SPRINT_user_study_Final - MSR25

ExpertReview score Fair

Default Question Block

Evaluating SPRINT, a GitHub Issue Report Assistant

RESEARCH GOAL AND PROCEDURE

The goal of this study is to evaluate SPRINT, an issue report management tool for GitHub. If you decide to participate, the study will last about 25 minutes in which you will be asked to use the three features provided by the tool (i.e., duplicate issue report detection, issue severity prediction, and buggy code localization) and answer a set of questions about your experience using SPRINT. You will answer the questions through this online questionnaire (*aka* survey).

PARTICIPATION AND CONFIDENTIALITY

You must be at least 18 years old to participate.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Your responses to this study will be kept confidential. You will be assigned a code number to protect your identity, and all data will be kept secure. Your decision whether or not to participate will not prejudice your future relations with The College of William & Mary. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty.

CONTACT

If you have any questions, please ask us at any moment. If you have any additional questions later, Antu Saha (asaha02@wm.edu, +1-757-243-3463), Ahmed Adan (bsse1131@iit.du.ac.bd, +8801813865290), and Dr. Oscar Chaparro (oscarch@wm.edu, +1-757-221-2144), will be happy to answer them.

CONSENT

YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE.
IF YOU WANT TO PARTICIPATE, PLEASE ENTER YOUR NAME IN THE TEXT FIELD BELOW, AND START THE SURVEY.

Q1

Enter your Name

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SPRINT Overview

SPRINT is a GitHub plugin prototype that aims to assist developers in managing and solving issue reports (in short, *issues*). The current version of SPRINT provides three features:

1. Duplicate Issue Detection: SPRINT suggests existing duplicate or similar issues for a newly created issue. This feature aims to avoid developer rework in solving recurrent issues or to inform developers about solved issues that can be helpful to solve the new issues.

2. Issue Severity Prediction: SPRINT suggest the severity level for a newly created issue (i.e., blocker, critical, trivial, major, and minor). This feature aims to help developers prioritize which issues need to solved first.

3. Bug Localization: SPRINT suggests source code files that may be related to the issue and/or files that need modification to solve the issue (*aka* the buggy code files). This feature aims to speed up and assist developers in bug localization in source code.

SPRINT is a prototype that provides suggestions and guides developers in performing the above tasks more effectively.

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Study Overview

In this study, we aim to assess each of the SPRINT's three features, i.e., Duplicate Issue Detection, Issue Severity Prediction, and Bug Localization. For each feature, you will create two issue reports on a GitHub repository and evaluate SPRINT's suggestions given for that feature.

You are provided with the SPRINT tool, already installed in two GitHub repositories, and six issue reports with details about software bugs in the two software projects (two issues per feature). **Repository-1** will be used to assess the Duplicate Issue Detection & Issue Severity Prediction features, while **repository-2** will be used to assess the Bug Localization feature. For each feature, you will read and understand the provided issues, submit two issues in the respective repository, and assess the suggestions suggested by SPRINT for that feature. Based on your experience with SPRINT, you will answer a set of questions to give us feedback on how well the tool performs and give us suggestions to improve it.

In summary, you will need to perform the following steps (later in this study):

1. SPRINT is already **installed** in the repositories that we are providing. You just need to:

Go to **Repository-1:** used for Duplicate Detection & Severity Prediction features (SPRINT_user_study_repository_1) and answer questions **2** to **7**.

Go to **Repository-2:** used for Bug Localization feature (SPRINT_User_Study_Repo2) and answer questions **8** to **10.**

2. For each feature, you will need to perform the following:

> **(a)** Read and understand the two issues with the provided details one by one (detailed instructions are provided later)
>
> **(b)** Submit two issues by copying and pasting the provided issue title and descriptions. This step will mimic the scenario when a user finds a problem with the system and reports the issue via the issue tracker.
>
> **(c)** Assess the suggestions suggested by SPRINT. Feel free to take notes of the suggested issues, severity labels, and buggy code files.
>
> **(d)** Answer the questions about SPRINT's behavior and functionality.

