

Working in Teams

CS 430 Applications Software Engineering (Development)

<https://student.cs.uwaterloo.ca/~cs430>

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Motivation

Why Team Projects?

In this section, we'll discuss the importance of teamwork and how to build a successful team. Why are we learning this?

- You will work in teams in this course, and likely in your future career.
- You will experience conflict at some point.
- You will have time management issues.
- You will have team motivation challenges.

We want you to be prepared for these challenges and have tools to overcome them!

Note

This module is based on the [Teamwork Skills Project](#) [1], produced in the Faculty of Mathematics. The main site contains extensive notes, slides and sample documents that you can use in this course.

Attributes of a Successful Team

Attribute	What does it mean?
Shared mission and goals	The team understands and agrees with the goals of the project.
Leadership	The team has a leader who can guide the team to success. Leadership tasks are performed reliably and consistently.
Communication	The team communicates effectively and efficiently.
Decision making	The team has an agreed-upon decision-making process.
Team meetings	Meetings are held regularly to facilitate communication and group decision making.
Conflict management	The team has a process for resolving conflicts and addresses conflict productively, it avoids personal conflict.
Self-management	Individual team members complete tasks and assignments effectively.

Team Assembly

Team Roles

Team Lead (required)

- Responsible for keeping the team on track and ensuring milestones are met.
- Ensures that requirements are accurate & the team is tracking work.
- Help the team coordinate to meet its goals for each deliverable.

Technical Lead (required)

- Responsible for ensuring the technical aspects of the project are correct.
- Ensures that code is complete, reviewed and merged.
- May be responsible for packaging the software release.

Front-End Designer

- Responsible for the UI/UX design, including prototypes.
- Leads the team in design decisions around UI implementation.

Back-End Designer

- Responsible for data representation, data models.
- Leads the team in database and service integration.

Team Roles

Rules for Team Roles

Everyone must contribute to the entire project.

- Team leads still write code and perform other tasks. Managing the project is not a full-time job.
- Everyone can still help with parts of the project outside of their immediate area of responsibility.
- Nobody is allowed to “take time off” i.e., you cannot “double up” work one iteration and then ghost the team for the next one.

No single person is “the boss” of the project

- Significant decisions should be made with the input of the entire team.
- Team and technical lead roles help with project coordination.
- Design lead roles help with early design around code parts of the project.

Team Contract

A team contract is a document that defines a shared understanding of the project and the roles of each team member. The exact structure and contents are flexible.

It must include:

- Team member names and contact info.
- Roles that you wish to define e.g., team lead, tech lead.
- How you will make decisions e.g., "we vote and majority rules".
- When and where you will meet.

It may include contract clauses such as:

- "All members will attend meetings or notify the team by email or phone in advance of anticipated absences."



See `Gitlab > Templates` for a sample team contract.

Project Planning

As an Agile team, you are not expected to plan everything up-front. Instead, you will plan in short iterations, called sprints. This allows you to adjust your plan as you learn more about the project and the team's capabilities.

However, it is still useful to have a high-level plan that outlines the project's goals, timeline, and resources. This plan can be used to guide the team's work and ensure that everyone is on the same page.

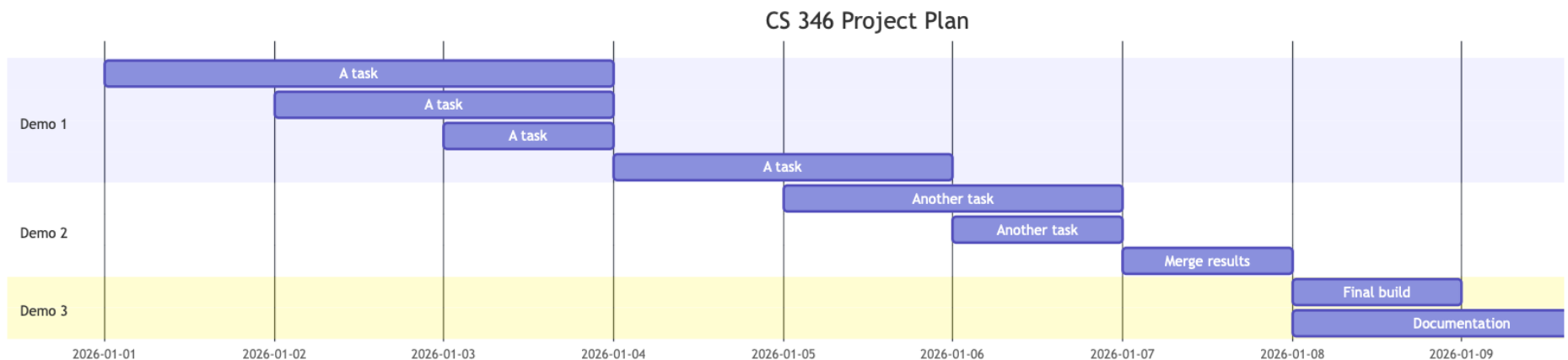


Figure 1: Gantt charts are useful to present a high-level overview of project goals. You can generate these in many software packages including [Mermaid](#).

