CSE 440 Fall 2013
Task Analysis

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## Problem Solution and Overview

Teaching a new class or student is often daunting and difficult. Oftentimes teaching styles and learning methods do not sync and for many students this becomes a major barrier in the learning process. In any type of learning environment whether it be in sports, academia or extracurricular there are disconnects between teachers and students. Recognizing that every student is different and learns through different means creates difficulty in designing lesson plans that engage, challenge and develop every type of student. Teachers are faced with the challenge of presenting and applying content to a class that most likely does not learn through one single methodology; this presents teachers with an overwhelmingly amount of pressure (to teach in a style they are not comfortable in) and a great deal of confusion (how to better reach students who don't learn in a certain way).Instructors often turn to group projects to empower and engage students not only with the content but with each other. This is a tactic used for empowering students and fostering individual learning through the collective effort of different learning styles. To help resolve the confusion and alleviate stress for teachers trying to reach their students in new ways, we are specifically focusing on learning through groups and designing a tool that will help instructors analyze their students learning styles (individually and as whole) and optimize groups depending upon their student' learning styles. Incorporating the 4mat learning assessment into our application will provide a valuable framework for data feedback and ultimately act as a stepping stone for our applications true purpose; dividing classes into optimal groups for learning.

## Task Analysis Questions (+ Current Versions of Tasks)

***1. Who is going to use the system?***
The main customers using the system will be educators, trainers and people coordinating group projects of any sort. After observing student-teacher interactions in class and interviewing teachers as well, it can be argued that using the system in the academic world will inevitably spread system use to other sectors such as non-profit, companies both global and local as well as retail environments. Wherever there is education in a group setting, the system can be applied to that specific area.

***2. What tasks do they now perform?***
Teachers and instructors perform an array of tasks. Our analysis focuses specifically on the tasks that relate to group formation and analyzing data to optimally divide people into groups. Our observations show that teachers/professors/instructors assess strengths and weaknesses of their students based on class participation, visitation requests during office hours, and overall test/project scores. Teachers also send out surveys and request student feedback as a means of informing their decisions when creating groups. Tasks also include analyzing feedback/survey results which can then be used to dictate their group formations.

***3. What tasks are desired?***
The desired tasks include receiving data input from their personal class body, dividing those people/students into groups optimally and more efficiently by way of the data received.

***4. How are the tasks learned?***
The tasks instructors currently use are learned through education, intuition and past experience. Our research indicates that teachers often explore areas that they themselves were educated by, for example working in groups. Forming groups in a class environment presents instructors with new challenges such as organizing a survey or assessment which can be learned simply through tutorial, online instruction or peer help.

***5. Where are the tasks performed?***
Tasks are performed mainly in schools, universities, and in-company training sessions however, wherever education and instruction to a collective people takes place, our system can be utilized. After observation and interviewing, it can be deemed that many of the tasks would be performed in an office or class room as these two places inherently involve the actions of teaching from an instructor and student learning.

***6. What's the relationship between customer & data?***
The data corresponds to the learner styles of the user's students. The data input from the students (the 4MAT assessment survey) informs the instructor as to what the learning landscape looks like for that specific class. The data can be analyzed and allow instructors to better form groups either through data similarities or differences.

***7. What other tools does the customer have?***
Other than surveys (ie. catalyst, surveymonkey, wufoo, kwiksurvey) there aren't any tools that exist to create groups optimally based on data input from the students themselves. Surveys such as surveymonkey or catalyst do not directly relate to group formation and thus our system is unique and novel in its approach. The often, long and complicated process of group formation can be at times messy and involve student input that is impossible to address***.***

***8. How do customers communicate with each other?***
Users most likely will not communicate with each other. The data allows them to interact with their students but not other users (ie teachers/instructors/coaches). Only outside of the system would users communicate with each other in regards to the application.

***9. How often are the tasks performed?***
Tasks will be performed depending on the user motives; As often or as little as they need to create groups. The system will allow such flexibility. Our research indicates that a large portion of tasks would be performed in the beginning stages of a class (i.e. the first day of the quarter) providing ample time for student data input and analyzation.

