Designing Groups for Scratch: Conceptual Exploration

Sophia Yuditskaya
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Introduction

Scratch has great potential for social learning and collaboration, but no effective group structure to support these community-based activities. In its present state, the Scratch community can be described as a set of individuals with little connection to each other beyond the shared interest in making Scratch projects, which again, are primarily individual works. As one enormous single-layer collection of individuals -- both people and projects -- it is becoming increasingly evident in Scratch that its current state of affairs is not scalable as a community. Not only is it hard for users to find common interests in a vast sea of individual work, but also it is difficult for Scratch users to find an appreciative audience and meaningful feedback in response to their creative efforts.

A more well defined way for Scratch members to identify with each other would greatly facilitate social learning. Groups would give Scratch users a platform to organize themselves into meaningful sub-communities. When organized well, meaningful sub-communities naturally come together to form a more meaningful and scalable overall community. Besides building community identities through groupings across shared interests, Scratch members would be able to use this construct to create long-lasting affinity groups out of collaborative efforts [1].

In addition, one of the underlying motivations for members to keep creating Scratch projects and be active long-term participants in the Scratch community is understood to come from the personal need for self-expression. Scratch was thus developed to play at least two intrinsic roles: in addition to being a hands-on classroom for learning programming concepts in an accessible way, it is also an open (but safe) forum of self-expression. From this perspective, a formal platform for forming social groups would inspire Scratchers to think consciously about their identities; this would in turn encourage more purposeful self-expression.

The goal of this work is to develop a conceptual design of a group construct for Scratch that will remove the existing barriers to social learning and collaboration in the community by providing a formal setting and toolbox for these activities and connecting users with shared interests in a very well-defined way. All features in this work have been designed with primarily an audience of children in mind.

A Study of the Community of Practice

A Scratch group construct needs to be customized to the preferences, culture, and unique character of the Scratch "community of practice". In order for users to find it useful and relevant, any new feature must address the needs of the community and seamlessly integrate into the existing Scratch design. To this end, the User Suggestions section of the Scratch Forums proved to be a valuable resource for gathering information about what features and improvements Scratchers would like to have introduced into Scratch, and to get familiar with the perspective of the experienced Scratch user.

Browsing through the forums, it quickly became evident that Scratch users are looking for some sort of meaningful organization of projects and galleries, as well as a greater sense of connectedness with others in the Scratch community. One Scratch user named Toasty mentions how, if they want to create their own sub-communities and connect with other Scratchers, they are left to their own devices. Multiple users voice their agreement that the gallery system is out of control with too many new projects that often are unrelated to the theme of a design studio. Hierarchical organization by topic is mentioned as a possible solution by Scratch user Paddle2See. Another user, ashbyr1, expresses how individual creative efforts seem to get lost in the sheer vastness of the corpus of projects, never quite finding their way to an appreciative audience:

> "The worst feeling in the world is to pour your hard work and creativity into a project only to have it ignored completely by the Scratch community.   The problem is not that the Scratch community doesn't care...The problem is that we are all overwhelmed with the number of new projects. " -- ashbyr1

Scratch Critique Groups

Ashbyr1 goes on to propose the idea of forming themed "critique groups" using Scratch galleries, the only Scratch resource that currently makes this possible. In a critique group, users would be able to submit relevantly-themed projects and receive feedback, advice, and other commentary from an appreciative audience. In effect, the existence of a critique group associated with a specific theme would act as a magnet to collect a focused audience that shares this same niche interest. This idea by ashbyr1 was extremely well received, and many such ad-hoc critique groups have since been created across a variety of niche interests.

