



An Exploratory Tester's Notebook

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Who I Am



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*I help solve testing problems
that other people can't solve.*

Acknowledgements



- James Bach
 - some material in this presentation is taken from our Rapid Software Testing course
- Cem Kaner
- Jon Bach
 - who introduced me to the Moleskine notebook and who, with James, created and documented session-based test management—and provides exemplary session notes

This Presentation Is Under Continuous Development



- For updated notes AND a more formal paper on notebooks: quest2009@developsense.com

The First Law of Documentation

“That should be documented.”

really means...

“That should be documented *if and when and how* it serves our purposes.”

**Who will read it? Will they understand it?
Is there a better way to communicate that information?
What does documentation cost you?**

Documentation: Product or Tool?



Paradigm:

Tool

Product

Audience:

Self

Team

Customers

Regulators

Purpose:

Recollection

Organization

Communication

Demonstration

Notebooks: A Personal View




- Over the last I've been keeping a set of notebooks
- This is an experience report on how *one* exploratory tester and consultant (me) has used them
- This is a context-driven talk; this is not a best-practices talk

My Introduction to the Moleskine

- I've kept documents (mostly for school or work) all my life
 - scribblers
 - legal pads
 - ASCII text files
 - Word documents
- In January 2004, I noticed Jon Bach's Moleskine notebook
- In January 2005, James Bach suggested I get one. I did.
- It turns out there's a something of a cult...
 - <http://www.moleskinerie.com/>
 - <http://www.moleskinecity.com>
 - <http://en.wikipedia.org/wiki/Moleskine>

So What's the Big Deal?

- Several form factors
 - larger notebook
 - smaller notebook (pocket size)
 - reporter style
 - memo pockets
 - Three line styles
 - plain
 - ruled
 - squared
 - Page marker
 - Elastic closure
 - Back pocket
 - Sewn binding, lies flat
 - Geek-chic-mystique-boutique appeal
- 
- Well-constructed
 - Durable
 - Somewhat expensive

Who Uses Notebooks?



People Who Need
to Remember Things

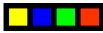


Investigators

Creators

Exploratory testers are all three, and more.
ALL testers are, at some point, explorers.
Maybe we should learn explorers' tools.

Paradigmatic Examples



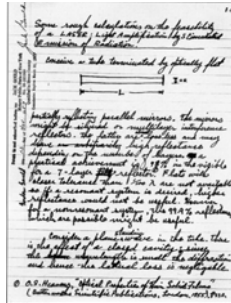
- Leonardo: inventor's notebook
 - Codex Arundel, Codex Leicester, Codex Foster, etc.
 - contents: sketches, inventions, architecture, elements of mechanics, painting ideas, human anatomy, grocery lists and even people that owed him money (Wikipedia)



Paradigmatic Examples

- Gordon Gould: inventor's notebook

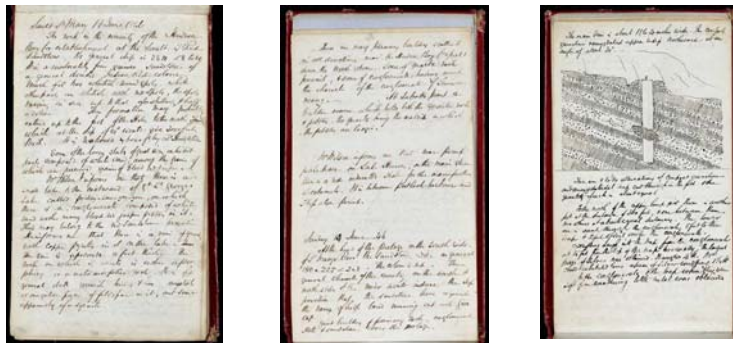
- One of the people involved in the invention of the laser.
- Notes created after meeting with Charles Hard Townes, November 1957 include the acronym "LASER" and several aspects of its design.



Paradigmatic Examples

- William Logan: explorer/geologist's notebook

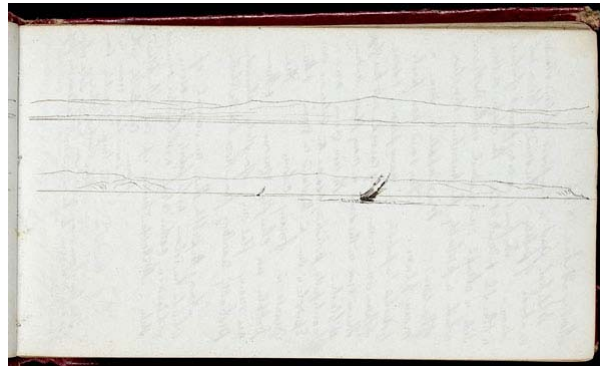
- Written in Stone—geological explorations of Canada
- <http://www.collectionscanada.ca/logan/021014-1000-e.html>