3. After that, you will need to answer some questions about your **Overall Experience** with SPRINT and your feedback about its behavior. Lastly, you will need to answer some questions regarding your **Professional Background**.

Show Discussion (2) Last Comment 22 Nov 2024 3:12pm by Ahmed Adnan

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Evaluating the effectiveness of SPRINT's features

Duplicate issue detection

Issue Report 1: Please read and understand the following issue:

The OpenOffice project received **Issue Report 1,** which describes the following issue:

Issue Report 1 **Issue Title:** When I was to install the new version of the OpenOfficce appeared the following error:Internal Error 2735. Shellextensionsdll5. **Issue Description:** And the wizard was interrupted before OpenOffice completely was installed.

To confirm that the issue is new, e.g., not reported before, the OpenOffice developers determined that issues with issue IDs **#2, #10, #16** described the same problem as the current issue. For evaluation purposes, you will need to compare SPRINT's suggestions with the issues just mentioned.

After reading and understanding the issue, please complete the following instructions.

1. Create the issue on **Repository-1 (**SPRINT_user_study_repository_1**)** by performing the following steps:

- **(a)** Go to the repository
- **(b)** Click on Issues
- **(c)** Click on 'New issue'
- **(d)** Copy and paste the content in the title and description sections
- **(e)** Click 'Submit new issue'

2. Observe SPRINT's suggestions for the Duplicate Issue Detection feature. Feel free to take notes of the issue IDs of the duplicate issues.

3. Assess the suggestions given by SPRINT by comparing them to the following issue reports: **[#2, #10, #16],** which are supposed to describe the same or a similar problem to the issue you submitted (Issue report 1) -- feel free to open and read these reports to validate their similarity with issue report 1.

Issue Report 2: Please read and understand the following issue:

The OpenOffice project received **Issue Report 2** which describes the following issue:

Issue Report 2 **Issue Title:** I have created 3 tables and then have gone to tools/relationships. **Issue Description:** Then I created 2 relationships and saved them, but when I open the relationships dialog again, none of the previously created can be seen. After asking in the forums they told me o write an issue here.

To confirm that the issue is new, e.g., not reported before, the developers determined that issues with issue IDs **#5, #12** described the same problem as the current issue. For evaluation purposes, you will need to compare SPRINT's suggestions with the issues just mentioned.

After reading and understanding the issue, please complete the following instructions.

1. Create the issue on **Repository-1 (**SPRINT_user_study_repository_1**)** by performing the steps:

- **(a)** Go to the repository
- **(b)** Click on Issues
- **(c)** Click on 'New issue'
- **(d)** Copy and paste the content in the title and description sections
- **(e)** Click 'Submit new issue'

2. Observe SPRINT's suggestions for the Duplicate Issue Detection feature. Feel free to take notes of the issue IDs of the duplicate issues.

3. Assess the suggestions given by SPRINT by comparing them to the following issue reports: **[#5, #12]**, which are supposed to describe the same or a similar problem to the issue you submitted (issue report 2) -- feel free to open and read these reports to validate their similarity with issue report 2.

Now, please answer the following questions:

Show Discussion (1) Last Comment 22 Nov 2024 2:38pm by Oscar Javier Chaparro Arenas

Q2

After inspecting SPRINT's suggestions, do you think SPRINT correctly suggested similar issues for the created issues?

- ◯ Yes
- ◯ No
- ◯ Unsure

Please explain your answer (why yes, no, or unsure?)

Q3

How easy is it to understand SPRINT's suggestions for the Duplicate Detection feature?