Communication

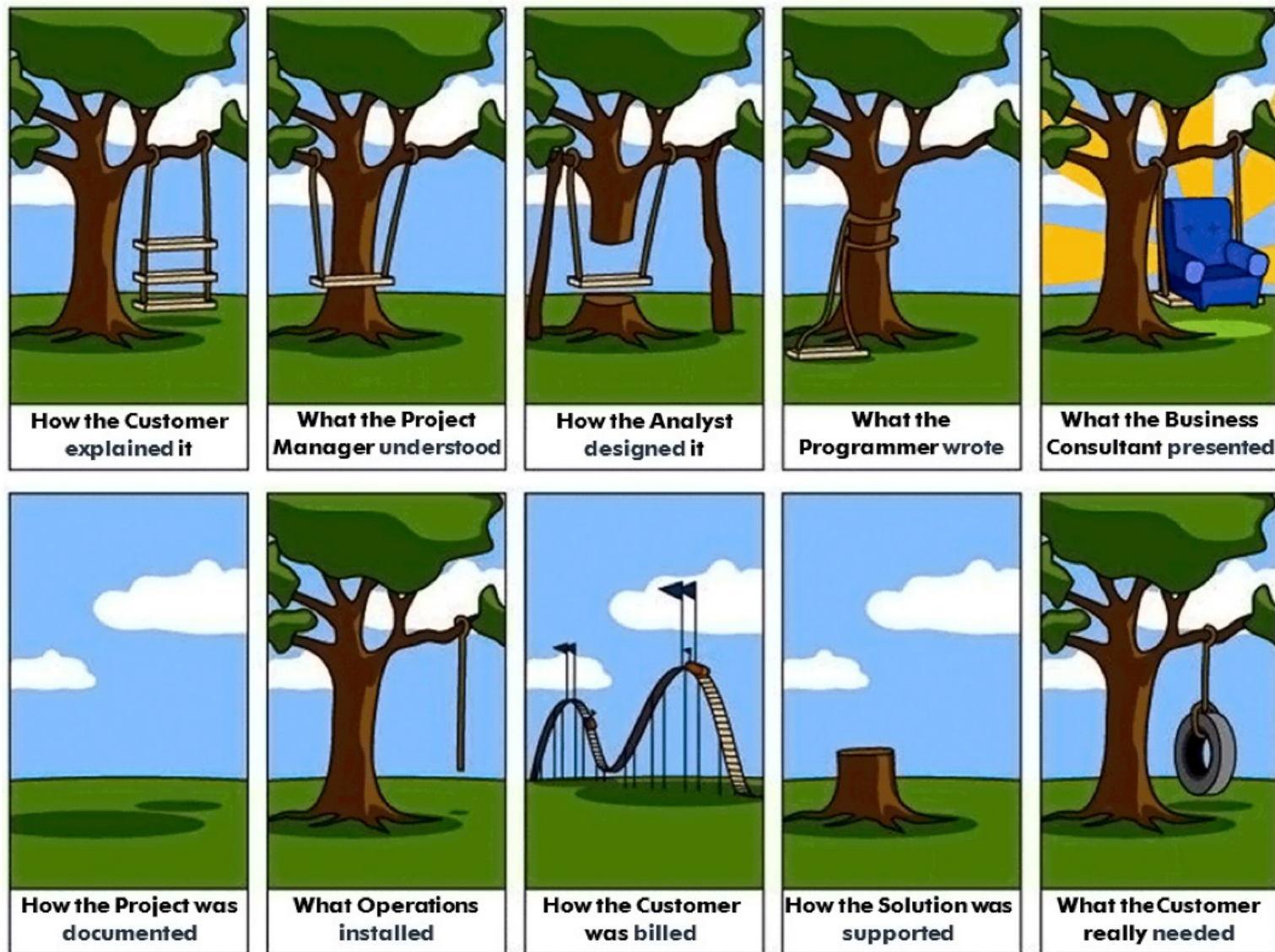


Figure 2: Effective communication is critical for a project to succeed.

Team Meetings

Team meetings provide an opportunity for team members to discuss progress, share ideas, and make decisions. They are most effective when you have a clear goal for the meeting.

You are required to meet twice each week (in-class is fine).

For each meeting:

- A team lead should circulate the agenda ahead of time.
- Everyone should prepare to discuss what's on the agenda.
- The project lead should ensure that the meeting stays on track.
- Someone should be designated to take notes during the meeting.
- Agenda and notes should be stored in the Wiki as part of your project.