1846 Lake Superior

Paradigmatic Examples

- William Logan – Explorer's notebook
 - Written in Stone—geological explorations of Canada
 - <http://www.collectionscanada.ca/logan/021014-1000-e.html>



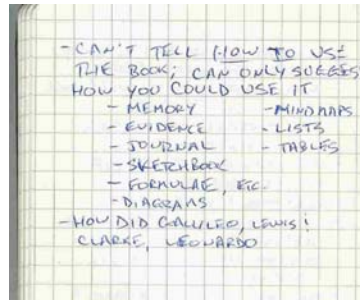
Why Notebooks Now?

- In the age of the Palm (I have one) and the smartphone (I have one) and the laptop (I have one), why use notebooks?
- They're portable
- They never crash
- They never forget to save
- Battery doesn't wear out
- They're free-form
- They're available
- They're personal

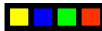
What I Use Notebooks For



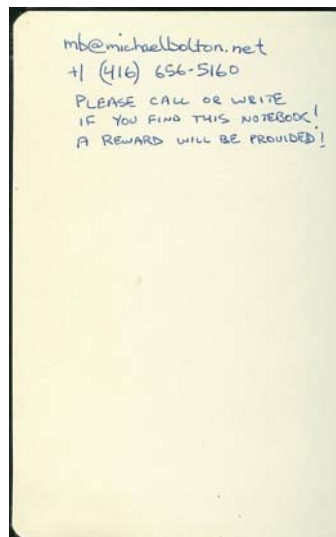
- Brainstorming
- Sketches
- Catalogs of heuristics
- Mind maps
- Diagrams
- Action items and reminders
- “Fieldstones” and blog entries
- Conference or workshop sessions
- Test notes, and practice taking them



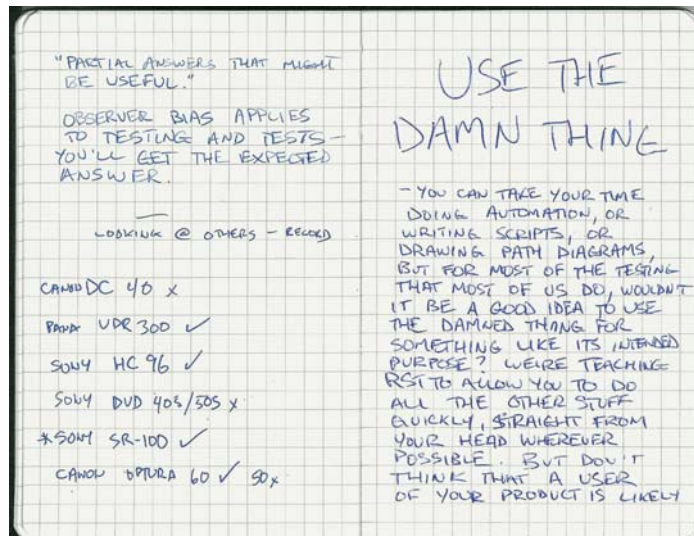
My Notebooks



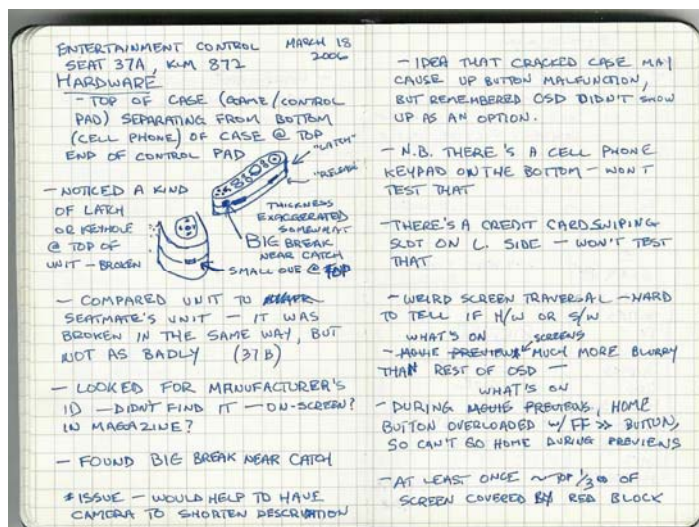
- I thought I lost my notebook once. Now...



