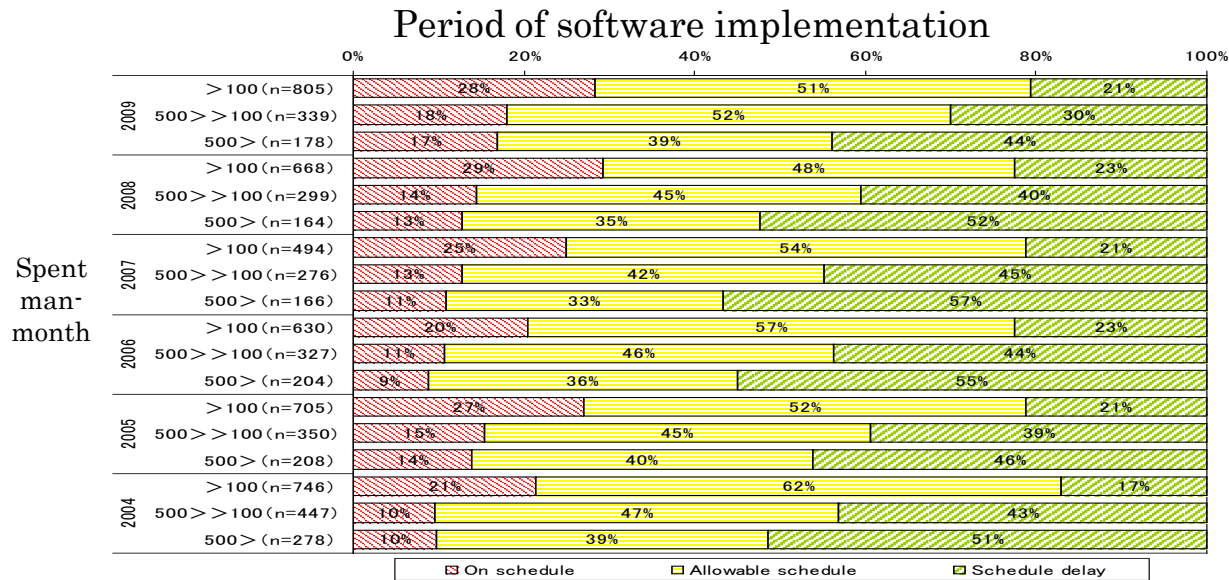


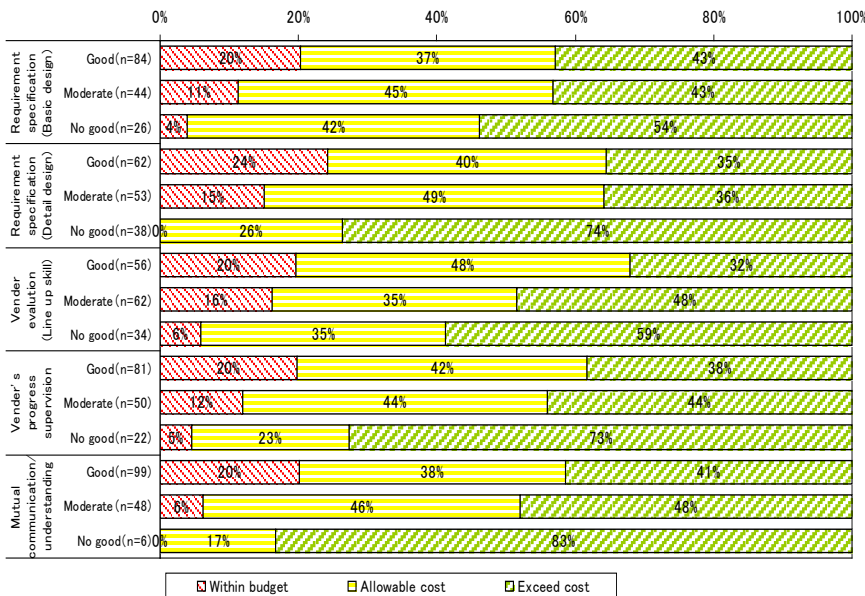
Research results

QCD Management for Application Software Engineering Management

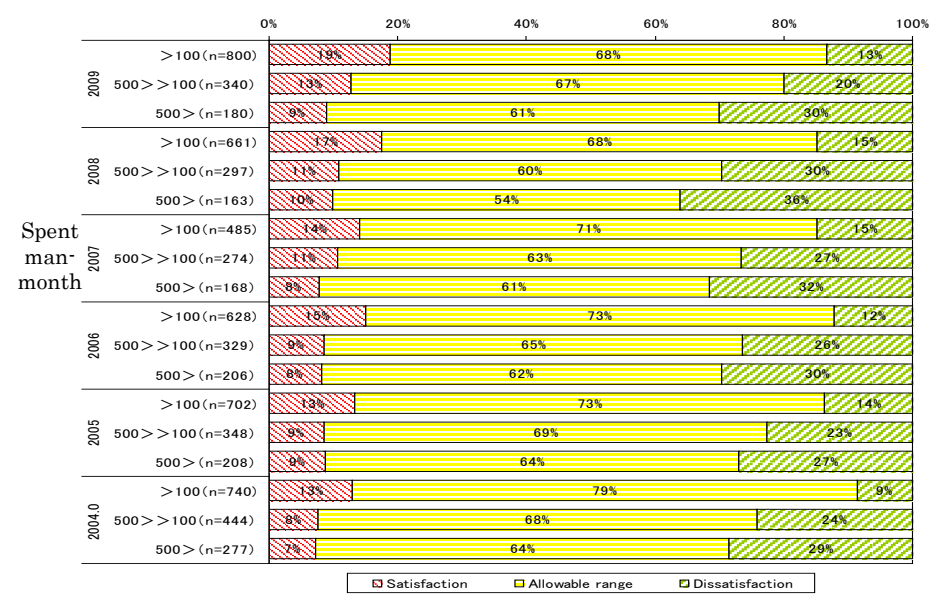
Expectation of QCD in Software Implementation



