Unit #13

MIS5203
Testing

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Agenda

- Quality characteristics
- Error detection techniques
- Entity inspection
- Evaluating datasets
- Issue tracking
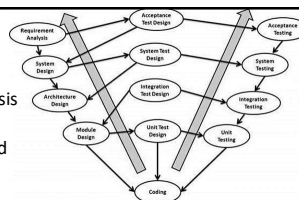
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Software Application Testing

- A test plan is developed during the analysis phase
- During the design phase, unit, system and integration test plans are developed
- The actual testing is done during implementation
- Written test plans provide improved communication among all parties involved in testing

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Testing Applications

- Testers should be different people than the developers
- Testers should use simulate the various ways end users will use the application, and document errors they find
- Use cases are helpful in developing test suites of alternative test cases
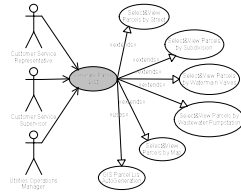
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Testing Process

- The purpose of testing is to confirm that the system satisfies the requirements
- Testing must be planned
  - **Bottom-up testing** (most systems are tested early using bottom up testing)
    - Begins testing the smallest units of the system (e.g. programs and modules), and works upward until a the entire system has been tested
    - Advantages: Can be started before all programs are complete; Errors in critical modules can be found early
  - **Top-down testing**
    - Begins testing the breadth and works into the depth of the system
    - Advantages: Tests of major functions and processing conducted early; Interface errors can be detected sooner; Confidence raised in system by seeing a working system
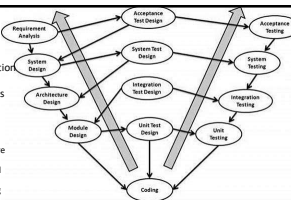
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Software Test Types

1. **Unit testing**: Each module is tested alone against its specification in an attempt to discover any errors in the controls structure and internal operation of the code
2. **Interface or Integration testing**: A hardware or software test that evaluates how well the application passes and exchanges information with another system
3. **System testing**: testing of programs that comprise a system to ensure that they function properly
   - **Recovery testing** – Checking system's ability to recover after a software or hardware failure
   - **Security testing** – making sure the system includes appropriate access controls and does not introduce any security holes that may compromise other systems
   - **Load testing** – Testing with large quantities of data to evaluate performance during peak use
   - **Volume testing** – Studying the impact of incremental volumes of data records to determine the maximum volume of data that the application can process
   - **Stress testing** – Studying the impact of incremental numbers of concurrent users/services to determine the maximum number that can be supported
   - **Performance testing** – Comparing the system's performance to other equivalent systems using well-defined bench marks
4. **Final acceptance Testing has 2 parts:**
   - Quality Assurance Testing (QAT) – focuses on the technical aspects of the system, done by IT staff to verify the application meets specifications and works as documented by testing the logical design and technology
   - User Acceptance Testing (UAT) – focuses on the functional aspects of the system, done by users to ensure the system is production ready and satisfies all documented requirements

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Phases of Testing

Pre Alpha → Alpha → Beta → Release Candidate (RC) → Release

- **Pre-Alpha**:- Software is a prototype. UI is complete. But not all features are completed. At this stage, software is not published
- **Alpha**: Software is near its development and is internally tested for bugs/issues
- **Beta**: Software is stable and is released to a limited user base. The goal is to get customer feedback on the product and make changes in software accordingly
- **Release Candidate (RC):** Based on the feedback of Beta Test, you make changes to the software and want to test out the bug fixes. At this stage, you do not want to make radical changes in functionality but just check for bugs. RC is also put out to the public
- **Release:** All works, software is released to the public

https://www.guru99.com/alpha-beta-testing-demystified.html

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Acceptance Testing

User Acceptance Testing

Unit Testing → Integration Testing → System Testing → Alpha Testing → Beta Testing

Process where actual users test a completed information system, the end goal is the users' acceptance of it

- **Alpha testing** is carried out in a lab environment and usually, the testers are internal employees of the organization
  - This kind of **testing** is called **alpha** only because it is done early on, near the end of the development of the software, and before **beta testing**
- **Beta Testing** of a product is performed by "real users" of the software application in a "real environment" and can be considered as a form of external User Acceptance Testing
  - Beta version of the software is released to a limited number of end-users of the product to obtain feedback on the product quality
  - Beta testing reduces product failure risks and provides increased quality of the product through customer validation
  - It is the final test before shipping a product to the customers. Direct feedback from customers is a major advantage of Beta Testing. This testing helps to tests the product in customer's environment

