willing to commit some time to. If you want to get something done, but no one else will commit to doing any work in that area, then consider closely whether or not it is really important enough to you to make the commitment to do the work yourself. If no one else thinks it is important enough for them to take some responsibility for it, then it might not be such a good idea after all. Consider also that you can get burned out.
3. Have an agenda for each meeting. An agenda with only two or three items for a one hour meeting works well for me. Review the agenda at the beginning of the meeting and make changes as necessary before proceeding with the meeting. Once the meeting starts, work hard to keep the meeting on track relative to the agenda. Once people agree to an agenda, they expect it to be followed and the person leading the meeting is responsible for making that happen.

THE POTENTIAL OF STUDY GROUPS

Study groups are an excellent way to keep up in the fast paced world of software development. Study groups are unique in that they are self-directed learning with enough structure to make them work. Reading a book on your own is also self-directed learning. However, you are more likely to finish a book in a study group because of the subtle peer pressure that comes from meeting with others on a regular basis. Furthermore, you will learn the material better than you would on your own due to the group discussions.

SGs provide the intangible benefit of networking. You'll get to know people in the company that you might not meet otherwise. As a result, you will have better insight into what is going on within the company. One of the most satisfying benefits of networking for me has been seeing all of the energy and potential in others. Seeing this has increased my respect for my coworkers and given me a better feeling about the company as a whole. Study group feedback results indicate that I'm not the only one that sees this effect. Here's one example:

"I had approached the job of coordinator for this group with some trepidation, since I had never met most of the members of the group. Over time, however, I found myself enjoying the meetings. The people who stayed with the group till the end impressed me with their intelligence and enthusiasm, and I think this company is very fortunate to have them working here. The opportunity to interact with my peers more than made up for the hassles of being a coordinator."

Study groups have worked for us and they can work for you. It's a matter of picking a book and inviting some friends to join you. However, someone has to take the initiative to introduce study groups and lead the development of an ongoing study group program. When employees take initiative and management provides support, study groups are likely to spread and make the workplace more efficient, more productive and more pleasant.

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About the Author

Nathan is a software practitioner at Raytheon E-Systems Falls Church with eight years of experience in software design for real-time and embedded systems. He holds a Master's degree in computer science from George Mason University. Nathan is an active member of the peer reviews technical working group and is the chairperson of the Software Study Group Support Group (SSGSG).