A Busy Couple of Days, With Rant



An Exploratory Testing Session



An Exploratory Testing Session



5 HOLED ACROSS

R.G. [REDACTED] 17 DOWN

RED BLOCK CONTAINED A GRID OF SINGLE-LINE TRANSPARENT HOLES - CORRECT PICTURE VISIBLE THROUGH THE HOLES

- WAITED TIL END OF PROMO - RED BLOCK DISAPPEARED WHEN MAIN (ENGLISH) MENU REDISPLAYED

SKY TEAM LOGO

WHAT'S ON

MOVIES

TV

MUSIC

GAMES

KIDS

FLIGHT TRACKING

SMS/EMAIL

FEEDBACK

INFO

SCREEN OFF

PICTURE

OPTIONS CASE - SENSITIVE

NOTE R. SUPPORT FOR AT LEAST 3 ACCENTED CHARS

HOME

HELP

KLMO

ENGLISH

FRANCAIS

PORTUGUES

ESPAÑOL

DEUTSCH

日本語

中文

- PRESSING HELP FROM MAIN SCREEN DOESN'T PROVIDE HELP; TAKES ME TO LANGUAGE SELECTION SO DOES 4

3:40 - GETTING SLEEPY

3:43 VERY SLEEPY (STOP)

An Exploratory Testing Session



7:40 AM

- RESTARTED. DID A VERY TENTATIVE AND LOW-IMPACT TEST OF RETRACTING CORD. THE BIG BREAK IS AT THE POINT WHERE THE UNIT HITS A VERY HARD PART OF THE RECEPTACLE - RUBBERIZE THEM?

- TURNED ON THE UNIT. NAVIGATED TO FLIGHT TRACKING SCREEN. SCREEN GOES COMPLETELY OFF, IT APPEARS, WHEN FETCHING THE DATA OR SWITCHING TO THAT MODE

- PRESSED MODE BUTTON - PROMPTS TO RESUME FLIGHT TRACKING OR RETURN TO MENU. CENTRE BUTTON DOESN'T SELECT THE HIGHLIGHTED OPTION - YOU HAVE TO PICK ON THE NAV BUTTON

MOVIES

KLMO LATEST (15 MOVIES)

POINT UP DOWN SHOWN AS ONLY OPTION (IMPLICIT)

WHEN ALSO WORKS TOO

KLMO LATEST

KLMO LIBRARY

CLASSICS

FAMILY

WORLD CINEMA

HELP

- PRESS HELP AT THIS POINT BRING ME ONLY TO A LAME ILLUSTRATION OF HOW TO USE

NO WAY TO CANCEL HELP, APPARENTLY; WHEN I FINISH, I'M DUMPED BACK TO MAIN MENU AND HAVE TO START OVER

FROM "CHOOSE LANGUAGE" SCREEN, IT APPEARS I CAN CHOOSE THE LANGUAGE FOR HELP, BUT NOT FOR THE PACKAGE OVERALL -

An Exploratory Testing Session

- IN WORLD CINEMA, LANGUAGES FOR THE MOVIES LISTED AS (e.g. An Sou Mn/Cn/En-s)
NO INDICATION OF WHAT THESE MEAN. COULD WE USE FLAGS W/ IDEOGRAMS? INFER -> MEANS SUBTITLES

- LISTINGS WON'T MEAN MUCH TO NON-ENGLISHERS. e.g. 中 日

TV MENU:

- NEWS - BLANK SCREEN
- SPORT - (3 ITEMS)
- COMEDY - CLASSIC (9 ITEMS) - SUMMARY POPULAR (9)
- DRAMA
- LIFESTYLE
- CULTURE
- NATURE
- TRAVEL

KEEP NAV'ING TO R. AND EVENTUALLY I GET INSTRUCTIONS ON HOW TO USE BOTTOM BUTTONS (NICER THAN ANY HELP SCREEN SO FAR)

- I LIKE THE BREADTH OF SELECTION - PRETTY IMPRESSIVE

- WHEN SEAT AHEAD IS RECLINED I HAVE TO GET VERY LOW TO SEE THE SCREEN (CLASSIC LCD ANGLE ISSUE)

- REWIND ** HARD TO SEE PROGRESS OR POSITION OR RATE
8:40 - STOPPED -> TO WATCH HILL STREET BLUES

- ON PAUSE, CLAIMS ELAPSED PROGRAM TIME IS 2 MINUTES - I THINK THAT'S SINCE LAST COMMERCIAL BREAK IN ORIGINAL SHOW

- SHOWS ELAPSED PROGRAM TIME BUT REMAINING FLIGHT TIME

- A SECOND PAUSE, MOMENTS LATER, SHOWS 17 MIN ELAPSED TIME -> ONE SCREEN ONLY

- SELECTION SCREEN SAYS GREEN BUTTON WILL PLAY - IT DOESN'T; YOU HAVE TO USE THE "LITTLE GREEN" BUTTON

Observation on Building Skill

BLOG FIELDSTONE 2006 07 02
BARCELONA

HOW PICASSO GOT TO BE A MASTER
LOB OF NATURAL TALENT BUT...