Cost of software implementation

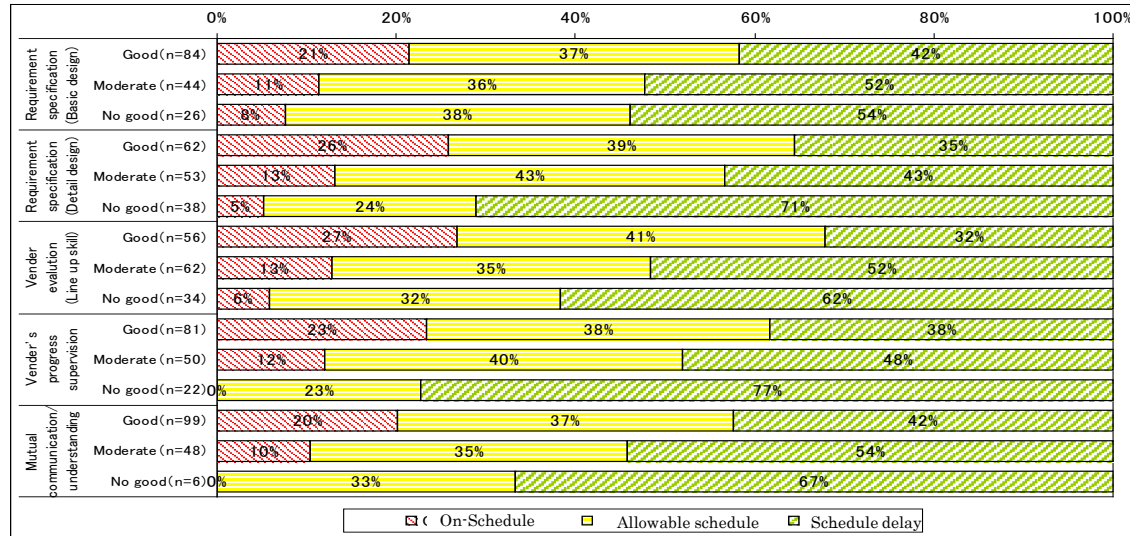


Quality of software implementation

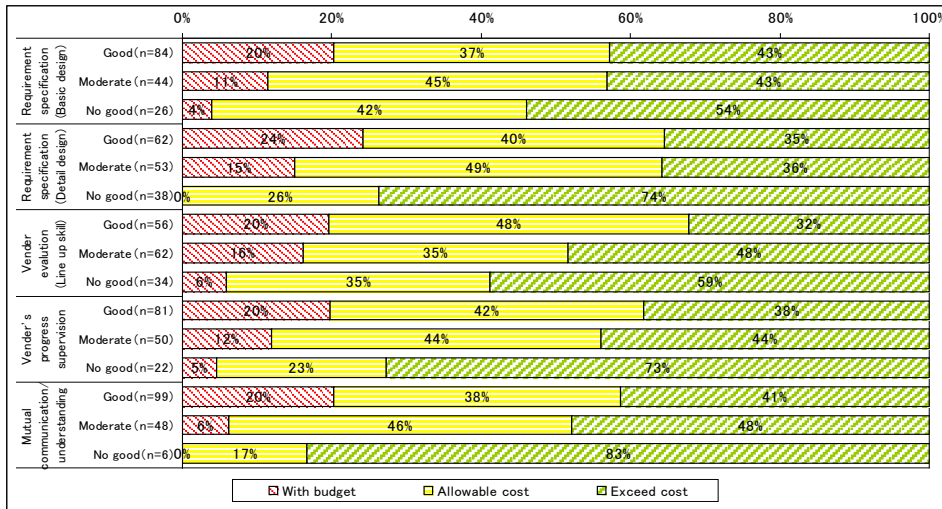


Owner's Specification and Supervising vs QCD Satisfaction (In case of more than 500 man-month projects)

