

Unit: III
Lecture: 5

Software Metrics:

Software metrics refers to **broad range of measures for computer software within the context of software project management**. We are concerned with:

- Productivity metrics output
- Quality metrics (customer requirements being satisfied or not)
- Technical metrics(logically complexity of software, degree of modularity)

Category of Software Metrics:

- a) Size Oriented Metrics:** Size oriented metrics are used to collect direct measures of software engineering output and quality.
- b) Function Oriented Metrics:** Function oriented metrics provide indirect measures. These measures try to quantify the functionality of the system i.e. what the system performs.

Size Oriented Metrics/ LOC (Lines of Code) Metrics:

Size oriented software metrics are **derived by normalizing the quality and productivity measures by considering the size of the product as a metric**.

LOC (Lines of Code) or thousands of LOC (KLOC) has been a very traditional and direct method of metrics of software.

It focuses on the size of the software that has been produced. A software organization maintains simple records, a table of size oriented measures such as show in the diagram below:

Project	LOC	Effort	\$(000)	Pp. doc.	Errors	Defects	People
alpha	12,100	24	168	365	134	29	3
beta	27,200	62	440	1224	321	86	5
gamma	20,200	43	314	1050	256	64	6
•	•	•	•	•	•		
•	•	•	•	•	•		
•	•	•	•	•	•		

Fig Size oriented metrics

The table lists each software development project that has been completed over the past few years and corresponding measures for the project.

In the above fig: for project alpha:

- for project alpha: 12,000 Lines of Codes (LOC) were developed with 24 persons months of effort at a cost of \$168,000.
- Further, it shows that 365 pages of documentation were developed, 134 errors were recorded before software was released and 29 defects were encountered after release to the customer within first year of operation and 3 people worked on this project alpha.

While counting lines of code, simplest standard is:

- Don't count blank lines
- Don't count comments
- Count everything else

The size-oriented measure is not a universally accepted method.

Advantages:

- Using these metrics, it is very simple to measure size.
- LOC is used by many methods that are already existing as a key input.

Disadvantages:

- This measure is dependent upon programming language.
- Sometimes, it is very difficult to estimate LOC in early stage of development.
- It cannot measure size of specification as it is defined on code.
- Thought it is simple to measure but it is very hard to understand it for users.