- ABILITY TO CAPTURE THE IMPORTANT STUFF is MODELING
- HUGE VOLUME OF WORK
- TRIED LOTS OF DIFFERENT STYLES
- WENT BACK TO BASICS
- LOTS OF PRACTICE
- LOTS OF STUDIES
- HOW MUCH WORK DID WE NOT SEE?
- LOTS OF THROWAWAY EXERCISES
- A PAINTING IS A MODEL

ALSO: NOW THAT WE VIEW HIM AS A GREAT ARTIST, HIS MINOR WORKS HAVE GREAT SIGNIFICANCE ASCRIBED TO THEM. MAYBE OUR "INSIGNIFICANT" WORKS HAVE THE SAME IMPACT.

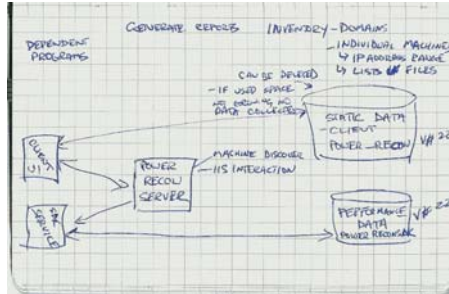
- LOTS OF EARLY STUFF IS QUITE IMITATIVE OF OTHER STYLES - ATTEMPTS TO DEVELOP SKILLS AND TO FIGURE OUT WHAT'S IMPORTANT
- THERE'S A LINK TO THAT WYNTON MARRASUS / CHICK COREA ARTICLE IN MUSICIAN MAGAZINE, WHERE ONE HELD THAT LOUIS ARMSTRONG WAS GREAT BECAUSE OF SKILL, AND THE OTHER BECAUSE OF HEART AND SOUL. BUT L.A. HAD BOTH; PEOPLE DON'T CONNECT AS STRONGLY WITH ROBERT PRUPP, WHO HAS BAGS OF SKILL; AND LOTS OF PEOPLE NEVER GET PUBLISHED BECAUSE, ALTHOUGH THEY HAVE LOTS TO SAY, THEY DON'T HAVE THE SKILL TO SAY IT WELL ENOUGH.

Diagramming

- “The diagram is nothing; the diagramming is everything.”
 - Jerry Weinberg

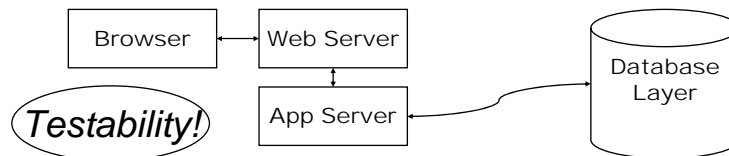
James Bach on White-Box Risk-Based Analysis, with Diagrams

- [pointing at a box] *What if the function in this box fails?*
- *Can this function ever be invoked at the wrong time?*
- [pointing at any part of the diagram] *What error checking do you do here?*
- [pointing at an arrow] *What exactly does this arrow mean? What would happen if it was broken?*



Guideword Heuristics for Diagram Analysis

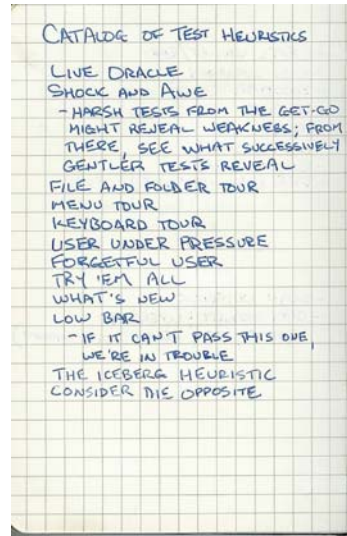
- | | | |
|--|---|--|
| <ul style="list-style-type: none"> • Boxes • <i>Missing/Drop-out</i> • <i>Extra/Interfering</i> • <i>Incorrect</i> • <i>Timing/Sequencing</i> • <i>Contents/Algorithms</i> • <i>Conditional behavior</i> • <i>Limitations</i> • <i>Error Handling</i> | <ul style="list-style-type: none"> • Lines • <i>Missing/Drop-out</i> • <i>Extra/Forking</i> • <i>Incorrect</i> • <i>Timing/Sequencing</i> • <i>Status Communication</i> • <i>Data Structures</i> | <ul style="list-style-type: none"> • Paths • <i>Simplest</i> • <i>Popular</i> • <i>Critical</i> • <i>Complex</i> • <i>Pathological</i> • <i>Challenging</i> • <i>Error Handling</i> • <i>Periodic</i> |
|--|---|--|



