
Proposal for Organizing the SBML Development Process

Michael Hucka, Andrew Finney
{mhucka,afinney}@caltech.edu
Systems Biology Workbench Development Group
JST ERATO Kitano Symbiotic Systems Project
Control and Dynamical Systems, MC 107-81
California Institute of Technology, Pasadena, CA 91125, USA
<http://www.cds.caltech.edu/erato>

Principal Investigators: John Doyle and Hiroaki Kitano

DRAFT 9 May 2003

1 Introduction

An intrinsic aspect of SBML's development has been the adoption of a participative, community-led approach. The Caltech ERATO Kitano team has actively sought the input of other interested parties in refining and evolving SBML. As a result, most of the features introduced in SBML Level 2 and currently planned for SBML Level 3 were originally proposed by various groups in what is informally known as the *SBML Forum*, the community of users and developers interested in SBML.

The SBML development process so far has been highly informal. There are no rules for membership in the SBML Forum, no formalized procedure for proposing changes to the language or incorporating them and ratifying them, no guidelines for resolving conflicting demands. Although this approach sufficed when SBML development first began and the community of users was relatively small, the size and diversity of the SBML user community has reached a point where more structure needs to be put into place. To ensure that SBML meets people's needs, the process of SBML language development must be open, systematic, transparent and capable of producing standards that are useful to the modeling community. At the same time, SBML should not end up controlled by the original development team. We want to ensure that SBML is an open resource that the entire community feels it has a stake in supporting.

To achieve these goals, our intent is to borrow ideas from successful organizations such as the W3C (the organization leading the development of standards such as HTML and XML), but apply them in a much simplified manner. The latter point is important because, although we believe the SBML development process needs to be more formalized, we also believe that keeping the organization and procedures as simple as possible will lead to greater success than imposing a ponderous new organization.

In this document, we propose an organizational structure to meet these needs. Under this proposal, the organization would be divided into two main groups: the *SBML Steering Committee*, responsible for coordinating activities and writing the final SBML specifications documents, and the *SBML Forum*, consisting of all individuals sufficiently interested in SBML to become members of the Forum mailing list and participate in activities. The SBML Forum itself would be organized into topic-oriented subgroups called *SBML Working Groups* whose members work on defining proposals for extensions and modifications to SBML. The Working Groups would follow a process essentially identical to the process stipulated for W3C Working Groups (Jacobs, 2001). The process is described in detail in Section 4.

2 The SBML Steering Committee

Broadly speaking, the SBML Steering Committee's role is to coordinate activities involving SBML, in particular the activities of the SBML Working Groups. One of the Committee's primary responsibilities in this regard will be to write the final, integrated SBML specifications based on input from the Working Groups. Membership in the SBML Committee will be voluntary, but members will be elected by the SBML Forum.

2.1 SBML Steering Committee Organization and Activities

The SBML Steering Committee will be responsible for the following:

1. Coordinating, moderating and managing an archived mailing list for the SBML Forum. This list will be the existing `sbml-discuss` list used for general SBML discussions.
2. Managing the web site for SBML, <http://www.sbml.org/>.
3. Coordinating the activities of the SBML Working Groups.
4. Organizing and managing biannual SBML Forum meetings.
5. Writing the final, integrated versions of SBML specifications, based on proposals formulated by the SBML Working Groups. This approach is intended to help produce better final specifications.
6. Performing fund-raising and other activities to fund the various aspects of SBML development as well as the biannual SBML Forum meetings and other needs.

2.2 SBML Steering Committee Membership Guidelines

1. The SBML Steering Committee will be comprised of three individuals.
2. The beginning and ending terms of members of the Steering Committee must be staggered, such that not all members' terms end at the same time. (This guideline is intended to provide some continuity across changes in Committee membership.)
3. The term of membership on the Committee will be two years. An individual may stay on the Committee longer if they nominate themselves for subsequent terms and are voted in by the SBML Forum. An individual may elect to leave the Steering Committee before the end of their term.
4. Persons interested in joining the SBML Steering Committee may officially nominate themselves by contacting the current Committee. All candidates will be considered for a position at the next opportunity when a sitting Committee member's term ends.
5. Membership on the Committee will be decided by a general election from among the nominees. The election will be carried out by electronic means. Only members of the SBML Forum will be allowed to vote, and each member of the SBML Forum will be allowed one vote.