The use of galleries to form critique groups is not well suited for social learning, however. In the current setup, critiques are submitted as comments to the project webpage, and are therefore buried within the context of the individual project. The process of searching for critiques thus involves wading through project after project in a critique group gallery, checking to see if there is any feedback on the project webpage. Tedious as this is, it is even more difficult to find *meaningful* critiques. Worse yet, finding meaningful critiques that are *relevant* to a user's personal interests in the current gallery

setup of critique groups seems equivalent to the task of finding a needle in a haystack. Scratch users have expressed opinions that more generally confirm these problems that are observed with galleries:

> "Galleries are nice, but it would be easier to find the projects you want if people from the scratch team gathered some of the model projects and sorted them into groups. Then, you would have a good library of simulations, artworks, tutorials, ect (*sic*) without going through the hassle of looking though a bunch of galleries." -- archmage

Scratch Companies

One measure of the success of an idea within a community is when it becomes the equivalent of a "household word" in that community. In other words, the relevance of that idea is widely accepted by the community to such an extent that there is a collective agreement on a particular name to describe it. When a concept earns this status within the community, it becomes a defining element of the culture of that community. Critique groups are one example of this phenomenon.

Another such user-created, community-named cultural concept, precedent to critique groups, is the Scratch "company" [2][3], which evolved out of the collaborative efforts of Scratch users. A company comes into existence when two or more Scratch users decide to work together on a single project, each contributing content to the project according to their various areas of expertise. Collaboration being one of the core design principles of Scratch [3], it is no surprise that companies evolved despite the fact that Scratch does not provide any formal structure for collaboration. (To note, remixing is an individual activity, and does not formalize a collaboration.) Similarly to the case of critique groups, the only resource currently available to anchor "companies" within the Scratch environment is the ad-hoc adaptation of galleries.

Recently, a Scratch user by the name of JSO proposed adding a "co-work" feature to the Scratch environment that would implement a toolbox and formal structure for collaboration to support Scratch "companies". This idea was very well received, with users acknowledging the fact that it would make "companies" easier to handle and would take collaboration to a whole new level. Andres Monroy-Hernandez of the Scratch Team also approved, saying that he has added this feature idea to the long Scratch website to-do list.

Proposed Design

My proposed design lends a close ear to the voices of the community, and consists of three types of groups: Company Groups, Critique Groups, and Special Interest Groups. Inspired by the co-work feature idea, Company Groups are designed as a platform for collaboration on Scratch projects, with the goal of replacing the ad-hoc use of galleries as the formal home for the user-created cultural concept of Scratch "companies".

Critique Groups would establish themed sub-communities to which people can submit their creative work for viewing, feedback, and commentary by an appreciative audience, as the formal home for the user-created cultural concept of Scratch "critique groups". Special Interest Groups would be configurable to support a variety of other purposes, ranging from workshops that are focused around scheduled events to location-specific sub-communities of Scratch users seeking to connect and identify with each other.

All three types of groups would have a similar core structure. Components common to all group types would be a statement of group identity, a list of members, an admin hierarchy, some kind of communication platform, and a join/invite/leave interface. This design may seem familiar and intuitive, because it evokes the set of features that are widely used across various existing social networking and online group sites, such as Facebook, Ning, and Google Groups. In fact, the very reason that these features are so ubiquitous is precisely because they are the bare essentials that are necessary to define a group.

A group would have its own website in the Scratch environment, designed with a tabbed view similar to the recent redesign of Facebook profiles (Figure 1, Figure 5). Every group website would contain an Info tab, initially displayed on top by default, and a Membership tab. The Info view contains, among other things, the statement of group identity, rules and announcements, the list of admins by name and role, and a preview of the group members list. The Membership tab would present the complete list of members. The statement of group identity would be presented both pictorially, either through a photo or a Scratch project, and in written form, as a mission statement.

The communication platform of a group can be a forum, blog, or comment section, or any combination of these media. The group website would have a separate tab for any Forum or Blog that it maintains, while a comment section would be included in the Info page.