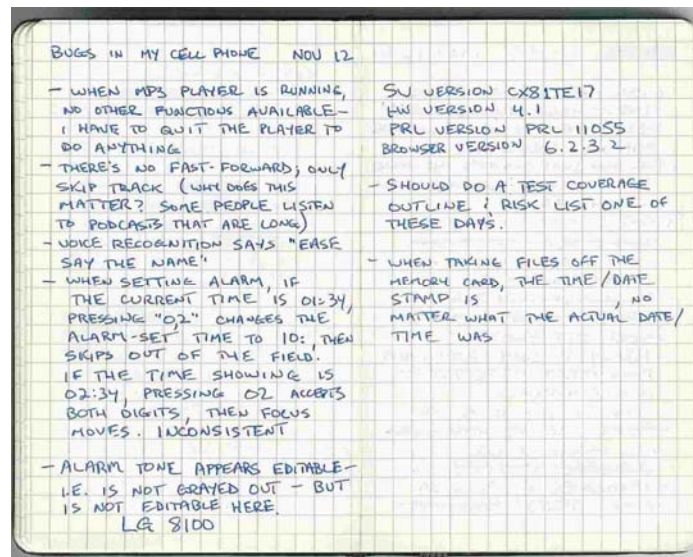
- James Bach, from our Rapid Software Testing course.

Incremental Catalogs

- As ideas occur to me, I might reserve a single page or two to consolidate them.



An Ongoing Bug Catalog



Portable Presentations!

- Easier than booting the laptop!

SUPPOSE EACH TEST ACTIVITY TAKES 2 MINUTES
 SUPPOSE EACH BUG COSTS 10 MINUTES - 2 FOR THE TEST,
 PLUS 8 MINUTES FOR INVESTIGATION & REPORTING

BUGS FOUND	TEST DESIGN & EXECUTION	BUG INVESTIGATION & REPORTING	TEST ACTIVITIES
0	90 mins (45 TESTS)	0 mins	45
1	80 mins (40 TESTS)	10 min (1 TEST)	41
8	10 mins (5 TESTS)	80 min (8 TESTS)	13

WHEN MORE BUGS ARE FOUND, TESTING SLOWS
 OR COVERAGE WORSENS OR BOTH

E.T. Skills and Tactics

- Mike Kelly elaborated on this list of exploratory skills and tactics, which was originally written by James and Jon Bach.
- In writing down the list, I reckoned that tooling (distinct from resourcing) and evaluating were (for me) missing.

MIKE'S E.T. COURSE SEPTEMBER 7

MODELING	} ORDERING & ORIENTING
RESOURCING	
QUESTIONING	} HOW YOU MANAGE ATTENTION
CHARACTERING	
OBSERVING	} TEND TO BE PAIRED
MANIPULATING	
COLLABORATING	} IS "EVALUATING" PHASE?
GENERATING/ELABORATING	
OVERPRODUCTION & ABANDONMENT	} TOOLING
ADJUSTMENT & RECOVERY	
REFOCUSING	} TEND TO BE PAIRED
ALTERATION/BACKTRACKING	
CONJECTURING	} TEND TO BE PAIRED
RECORDING	
REPORTING	} TEND TO BE PAIRED

- THE PRESENCE OF ANY OF THESE THINGS **NEEDS** IS LIKELY TO IMPROVE THE QUALITY OF THE E.T. EFFORT, AND THE ABSENCE OF ANY OF THESE THINGS MAY DEGRADE THE QUALITY OF THE E.T. EFFORT.

- INSTEAD OF A BUG TANDUM, CONSIDER A TEST IDEA TANDUM.

- DON'T ADD ALL AT ONCE! DON'T ADDRESS ALL AT ONCE!

- EXPLORATION, APPLICATION, INVENTION

FRAMEWORK FOR EXERCISE DESIGN

KEY IDEA

How do you record your work?

**Use concise, modular documents
that help tell the testing story.**

How Might We Organize, Record, and Report Coverage?