***10. What are the time constraints on the tasks?***
The main time constraints depend on student data input but otherwise it is quick and simple to perform the desired tasks either through ones mobile browser or desktop/laptop computer.

***11. What happens when things go wrong?***
Possible problem scenarios include: a group list is created that the educator doesn't like, students don't respond to initial assessment, not enough students respond, the assessment is heavily skewed in one sector or an accidental deletion of a list/group.

***Potential Revision to Tasks***
A potential aspect to a single task would be editing an existing group.  Due to unforeseen circumstances the group is functioning or learning in a negligible way . The instructor identifies students that are struggling or could thrive in a different group. Giving the user the ability to makes these changes and receive data feedback would give instructors more flexibility and a sense of calm in that groups could be changed later.

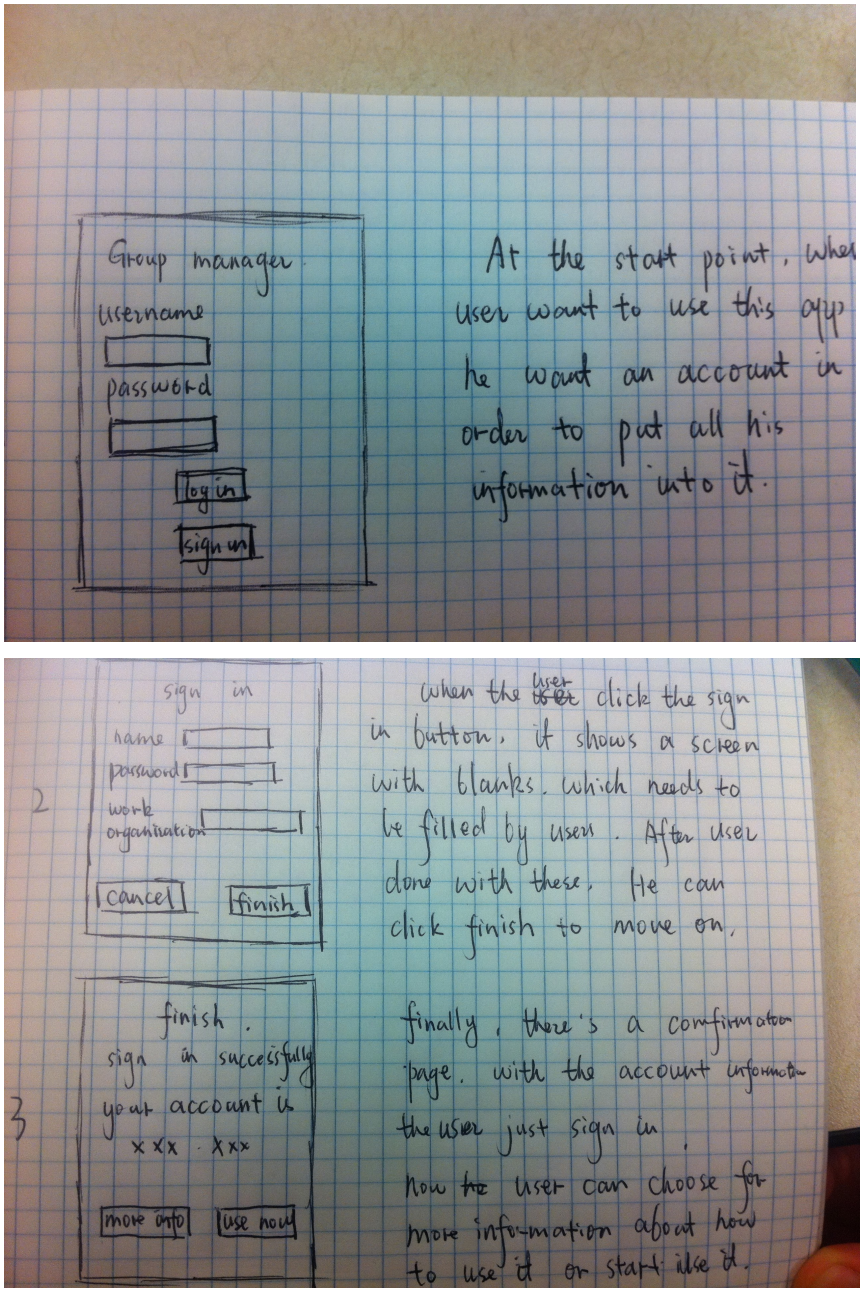
## Current Versions of Tasks
*Task 1 - Analyze learner styles in a class*