In the specific context of Scratch, I also envision groups as wrappers for the existing design gallery construct. Thus, every group would be able to create and maintain its own gallery of Scratch projects. A group gallery (or set of galleries) would be essential in the case of Company Groups and Critique Groups, but optional for Special Interest Groups. In terms of presentation, the group's Info page would contain a preview of the most recent Scratch projects in the group gallery, and the group's website would also include a Galleries tab that presents the full view.

Together, these three group types would thus implement the organization that the Scratch community finds lacking in galleries as they currently exist.
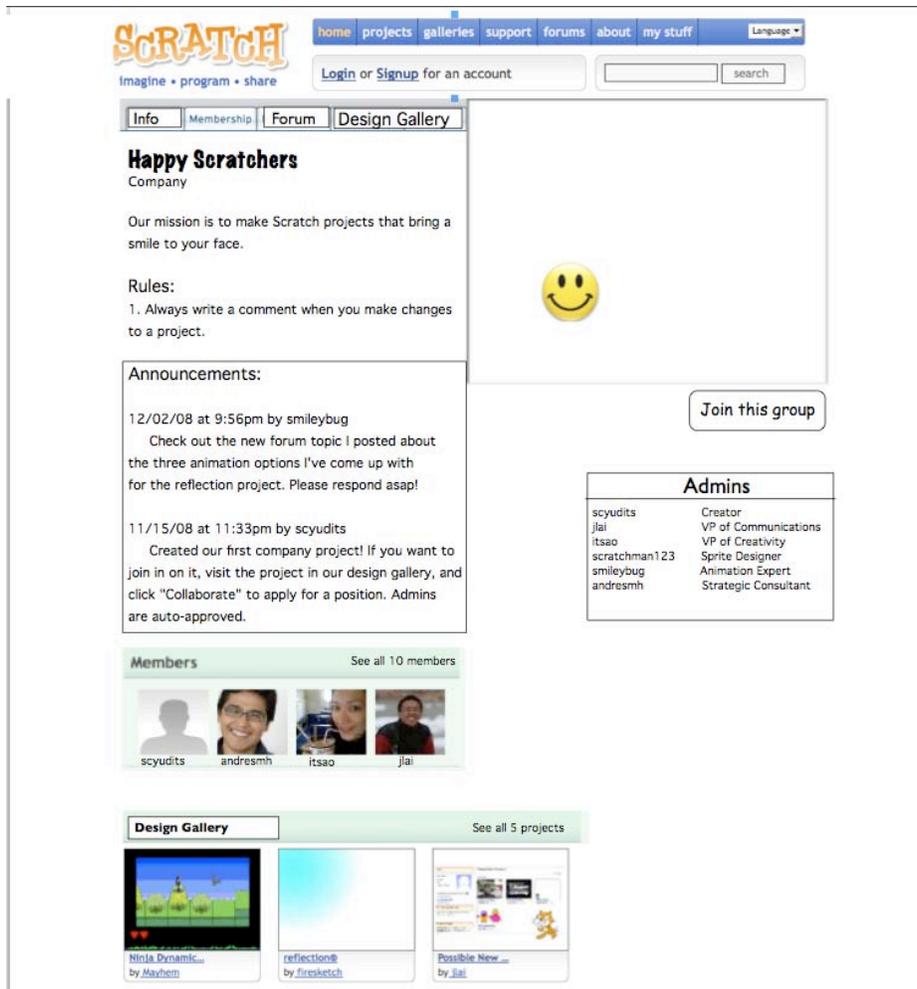
Figure 1. Prototype of a Company Group Website.

Company Groups

The Company Group brings together the creative efforts of multiple people on a particular niche topic. In order to support collaboration on Scratch projects, the design of the Company Group involves innovations to both the Scratch website and the Scratch programming environment.