- annotated diagrams (see earlier slides)
- coverage outlines and risk lists
 - plentiful examples in the Rapid Software Testing notes
<http://www.satisfice.com/rst-appendices.pdf>
- requirement / risk vs. coverage matrices
 - (see subsequent slides)
- bug taxonomies (external and in-house)
 - example: appendix to Testing Computer Software
 - example: “Bugs in your Shopping Cart”,
www.kaner.com/pdfs/BugsInYourShoppingCart.pdf
- summarized log files
- automated tools (e.g. profilers, coverage tools)

Quality Criteria Coverage Matrix



Microsoft Excel - quality category matrix.xls

Test Idea	Connectivity	Reliability	Usability	Security	Performance	Interoperability	Compatibility	Supportability	Flexibility	Manufacturability	Testability
1 Notepad can exchange data with any other Windows application via cut and paste.	X		X								
2 Notepad has some kind of user documentation.		X									
3 The title bar font selected in the Appearance section of the Display control panel is properly reflected in Notepad.											
4 Search function works with a range of files, big and small, and a range of search strings.											
5 Notepad can print text to the default printer.											
6 By default, Notepad will be located on the Accessories sub-menu of the Vista Start menu.											
7 Notepad never crashes.											
8 Notepad can be run alongside many other applications on the same desktop.											
9 Many instances of Notepad can be executed simultaneously, without performance degradation.											
10 Double-clicking on any text file icon will automatically launch Notepad.											
11 Notepad doesn't take too much space on the disk, and is easy to remove.											
12 Time/Date stamp feature properly inserts system time and date in a wide variety of situations.											
13 No memory leaks occur that cause Notepad to fail.											
14 Notepad is included in the default Windows installation.											
15 Notepad takes as little or less time to launch than any other application on the same platform.											
16 TOTAL	1	0	1	1	0	0	0	0	0	0	0

Product Element Coverage Matrix



Microsoft Excel - product element matrix.xls

Requirement	Navigation	Data	Function	Pattern	Structure	Style
1 Notepad can exchange data with any other Windows application via cut and paste.					X	
2 Notepad has some kind of user documentation.					X	
3 The title bar font selected in the Appearance section of the Display control panel is properly reflected in Notepad.				X		
4 Search function works with a range of files, big and small, and a range of search strings.		X				
5 Notepad can print text to the default printer.						
6 By default, Notepad will be located on the Accessories sub-menu of the Vista Start menu.			X			
7 Notepad never crashes.						X
8 Notepad can be run alongside many other applications on the same desktop.			X			
9 Many instances of Notepad can be executed simultaneously, without performance degradation.				X		
10 Double-clicking on any text file icon will automatically launch Notepad.			X			
11 Notepad doesn't take too much space on the disk, and is easy to remove.						
12 Time/Date stamp feature properly inserts system time and date in a wide variety of situations.		X				
13 No memory leaks occur that cause Notepad to fail.						
14 Notepad is included in the default Windows installation.			X			
15 Notepad takes as little or less time to launch than any other application on the same platform.						X
16 TOTAL	0	0	2	5	3	2

E.T. Notetaking Online: Session-Based Test Management

- Charter
 - A clear, concise mission for a session of testing
- Time Box
 - 90-minute (+/- 30), long enough for setup and focused work; short enough to make sure things don't get off track
- Reviewable Result
 - next slide!
- Debriefing
 - conversation between tester and manager
 - problems, bugs and issues can be discussed
 - new risks can be identified
 - coaching and mentoring can happen

Charter

- ***A clear mission for the session***
- A charter may suggest what should be tested, how it should be tested, and what problems to look for.
- A charter is not meant to be a detailed plan.
- General charters may be necessary at first:
 - “Analyze the Insert Picture function”
- Specific charters provide better focus, but take more effort to design:
 - “Test clip art insertion. Focus on stress and flow techniques, and make sure to insert into a variety of documents. We're concerned about resource leaks or anything else that might degrade performance over time.”

Time Box

Focused test effort of fixed duration

Short: 60 minutes (+-15)

Normal: 90 minutes (+-15)

Long: 120 minutes (+-15)

- Brief enough for accurate reporting.
- Brief enough to allow flexible scheduling.
- Brief enough to allow course correction.
- Long enough to get solid testing done.
- Long enough for efficient debriefings.
- Beware of overly precise timing.

Reviewable Results

*A test session sheet that can be scanned
by a Perl script for compilation elsewhere*

- Charter
 - #AREAS
- Start Time
- Tester Name(s)
- Breakdown
 - DURATION
 - TEST DESIGN AND EXECUTION
 - BUG INVESTIGATION AND REPORTING
 - SESSION SETUP
 - CHARTER/OPPORTUNITY
- Data Files
- Test Notes
 - Bugs
 - BUG
 - Issues
 - ISSUE

```
CHARTER
-----
Analyze requirements to view user functionality and
define the scope of product use.

RANGE
00 | Module 200
Main | View
PLANING | Functional Testing
PLANING | Functional Analysis

FORM
-----

TESTER
Jonathan Bach

TASK BREAKDOWN
-----
ESTIMATION
00
TEST DESIGN AND EXECUTION
00
BUG INVESTIGATION AND REPORTING
00
SESSION SETUP
00
```