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Other Types of Testing

- **Pilot testing** – Preliminary test that focuses on specific predetermined aspects of the system. Not intended to replace other testing methods, but to provide a limited evaluation of basic functionalities of the system
- **White box testing** – Assesses the effectiveness of software program logic. Test data used to determine procedural accuracy or conditions of specific program logic (applies to unit and integration testing). Used in a focused manner as exhaustive white-box testing is often cost prohibitive
- **Black box testing** – Integrated testing of the an information system's functional effectiveness without regard to any specific internal program structure. Applicable to integration (interface) and user acceptance testing
- **Functional/validation testing** – A form of system testing that evaluates functionality against detailed requirements to trace back to customer requirements (did they build the right product)
- **Regression testing** – Testing against use-cases in test plan to assure that changes did not introduce new errors
- **Parallel testing** – Testing the same data within the original system (which will be replaced) and the new systems and comparing the results
- **Sociability testing** – Tests to confirm that he new system can operate in its target environment without adversely impacting existing systems. Focuses on application processing examining the interfaces with other systems that can be running at the enterprise and within the user's desktop application environment and with the user's browser

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Internal Quality Characteristics

Programmers care about internal characteristics of application quality, as well as external characteristics

1. Maintainability
2. Flexibility
3. Portability
4. Reusability
5. Readability
6. Testability

McConnell, Steve (2004), <u>Code Complete,</u> Microsoft Press

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Internal Quality Characteristics

1. **Maintainability**: Ease of revising or fixing an geospatial application
2. **Flexibility**: Ease of extending a geospatial application to support new uses
3. **Portability**: Ease of modifying a geospatial application to operate in a new environment
4. **Reusability**: Ease with which parts of the geospatial application can be reused
5. **Readability**: Understandability of the source code
6. **Testability**: Degree to which a geospatial application can be verified to meet requirements

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External Quality Characteristics

Users care that applications are:

- *Are easy to use, not if they are easy for developers to modify*
- *Work correctly, not about the structure and readability of the code*

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External Quality Characteristics

1. Correctness
2. Usability
3. Efficiency
4. Reliability
5. Integrity
6. Adaptability
7. Accuracy
8. Robustness

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External Quality Characteristics

1. **Correctness:** Accuracy of specification, design, data and implementation
2. **Usability:** How easy it is for user to perform their work
3. **Efficiency:** Appropriate use of system resources (memory, execution time, storage, bandwidth)
4. **Reliability:** How well the application performs under prolonged use
5. **Integrity:** Prevents unauthorized or improper access to its programs and its data
6. **Adaptability:** Can be used, without modification, in other systems
7. **Accuracy:** Produces valid results
8. **Robustness:** Continues to function with invalid inputs or a stressful environmental

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External quality issues are:

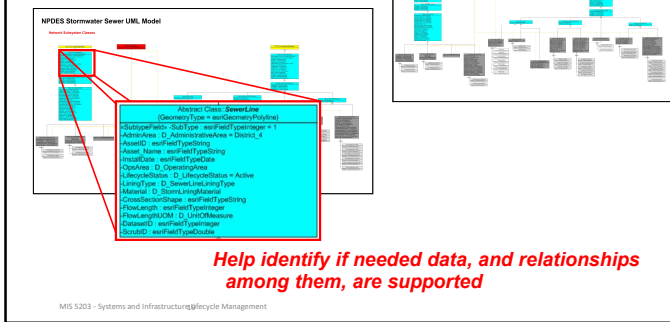1. Defects, errors, or bugs
2. Omissions
3. Usability problems

…that negatively affect user satisfaction, application acceptance, and project completion!

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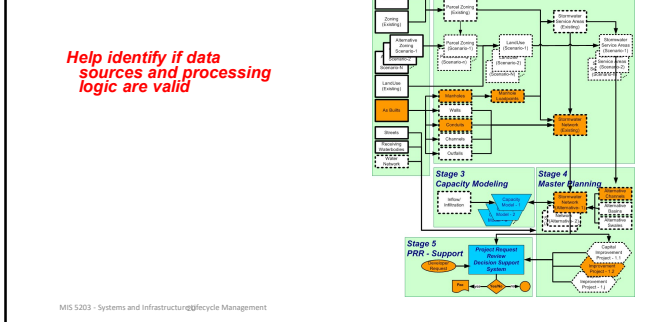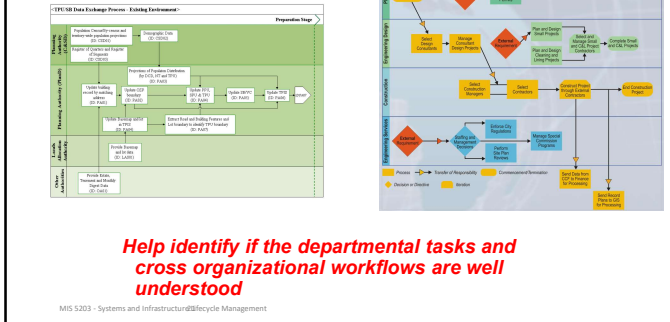
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Error Detection Techniques…