*Task 2 - Divide a class into groups such that the students of each group have similar strengths.*

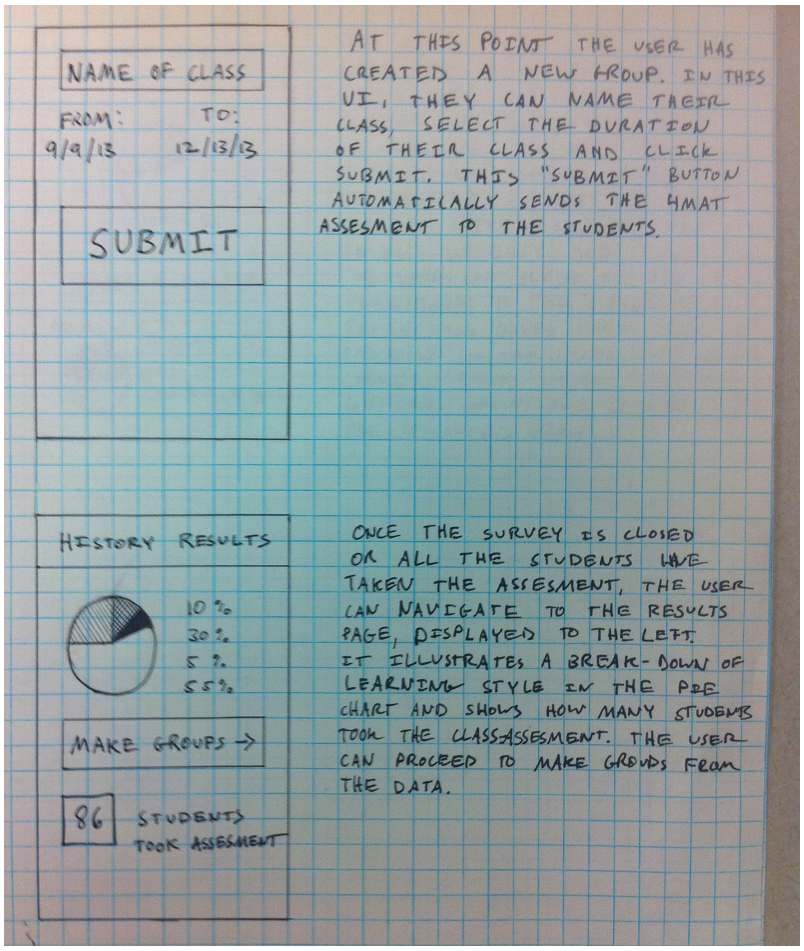
*Task 3 - Create a Group List for each week over the course of a 10 week quarter that distributes students such that each group represents an optimal balance across the spectrum of learner styles.*