- ◯ Very easy
- ◯ Moderately easy
- ◯ Neutral
- ◯ Moderately difficult
- ◯ Very difficult

Show Discussion (2) Last Comment 24 Nov 2024 9:16am by Ahmed Adnan

Please elaborate on your answer (Optional):

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Evaluating the effectiveness of SPRINT's features

Severity Prediction

Issue Report 3: Please read and understand the following issue:

The OpenOffice project received **Issue Report 3** which describes the following issue:

> **Issue Report 3**
>
> **Issue Title:** Standard output in Output window is not flushed
>
> **Issue Description:**
> after Steps to reproduce: - create Fractal sample - set Output window as a console type - run the project Result: Application starts but a user is not informed about it as message "Calculating. Please wait...." does not appear in the Output window. It appears only when the program finishes. To make the message appear I need to insert "fflush(stdout);" after "printf("Calculating. Please wait....");"

After triaging the issue, the OpenOffice developers marked it as a **"Blocker"** issue, indicating the issue is extremely severe and needs to be solved immediately.

After reading and understanding the issue, please complete the following instructions.

1. Create the issue on **Repository-1 (**SPRINT_user_study_repository_1**)** by performing the steps:

- **(a)** Go to the repository
- **(b)** Click on issues
- **(c)** Click on 'New issue'
- **(d)** Copy and paste the content in the title section
- **(e)** Click 'Submit new issue'

2. Observe SPRINT's suggestions (i.e., trivial, major, minor, etc.) for the Issue Severity Prediction feature. To get a better idea, all the severity levels are described below:

- **Trivial:** Minor visual defects or typos with no functional impact.
- **Minor:** Small issues causing minimal inconvenience.
- **Major:** Significant functional problems affecting usability but not critical.
- **Critical:** Severe issues causing crashes, data loss, or major disruptions.
- **Blocker:** Complete failure halting progress; must fix immediately.

3. Assess the suggestions compared to similar issue reports determined by developers. The severity level of the issue should be **"Blocker"**.

Issue Report 4: Please read and understand the following issue:

The OpenOffice project received **Issue Report 4** that describes the following issue:

> **Issue Report 4**
>
> **Issue Title:** [indentation]Auto comment doesn't correctly align comments The auto comment doesn't correctly align the comments added.
>
> **Issue Description:**
> If I have a method that is indented, the auto comment should add the comment for the method in line with the method - not at the start of the line. Example I have public class MyClass extends Object { public MyClass(int i) { } } If I use auto comment to add a comment it will do this public class MyClass extends Object { /** My class comment * @param i */ public MyClass(int i) { } } shouldn't it be public class MyClass extends Object { /** My class comment * @param i */ public MyClass(int i) { } }

After triaging the issue, the OpenOffice developers marked it as **Minor,** indicating that it is not that severe and does not require an immediate fix.

After reading and understanding the issue, please complete the following instructions.

1. Create the issue on **Repository-1 (**SPRINT_user_study_repository_1**)** by performing the steps:

(a) Go to the repository
(b) Click on issues
(c) Click on 'New issue'
(d) Copy and paste the content in the title section
(e) Click 'Submit new issue'

2. Observe SPRINT's suggestions (i.e., trivial, major, minor, etc.) for the Issue Severity Prediction feature. To get a better idea, all the severity levels are described below:

Trivial: Minor visual defects or typos with no functional impact.
Minor: Small issues causing minimal inconvenience.
Major: Significant functional problems affecting usability but not critical.
Critical: Severe issues causing crashes, data loss, or major disruptions.
Blocker: Complete failure halting progress; must fix immediately.

3. Assess the suggestions compared to similar issue reports determined by developers. The severity level of the issue should be **"Minor"**.

Now, please answer the following questions:

Q4 *

After inspecting SPRINT's suggestions, do you think SPRINT correctly suggested severity levels for the created issues?

- ◯ Yes
- ◯ No
- ◯ Unsure

*

Please explain your answer (why yes, no, or unsure?)

Q5 *

How easy is it to understand SPRINT's suggestions for the Severity Prediction feature?