3 The SBML Forum

Under this proposal, the SBML Forum would remain essentially unchanged, comprised (as it is today) of all parties who are interested in being actively involved in SBML's development. However, we propose to formalize how the SBML Forum introduces changes to SBML by recommending that members form special-interest *SBML Working Groups* focused on particular tasks, and that these groups follow the process used by Working Groups in the W3C, as discussed in Section 4. Each W3C Working Group has a charter delineating its purpose, goals, expected deliverables, and duration of existence and each has at least two members, one acting as chairman and a separate person acting as group contact. The W3C Working Group process is well defined and suits our purposes sufficiently well; by using this already-established process, we will save much effort and trouble inventing and debugging our own process.

3.1 SBML Forum Organization and Activities

1. The primary activities of the SBML Forum are:
 - Discussing SBML and its evolution. These discussions can be expected to raise issues in SBML, leading to calls for the formation of Working Groups to address the issues.
 - Creating Working Groups to propose and develop changes in SBML in response to needs; and
 - Collectively ratifying proposed changes to SBML arising from the Working Group process.
2. SBML Forum activities take place primarily over electronic mailing lists and in ad-hoc face-to-face meetings.
3. Twice per year, the SBML Forum will gather in a general meeting to discuss the status of SBML and various proposals, and to provide an opportunity for face-to-face meetings both in and out of Working Groups.
4. Changes to SBML must be ratified by the entire SBML Forum through an electronic voting process that is organized and managed by the SBML Steering Committee.

3.2 SBML Forum Membership Guidelines

1. Any individual may choose to join the SBML Forum. By doing so, the member agrees to abide by the guidelines of the SBML Forum and the SBML Working Group Process defined in Section 4.
2. Any institution may choose to join the SBML Forum; to do so, the institution must nominate one or more members who will act as representatives for the institution in the SBML Forum. The institutional representatives must abide by the same guidelines as individual members of the SBML Forum.
3. Every member of the SBML Forum must be a member of the `sbml-discuss` mailing list.
4. All members of the SBML Forum (individual and institutional) agree to allow their names to be disclosed publicly as being members of the SBML Forum and the `sbml-discuss` mailing list.
5. Forum members have the right to attend the biannual SBML Forum meetings.

4 The SBML Working Groups

SBML Working Groups are formed in response to a significant need identified by members of the SBML Forum. A Working Group should begin by assembling a set of models (preferably published) that cannot be represented in the existing version(s) of SBML without a critical loss of information. An SBML Working Group's primary deliverable will typically be a recommendation one of the following: (a) a change to SBML, (b) a new feature to be incorporated into a new level of SBML, or (c) a new separate standard that interacts with SBML. It will also be the Working Group's responsibility to provide an accompanying reference implementation of software that uses the proposed new SBML feature or change. This will help ensure the feasibility of the proposed change.

The following guidelines are largely taken verbatim (with some modifications) from the W3C's Working Group Process document (Jacobs, 2001).

4.1 SBML Forum Membership Guidelines

1. Each Working Group must have a *Chair* (or co-Chairs) to coordinate the group's tasks. The SBML Steering Committee appoints the Chair of a Working Group from among the members of that group.
2. Each Working Group must have a *Group Contact* who acts as an interface between the members of the group, the SBML Steering Committee, and the SBML Forum at large. This individual is responsible for ensuring that all Working Group members are on the Working Group's mailing list. The Group Contact and the Chair cannot be the same person; this restriction is to prevent Working "Groups" that are composed of only one person.