In terms of social dynamics, the creator of the group website would be the leader of the company group. Members of the group can apply for specialized leadership positions within the company, and would be appointed selectively by the creator, based on any particular areas of expertise that the collaborator may bring to the table. In the same vein, users can apply to collaborate on a specific project, much like applying for a job. The interface for this application process will be described below. Any admin would be able to review an application and approve the applicant to collaborate on a project. For effective collaboration, it would work best for participants to assume specific, well-

defined roles. Their activities may range outside of their specific roles as desired, but at the core, the well-defined role would serve as the foundation.

The website of a Company Group would enable members to create new galleries for the group's projects. In terms of communication, Monroy-Hernandez writes that chat is the communication platform of choice for long-distance collaborations over the internet [2]. However, since there are many issues surrounding the use of chat in Scratch, the next best communication platform for collaborative work would seem to be a Forum, because it provides a hierarchical view of discussion and announcement related content, starting from the general topic, then going deeper to thread subjects within a topic of choice, and finally to the contents of posts within a particular thread. Such organization makes communication efficient across a variety of topics and issues and ensures that members stay informed about the state of collaborative efforts within the group.

In his case study of the Green Bear Group "company" that was founded in Scratch by three children [2], Monroy-Hernandez also mentions that voting on certain decisions, such as whether to allow an applicant to join the company and which new projects to pursue, is a popular feature in the social dynamics of collaboration in Scratch. For this reason, I also include a survey-type voting feature in Company Groups. However, it should be noted that this feature is not the same as election infrastructure and would not implement any functionality for electing or impeaching company leadership.

Collaboration Interface

On the programming side, a user should first and foremost have the ability to turn an individual project into a company project. Only admins of the Company would have this privilege. A "Collaboration Setup" button can be added to the programming interface for this purpose. When the user clicks this button, an entry form dialog would appear (Figure 2), in which the user can specify a Company name with which to associate this project . Submitting this information, authenticated by the user's username and password, would formally register this project in the Company Group website, upload this project into the Company Group's design gallery, and transform it into a company project with all associated collaboration features. Namely, these collaboration features are version control, the ability to share projects to the Scratch website in the name of the company, and an interface to enable users to apply for collaboration on a company project.
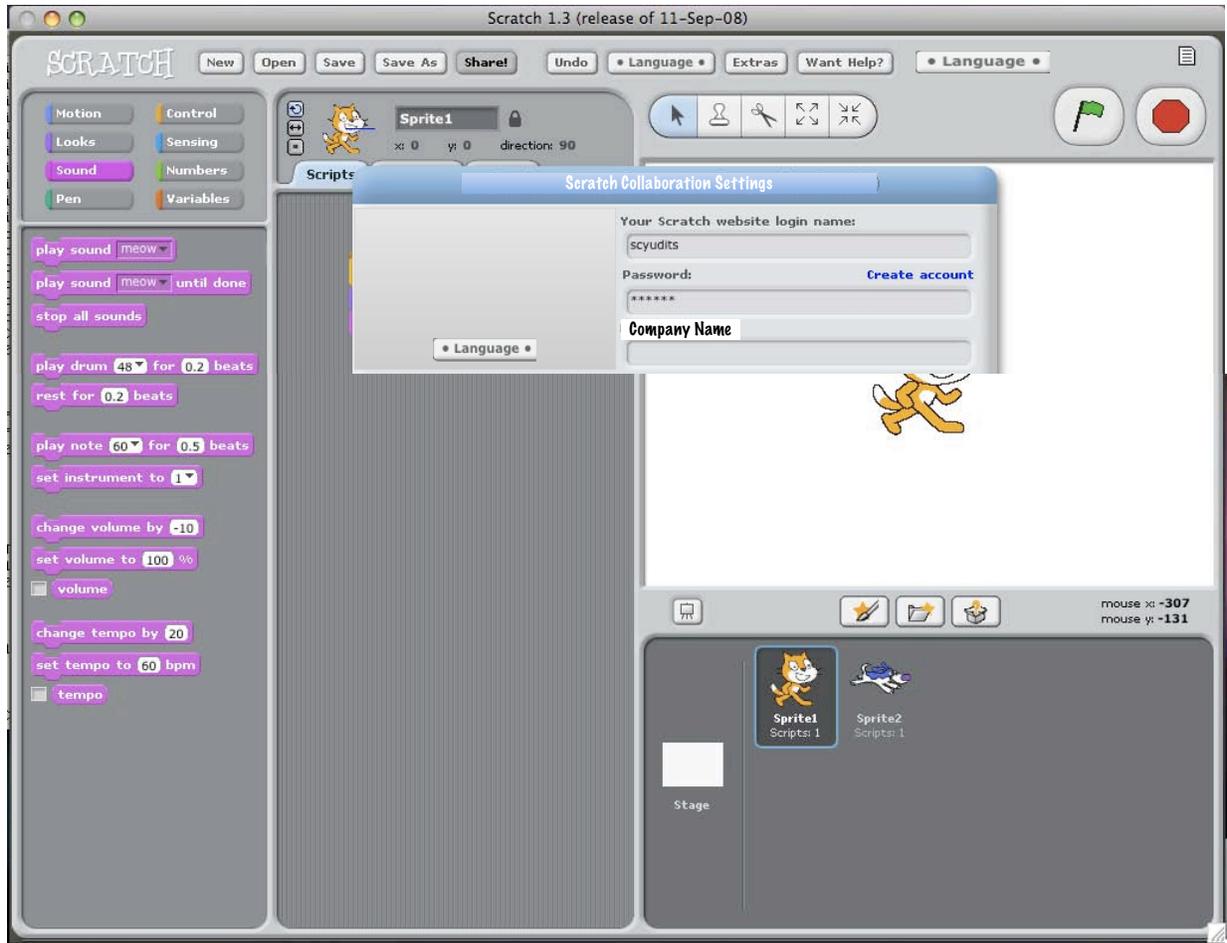
Figure 2. Collaboration Setup Process in Scratch Programming Interface