No single defect-detection technique is effective by itself

- *Reviewing designs*
- *Evaluating datasets*
- *Testing the completed applications*

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Reviewing designs…

- *Use cases*
- *Data models*
- *Data flow models*
- *Business process models*
- *System architecture models*

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Use case specifications

Help identify if the functional specifications are complete, and the desired behavior achieved

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Data Models

Help identify if needed data, and relationships among them, are supported

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Data Flow Models

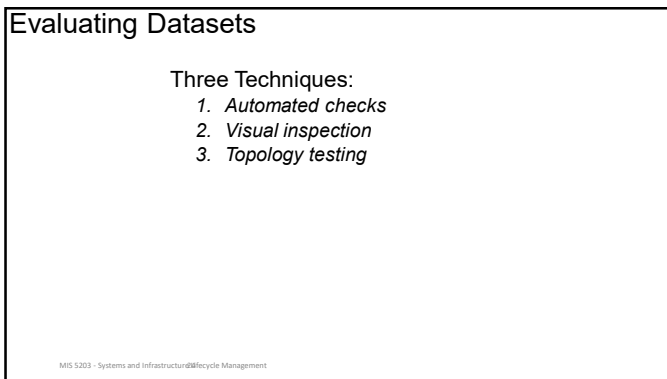*Help identify if data sources and processing logic are valid*

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Business Process Models

Help identify if the departmental tasks and cross organizational workflows are well understood

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System Architecture Models

Help identify if the technology choices are appropriate, and the configuration is comprehensive and valid

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Defect Detection Techniques…

- *Reviewing designs*
- ***Evaluating datasets***
- *Prototyping*
- *Inspecting software code*
- *Testing applications*

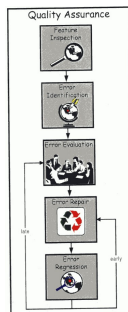MIS 5203 - Systems and Infrastructure Lifecycle Management

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Evaluating Datasets

Three Techniques:
1. *Automated checks*
2. *Visual inspection*
3. *Topology testing*

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Automated Checks

- Domain Checks (including Valid Values)
- Nulls and Zeros Checks
- Uniqueness Check
- Default Value Checks
- Duplicate Geometry Check
- Functional Dependency Check

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Defect Detection Techniques
Evaluating Datasets

Three Techniques:
- ✓ *Automated checks*
- **2. _Visual inspection_**
- 3. *Topology testing*

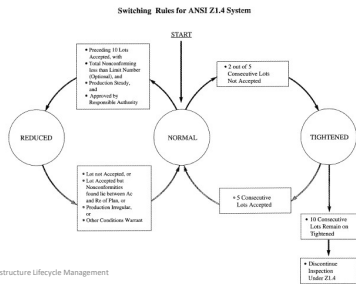MIS 5203 - Systems and Infrastructure Lifecycle Management

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Visual Inspection

- *Entities inspected*
  - *each found error is identified and documented*
- *Severity and priority of each error is determined*
  - *cost and risk that repairs will cause further problems are evaluated*
- *Repaired errors are "regressed" to confirm fix*
  - *and to see if fix caused additional errors*

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Quantifying Inspection Needs

Entities

	lines	points	nodes	Total
waste	170,000	12,100	167,900	350,000
storm	57,600	28,000	75,350	160,950
water	481,900	173,200	1,489,700	2,144,800
hpfs	8,757	9,500	8,886	27,143
Total	718,257	222,800	1,741,836	2,682,893

X

Attributes

	lines	points	nodes	Total
waste	43	22	25	90
storm	43	22	25	90
water	31	22	21	74
hpfs	31	22	21	74
Total	148	88	92	328

=

67,450,000 attributes
+   2,682,893 graphic features
_____

~70,133,000 data elements   *Requiring 1,686 person years (@ 3 minutes to compare each to the value in its source document !)*

Note: Data volume estimate for water and sewer utility data automated in Philadelphia

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Two Methods for Entity Inspection

1. **Entity prioritization**
   - Prioritized entity lists
   - Assures more important entities are examined first (before resources expended)
2. **Random sampling**
   - Statistical approach, based on randomly sampled entities
   - Yields objective measures of error rates for each entity type
   - Provides objective measures of a product's quality

   ➢ *If features within a dataset have error rates that are too high, errors are fixed and entities are sampled again, process continues until the desired quality is reached*

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Random Sampling

1. Random samples of data selected for inspection
2. Errors counted, and compared to threshold of "acceptability"

ANSI Z4.1 Standard is often used to determine:
   - Size of random samples
   - Error rates for accepting / rejecting a dataset