3. Each Working Group must have an archived mailing list for formal group communication (e.g., meeting announcements, objections to decisions, etc.).
4. A Working Group comes into existence when all of the following conditions are met: (1) the charter (see below) is defined and communicated to the SBML Steering Committee; (2) the SBML Steering Committee approves the charter and the formation of the Working Group; (3) the Group's archived mailing list is made operational; and (4) the initial Chair and Group Contact issue a call to the SBML Forum for participation in the Working Group.

The requirement that Working Groups be approved by the Steering Committee is intended to give the Committee a chance to ensure different Groups do not overlap in the goals as well as to ensure generally smooth activities in the SBML community.

The call for participation in a Working Group must include a reference to the charter for the Group, the name(s) of the Group's Chair(s), the name of the Group Contact, and instructions for joining the Group.

4.2 SBML Working Group Organization and Activities

1. Each Working Group must have a *charter*. The charter is a document that is communicated to the SBML Steering Committee and must explicitly state the following:
 - The Chair or co-Chairs of the Working Group.
 - The Group Contact.
 - The Working Group's mailing list address and archive.
 - The mission of the Working Group. The mission may be, for example, the definition of a specific new set of functionality for SBML.
 - The scope of the Group's work.
 - The lifetime of the Working Group.
 - The criteria for the Group's success. In other words, how exactly will everyone know when the Group has achieved its goals?
 - Quorum conditions for reaching decisions on issues with little support and substantial abstention during voting. A quorum condition is a stated minimum threshold of active support before a decision on a vote can be recorded. (See below.)
 - The nature of any deliverables, including the form of the deliverables and how they are to be, well, delivered. The deliverables will usually be a formal proposal document and a software implementation demonstrating the proposed SBML facility or feature.
 - Any dependencies of this Group on other entities. For example, the charter may state that another Working Group's output is expected before the Group can begin its work.
 - Instructions for joining the group. (These can be as simple as telling people to contact the Group Contact.)
 - Information about how the group will meet and how frequently. (See below for more information.)
2. After the charter is approved by the SBML Steering Committee and the Working Group has been officially started, the charter must be made public. At minimum, this can involve mailing the charter to the Group's mailing list. (A better approach would be to make the charter available from a web page dedicated to the Group.)

4.3 SBML Working Group Meetings

We distinguish two types of meetings: (1) a face-to-face meeting, where most of the attendees are expected to participate in the same physical location; and (2) a distributed meeting, where most of the attendees are expected to participate from remote locations by telephone, video conferencing, IRC, etc.

Table 1 lists requirements for organizing a meeting. Announcements of planned Working Group meetings should be sent to the `sbml-discuss` mailing list. Every meeting should have a record kept (as minutes). This record should be made publicly available after the meeting.

Activity	Face-to-face meetings	Distributed meetings
Meeting announcement (before)	8 weeks*	1 week*
Agenda available (before)	2 weeks	24 hours (or 72 hrs for Monday meetings)
Participation confirmed (before)	3 days	24 hours
Action items available (after)	3 days	48 hours
Minutes available (after)	2 weeks	48 hours

Figure 1: *Requirements for organizing an SBML Working Group meeting. *To allow proper planning (e.g., travel arrangements), the Chair must give sufficient advance notice about the date and location of a meeting. Shorter notice for a meeting is allowed provided that there are no objections from group participants.*

Face-to-face meetings should be held, when possible, at SBML Forum meetings. (They may of course be held more frequently than Forum meetings if the participants make suitable arrangements.)

4.4 SBML Working Group Voting Procedures

The SBML process requires Chairs to ensure that groups consider all legitimate views and objections, and endeavor to resolve them. Decisions may be made during meetings (face-to-face or distributed) as well as through email. The following terms are used in this document to describe the level of support for a group decision:

Unanimity All participants agree.

Consensus No participants object (but some may abstain).

Dissent At least one participant objects.

