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Exploratory Testing - Google Slides

https://docs.google.com/presentation/d/1XVUZyk4MGEiRRuWvwwfwd7Lu_bARut2GqHluRcnsg2cE/present#slide=id.g444885f993_0_6

What is Exploratory Testing?

"Exploratory testing is the simultaneous learning, design and execution of the tests"

"The key to conducting exploratory testing is the cognitive involvement of the tester, this means, his ability to execute this activity and the responsibility to manage his own time."

James Bach, Exploratory Testing 2015

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Firefox, Terminal, Files, 28, Camera, App, R, Python, VS Code, Jupyter, S, Notepad, WPS, Video, System

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Exploratory Testing

```
graph TD; A["In some cases, it is possible to detect more and better defects than following a set of previously defined test cases"] --> B["This does not necessarily mean that the previously defined test cases are inconsistent or the test lacks of sufficient coverage"]; B --> C["But just by following a finite sequence of previously defined steps it is likely that details and behaviors could be ignored"]; C --> D["The exploratory tests should be complementary to the guided or scripted tests"]
```

In some cases, it is possible to detect more and better defects than following a set of previously defined test cases

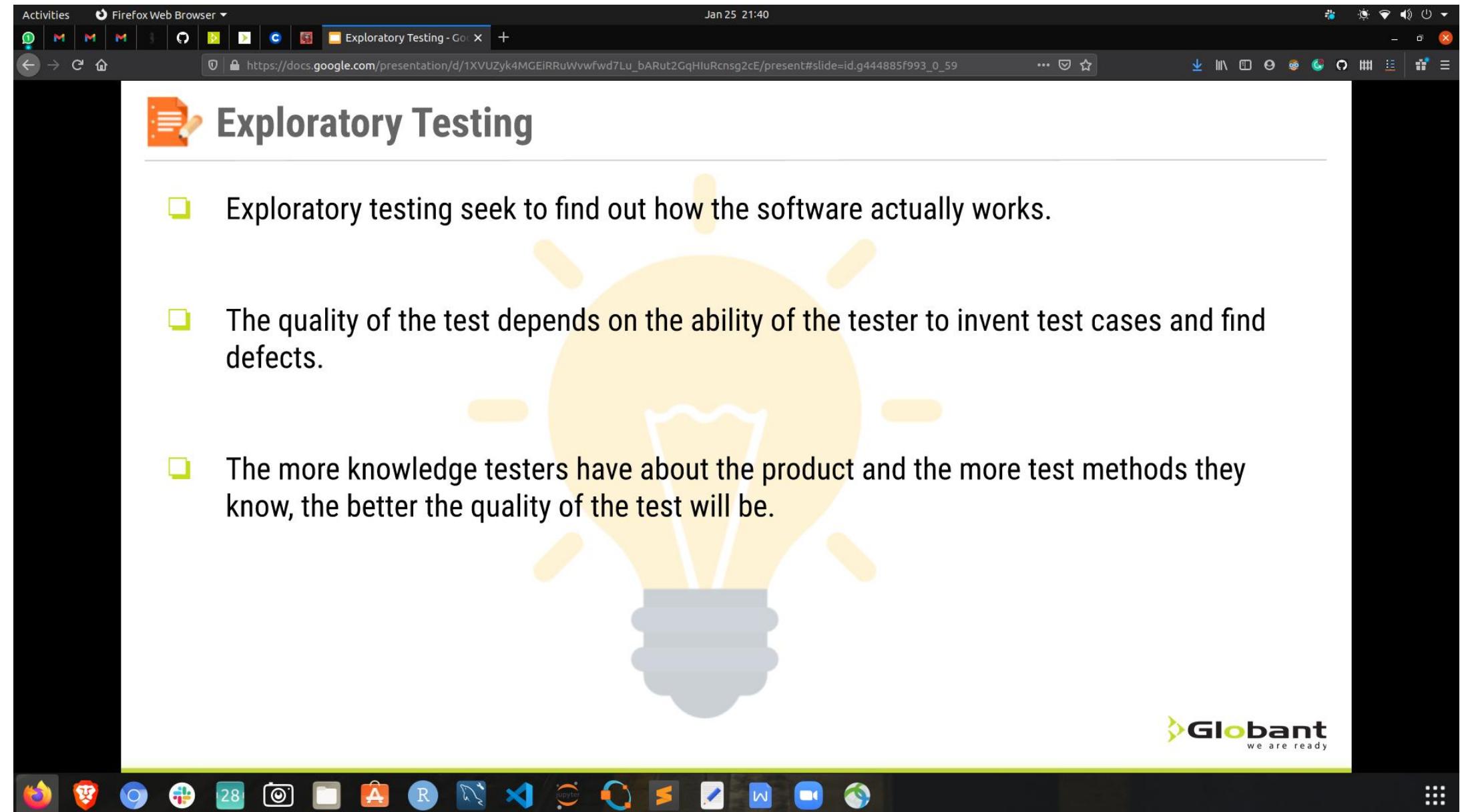
This does not necessarily mean that the previously defined test cases are inconsistent or the test lacks of sufficient coverage