AMERICAN NATIONAL STANDARD

Sampling Procedures and Tables for Inspection by Attributes

Prepared by
American Society for Quality Standards Committee
For
AMERICAN NATIONAL STANDARDS COMMITTEE
Z-1 ON QUALITY ASSURANCE

Sponsor and Secretariat
AMERICAN SOCIETY FOR QUALITY

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Determining Sample Size

In Z1.4, sample size is a function of dataset size

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Determining Sample Size

In Z1.4, sample size is a function of dataset size and inspection level

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Determining Acceptance/Rejection Error Rates

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Rules for Stopping the Inspection and Rejecting a Dataset

Switching Rules for ANSI Z1.4 System

START

- Preceding 10 Lots Accepted, with
- Total Nonconforming less than Limit Number (Optional), and
- Production Steady, and
- Approved by Responsible Authority

REDUCED   NORMAL   TIGHTENED

- 2 out of 5 Consecutive Lots Not Accepted

- Lot not Accepted, or
- Lot Accepted but Nonconformities found lie between Ac and Re of Plan, or
- Production Irregular, or
- Other Conditions Warrant

- 5 Consecutive Lots Accepted

- 10 Consecutive Lots Remain on Tightened

- Discontinue Inspection Under Z1.4

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Evaluating Datasets

Three Techniques:
- ✓ *Automated checks*
- ✓ *Visual inspection*
- 3. ***Topology testing***

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Topology Tests

- Cardinality checks
- Valid connections
- Directionality checks
- Gap detection

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Topology Tests
Cardinality Testing

A hydrant is shown with 3 connected pipes.

Typically, a hydrant terminates a single pipe. Source documents will need to be reviewed to see if the hydrant should be a different structure, the pipes need realigned, or if there is a missing hydrant lateral.

Connections need to be investigated

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Topology Tests
Valid Connections
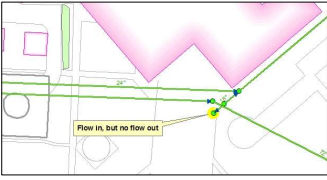
Duplicate geometry in the sanitary sewer system.

In this case, the From and To nodes share the same coordinates even though the pipes themselves do not share the same digitized geometry

Duplicate features

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Directionality Testing

A sanitary sewer manhole is shown with a pipe flowing into it, but no pipes flowing out.

Looking at the rest of the system in the area, it is apparent that the connected pipe needs to be flipped to correct the problem..

Flow in, but no flow out

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Gap Detection

Intersections are highlighted where a connection node feature should exist

Most shown here will become tees, but a possible hydrant, cap, or plug may be created on the lower-right node. Source documents may need to be consulted in this case.

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Error types and tests to find them:

		Automated Checks	Context Inspection	Random Visual Inspection	Connectivity Testing	Flow Trace Testing
Dataset	Format/Domain Error	●		x		
Source	Missing/Unusable			●		
Feature	FeatureMissing		●	x		
Feature	FeatureShouldNotExist		●	x		
Attribute	AttributeMissing	x		x		
Attribute	AttributeShouldNotExist	x		x		
Attribute	AttributeValueError	x		●		
Attribute	AttributeSourceError			●		
Graphic	LocationError		x	●		
Graphic	ShapeError		x	●		
Graphic	GraphicSourceError			●		
Topology	ConnectionBreak		x	x	x	●
Topology	ConnectionInvalid		x	x	●	x
Topology	DirectionIncorrect			x		●
Annotation	Missing	x	x	●		
Annotation	ShouldNotExist		x	●		
Annotation	LabelWrong		x	●		
Annotation	LocationWrong		x	●		
Annotation	FontWrong		x	●		

Note: ● = Major Goal x = Secondary Goal

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Defect Detection Techniques…

✓ *Reviewing designs*
✓ *Evaluating datasets*
✓ *Prototyping*
✓ *Inspecting software code*
• ***Testing applications***

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Issues are:

1. Defects, errors, or bugs
2. Omissions
3. Usability problems

…that negatively affect user satisfaction, geospatial application acceptance,
and project completion!