Where unanimity is not possible, the group should strive to make decisions where there is at least consensus with substantial support (i.e., few abstentions) from all participants. To avoid decisions that are made despite nearly universal apathy (i.e., with little support and substantial abstention), groups are required to set quorum conditions—minimum thresholds of active support before a decision can actually be recorded. The appropriate percentage may vary depending on the size of the group and the nature of the decision.

In some cases, even after careful consideration of all points of view, a group may find itself unable to reach consensus. When this happens, if there is a need to advance (for example, to produce a deliverable in a timely manner), the Chair may announce a decision to which there is dissent. When deciding to announce such a decision, the Chair must be aware of which participants work for the same (or related) member organizations and weigh their input accordingly. When a decision must be reached despite dissent, groups should favor proposals that create the least strong objections. This is preferred over proposals that are supported by a large majority of the group but that cause strong objections from a few participants.

The Chair decides when to resolve an issue in the face of dissent. In this case, a dissenter may request that any formal objections be reported at later review stages.

4.4.1 Issues Must Be Formally Addressed

In the context of this document, a Working Group has formally addressed an issue when the Chair can show (archived) evidence of having sent a response to the party who raised the issue. This response should include the Working Group’s resolution and should ask the party who raised the issue to reply with an indication of whether the resolution reverses the initial objection.

4.4.2 Formal Objections Must Be Archived and Reported

If dissenters say they can live with a given decision, this should be taken as an indication that the group can move on to the next topic, but the inverse is not necessarily true: dissenters cannot stop a group's work simply by saying that they cannot live with the decision. When the Chair believes that the legitimate concerns of the dissenters have received due consideration as far as is possible and reasonable, then objections must be recorded and the group should move on.

A formal objection should include technical arguments and propose changes that would remove the dissenter's objection; these proposals may be vague or incomplete. The Chair must report an objection that includes such information to the SBML Steering Committee at later review stages (e.g., in the request to the Steering Committee to advance a technical report to Candidate Recommendation). If an objection does not include this information, the Chair is not required to report it at later review stages.

During an SBML Steering Committee Review, Steering Committee representatives must be able to refer to archived objections.

4.4.3 The Chair May Reopen a Decision when Presented with New Information

The Chair may reopen a decision when presented with new information, including: additional technical information; comments by email from participants who were unable to attend a scheduled meeting; comments by email from meeting attendees who chose not to speak out during a meeting (e.g., so they could confer later with colleagues, for cultural reasons, etc.).

The Chair should archive that a decision has been reopened, and must do so upon request from a group participant.

4.4.4 Appeal of a Chair's Decision

Participants should always try to resolve issues within the group and should register with the Chair any objections they may have to a decision (e.g., a decision made as the result of a vote). When participants believe that their concerns are not being duly considered within the group, they may ask the SBML Steering Committee to confirm or deny the decision. The participants should also make their requests known to the Group Contact.

Any requests to the SBML Steering Committee to confirm a decision must include a summary of the issue (whether technical or procedural), decision, and rationale for the objection. All counter-arguments, rationales, and decisions must be archived. The SBML Steering Committee will make a decision on the matter by attempting to achieve consensus in the community, and give a written response.

4.4.5 Votes

Only after the Chair has determined that all available means of reaching consensus through technical discussion and compromise have failed, and that a vote is necessary to break a deadlock, should a group vote to resolve a substantive issue. In this case, the Chair must archive: (1) the decision to conduct a vote (e.g., a simple majority vote) to resolve the issue; (2) the outcome of the vote; and (3) any objections.

Working Groups may vote for other purposes. For instance, the Chair may conduct a "straw poll" vote as a means of determining whether there is consensus about a potential decision. Votes may also be used for arbitrary decisions. For example, it is appropriate to decide by simple majority whether to hold a meeting in San Francisco or San Jose; (there's not much difference geographically). When simple majority votes are used to decide minor issues, members of the minority are not required to state the reasons for their dissent, and the votes of individuals need not be recorded.

References

Jacobs, I. (2001). World wide web consortium process document. Available via the World Wide Web at <http://www.w3.org/Consortium/Process/>.