When a project becomes a company project, a new section column would be added to its programming interface view (Figure 3). This column would identify the name of the company and contain a set of tabbed panels -- one tab for the version control display, and another for the list of collaborators that have been approved, and therefore have access, to work on this project. Designing a version control feature in detail is beyond the scope of this work, but in essence it would contain a hierarchical list of the versions of this project, each version corresponding to a modification to the project made by a single user. Each version entry is identified by a version number, the user who made the modification, and the date and time that this version was shared to the Scratch website. It also includes any comments describing the modification: the comments can be optionally hidden or displayed by the user, as shown in Figure 3.
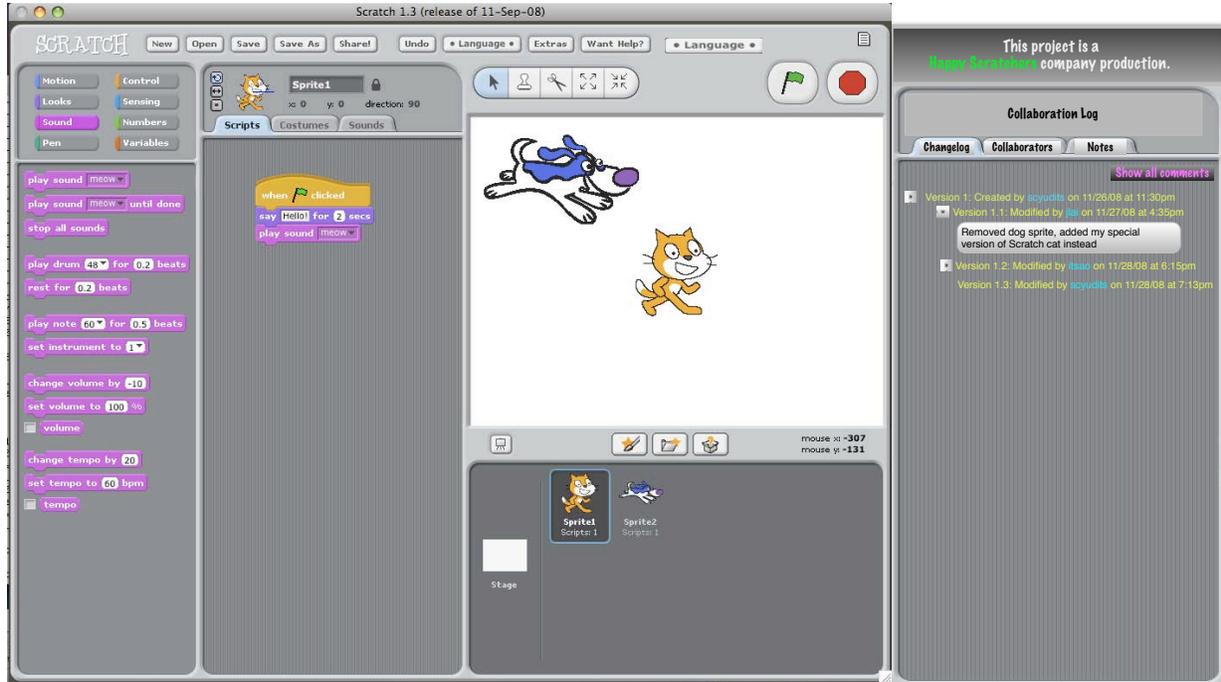
Figure 3. Collaborative Interface for Company Groups