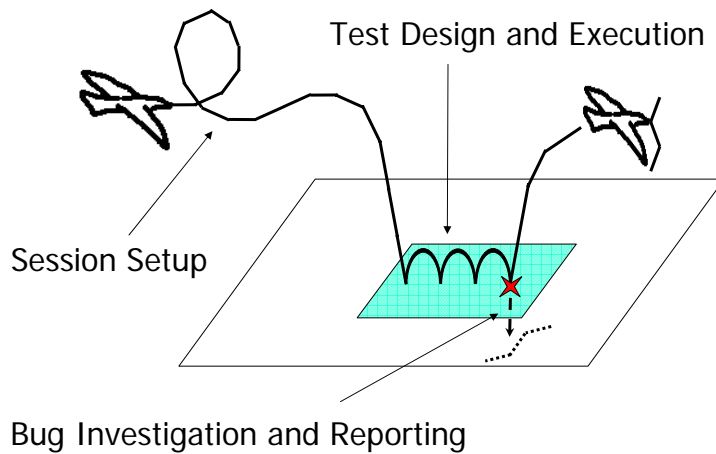
Debriefing

Assessment begins with observation

- The manager or test lead reviews the session sheet to assure that (s)he understands it and that it follows the protocol.
- The tester answers any questions.
- Session metrics are checked.
- Charter may be adjusted.
- Session may be extended.
- New sessions may be chartered.
- Coaching and mentoring happens.

The Breakdown Metrics

Testing is like looking for worms



Reporting the TBS Breakdown

A guess is okay, but follow the protocol

- Test, Bug, and Setup are orthogonal categories.
- Estimate the percentage of charter work that fell into each category.
- Nearest 5% or 10% is good enough.
- If activities are done simultaneously, report the highest precedence activity.
- Precedence goes in order: T, B, then S.
- All we really want is to track interruptions to testing.
- Don't include Opportunity Testing in the estimate.

Test Session Effectiveness

- A “perfectly effective” testing session is one entirely dedicated to test design, test execution, and learning
 - a “perfect” session is the exception, not the rule
- Test design and execution tend to contribute to test coverage
 - varied tests tend to provide more coverage than repeated tests
- Setup, bug investigation, and reporting take time away from test design and execution
- Suppose that testing a feature takes two minutes
 - this is a highly arbitrary and artificial assumption—that is, it's *wrong*, but we use it to model an issue and make a point
- Suppose also that it takes eight extra minutes to investigate and report a bug
 - another stupid, sweeping generalization in service of the point
- In a 90-minute session, we can run 45 feature tests—as long as we *don't find any bugs*

How Do We Spend Time? (assuming all tests below are *good* tests)

Module	Bug reporting/investigation (time spent on tests that find bugs)	Test design and execution (time spent on tests that find no bugs)	Number of tests
A (good)	0 minutes (no bugs found)	90 minutes (45 tests)	45
B (okay)	10 minutes (1 bug, 1 test)	80 minutes (40 tests)	41
C (bad)	80 minutes (8 bugs, 8 tests)	10 minutes (5 tests)	13

Investigating and reporting bugs means....

SLOWER TESTING or...
REDUCED COVERAGE ...or both.

- In the first instance, our *coverage* is great—but if we're being assessed on the number of bugs we're finding, we look bad.
- In the second instance, coverage looks good, and we found a bug, too.
- In the third instance, we look good because we're finding and reporting lots of *bugs*—but our *coverage* is suffering severely. A system that rewards us or increases confidence based on the number of bugs we find might mislead us into believing that our product is well tested.

What Happens The Next Day? (assume 6 minutes per bug fix verification)

Fix verifications	Bug reporting and investigation today	Test design and execution today	New tests today	Total over two days
0 min	0	45	45	90
6 min	10 min (1 new bug)	74 min (37 tests)	38	79
48 min	40 min (4 new bugs)	2 min (1 test)	5	18

Finding bugs today means....
VERIFYING FIXES LATER
...which means....

EVEN SLOWER TESTING or...
EVEN LESS COVERAGE ...or both.

- ...and note the optimistic assumption that all of our fixed verifications worked, and that we found no new bugs while running them. Has this ever happened for you?

Testing vs. Investigation



- Note that I just gave you a compelling-looking table, using simple measures, but notice that we still don't know anything about...
 - the quality and relevance of the tests
 - the quality and relevance of the bug reports
 - the skill of the testers in finding and reporting bugs
 - the complexity of the respective modules
 - luck

...but if we ask better questions, instead of letting data make our decisions, we're more likely to make progress.