Communication Channels

It's often necessary to communicate outside of meetings!

Identify other channels:

- Messaging applications e.g., Slack, Discord, Microsoft Teams.
- Shared online spaces e.g., Google Docs, MS Teams channels.
- Email. e.g., your UW email account.

These tools can be used to share information, ask questions, and discuss ideas. They can also be used to share files and other resources.

Use both planned team meetings and informal communication to keep the project moving.



The team should agree to monitor one of these channels.
List it in your contract.

Conflict Management

How Conflict Arises

Conflict is a natural part of work on a team. It can arise from personality differences, differences in opinion, or differences in work style.

Conflict can actually be beneficial to a team, as it can lead to better decision-making and more creative solutions. However, if not managed properly, it can also lead to stress and demotivation.

When conflict arises, your goal should be to address it immediately so reduce the negative impact on the project. Letting things “simmer” never improves the situation.

How Conflict Arises

Sources of Conflict

There are eight potential sources of conflict on a team:

1. **Work Scope:** Differences of opinion on how work should be done.
2. **Resource Assignments:** Who is assigned certain tasks, what they are assigned.
3. **Schedule:** The sequence or tasks, or how long tasks should take.
4. **Cost:** How much the work should cost (n/a in this course).
5. **Priorities:** People being assigned multiple conflicting tasks, or when various people need to use a limited resource at the same time.
6. **Organizational:** Disagreement over the need for certain procedures, or ambiguous communication, or failure to make timely decisions.
7. **Stakeholder:** Issues with certain stakeholders e.g., the instructor.
8. **Personal:** Differences in individual values/attitudes on the team.

How Conflict Arises

Strategies for Handling Conflict

1. **Avoiding or Withdrawing.** Individuals in conflict retreat from the situation to avoid the disagreement. This can cause the conflict to fester and possibly escalate.
2. **Competing or Forcing.** Conflict is viewed as a win-lose situation i.e., winning the conflict is seen as more important than the relationship between the individuals. This can result in resentment and deterioration of the environment.
3. **Accommodating or Smoothing.** This approach emphasizes finding areas of agreement within the conflict and minimizes addressing differences. Topics that may cause hurt feelings are not discussed. This may make a situation bearable but doesn't solve the issue.
4. **Compromising.** Team members search for an intermediate position. Compromise may not result in the optimal solution.
5. **Collaborating, Confronting, or Problem Solving.** Team members confront the issue directly, with a constructive attitude, and look for a win-win outcome. They place high value on both the outcome and the relationship.

How Conflict Arises

Recommended Strategy

We recommend team-friendly strategies: accommodating, compromising or collaborating. When possible, you should attempt to negotiate outcomes in a way that addresses everyone's concerns.

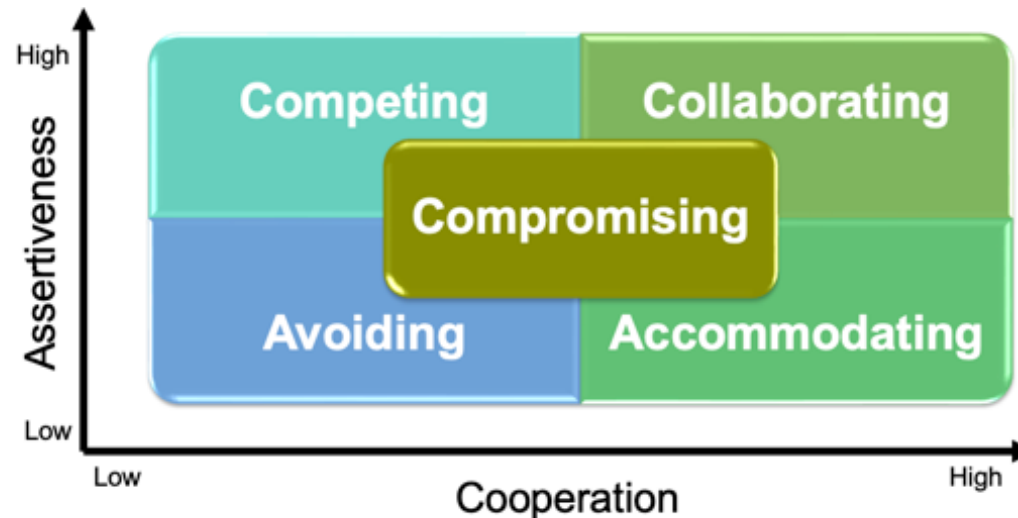


Figure 3: Cooperative strategies are preferred: collaborating to find the best solution, or looking to find a compromise between competing opinions.

Bibliography

- [1] M. Liu, “Teamwork Skills Project.” [Online]. Available: <https://uwaterloo.ca/scholar/m47liu/teamwork-skills-project>