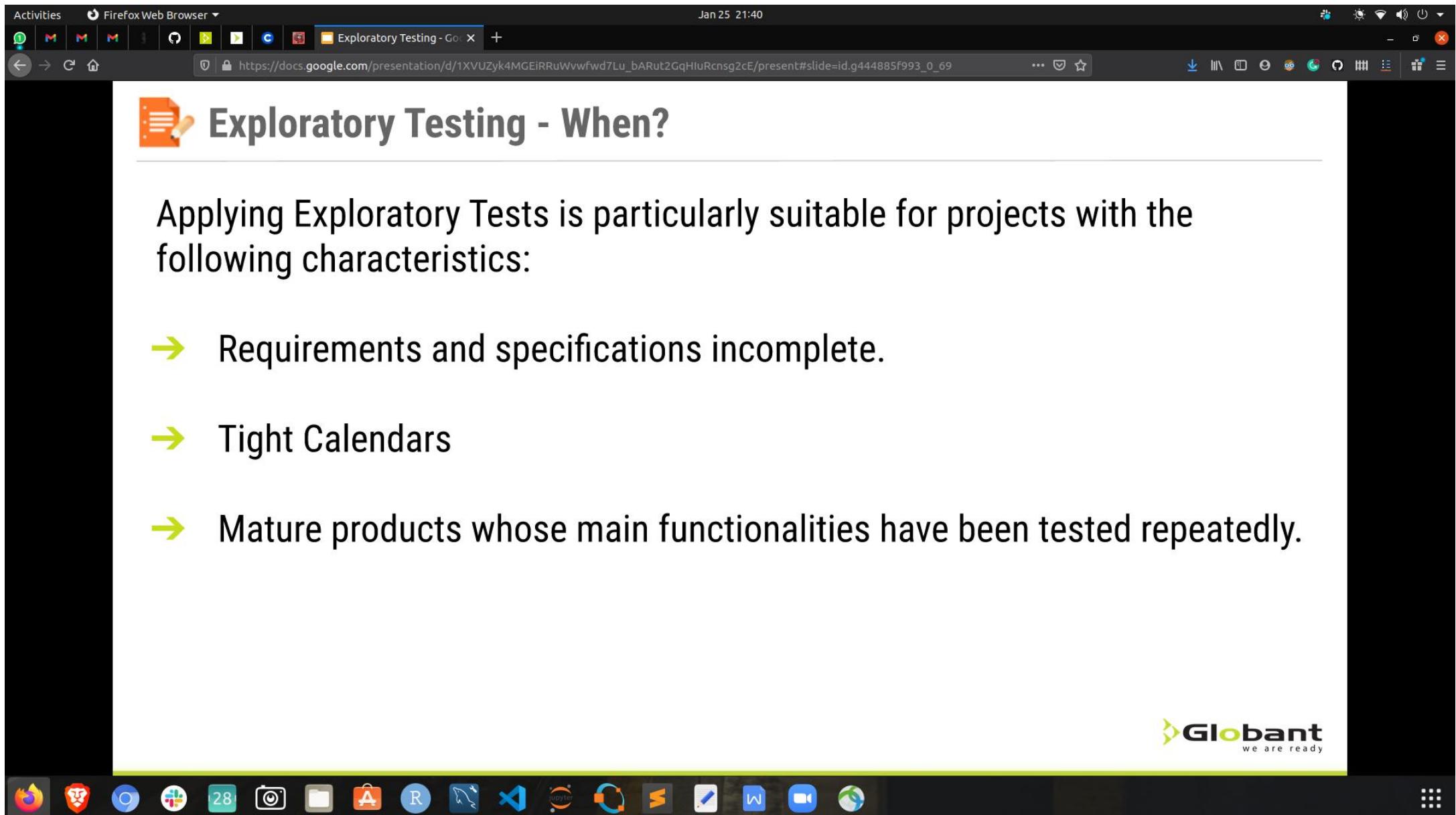
But just by following a finite sequence of previously defined steps it is likely that details and behaviors could be ignored

The exploratory tests should be complementary to the guided or scripted tests

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How we are doing it? Exploratory Testing (ET) Elements

```
graph TD; ET[Exploratory testing] --> PE((Product Exploration)); ET --> TD((Test Design)); ET --> TE((Test Execution)); ET --> RR((Reviewable Results)); PE --> P_desc["Purpose and function of the product and areas of potential instability"]; TD --> H_desc["Guidelines or rules that helps to decide What/How should be tested"]; TE --> O_desc["Strategies for operating, observing and evaluating the product"]; RR --> N_desc["Notes about the product, failures found and concise record of the strategies used to test"]
```

Product Exploration

Purpose and function of the product and areas of potential instability

Test Design

Guidelines or rules that helps to decide What/How should be tested

Test Execution

Strategies for operating, observing and evaluating the product

Reviewable Results

Notes about the product, failures found and concise record of the strategies used to test

More details about elements and procedure of ET: <http://www.satisfice.com/tools/procedure.pdf>

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Exploratory Testing - Exploratory Tester Skills

The diagram illustrates the 'Exploratory Tester Skills' as a central concept surrounded by seven interconnected skills, each represented by a blue rounded rectangle. The central circle is also blue and contains the text 'Exploratory Tester Skills'. Arrows point from each of the surrounding boxes to the central circle, indicating their interdependence.

- Passion for testing
- An inquiring mind
- An excellent communicator
- A skilled tool smith
- A skilled observer
- A skilled test designer

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Exploratory Testing vs SCRIPTED Testing

EXPLORATORY TESTING

- Expectations are open: the test starts when the product is received. The requirements might be defined.
- Some results may be predictable and / or expected. Others NO.
- The tester executes, observes and evaluates the product and its behavior.

SCRIPTED TESTING

- The tests are designed in advance based on requirement specifications.
- Tests design includes individual steps and expected results.
- Test are based on comparing the actual result with the expected result (test oracle)

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Exploratory Testing: Pros and Cons



It is valuable in situations where the choice of the next test case can not be determined in advance

Provides quick feedback about product quality

Defect exploration occurs more quickly

Execution time can be better managed and the documentation effort is minimized

Defects detection is subject to the experience of the tester

In some cases, the defect reproduction could be difficult

Since the test cases are defined during the execution, there is no previous review

Test coverage is not assured

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Exploratory Testing - Risks

Exploratory Testing may have some associated risks:

Unrepeatable defects: after several hours of testing, a defect can be discovered, but the tester may not understand or not reproduce the steps that triggered the failure.