Session-Based Test Management



For more information on SBTM, see <http://www.satisfice.com/sbtm>

KEY IDEA

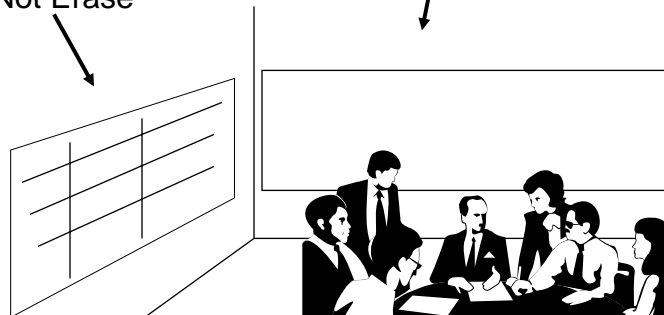
How do you effectively report your work?

Learn to tell a compelling story
that provokes the right questions.

The Dashboard Concept

Large dedicated whiteboard
“Do Not Erase”


Project conference room



Project status meeting

Testing Dashboard				Updated: 2/21	Build: 38
Area	Effort	C.	Q.	Comments	
file/edit	high	1	😊		
view	low	1+	😐	1345, 1363, 1401	
insert	low	2	😊		
format	low	2+	😐	automation broken	
tools	blocked	1	😞	crashes: 1406, 1407	
slideshow	low	2	😞	animation memory leak	
online help	blocked	0		new files not delivered	
clipart	none	1	😐	need help to test...	
converters	none	1	😐	need help to test...	
install	start 3/17	0			
compatibility	start 3/17	0		lab time is scheduled	
general GUI	low	3	😊		

Product Area



Area	
file/edit	<ul style="list-style-type: none"> 15-30 areas (keep it simple) Avoid sub-areas: they're confusing. Areas should have roughly equal value. Areas together should be inclusive of everything reasonably testable. "Product areas" can include tasks or risks- but put them at the end. Minimize overlap between areas. Areas must "make sense" to your clients, or they'll ignore the board.
view	
insert	
format	
tools	
slideshow	
online help	
clipart	
converters	
install	
compatibility	
general GUI	

Test Effort



None	Not testing; not planning to test.
Start	No testing yet, but expect to start soon.
Low	Regression or spot testing only; maintaining coverage.
High	Focused testing effort; increasing coverage.
Pause	Temporarily ceased testing, though area is testable.
Blocked	Can't effectively test, due to blocking problem.
Ship	Going through final tests and signoff procedure.

Test Effort



- Use red to denote significant problems or stoppages, as in **blocked**, **none**, or **pause**.
- Color **ship** green once the final tests are complete and everything else on that row is green.
- Use neutral color (such as black or blue, but pick only one) for others, as in start, low, or high.

Test Coverage



0	We don't have good information about this area.
1	Sanity Check: major functions & simple data.
1+	More than sanity, but many functions not tested.
2	Common & Critical: all functions touched; common & critical tests executed.
2+	Some data, state, or error coverage beyond level 2.
3	Complex Cases: strong data, state, exceptional, error, extreme, stress or long-sequence testing.

Test Coverage



- Color green if coverage level is acceptable for ship, otherwise color black.
- Level 1 and 2 focus on functional requirements and capabilities: *can* this product work at all?
- Level 2 may span 50%-90% code coverage.
- Level 2+ and 3 focus on information to judge performance, reliability, compatibility, and other "ilities": *will* this product work under realistic usage?
- Level 3 or 3+ implies "if there were a bad bug in this area, we would probably know about it."

Quality Assessment



“We know of no problems in this area that threaten to stop ship or interrupt testing, nor do we have any definite suspicions about any.”



“We know of problems that are possible showstoppers, or we suspect that there are important problems not yet discovered.”



“We know of problems in this area that definitely stop ship or interrupt testing.”

Comments

Use the comment field to explain anything colored red, or any non-green quality indicator.

- Problem ID numbers.
- Reasons for pausing, or delayed start.
- Nature of blocking problems.
- Why area is unstaffed.

Using the Dashboard

- **Updates:** 2-5/week, or at each build, or prior to each project meeting.
- **Progress:** Set expectation about the duration of the “Testing Clock” and how new builds reset it.
- **Justification:** Be ready to justify the contents of any cell in the dashboard. The authority of the board depends upon meaningful, actionable content.
- **Going High Tech:** Sure, you can put this on the web, but will anyone actually look at it???

“We shape our tools;
thereafter they shape us.”
-- Marshall McLuhan