## Storyboards

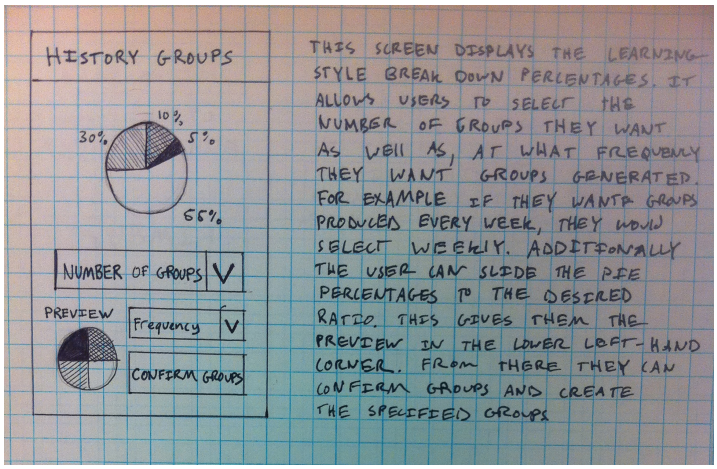
Storyboard Version 1 Screen 1-3



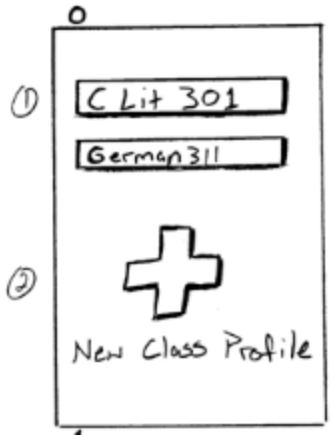
Storyboard Version 2 Screens 1-2



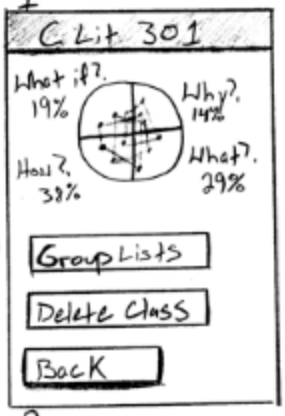

Storyboard Version 2 Screens 3



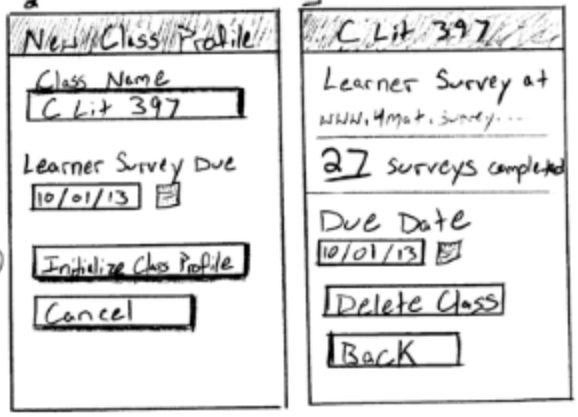
Storyboard Version 3 (Screen numbers on top left of each screen.)