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Issue Tracking

Issue tracking improves project quality by:
- *Documenting application and data defects*
- *Measuring application and database quality*
- *Determining project status*
- *Managing, prioritizing, scheduling and communicating development and quality assurance tasks*

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Standard Operating Procedures

- **Issue Resolution Workflow**
- Triage
- Lessons Learned

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Issue Resolution Workflow

There are 3 phases in the issue resolution workflow:
1. **Opening**
2. **Resolving**
3. **Closing**

Issue Resolution Workflow

| Opening | → | Resolving | → | Closing |
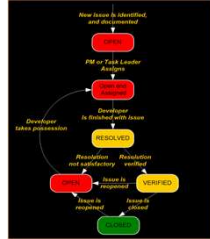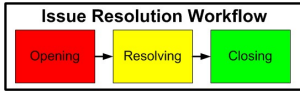
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"Opening" a New Issue

When a new issue is found:
- Create a new issue record form to fill in
- Document the problem
- Save the issue record documenting the problem
- Assign the issue to the person responsible for resolving the issue
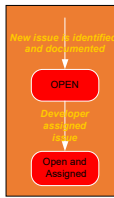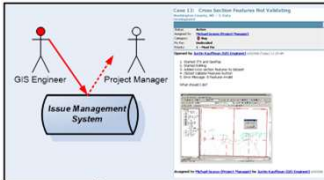
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Opening a New Issue

- Issues are found by project team members and by end-users
- New issues are opened

For example by clicking on the Add New Issue button in the "Issue Manager" system, which responds with the Add/Edit Issue screen, illustrated below:
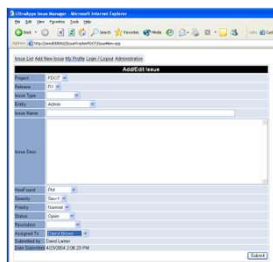
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Opening and new issue
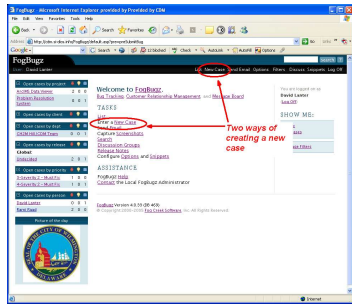
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Issue form
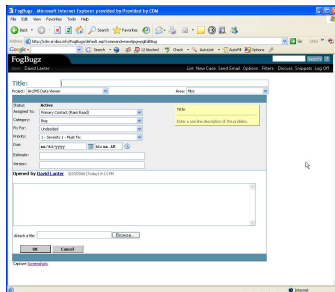
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Information for <u>Opening</u> a New Issue

1. Status
2. Application Name and Version
3. Title
4. Category
5. Area
6. Error Type
7. Severity
8. Notes
9. Assigned To
10. Release
11. Priority
12. Opened By
13. Opened Date/Time
14. IssueID

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Title

BugID	OpenedBy	Title
107	a-samja	FPL - Wild Rouge Wilderness listed in wrong state
108	a-samja	G_O - symbology for Wild Rogue Wilderness incomplete
109	a-derekl	TRA - A stretch of I-405 near Bothell, WA is labeled as I-130
110	a-samja	G_O - Incomplete symbology for Marble Mountain Wilderness
111	a-samja	G_O - Incomplete symbology for Yolla Bolly Middle Eel Wilderness
112	a-samja	G_O - Incomplete symbology for Dome Land Wilderness
113	a-derekl	TRA - Ardrossan-Douglas ferry route near Drummore, GB is broken
114	a-jordym	TRA - Font wrong, Southwest Coast Path, UK
115	a-derekl	TRA - A segment of A14 near Thrapston is labeled as A604
116	a-derekl	TRA - Douglas-Liverpool ferry route is broken
117	a-samja	TRA - Best Ferry left out of route from Sweden to Finland

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Area (continued)

- For example, a Computerized Maintenance Management Systems, might have Areas setup for:
  - User login accounts
  - Authentication and access permissions
  - Service requests
  - Work orders
  - Database
  - Map controls
  - Map data themes, e.g. Assets, BaseMap, Roads, Populated Places, etc.
  - Reports
  - Documentation

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Severity

Identifies the importance of the quality issue, four level ranking:
- "Severity 1"
- "Severity 2"
- "Severity 3"
- "Severity 4"

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Severity 1

- A "Brand Damaging error"
- Can be a defect which renders the application unusable - a system crash, an unhandled application error, inability to start/stop, failure to login, etc.
- *Do not deliver a product that contains Severity 1 defects*

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Severity 2

- "Product Damaging error"
- May be a systematic error, such as a Query subsystem that returns incorrect result sets;
- *Do not a product that contains Severity 2 defects*

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Severity 3

- A "Non-show Stopper"
- A simple (non-systematic) error that will be fixed if there is time and resources
- Associated with a work around
- Or, misspelled text message, missing lable, or consistency problem
- *Fix if there is time and budget*

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Severity 4

- A "recommendation"
- Is not a defect nor product acceptance issue
- Usually a recommendation or request that falls outside the scope of the current project
- Associated with a work around
- Or, misspelled text message, missing lable, or consistency problem
- *Do not fix*

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Notes

Opening a New Issue

- The description of the problem
- Extremely important, this is where the person identifies the problem and reports how to reproduce it.
- Every good bug report needs exactly three things in the Notes or Description field:
  - Steps to reproduce
  - What you expected to see
  - What you saw instead (see description below)

Also referred to as "Description" in some issue tracking systems.