Figure 4. Collaborate! and other group-related changes to project webpage.

Sharing a Scratch project in the name of a company would be a transparent addition; this will change nothing in the interface. As long as the project is associated with a company as described above, the user would simply need to click "Share" as usual, provide his or her personal username and password, and this would share the current version of the project to Scratch in the name of that company. Besides the username and the password, the "Share" dialog would also provide space (as it already does) for any comments that the collaborator would like to include in his or her version control entry.

A shared Company project would be automatically saved to the Company Group's design gallery and would have its own webpage just like any individual project, with two main differences. First, instead of an individual username, the company name will be listed as the entity that shared the project. The project webpage will separately include a list of the specific company members who collaborated on this project. Second, the page of a company project would include a "Collaborate!" button (Figure 4). Clicking this button would launch the process of applying for a job as a collaborator on this project within its company. Any nonmembers who submit an application would automatically become members of the company if they are accepted for the job. Once approved, the user is added to the collaborators list for the project and all version control features are enabled for this user.

Critique Groups

Fundamentally different in nature from Company Groups, Critique Groups bring together an individual's creative work and a niche audience that is interested in it in some way. An appreciative audience consists of experts as well as novices. Experts are usually interested in maintaining a high quality of existing content in their niche area of expertise. Therefore, they willingly provide constructive, thoughtful feedback and in fact seek out opportunities to do so. Novices are those interested in learning more about the process of creating content in the niche subject matter. They seek guidance in their creative efforts within the niche as well as opportunities to learn from other projects their feedback that may be relevant.

The social dynamics of a Critique Group suggest that a democratic leadership structure would work well in this context, where the community can elect new leadership given a majority agreement of opinion. Although not necessary, I think a democratic leadership structure would help any online community remain active in the long run, as turnover in membership occurs over time. The original founder(s) would inevitably would lose interest or leave the website eventually to move on other pursuits, and without a way to elect new leadership, the group would simply become inactive. In the case of Company Groups, democracy is counterproductive for collaborative work and therefore not an option. But since Critique Groups do not share these issues, they should certainly provide the option for a democratic leadership structure. In addition, a democratic leadership structure would benefit the quality of content in a Critique Group, since the leaders would be motivated to keep the community happy to avoid impeachment.