Defects of low priority: you can focus all the effort and waste time in finding defects that later nobody is willing to repair.

De-focusing: sure of what could be interesting to try, after an exploratory session you could find yourself in a test state without a goal.



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Exploratory Testing: Challenges & Mitigation

The diagram consists of a large circle divided into four quadrants by a horizontal and a vertical line. Each quadrant contains text and a bulleted list of mitigation strategies.

- Top Left Quadrant:** **Depends heavily on the skills and domain knowledge of the testers**
 - Assign Scope based on tester skills and domain knowledge
 - Continuous training & coaching
- Top Right Quadrant:** **Tracking Effort and Progress**
 - Implement SBTM (Session Based Test Management)
 - Define test "Charter"
- Bottom Left Quadrant:** **Accountability**
 - Goals definition per session.
 - Set and collect metrics.
- Bottom Right Quadrant:** **Limited Test Reusability and reproducibility of failures**
 - Previous charter definition
 - Correct charter definition and appropriate tools

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Exploratory Testing - Keys to Success

- ❑ Use a wide variety of analysis / testing techniques to identify vulnerabilities from multiple perspectives.
- ❑ Use Test "Charters" to focus efforts on those vulnerabilities that are of most interest to stakeholders.
- ❑ Procedures to Manage and Measure:
 - Creation of a "Charter" test to use as a guide.
 - Execute "Exploratory Test Sessions"



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Exploratory Testing - Start the Exploration

A useful technique to start the exploration consists on defining **Test Charters**

A Charter is a document stating:

1. mission
2. areas to test

Test Charter Elements

- Actor: Rol that tester is going to play
- Purpose: Expected Outcome
- Set Up: Configuration and initial system state
- Priority: based on requirements and risk level
- Reference: Information source
- Data: Characteristics, data file, data set
- Activities: What the actor should do with the system
- Oracle Notes: Things to pay special attention
- Variations: Additional system or user events

They are used to guide the tester in their exploration, which also have the positive effects of decreasing the required (traditional) test documentation



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Charters from requirements

Sources of charters:

- Stakeholders questions
- Quality Attributes
- Risks
- Any other need for information