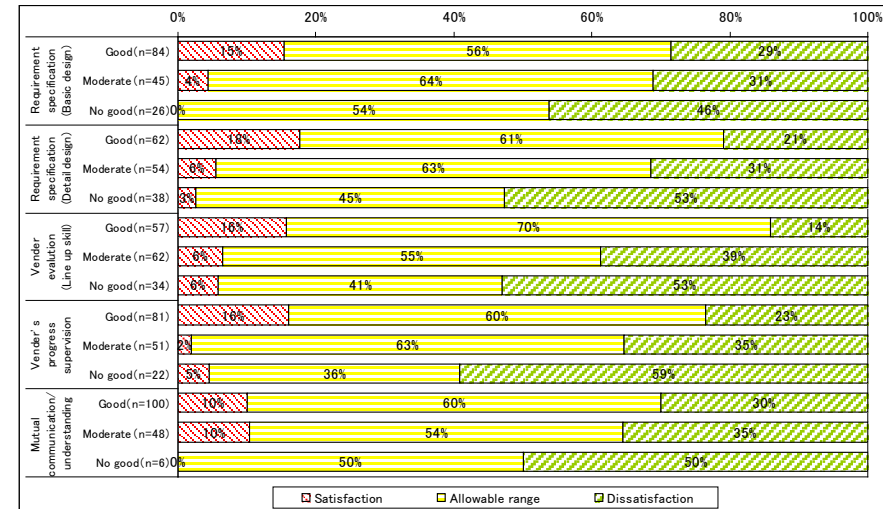
Period of software implementation



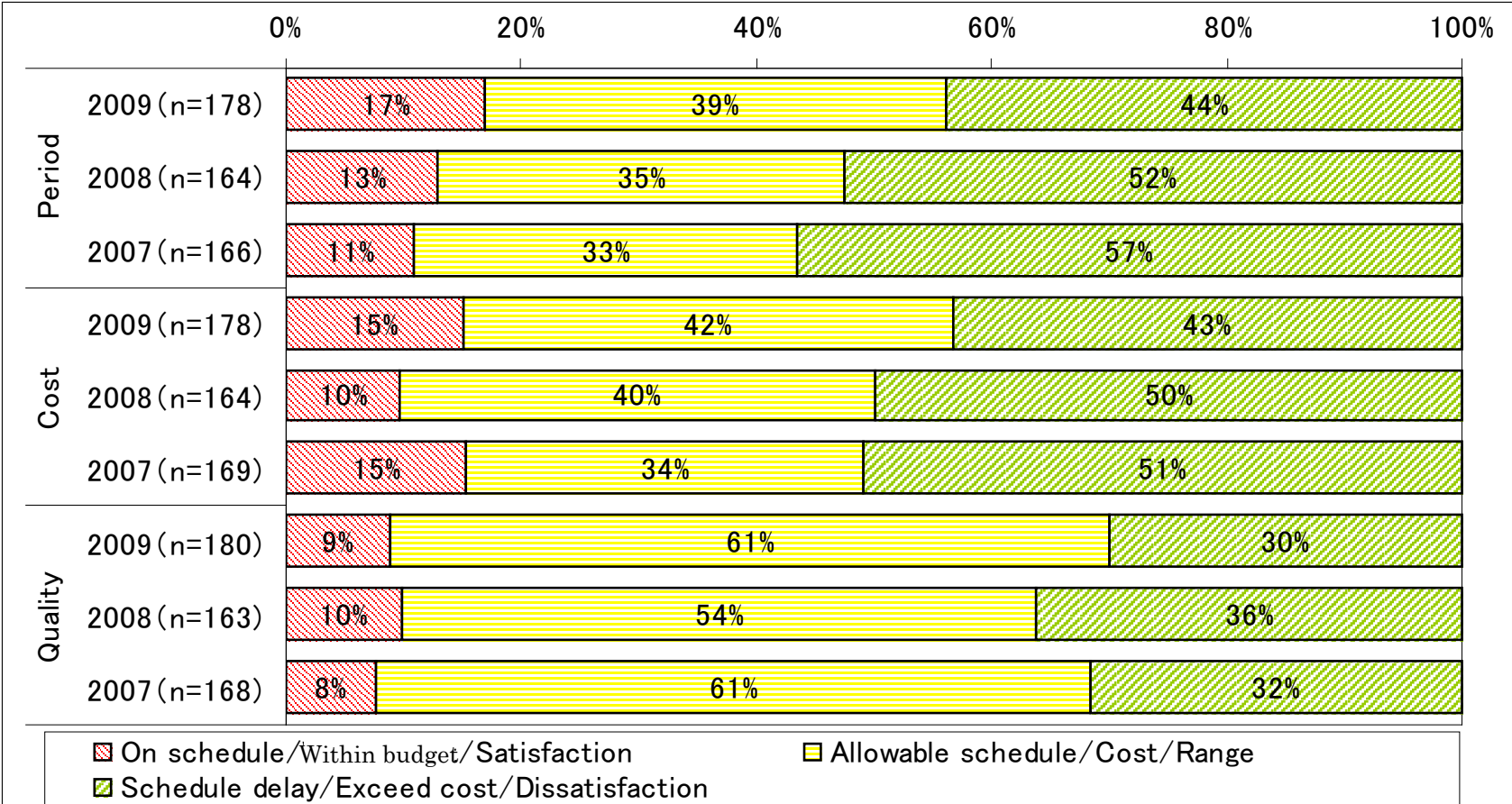
Cost of software implementation



Quality of software implementation

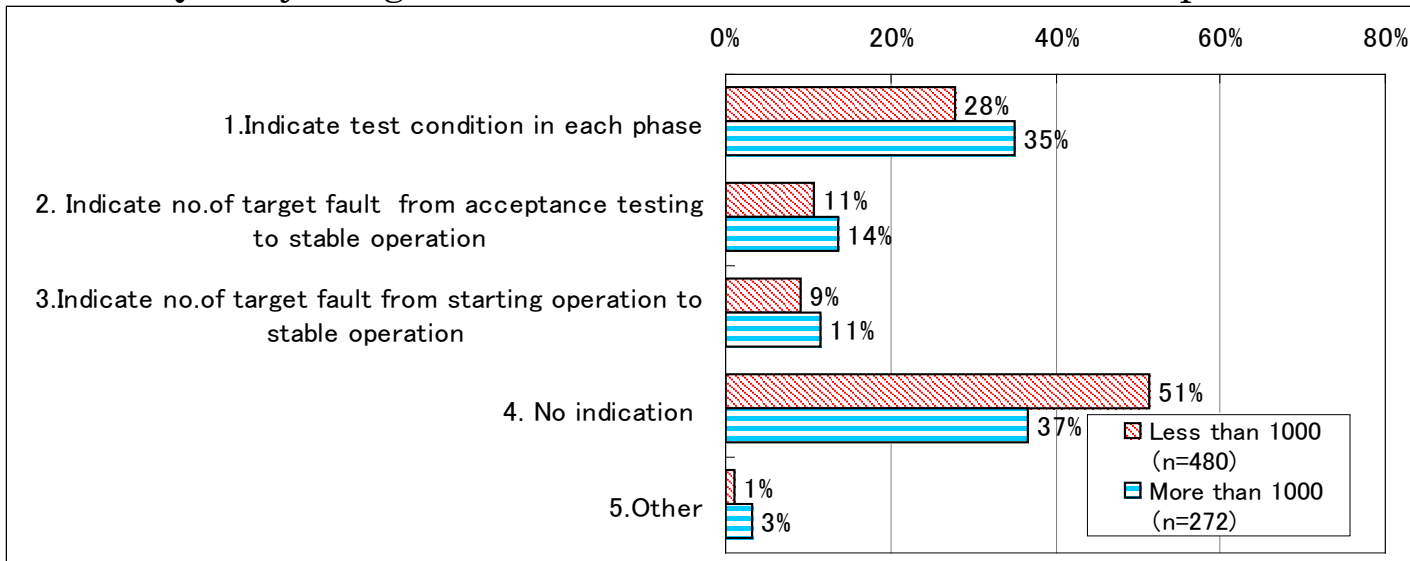