Leaders of a Critique Group would have the option to set the exclusivity of the group. At the higher setting, users must submit an application to join the group, becoming members only if approved by the leadership. This is the only setting available for Company Groups. At the lesser setting, users would be free to join the group without any approval process. In theory, there is also the question of who can contribute content. Given the problems of over-contribution and the consequent flooding of irrelevant projects that currently plague Scratch galleries, I think that only members should ever be allowed to contribute content to any group. Besides, if nonmembers were allowed to contribute, the very concept of membership in the group would become meaningless.

The design of a Critique Group revolves around three pivotal, unique features: a critique blog, reflective questionnaires that guide submission and feedback, and critique points. The following sections describe these three proposed features in greater detail.

Critique Blog

Each project submitted for critique creates a new blog entry in the critique blog (Figure 5). The entry consists of a title chosen by the submitting user to describe the submission, a thumbnail view of the project that is also a link to the project webpage, and a description summarizing the project and the kind of feedback that the user is looking for. Critiques for this submission appear as responses within the blog entry (Figure 6).

Reflective Questionnaires

A key design goal for Critique Groups is to encourage meaningful critiques to maximize the quality of social learning. One challenge in addressing this goal is that, in the words of Scratch user mletreat, "It is often very difficult for people to give constructive feedback." Learning how to think reflectively and critically about other people's work has always been an essential skill for the intellectual success of the individual and the technological progress of a society. Schwarz names critical thinking and complex communication as some of the 21st century skills that are necessary for success in the modern workplace. Designing Scratch features that develop this skill in children on such a grand scale would truly be of benefit to society.

As I developed my design for Scratch Groups, I exchanged ideas and discussion with fellow student Justin Lai, who had made this very design goal -- encouraging reflective communication in Scratch -- the focus of his project. I was also inspired by the constructive and insightful forum post by Scratch user mletreat about constructive feedback for critiques. Both Justin and Mletreat agree that an effective way to develop critical thinking is to guide the user's thought process with sample reflective questions. Mletreat proposed some excellent questions for both the project submission and its critiques. I believe mletreat's questions would be so effective to include in Critique Groups that I will simply quote them here verbatim:

"For the creator, it is helpful to explain some things up front when you are asking for a critique:

--What is your project about?
--What are you trying to achieve?
--Why is is worth achieving?
--How are you attempting to achieve this?

For those of you offering to critique others projects, here are some types of questions to answer in a critique:

--Why did this project catch your eye? What is the first thing you see/notice?
--How do you connect to this project?
--What stands out about this project the most?
--What makes this project different or similar to others?
--Why did you love this project?
--What impression does this project leave you with?
--Does the style of this project distract from the purpose/concept?
--What message does this project send?
--Is there an emotional story attached to this project? How does that make you feel?
--What is the creator trying to communicate with this project?
--Does the creator do a god job of achieving what they say they want to achieve?"

<div align="right">-- mletreat (Scratch user)</div>

Given these excellent reflective questions, my design problem was to consider when and through what interface to apply these questions effectively to encourage meaningful communication in Critique Groups. In my proposed design, I decided to present these reflective questions to the user in the form of a "reflective questionnaire" to fill out as part of the submission and critique interfaces, as described below in the Submission Process and Critique Process sections. All the questions would be optional, and the section for open-ended commentary would still also be provided as an option.

Critique Points

Critique Points are inspired by Sun Java forums' Duke Stars to serve a dual purpose: controlling the number (and therefore, quality) of submissions per user, and encouraging meaningful critiques. When a user first joins the Critique Group, he or she would start out with (e. g.) 5 Critique Points. Submitting a project for critique would cost 1 Critique Point. The user can also offer a certain number of his or her additional critique points as a reward for any helpful feedback that is provided in response to this submission. In the resulting "economy" of Critique Points, users can therefore earn critique points by submitting meaningful critiques. The Critique Group would have a list of the top X critiquers. This would be a label of honor that could also go into the individual's profile.