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Notes

Opening a New Issue

To reproduce:
1. Logged in as: mt491jm
2. Selected: Application/Service/Search/Service Requests
3. Searched by:
 Depth Of Search = SR
 Check "Service Request" box
 Status = Open
 Priority = High
Click "Go", got a list of SRs on the left panel
Click the link of WO-1329-1-2, the Work Order detail shows up
Click the link of SR-1329 - Got error message: "No matching items were found in the list," Expected to see SR's details

Opened by Fei Wang 3/29/2006 (Yesterday) 3:18 PM

Reproduce steps:
1) go to http://imserver/wilmington
2) zoom in the map so that you can see buildings and pipes
3) click on "redline tool"
4) digitize a polygon
5) click on Save button on Redling frame
6) type in Title, Description, Name, then click on Save Session
7) an error message shows up: "Error: adding session information - details: Operation must use an updateable query"

what is an updatable query?
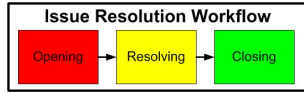I didn't see any definition in their User Guide document

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Issue Resolution Workflow

There are 3 phases in the issue resolution workflow:
1. Opening
2. **Resolving**
3. Closing

Issue Resolution Workflow
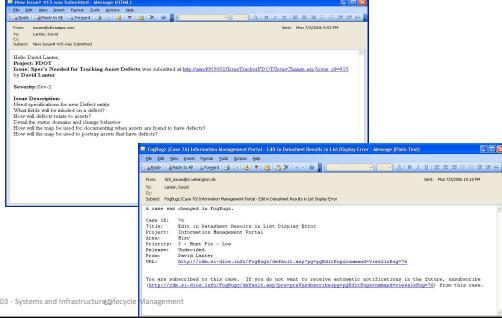
| Opening | Resolving | Closing |

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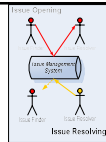
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Email Notifications

Opening a New Issue

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Resolving an issue

- After you are notified that you have a new issue
- Follow the directions in the notes and attempt to reproduce the issue
- Decide:
  - If the Notes provided enough information to reproduce the issue
  - If the issue is a valid issue
  - If you are the appropriate person to resolve the issue
  - Estimate how long it will take to resolve the issue
- Resolve it in order, by: Release, Severity, and Priority
- Reassign the issue for validation of your resolution

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Re-Assigning Issues

- Sometimes, you are assigned issues that should be resolved by someone else
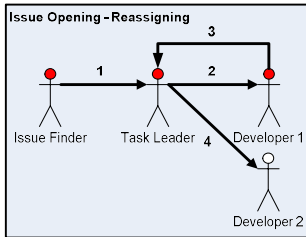- When this happens, reassign it by changing the "Assign To" value:
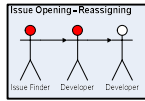
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Re-Assigning Issues

Resolving an issue

Reassign open issues among staff based on skills, knowledge, experience, and workload

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Resolving an issue - example

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Resolution example

Resolving an issue

By	Krishnappa, Prakash
Date	8/21/2004 4:49:00 PM
Response	The issue is fixed by adding the validation for the user logged on against the AssignedByID. If they are same then they are allowed to delete the ASR. Also the UI is tightened further. The supervisor cannot reassign the ASR. He can only change the Status, add the status related comments & date & then save it . ALL other fields are locked. This patch is applied since there was no supervisory(ASR level) group in the security database. I have added the ASR level group in the security database. Changed the dependency code in AssignedSR.asp & global.asa. Fei check the functionality and let me know.
Entity	Service Request
Type	Security
Assigned To	Fei Wang
Severity	Sev-2
Priority	Normal
Status	Open
Resolution	Fixed

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Resolving an Issue – Required Information

Resolving an issue

- Estimate
- Resolution
- Status
- Note
- Assigned To
- Resolved by
- Date/Time Resolved
- Related Issues

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Estimate

Resolving an issue

✓ **The developer should estimate how long it will take to resolve it and fill in the estimate**
  ➤ *Adjust the estimate for big issues that still require work, this enables tracking how much work remains*
✓ **Some issue tracking systems track the "Original Estimate", and provide other fields, such as:**
  ➤ **"Current Estimate" for re-estimating the remaining work**
  ➤ **"Elapsed Work" to enable the developer to show how much time has been expended**
  ➤ **"Time Remaining" can be calculated by subtracting elapsed from current estimate**