Satisfaction of QCD in Large Projects (More than 500 man-month)

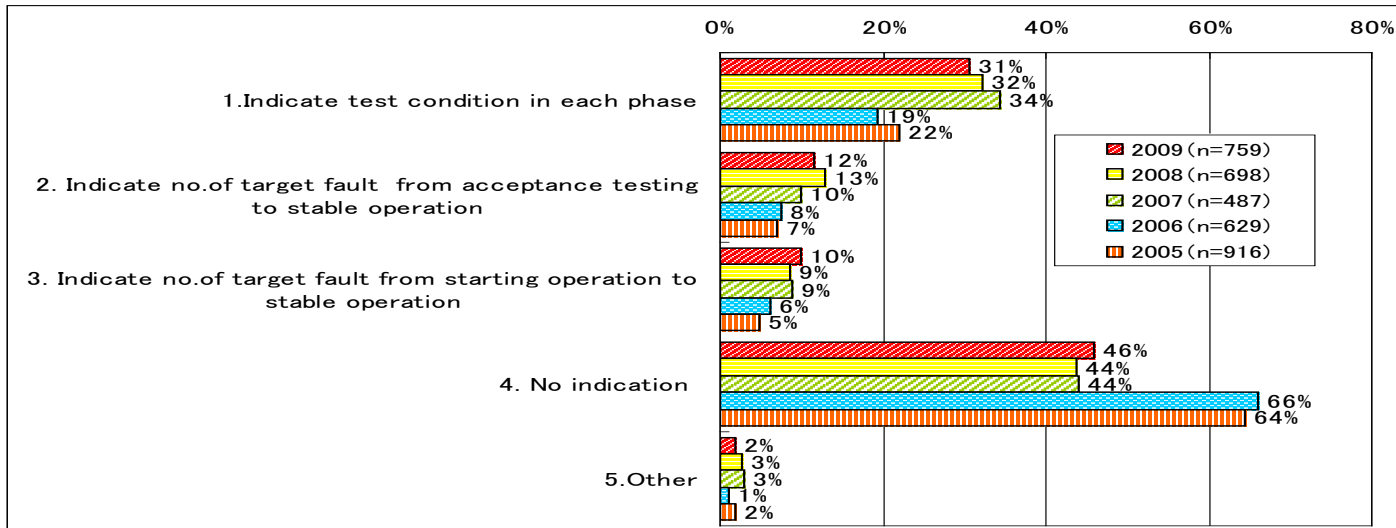


Quality Target to Vender

Quality Target to indicated for Vender(Size of enterprise)



Quality Target to indicated for Vender (By year)



Project Quality with/without Quality Target

Definition of Quality of Software by JUAS

Defect rate = Density of no. of the defect which are found by user

$$= \frac{\text{(No. of defect which are found through overall systems testing and follow up phase)}}{\text{(Total project man-month)}}$$