Figure 5. Critique Group Blog Entry

Submission Process

Members of the group would initiate a submission by clicking on the "Submit a project" button that would be located on the Info page of the Critique Group. If the user has at least 1 Critique Point, this would take the user to a dialog or a new webpage that displays all the user's projects in a scrollable list. After the user selects the desired project and clicks "Next", the submission process would take the user to the reflective questionnaire form that requests the user to provide details about the project and the reasons for submission. Again, all of the questions would be optional, and there would still be an open-ended comments section in which the user can write freely. This interface also enables the user to specify how many of his or her remaining Critique Points to put up as a reward for helpful critiques of this project submission. Clicking "Post" would create a new blog entry corresponding to this project submission, with

everything the user wrote in this questionnaire (and the corresponding questions, if any were answered) posted as the body of the entry. An example entry with reflective questions is shown in Figure 5.

Critique Process

As mentioned above, every project submission creates a new blog entry. Within this blog entry, there would be a button labeled "Critique this Project". When it is clicked, a reflective questionnaire form would appear, presenting well defined sample critique questions as well as open ended comment space. Finally, clicking "Post" would post the contents of this critique as a response to the project submission blog entry.

Figure 6. Critique Process

Special Interest Groups

As described in preceding sections, Company Groups and Critique Groups are highly specialized communities, each serving a specific purpose that is intimately connected to the culture of the Scratch community. In contrast, Special Interest Groups are intended as a generalized infrastructure to support the creation of new subcommunities within the Scratch community. Like the Ning.com social networking website, Special Interest Groups would be configurable to support a variety of purposes, such as Scratch-related workshops that maintain a calendar of scheduled events, location-specific groups of Scratch users seeking to connect and identify with each other, and any other kind of niche interest group. Niche interest groups would be communities in which users with a common interest exchange and discuss ideas and develop inspirations for new Scratch projects.

Some features that would be useful as options for configuration are
* An event calendar
* Choice of communication platform (Blog, forum, comment feed
* Election and survey infrastructur
* A map for group members to indicate their location
* Language setting
* Wiki

Extending the Individual

In order to implement a useful group construct, it is also necessary to add some extensions at the individual level -- both the personal profile and the individual project webpage. Projects should be shareable in the name of a Company, and the webpage of a Company-shared project should list the collaborators in addition to the name of the company. Also, a project webpage should contain a list of all existing critiques of this project and the Critique Groups in which they were created (Figure 4).

Companies	Critique Groups	Special Interests
Happy Scratchers Harry Potter Sprite Co. Gravity Games	Tutorial Critique Group Beginning Game Design Publishing Periodicals	Hong Kong Educators' Workshop Save the Planet Boston-Area Scratchers

Figure 7. Example List of User's Groups, by Category, for Personal Profile.

The personal profile should be extended to list a user's groups, by category (Figure 7), as well as the user's group-related honors such as admin leadership titles, critique points earned, and company roles.

These extensions would help individual users to learn of new groups. Friends' group lists, status updates when they join or leave groups, project critique lists, and company-shared projects would all be useful resources for finding out about groups. Beyond this word-of-mouth approach, a hierarchical index of existing groups, organized by topic, would be another essential extension to support Scratch Groups.

Finally, how can individuals create new groups? A "Create New Group" button can be added to the Scratch menu and/or a user's profile. When clicked, it would initiate the group creation process, during which the user would be able to specify the type of group as well as any configuration options that may be available, depending on the group type.

Final Reflections

This design has focused around a conceptual distinction between three types of groups intended to implement a group construct in Scratch: Company Groups, Critique Groups, and Special Interest Groups. This distinction was made to serve as an exhaustive analysis of the categories of group usage purposes that would be most relevant to the Scratch community. However, further reflection suggests that it may be possible to integrate these three group types into a single, highly configurable group construct. For example, a special interest group can contain version control and project sharing options that make it also a company group, as well as a critique blog that makes it a critique group associated with that niche interest.

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