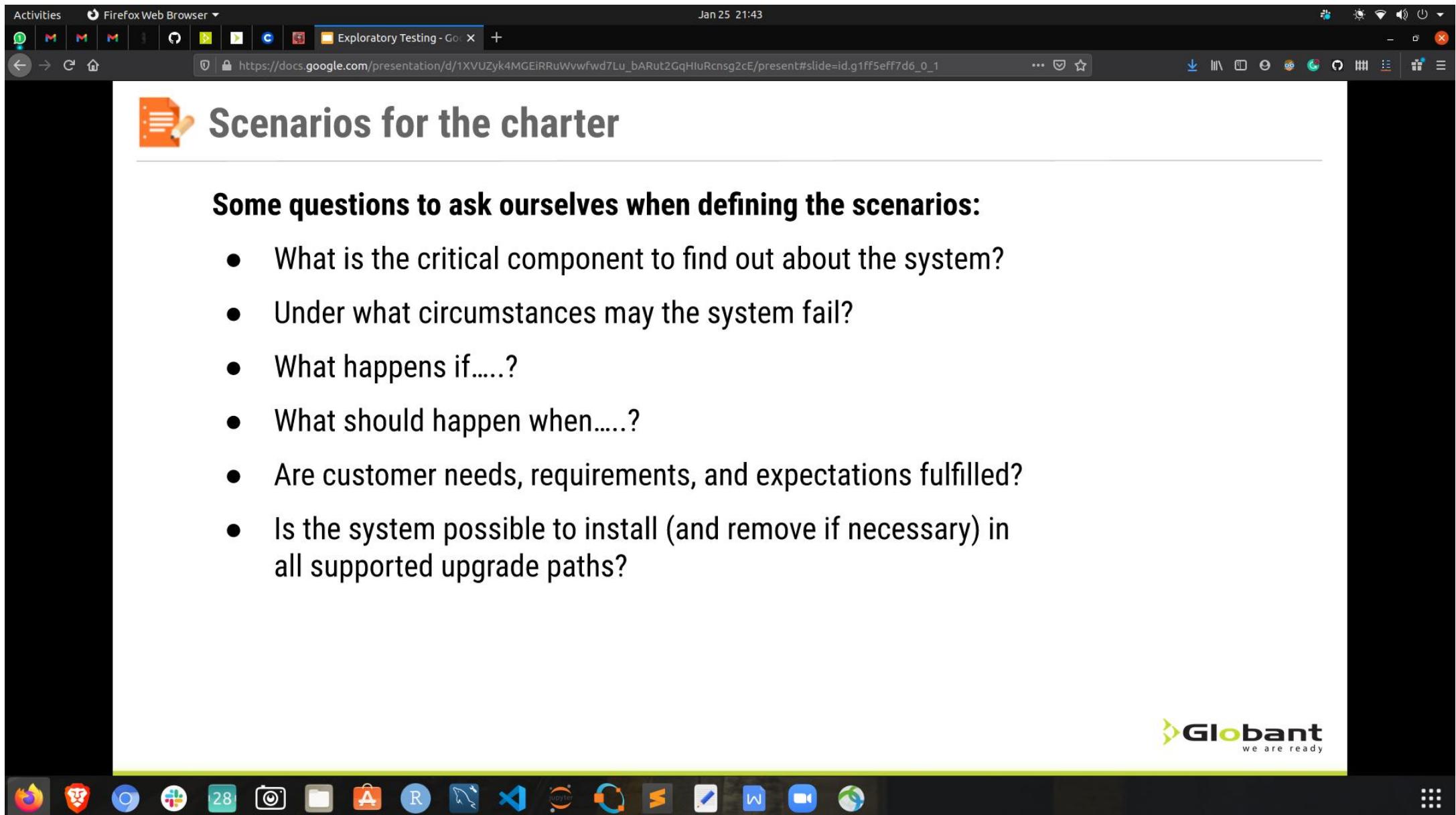
User Story

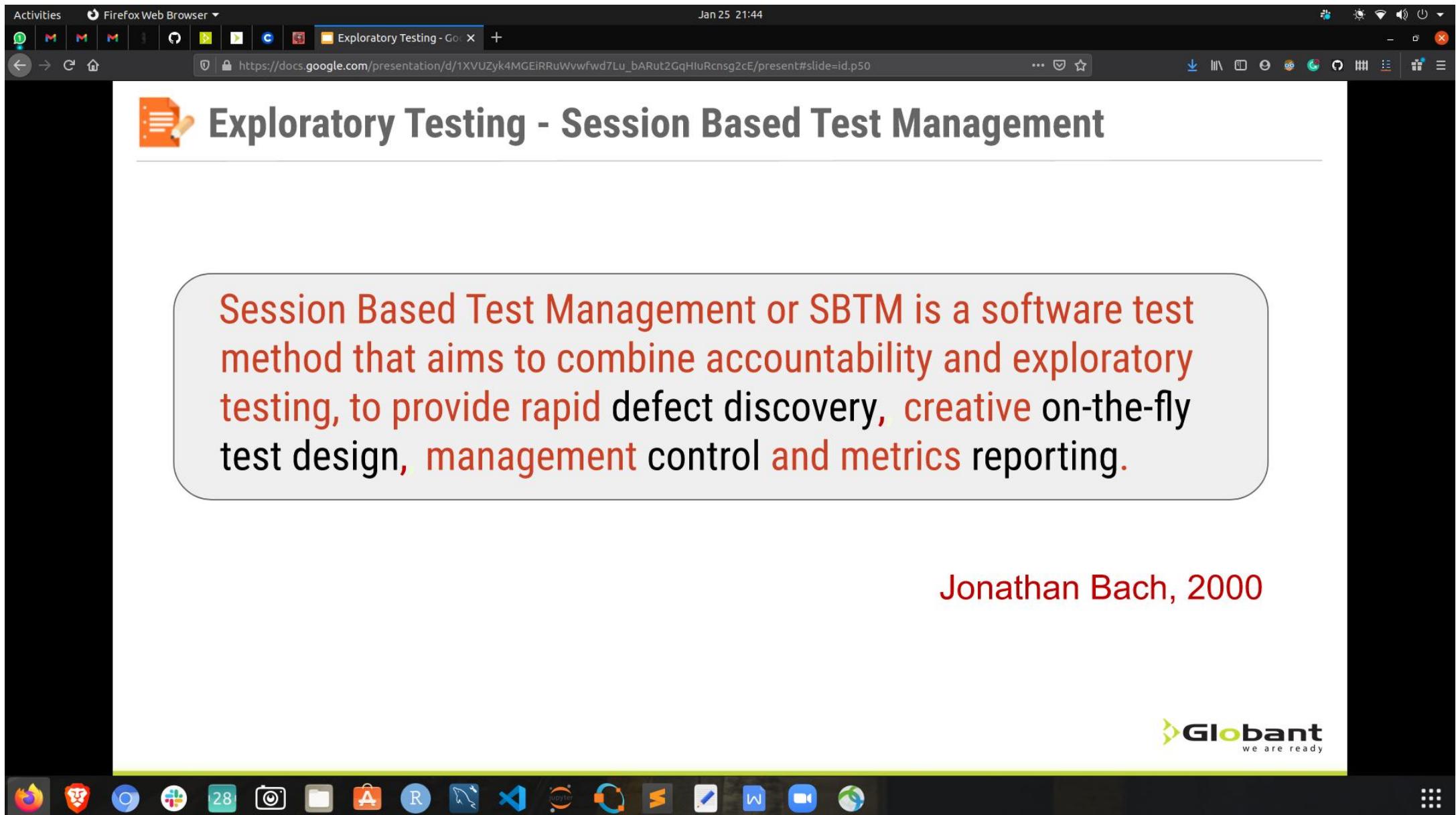
As a user, I want to update my personal information on my profile so that my public profile stays up to date.

Charters

- Explore editing profiles with sql and javascript injection attacks to discover security vulnerabilities
- Explore editing profiles with the authentication feature to discover surprises
- Explore editing profiles with different kinds of users to discover interactions between profile editing and roles

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Session-Based Test Management: Elements

- ★ **MISSION:** The mission tells us "*what we are testing or what problems we are looking for*". Identifies the purpose of the session, helping to focus the session while still allowing for exploration of the system under test.
- ★ **CHARTER:** A charter is a goal or agenda for a test session. Charters are created by the test team prior to the start of testing, but they may be added or changed at any time. Often charters are created from a specification, test plan, or by examining results from previous sessions.
- ★ **SESSION (Time Box):** An uninterrupted period of time spent testing, ideally *lasting one to two hours*. Each session is focused on a charter, but testers can also explore new opportunities or issues during this time. The tester creates and executes tests based on ideas, heuristics or whatever frameworks to guide them and records their progress.

