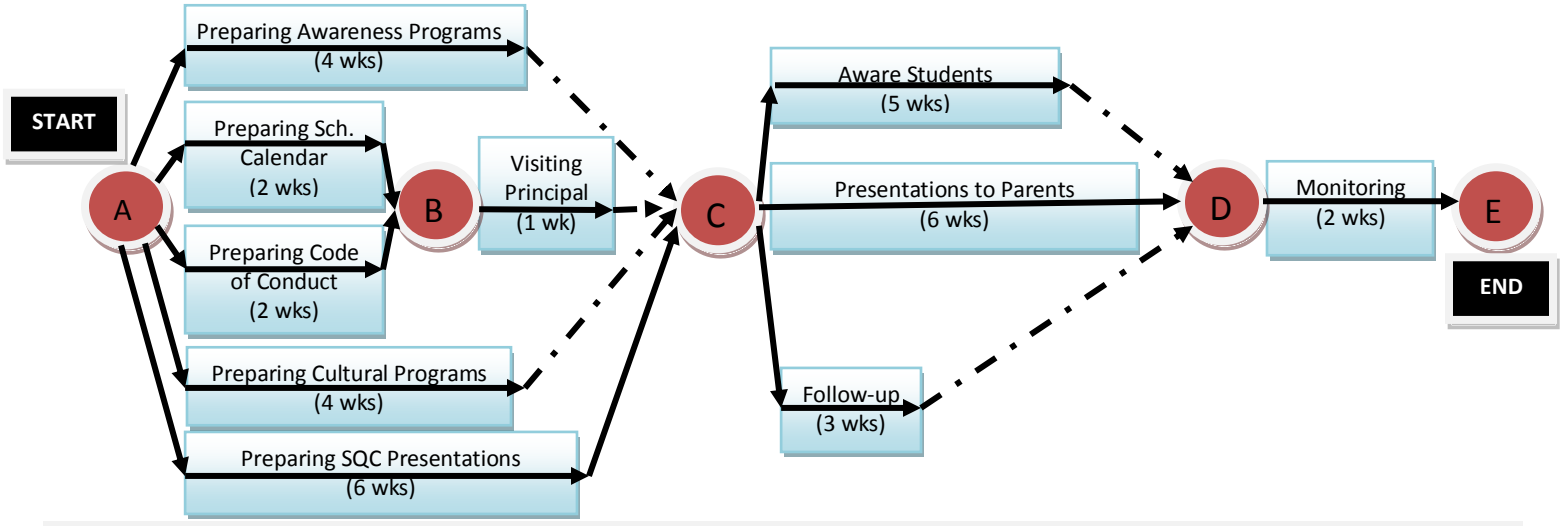
Arrow Diagram:

A Simple Visual Tool for Scheduling Complex Project Activities for SQC team

Prof. Dinesh P. Chapagain

A Hypothetical Case: One Students' Quality Circle (SQC) team of a secondary school in Kavre wanted to solve their problem of bullying at schools by schoolmates. The team did several brainstorming activities, did various analyses collecting verbal and numerical data to identify four prioritized root causes of bullying at schools- (1) Development of superiority and inferiority complex (economic, physical, social and intellectual) among students, (2) Excessive competitive activities in school, (3) Lack of parental awareness and monitoring on bullying, and (4) Lack of school code of conduct and monitoring. After three months of rigorous SQC exercise the team did again a serious brainstorming to list out the following countermeasure activities with respective time duration required for each activity, and then constructed an arrow diagram collaboratively which acted as the implementation schedule for the team to work comfortably.