Converted Defect Rate vs Quality Target

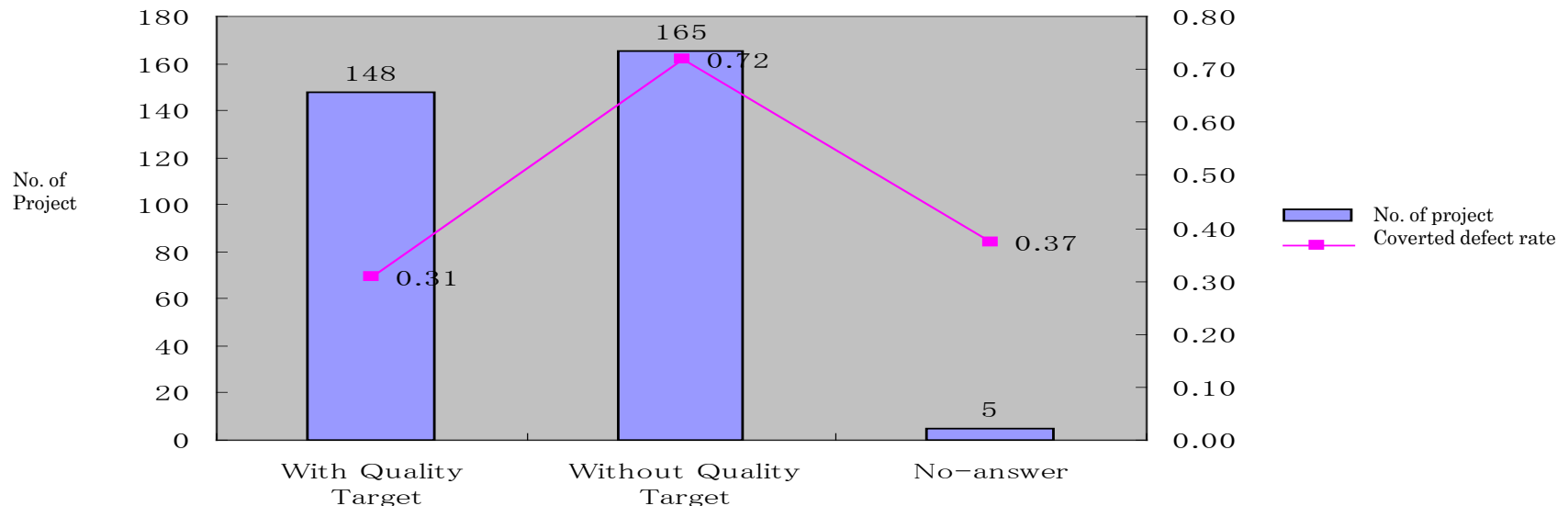
No. of Converted defect = $2.0 \times A + B + 0.5 \times C$

A = Big defect (Necessity of many man-month and long period for fatal defect or urgent defect)

B = Medium defect (Necessity of medium range of period for non-fatal defect)

C = Small defect (Required few man-month and short period for defect)

Converted defect rate = $(\text{No. of Converted defect}) \div (\text{Total project man-month})$



JUAS' s Advice: Essential Index for Software Engineering

Productivity of software engineering is as follows.

1 Average value 1.28 KLOC/Man-month (Maximum 3.83 KLOC/Man-month : Minimum 0.81 KLOC/Man-month)

Average value 9.84 FP/Man-month (Maximum 35.56 FP/Man-month : Minimum 6.72 FP/Man-month)

Note : Productivity is depending on size of project (man-month) and complexity of function/software.

2 Standard period (Statistical period) is $2.51 \times \sqrt[3]{\text{Total man-month}}$

Note : Standard period of 1000 man-months project is 25 months. If this project is shortening of more than 40%, it is required very hard work.

3 One bug per 5 million yen of software design and production occurs among acceptance testing to stable operation

4 One tenth of the bug in the normal operation is occurring to compare with the found bug in the total systems testing phase.

Note :If 100 bug were corrected in the total systems testing,10 bug will be occurring in the normal operation.

5 If quality target is indicated at contracting, the quality (Defect rate) is improved more than twice.

6 If the well experienced and excellent project manager is appointed, the quality (Defect rate) is improved more than 3~5 times,

7 The level of expertness of accountable person in owner is influenced the period of requirement definition.