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- Research Purpose
- Research Scope
- Research Method
- Related Research
- Measurement Model for Reliability on e-Biz solution
- Findings & Conclusion

- Research Purpose
  - Present a Reliability Measurement Model for e-biz solutions in J2ee environment
    - Address problems with software reliability of e-biz solutions
  - To remove defects as early as possible in the development process
  - Reduce or eliminate defects from software - improve software quality

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- Research Scope
  - Limited to propose the Model of e-biz solution based on Software Reliability Engineering (SRE)
  - Limited to based on B2B business architecture
  - Limited to based on failure of the software
  - Propose Software Reliability Measurement Metric based on exponential distribution Estimation

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- Research Method
  - Estimate and prediction case calculated by Software Reliability Measurement Metric

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- Software Reliability
  - Predicts how software reliability should improve over time as faults are discovered and repaired
  - Based on an analysis of the accuracy of similar predictions at earlier stages in the acquisition of data from testing a program
  - There are several different reliability metrics
  - The most appropriate metric for a specific system depends on the type of system and application domain

- Definition
  - The probability that software fault do not cause a failure during a specific exposure period in a specified use environment
  - Fault
    - defect that causes or can potentially cause a failure when executed
  - Failure
    - departure of system behavior in execution from user requirements
  - Execution Time
  - Calendar Time
  - Operational Profile

- Quantitative study of the operational behavior of software-based systems with respect to user requirements concerning reliability
- Software reliability engineering
  - Software reliability measurement, which includes estimation and prediction, with the help of software reliability models established in the literature
  - the attributes and metrics of product design, development process, system architecture, software operational environment, and their implications on reliability
  - the application of this knowledge in specifying and guiding system software architecture, development, testing, acquisition, use, and maintenance

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- Case Study
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- Reliability Issues B2B
  - Using different hardware and, software platforms, and altogether different application formats
  - Exchange two or more application to information
  - Very important an accurate information delivery
  - A serious problem is occurred when does not accurate information delivery by system down and failure occurrences
  - Accordingly unreliable systems may cause information loss

- Four major component

4 MAJOR COMPONENT

Defined quantitatively from defining failures and failure severity by determining a reliability objective, and by specifying balance among key quality objectives

Step1 : Reliability Objective

Step2 : Operational Profile

Step3 : Reliability Measurement

Step4 : Reliability Validation

contributes to more accurate estimation of software reliability in the field.

reliability can be analyzed in the field to validate the reliability engineering effort and to provide feedback for product and process improvements.

- Perform goodness-of-fit test
- Make reliability predictions

- time-based
  - time of failure, time between failures
- failure-based
  - cumulative failures, failures per time period
- think about unit of analysis
  - CPU hour, calendar day, week, month

Week	Defects/KLOC Arrival	Defects/KLOC Cumulative

- Plot the data, analyze it informally, observe trend, fluctuations, look for obscure patterns, link patterns to the testing process, time-unit granularity, look at noise of data

Density distribution

Cumulative distribution

- Plot of data is helpful to select the model
- Determine whole-life-cycle model or model for testing
- Some noise in the data, Overall decreasing trend
  - Select Exponential model

- Use statistical methods
- Use tools that estimate your model parameters
- Done with the help of a software tool

- Input:
  - Failure data
  - Type of model used
- Result:
  - K = 6.597
  - λ = 0.0712

- Plug your parameters in the model

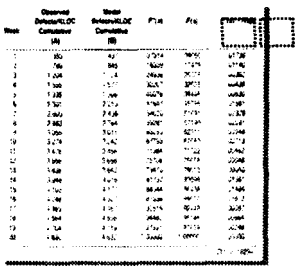
$f(t) = K \lambda e^{-\lambda t}$

$F(t) = K (1 - e^{-\lambda t})$

t=number of weeks since start of system test

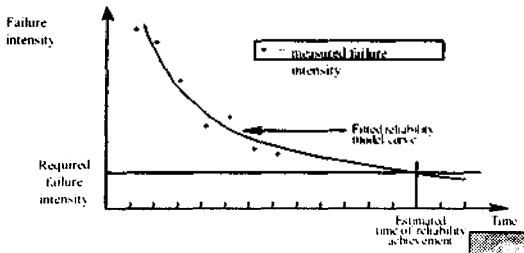
- F(t) corresponds to the mean value function
- f(t) corresponds to the failure intensity λ(t)

- Use the Kolmogorov-Smirnov test or χ^2 test
- Kolmogorov-Smirnov : Time between failure models



- Assume that the system is released after 20 weeks of testing.

$F(t) = 6.597 (1 - e^{-0.0712 t})$



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- **Measurement Model for Reliability on e-biz solution**
- **Findings & Conclusion**

- Findings
  - Could estimate Reliability and could predicate Reliability

- Further Researchable Areas
  - In further, must present each component reliability Measurement model
  - Need research about Reliability growth model as well as Reliability Measurement model

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