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Resolution

Resolving an issue

- <u>Bugs</u> can be resolved as:
  - Fixed
  - Not Reproducible
  - Duplicate
  - Postponed
  - Won't Fix
  - By Design

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Resolution

Resolving an issue

- New <u>feature</u> requests can be resolved as:
  - Implemented
  - Postponed
  - Won't Implement
  - Already Exists

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Issue Resolution Workflow

There are 3 phases in the issue resolution workflow:
1. Opening
2. Resolving
3. **Closing**

Issue Resolution Workflow

Opening → Resolving → Closing

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Closing an Issue

If the resolution is valid, the issue's Status is set = to "Closed"
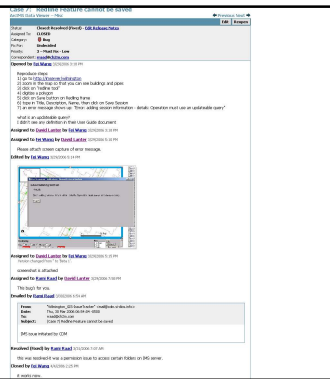
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Closing an Issue – Required Information

- Resolution
- Status
- Closed by
- Date/Time Closed

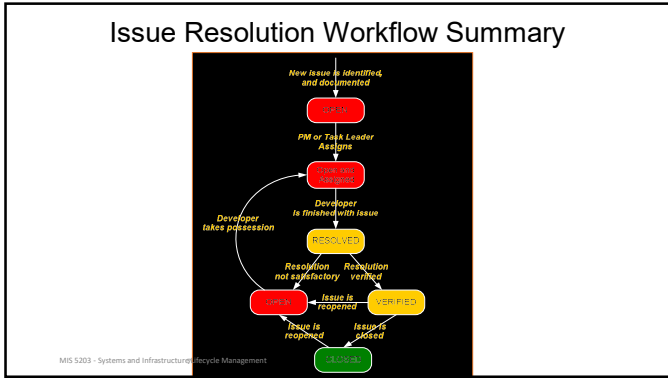MIS 5203 - Systems and Infrastructure Lifecycle Management

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Reopening an Issue

Closing an issue

If an issue resolution is found to be incorrect (e.g. the bug is found to be not fixed):
- Status is changed from "Resolved" to "Open"
- Resolution is changed from "Fixed" to null
- Note is updated to let the Developer know that the issue is still open, providing any additional guidance for reproducing it
- Issue is reassigned by changing Assigned To and assigning it back to the Developer for resolution

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Issue Resolution Workflow Summary

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Standard Operating Procedures

✓Issue Resolution Workflow
- **<u>Triage</u>**
- Lessons Learned

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Triage

The process of sorting, prioritizing, and selecting which issues to allocate resources to, and which to postpone or avoid based on decisions concerning:

1. Where funds are most needed and can be best used
2. Which development risks are acceptable, and which should be avoided based on abilities of the development team, remaining budget, and time left in the schedule

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A Triage-based View of Project Schedule

- **Pre-Triage**
  - From "Project Kickoff" project milestone through "Application Development 50% Complete" milestone
  - Scoped features designed and prototyped, and Developers implementing critical core features
- **Early Triage**
  - From "Application Development 50% Complete" milestone to "Code Complete" milestone
  - Testing begins and issues are recorded, prioritized, and resolved.
- **Late Triage**
  - From "Code Complete" milestone through Alpha, Beta, and "Final Release and Delivery" of the application
  - No new features worked on

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Triage – Analyzing Issues

Issues from issue tracking systems can be analyzed in reports, Excel Pivot Tables and Charts to assess application stability and project status
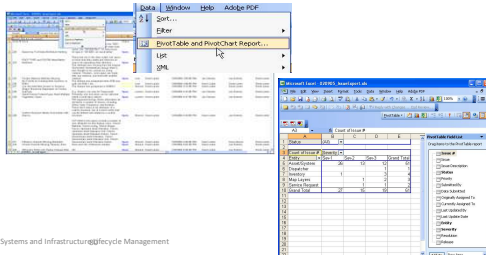
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Triage – Scheduling a Release

Examine the pivot table of Open issues below. Assume that all the areas ("Entity" is a synonym for "Area") have been tested, and Entity = "ALL" identifies issues affecting all areas

1. Is this application ready for delivery to the client?
2. Which subsystems are ready for delivery?
3. Formulate a strategy for quickly achieving a first release of this application.