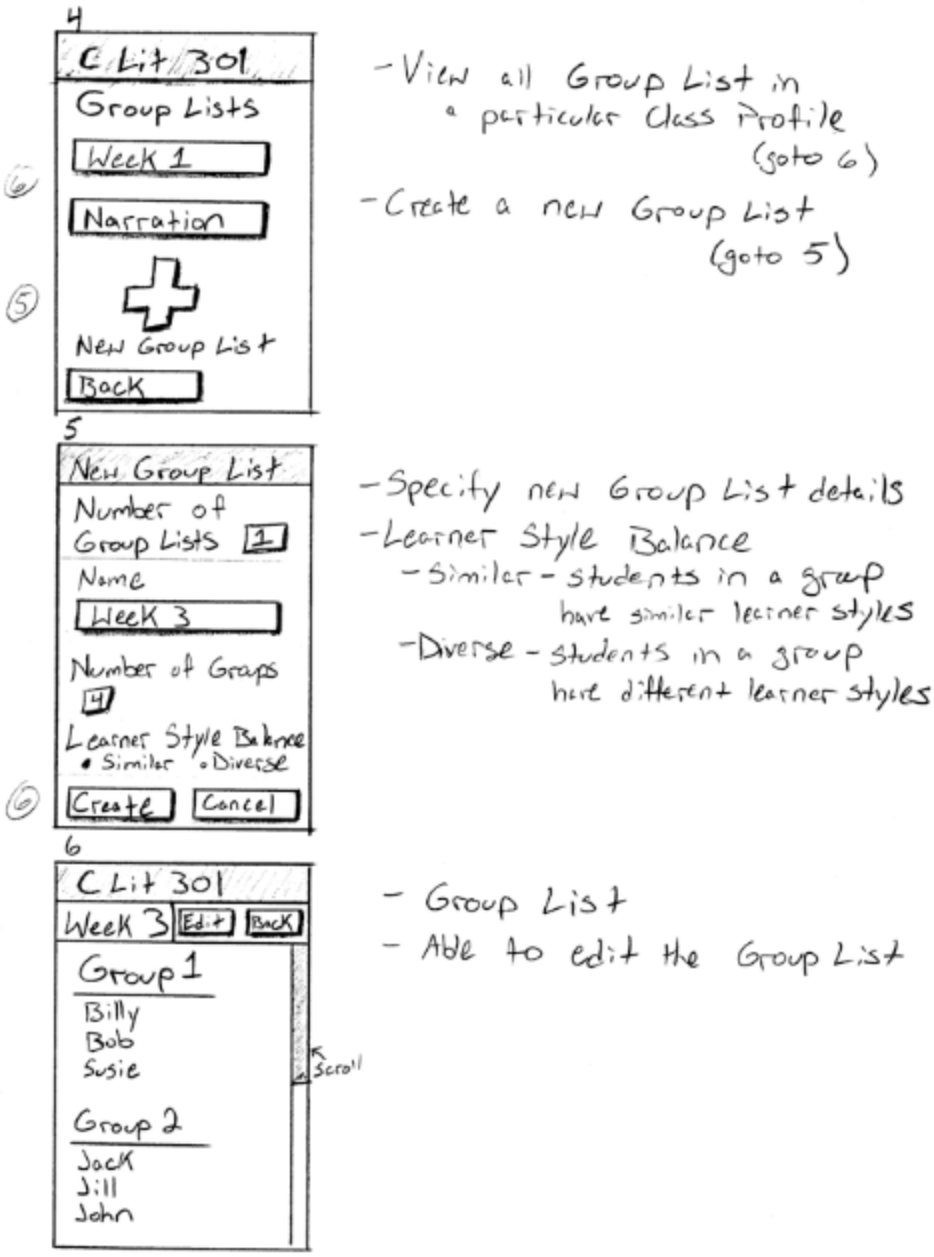

- Initial screen.
- Shows list of previously set up Class Profiles. (goto 1)
- Provides option to create a new Class Profile. (goto 2)




- Class Profile
- Displays distribution of learner style data.
- View Group Lists (goto 4)
- Allows user to delete the class Profile




- Set up a new Class Profile
- Enter name and survey due date
- Once a Class Profile is initialized give link to students.
- Can change due date




## Selected Interface Design (screen references to storyboard 3)

We each spent time sketching and storyboarding different interfaces for the tool that we are designing. After coming together, we analyzed the pros and cons of each design and decided to move forward with storyboard version 3. Our goal was to come up with something simple in order to reflect the simplicity of the tasks our tool is enabling. Typically, the task of analyzing a group of students and their learner styles is time consuming and very difficult. In fact, at times it may not be possible to reap valuable data quickly enough to even use it. Furthermore, if and when an instructor does come up with this information, applying it to divide the students into

groups that will maximize their learning requires knowledge and skills that require time and effort to gain. This often forces educators to use a more time-efficient, however less effective, method of creating groups randomly.

These factors brought us to the conclusion that our tool needs to be as simple as possible. This means a clean interface without too many options. We want the target tasks to be clear, intuitive to perform, and simplistic in nature. Therefore, the interface provides the straight forward functionality of allowing educators to generate what we call group lists for their classes. This functionality is based on learner style data gathered by the system. The learner style assessment is taken from a teaching methodology called 4MAT, developed by a company called AboutLearning Inc. This assessment takes approximately 10 minutes for a student to take and the results are fed directly to the system. After all students have submitted their learner style assessments, the educator can view the balance of learner styles in his or her class and then use it to divide the class into groups.

A very important factor in the simplicity of this function is that it does not presume the educator's motivations for dividing the class into groups, nor does it limit the ability to divide the class into a new set of groups. Once the learner assessments are in, the instructor is in control of what to do with this information.

The 4MAT learner assessment asks questions regarding aspects of the learning process and of learning environments that are important to them. Learners rank answers according to how much they identify with them. It also asks a series of questions about learning habits, such as studying and in class behavior. The results would be totally anonymous and behind the scenes. This takes the burden of analyzing student's learning types away from the instructor.

The tool allows an educator to have learner style data for multiples classes (screen 0). When he or she sets up a new class profile (screen 2), the only setup required is to name the class and set a due date for the learner assessments. Then the system gives a link to where students can take it. Before the due date (screen 3), the instructor can see how many students have submitted their assessments so far. They can change the due date, or simply delete the class.

