What is software quality assurance?

-Planning  
-requirement extraction  
-Design elements  
-Testing  
-Change Control

-Methods and tools  
-audits and compliance  
-reviews  
-measurements and reporting: we want to use qualitative to look into project, to get a good understanding of what you want to achieve, and if that’s being achieved.

**Must keep in mind** that resources, time, money and people are limited. You sometimes just cannot implement every quality assurance.

**Elements of SQA (Software quality assurance)**

-Standards

-Reviews and Audits: As discussed in prev chapter with formal and informal

-Testing

-Error/Defect collection and analysis: Wed lecture  
Measurements you will have to come up with in test.

-Change Management:

-Education: Look at the education of people using

-Vendor Management:

-Security Management:

-Safety:

-Risk Management:

**We will cover above more later**

**SQA Processes and product characteristics**

SQA procedures and approaches that work in one environment may not work well in another. Different software products may exhibit different levels of quality.

Solution: Understand the specific quality requiments for the software and the actions…

**SQA Process**

**Start:** Take measurements to Improve

Identify problem area:

Identify indicators:

Prepare Criteria:

Compare results:

Analyse the assessment: to determine what is going on.

**This** is a **cyclic** process

**Tasks for SQA**

-Prepare an SQA plan for the project: this is done before designing the project

-Participants

-Reviews software engineering activities to verify compliance with defined software process

-Audits s software product is adhered to compliance with defined software process

-Ensures that deviations in software work and work products are documented and handled according to a documented procedure.  
**Important**: as any deviations must be fixed ASAP, as wastes time and resources.   
No matter how fancy something might be, if it doesn’t fix the problem, it doesn’t matter. Only once main problem is done can you do side things.

-Records any noncompliance and reports to senior management.

**SQA Goals**

In SQA, you are working to achieve a goal.

**Requirements Quality:** SQA must ensure that the software team has properly reviewed the requirements model to achieve high quality

**Design Quality:** SQA look for attributes of the design tat are indicators of quality.

**Code Quality:** SQA should isolate these attributes that allow a reasonable analysis of the quality of code. Unit tests. Modularity.

**Quality Control Effectiveness:** SQA analysis the allocation of resources for reviews and testing to assess whether they are being allocated in the most effective manner. --Is about resource allocation, but also the quality control assurance: very expensive, time consuming (meetings, setting up goals). This is justified by reducing number of errors you will face later on

**St1, study up till here  
St1, only need to study up till formal approaches to software assurance.  
What we’ve covered: project management concepts chp24, chp15,16,17 (half of 17)  
Chp 15 quality: discussion in class how to determine quality, quality concepts application, is NB  
ST1 5 mark question for business lecture**

**Statistical SQA**

-Information about software errors and defects is collected and categorised: Establish Measure if something is quality or not (metric/criteria evaluation… how good or how bad)

-An attempt is made to trace each error and defect to its underlying cause: Defects both propagate in system and start cascading and causing more and more errors elsewhere.

-Using the Pareto Principle (80 percent of the defects can be traced to 20 percent of all the causes), isolate the 20 percent:

-Once the vital few causes have been identified, move to correct the problems that have caused the errors and defects:

Now, **What is software quality? NB**

An effective software process applied in a manner that is useful to the people using it and adds value.

Looking at effective software process.  
Is it useful?  
Does it add value to person using it?

It is difficult to define quality in advance, easier to do it retroactively. So you can analyse past work to determine what adds and subtracts quality from those project for **future analysis.** However, you want to put steps in place beforehand to make sure that the end product is quality (by looking at requirements and such).

Philip Crosby: The problem of quality management is not what people don’t know about it. The problem is what they think they do know.

A develop is responsible for the quality of their own code, and should test their own code!

**SQA encompasses (nbnbnb used to setup SQA for ST1 when setting up project)**

1. A SQA process:
2. Specific quality assurance and quality control tasks:
3. Effective software engineering practices:
4. Control of all software work products and changes made to them
5. Procedure to ensure compliance with software development standards
6. Measurement and reporting mechanisms.