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 **Session-Based Test Management: Elements**

★ **SESSION REPORT:** The session report records the test session. Usually this includes:

- Session start time and duration
- Charter.
- Area tested.
- Detailed notes on how testing was conducted.
- A list of any bugs found.
- A list of issues (open questions, product or project concerns)
- Any files the tester used or created to support their testing
- Percentage of the session spent on the charter vs investigating new opportunities.
- Percentage of the session spent on:
 - Testing - creating and executing tests.
 - Bug investigation / reporting.
 - Session setup or other non-testing activities.



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Session-Based Test Management: Elements

★ **DEBRIEF:** A debrief is a short discussion between the lead and tester (or testers) about the session report. The acronym PROOF is used to help structure the debriefing. PROOF stands for:

- Past. What happened during the session?
- Results. What was achieved during the session?
- Obstacles. What got in the way of good testing?
- Outlook. What still needs to be done?
- Feelings. How does the tester feel about all this?

★ **RESULTS:** With a standardized Session Report, software tools can be used to parse and store the results as aggregate data for reporting and metrics. This allows reporting on the number of sessions per area or a breakdown of time spent on testing, bug investigation, and setup / other activities.

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 SBTM Sample

CHARTER

- Analyze and view menu functionality and report on areas of potential risk.

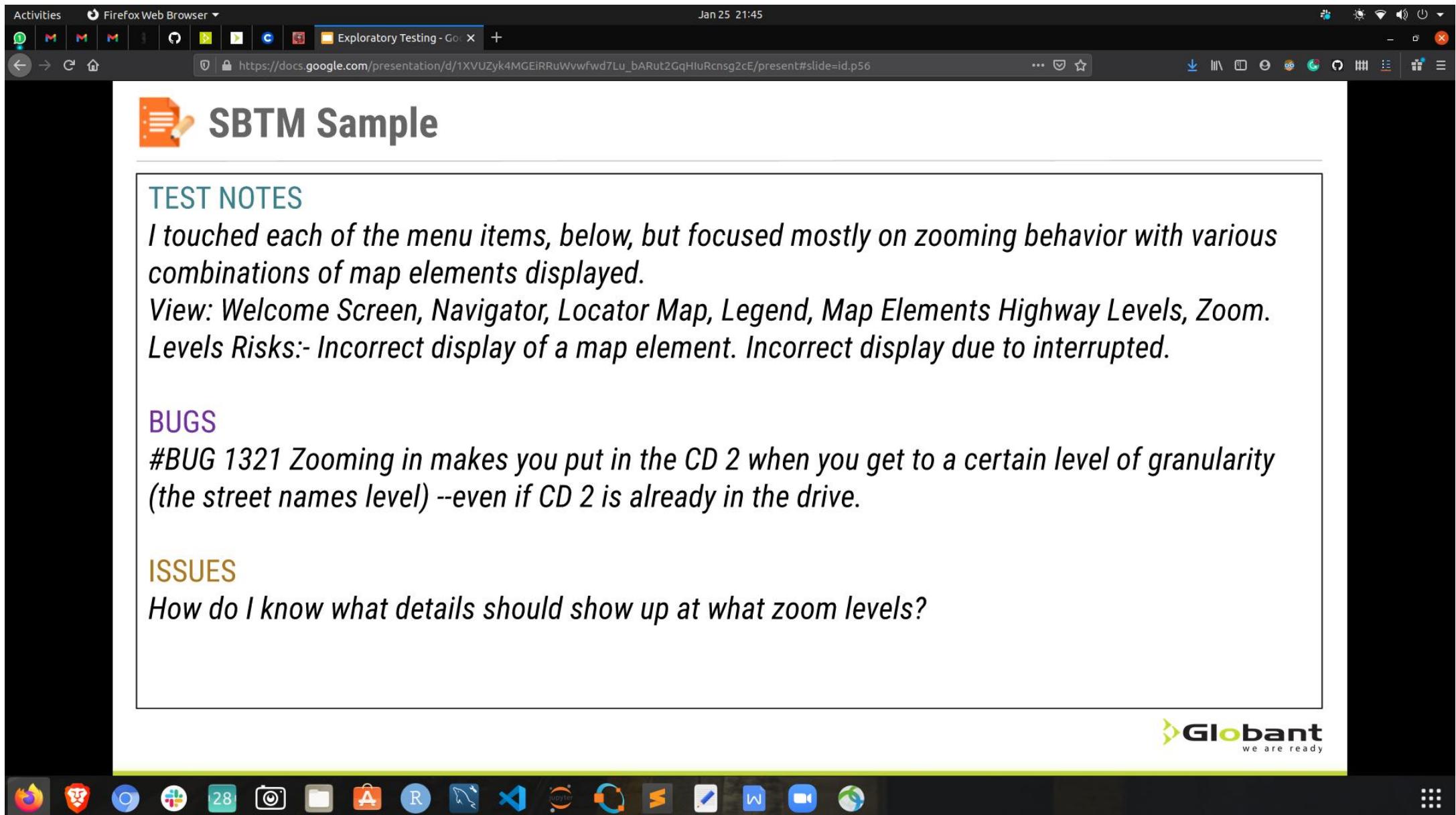
AREAS

- OS | Windows 7 Menu | View Strategy | Function
- Testing Start: 08.07.2013 10:00
- End: 07.08.2013 11:00
- Tester: John Doe

For another example you can check: http://www.satisfice.com/sbtm/sample_session.htm



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 Session-Based Test Management - TIPS