Count of Issue #	Severity				
Entity	Sev-1	Sev-2	Sev-3	Sev-4	Grand Total
Admin	5	3	4	1	13
ALL	1	9	4	1	15
Asset/System	38	77	39		154
Citizen Complaint	3	16	10	1	30
Dispatcher	1	1	3	2	7
Inspection		1			1
Inventory	4	8	4		16
Map Layers	1	1	3		5
Project		1			1
Report			6		6
Service Request	22	80	33	9	144
Spill Response			1		1
ToDo	2	4	1	1	8
WorkOrder	2	7			9
Grand Total	79	208	108	15	410

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Triage – Managing Resources

- Examine the co-variation of issues by their severities and assignments to developers
  - Keep the focus on Severity 1 and Severity 2 issues
  - Look for overloaded developers
    - Determine if the resolution of issues can be better spread across the development team
    - Reschedule issues for later releases, if possible
    - Determine if additional resources are needed
    - Proactively forecast schedule slips

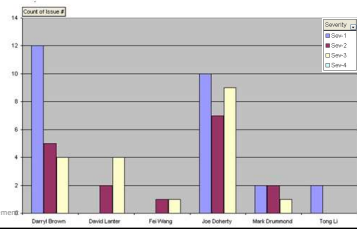MIS 5203 - Systems and Infrastructure Lifecycle Management

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Example - Examine the graph in the email below

Who looks like they may be overloaded?

Formulate a strategy for managing the staff to handle the overload.

From: Lanter, David
Sent: Tuesday, February 01, 2005 2:09 PM
To: Doherty, Joseph; Brown, Darryl; Wang, Fei; Li, Tong; Drummond, Mark; Nehrke, Seth
Subject: FDOT Issues...

Here's the distribution of R3B-1 issues in the issue tracking system. Please make sure to periodically check the issue tracker, query for Release = R3B-1, and Status not= Closed, and clear out the bugs assigned to you.

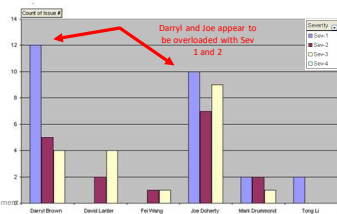MIS 5203 - Systems and Infrastructure Lifecycle Management

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Example - Examine the graph in the email below

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Here's the distribution of R3B-1 issues in the issue tracking system. Please make sure to periodically check the issue tracker, query for Release = R3B-1, and Status not= Closed, and clear out the bugs assigned to you.

Darryl and Joe appear to be overloaded with Sev 1 and 2

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Good Issue Management

Requires a bit of policing and guidance, until everyone is familiar with the issue resolution workflow and what they need to do within it

From: Lanter, David
Sent: Tuesday, February 01, 2005 2:09 PM
To: Doherty, Joseph;
Subject: FDOT issues...

Joe, the next chart suggests that you are resolving issues – but when you resolve them you also need to assign them to someone (likely Mark or Tong) to confirm the resolution and close them.
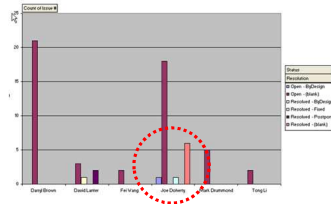
As a reminder:
Work through the bugs by severity, Sev-1's first, then Sev-2's, then Sev-3's.
If the issue is assigned to you, resolve it, and reassign back to the finder (usually Mark, Tong, or Seth) for them to agree it's been resolved and then they can close it.
If you found the issue, and it is now re-assigned back to you, check to see that it has been resolved and close it.
If you think the issue should be postponed or if there is any other complication we should discuss, then assign the issue to me and I'll follow up.
...dave

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Triage – Managing Final Delivery

- Resolved issues must be validated and closed
- Remaining Open issues are
  1. Fixed if they are truly Severity 1 or Severity 2, or postponed if Severity-3 or Severity-4
  2. Closed
- All issues must be closed before an application development project can be closed out

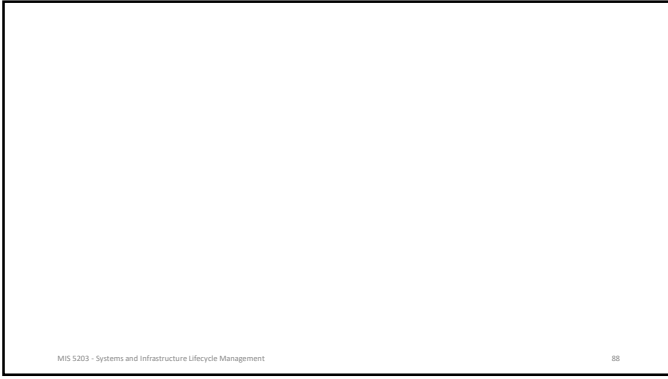MIS 5203 - Systems and Infrastructure Lifecycle Management

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Agenda

✓ Quality characteristics
✓ Error detection techniques
✓ Entity inspection
✓ Evaluating datasets
✓ Issue tracking

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