Once a class profile is set up (screen 1), an instructor can see the results of the learner assessments in a graph. The way this information is displayed corresponds to the nature of 4MAT. The 4MAT teaching methodology is based on research that shows that everyone's brain goes through the same learning cycle. An individual's learner style is described by where in that cycle they find themselves most comfortable. This means that the results of the assessment show different weights in each of the 4 quadrants, which represent the 4 main identifiable learner types. The display is an overlay of each student's results, giving a visual representation of the weights of learner styles in that particular class. Each quadrant (learner style) is characterized by the type of question being answered at that stage of the learning process. These are Why, What, How and What If.The display indicates the weights as percentages.

Now the instructor is able to create a Group List. A Group List is a set of groups into which a class gets divided. An instructor can create several group lists to accommodate their own course plan and learner outcomes. (Screen 4) Perhaps they want to divide students into groups during Week 1 of the quarter to work on some intro assignment for the course. A few weeks later, there will be a group assignment on the topic Narration. The Group Lists are generated so that an optimal shuffle occurs. This way each Group List is as unique as possible.

The instructor can access a Group List (screen 6) to view what was generated. They can also edit the list, which includes being able to change the name or move students around if for some reason there were additional factors to take into account, such as two troublesome kids being in the same group. To create a new Group List (screen 5), the instructor first specifies how many lists to generate. In the most simple case, they will create one. But allowing the instructor the ability to generate several at once makes it easy to plan several weeks of group projects, where the groups should not always be the same. When the number of list fields change, the number of group list name fields automatically change with it. Then they must decide how many groups they want the class to be divided into.

The final option is to choose what type of balance the educator wants for the groups. The tool can divide students into groups such that each student in a single group is as similar in learner style as possible, or it can divide students into groups such that each group represents as much balance across the spectrum of learner styles as possible. This option allows the instructor to divide their classes into groups according to the specific goals and learning outcomes they have planned.

## Three Scenarios Corresponding to Your Tasks

***Scenario 1***
*Task 1 - Analyze learner styles in a class*

Analyzing learner styles in a class is what our tool does for the user in the process of setting up a Class Profile. The user begins at screen 0. In order to set up a new Class Profile, the user simply presses the + button that says “New Class Profile”. Say the class they are setting up is for C Lit 397. So they type that in the Class Name field. They set a due date, say 10/01/13, for the 4MAT learner assessment and then click “Initialize Class Profile”.

This brings the user to screen 3. They are given a URL. This is the website to which they can direct their students to take the learner assessment. As students submit the assessments, the user can see how many assessments have been completed by the students. This way they can remind people if the due date is approaching if not everyone has submitted one yet.

Now the class profile is set up. When the user clicks “Back”, they will be returned to Screen 0, where the newly created Class Profile will appear in the list.

***Scenario 2***
*Task 2 - Divide a class into groups such that the students of each group have similar strengths.*

Once an instructor has set up a Class Profile, they are ready to generate a Group List. When they select a class on screen 0, say C Lit 301, they are brought to screen 1. Here they can see the learner style distribution in their class and create a new Group List. When clicking the “Group Lists” button, they are directed to screen 4, where they can see any pre-existing lists and/or create new ones.

Now the instructor would press the + button that says “New Group List”. They are given screen 5. Here they would type in 1 for “Number of Group Lists” and then choose a name for the list, say “Week 3”. Choose a number of groups, say 4, and type it into the field labeled Number of Groups. The last step is to select “Similar” under Leaner Style Balance and press “Create”.

This brings the user to screen 6 where they can view the newly generated Group List.

***Scenario 3***
*Task 3 - Create a Group List for each week over the course of a 10 week quarter that optimally distributes students such that each group represents an optimal balance across the spectrum of learner styles.*

After navigating to the Group Lists within a Class Profile (screen 4), such as in Task 2, the user clicks the + button that says “New Group List”. Here, (screen 5) the user types in 10 for the number of Group Lists to generate and then fills in the names for the lists (i.e. Week1, Week2, etc.) The instructor can choose “Diverse” under Learner Style Balance.” When they are redirected to the screen 4, they will see the newly created Group Lists there.