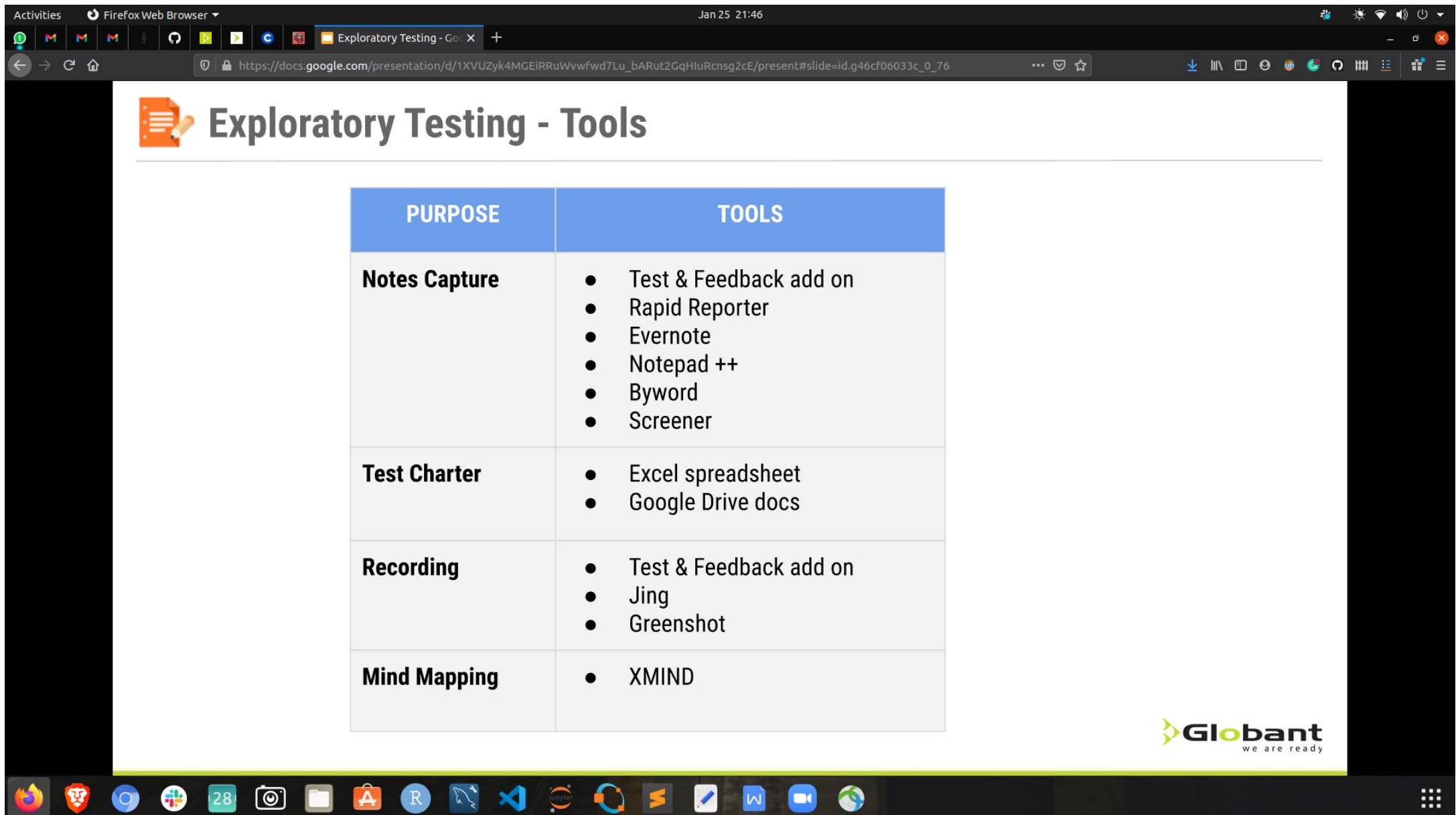
Tips and Tricks:

A set of heuristics can be applied when testing which can guide the tester in how to perform the testing and to evaluate the results. Examples include:

- Boundaries analysis
- CRUD (Create, Read, Update, Delete)
- Configuration variations
- Interruptions (e.g., log off, shutdown, or reboot)
- Any other experience or specification based testing technique.



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Exploratory Testing: Measures and Metrics

- ★ Number of sessions completed.
- ★ Number of issues found per charter.
- ★ User stories under testing coverage.
- ★ Session effort invest in setting up testing.
- ★ Session effort invest in testing execution.
- ★ Effort invest in charter creation.



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Sample Report Structure

Sprint	User Story	Charter	Planned Sessions per charter	Executed Sessions per charter	Planned time per session (min)	Time per session (min)	Remaining time (min)	Coverage	Priority	Complexity
1	US 123	Menu functionalit	4	2	60	50	120	50%	1	3
1	US 432	XXX		5						
3	US 321	YYY								