- Visit Principal to get permission (a) for meeting students to make them aware on the psychosocial complexes they may have and its bad effects, (b) for introducing more periodic parents gathering to show SQC and other team activities like drama and cultural programs without competition motto, (c) for promulgating a code of conduct for bullying and (e) for installing CCTV to monitor the out-of-code conduct activities of students at school premises. **(say in short- Visiting Principal – 1 week)**
- Prepare awareness audio-visuals, lecture and cartoons on how psychosocial superiority and inferiority complex among students are developed and what are its negative effects among students. **(say in short, Preparing awareness programs – 4 weeks)**
- Prepare an appropriate code of conduct for bullying and its monitoring system (including CCTV camera) to be introduced at school. **(say in short, Preparing code of conduct – 2 weeks)**
- Prepare an appropriate school calendar for periodic parents gathering to show team activities like SQC case study and cultural programs. **(say in short, Preparing School calendar – 2 weeks)**
- Visit each class to present audio-visuals, including cartoons and make aware of bad effects of bullying to all students. **(say in short, Aware students – 5 weeks)**
- Prepare school skit and cultural programs highlighting the culture of collaboration and cooperation minimizing competition among students**. (say in short, Preparing cultural programs – 4 weeks)**
- Help to complete various SQC case study show case projects from each class, showing results and benefits of collaboration team efforts. **(say in short, Preparing SQC presentations – 6 weeks)**
- Present SQC case study and cultural programs to parents and teachers together periodically. **(say in short, Presentation to parents – 6 weeks)**
- Follow-up for promulgating code of conduct and CCTV installation. **(say in short, Follow-up – 3 wks)**
- Monitoring the status of bullying at school. **(say in short, Monitoring – 2 weeks)**



Arrow Diagram: Countermeasure Implementation Project Schedule for Bullying Problem at Schools

Introduction: The Activity Diagram is also called activity network diagram, network diagram, activity chart, node diagram, CPM (critical path method) chart, PERT (program evaluation and review technique) chart. The arrow diagram shows the required order of tasks (small components of activity) in a project suggesting the best schedule for the entire project. The arrow diagram lets you calculate the "critical path" of the project. This is the flow of critical steps where delays will affect the timing of the entire project and the team should take care at that activity.

Origin: Critical Path Method (CPM) was the discovery of M.R.Walker of E.I.Du Pont de Nemours & Co. and J.E.Kelly of Remington Rand, circa 1957 and was applied to the construction of a new chemical plant. Almost at the same time Project Evaluation and Review Technique (PERT) was devised in 1958 for the POLARIS missile program by office of the U.S.Navy.

Later on, in 1976, a special team of Japanese Union of Scientists and Engineers formed to devise new QC tools beyond the famous 7 basic tools, adapted this project scheduling tool and called it as the Arrow Diagram with a little bit modification.

Purpose: The purpose of an arrow diagram is to create a visual presentation of the steps of tasks necessary to complete a project with special emphasis on the time taken for these activities. The diagram provides a clear understanding of the schedule of various steps in the process which helps one to monitor the process for ensuring its completion on time.

When you know the steps of the project or process, their sequence and how long each step takes, then the arrow diagram can guide you to review and monitor the job your team is doing.

Construct: Materials needed: Post-its, sticky notes or cards, marking pens, large writing surface, like chart paper or flipchart pages

1. First, the SQC team lists all the necessary tasks in the project. One convenient method is to write each task on the top half of a card or sticky note, and time required to finish the task on second half of the card. Across the middle of the card, draw a horizontal arrow pointing left to right.
2. Determine the correct sequence of the tasks. Do this by asking three questions for each task:
    - Which tasks must happen before this one can begin?
    - Which tasks can be done at the same time as this one?
    - Which tasks should happen immediately after this one?
3. Diagram the network of tasks. If you are using notes or cards, arrange them in sequence on a large piece of paper. Time should flow from left to right and concurrent tasks should be vertically aligned. Leave space between the cards.
4. Between each two tasks, draw circles for "events." An event marks the beginning or end of a task. Thus, events are nodes that separate tasks.
5. Look for three common problem situations and redraw them using "dummies" or extra events. A dummy is an arrow drawn with dotted lines used to separate tasks that would otherwise start and stop with the same events or to show logical sequence. Dummies are not real tasks.

Very simple isn't it? Students! You try it next time.