Planned charters per sprint

Sprint	1	2	3
Charter	0	0	0

Executed charters per sprint

Sprint	1	2	3
Charter	0	0	0

Sessions

Planned Sessions per charter	Planned
Executed Sessions per charter	Executed

Executed sessions x sprint

Sprint	1	2	3
Charter	0	0	0

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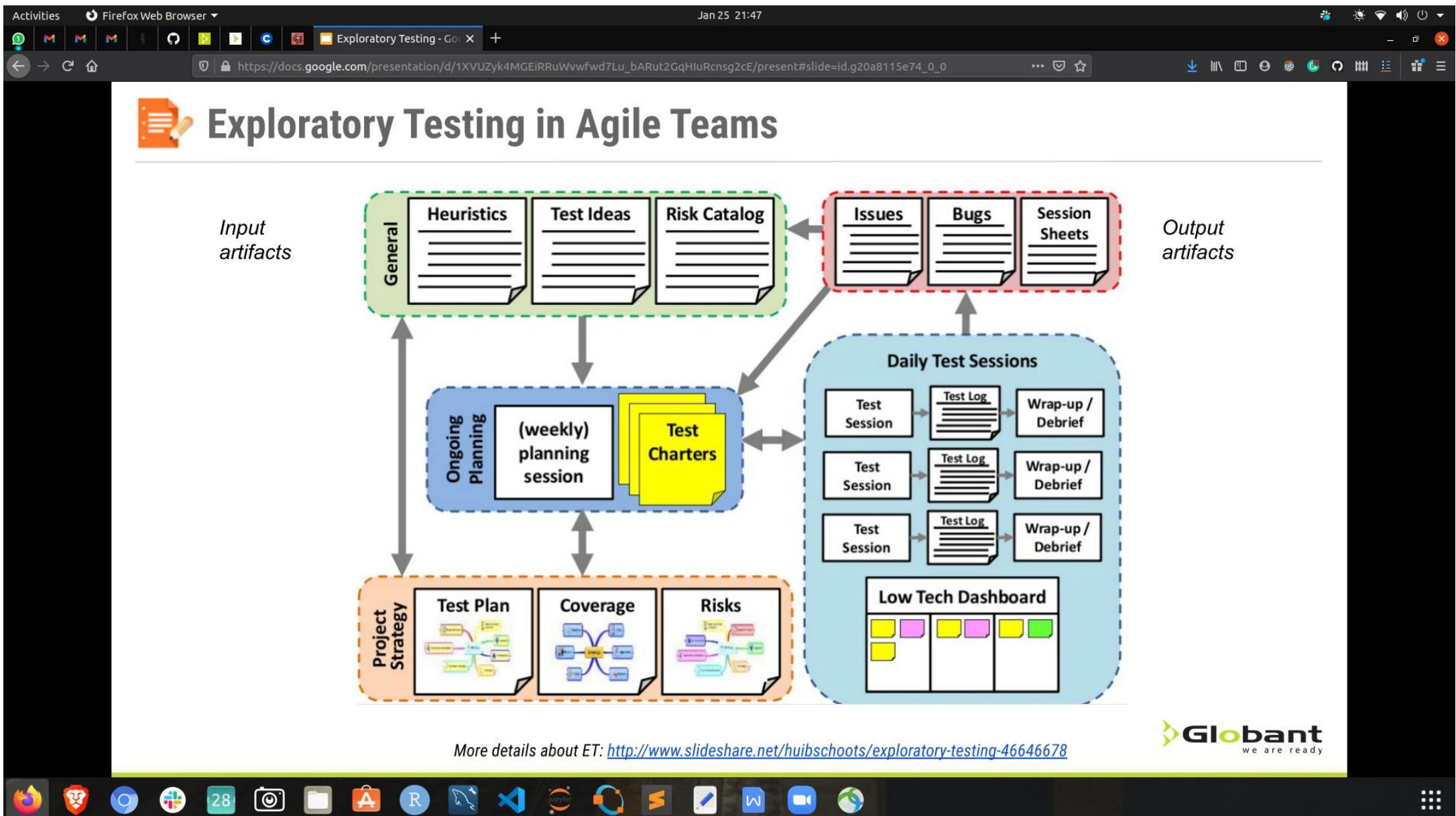
Exploratory Testing in Agile Teams

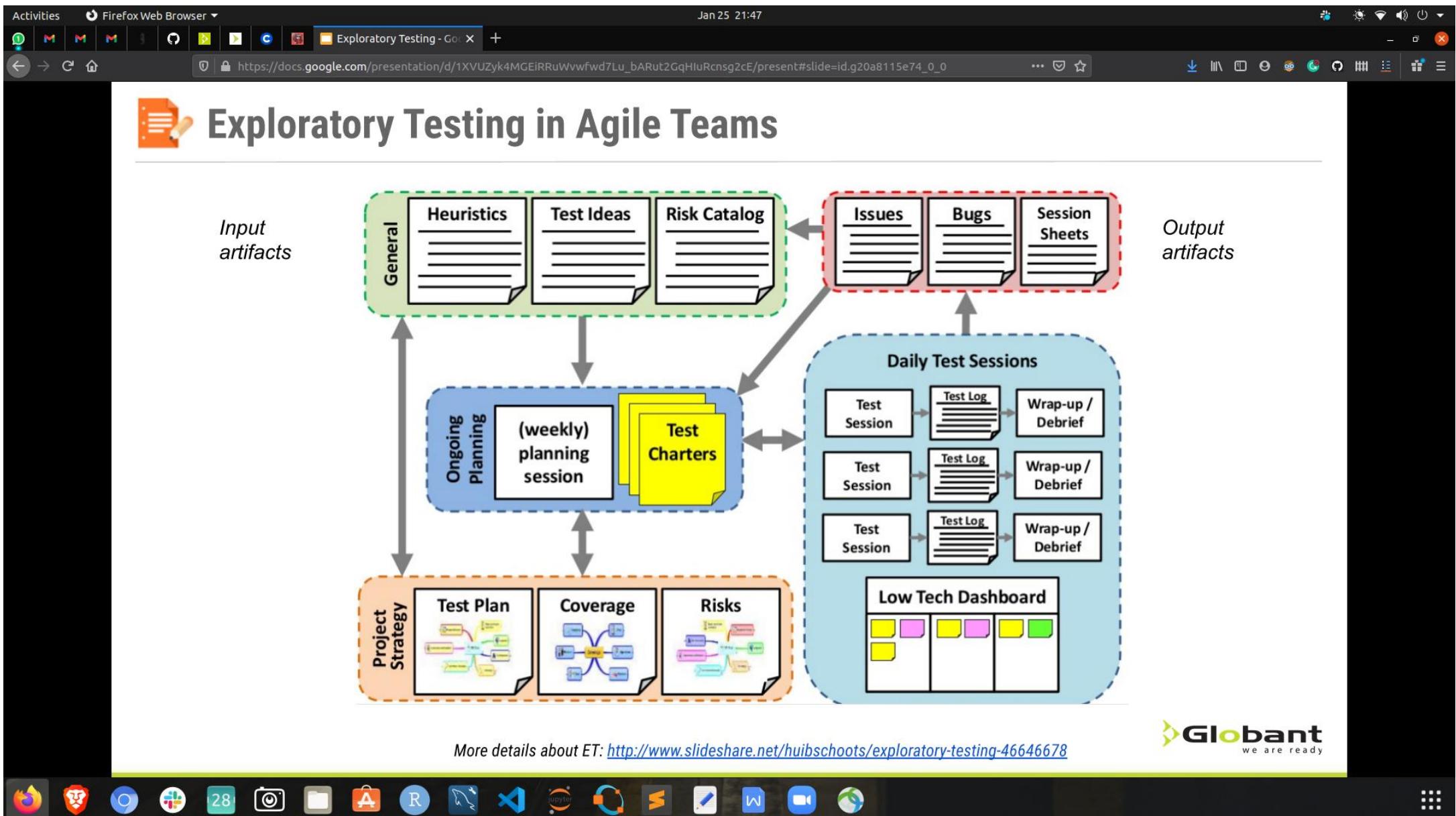
Why Exploratory Testing is Important in Agile Projects?:

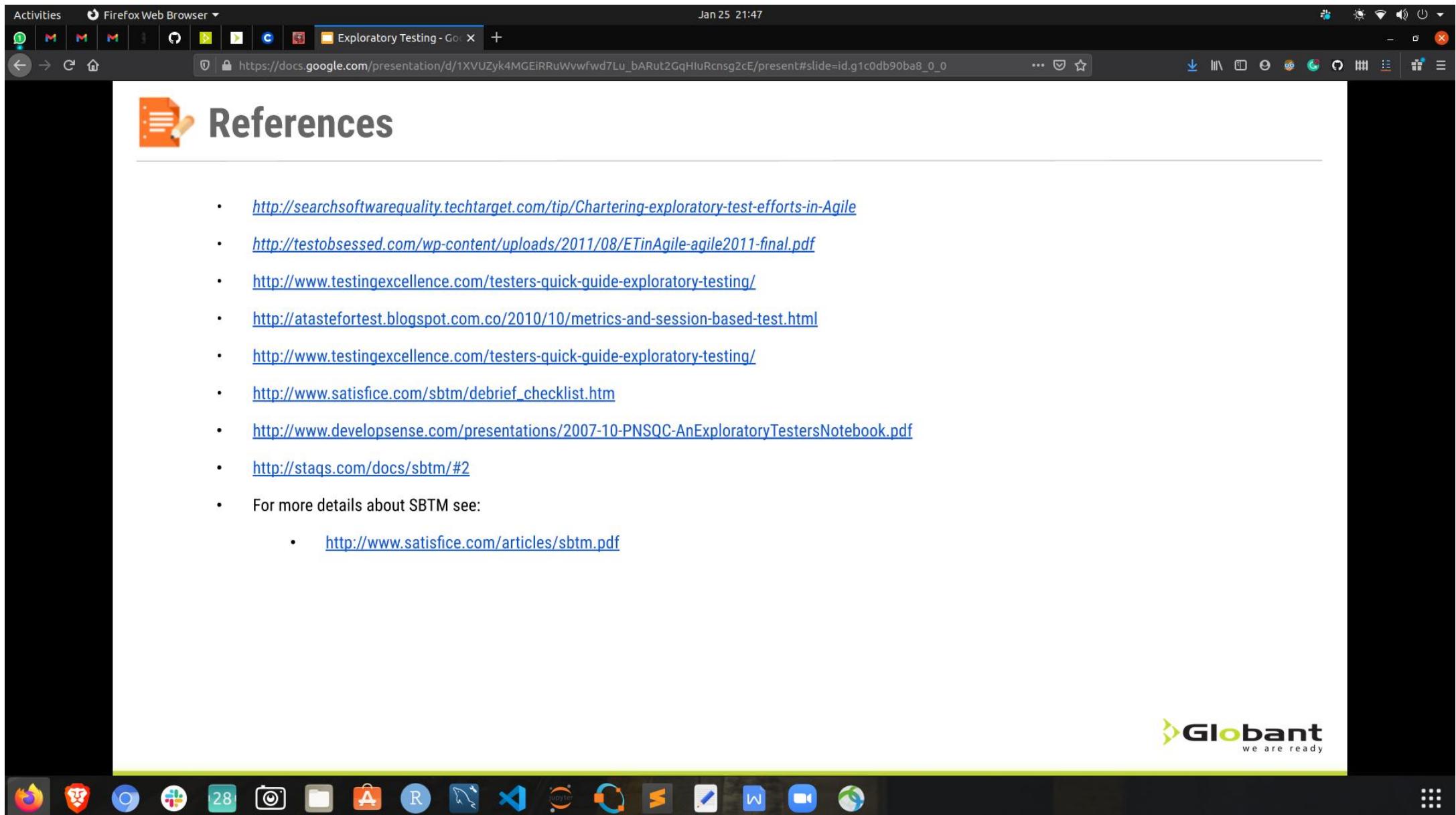
- Limited time available for test analysis.
- Limited details of the User Stories (common symptom)
- Help testers to keep up with the rapid development pace.
- Good complement of the regression testing. Help to identify defects in areas not covered by test automated regression testing.
- Promotes a collaborative environment with a common goal: find defects. Exploratory sessions can be runned by different team members: both technology and business.

```
graph TD; A[Interpret] --> B[Design]; B --> C[Execute]; C --> D[Learn]; D --> A;
```

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Q&A

Do you have any question? Please feel free to reach out to qe-trainings@globant.com



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