- ◯ Very easy
- ◯ Moderately easy
- ◯ Neutral
- ◯ Moderately difficult
- ◯ Very difficult

Please elaborate on your answer (Optional):

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Evaluating the effectiveness of SPRINT's features

Bug Localization

Issue Report 5: Please read and understand the following issue:

The wso2 testgrid project received **Issue Report 5** which describes the following issue:

> **Issue Report 5**
>
> **Issue Title:** Deployment.json is not parsed properly
>
> **Issue Description:**
> Deployment.json created by deploy,sh should be parsed in the format of tomcat host to be able to pass the correct values to replace in the jmeter scripts.
> **Suggested Labels:** Type/Bug
> **Suggested Assignees:** AsmaJ

The wso2 testgrid developers determined that **source code files:**

(1) DeploymentValidator.java
(2) ShellScriptProvider.java

needed to be modified to fix the bug. In other words, they are the buggy code files.

After reading and understanding the issue, please complete the following instructions.

1. Create the issue on **Repository-2 (**SPRINT_User_Study_Repo2**)** by performing the steps:

- **(a)** Go to the repository
- **(b)** Click on issues
- **(c)** Click on 'New issue'
- **(d)** Copy and paste the title and description
- **(e)** Click 'Submit new issue'

2. Observe SPRINT's suggestions for buggy code files the Bug Localization feature. Feel free to take notes of the suggested code files' names.

3. Assess the suggestions compared to the buggy code files determined by developers (see above). Check if the buggy code files appear in the suggestions given by the tool and whether they appear as close to the top of the suggestion list.

Issue Report 6: Please read and understand the following issue:

The wso2 testgrid project received **Issue Report 6** which describes the following issue:

> **Issue Report 6**
>
> **Issue Title:** Scenario tests execution hangs
>
> **Issue Description:**
> Scenario test execution hangs just after the server startup.
> **Affected Product Version:** 0.9.0-m18
> **OS, DB, other environment details and versions:** N/A
> **Steps to reproduce:**
> - Generate test plans
> - Execute one test-plan

The wso2 testgrid developers determined that **source code files:**

(1) AWSProvider.java
(2) ShellDeployer.java
(3) HelmDeployer.java

needed to be modified to fix the bug. In other words, they are the buggy code files**.**

After reading and understanding the issue, please complete the following instructions.

1. Create the issue on **Repository-2 (**SPRINT_User_Study_Repo2**)** by performing the steps:

- **(a)** Go to the repository
- **(b)** Click on issues
- **(c)** Click on 'New issue'
- **(d)** Copy and paste the title and description
- **(e)** Click 'Submit new issue'

2. Observe SPRINT's suggestions for buggy code files the Bug Localization feature. You can take notes of the suggested code files' names.

3. Assess the suggestions compared to the buggy code files determined by developers (see above). Check if the buggy code files appear in the suggestions given by the tool and whether they appear as close to the top of the suggestion list.

Now, please answer the following questions:

Q6 *

After inspecting SPRINT's suggestions, do you think SPRINT correctly suggested the buggy code files for the created issues?

- ◯ Yes
- ◯ No
- ◯ Unsure

*

Please explain your answer (why yes, no, or unsure?)

Q7 *

How easy is it to understand SPRINT's suggestions for the Bug Localization feature?

- ◯ Very easy
- ◯ Moderately easy
- ◯ Neutral
- ◯ Moderately difficult
- ◯ Very difficult

Please elaborate on your answer (Optional):

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Evaluating the Overall Experience with SPRINT

Q8

How easy or difficult to use SPRINT is?

- Very easy
- Moderately easy
- Neutral
- Moderately difficult
- Very difficult

Q9

Please provide any suggestions for improving SPRINT's Graphical User Interface (If any)

Q10

Overall, how accurate were the suggestions for SPRINT's three features?

- Very accurate
- Moderately accurate
- Neutral
- Moderately inaccurate
- Very inaccurate

Please explain your answer (optional)

Q11

How helpful is SPRINT to manage and address issue reports?

- ◯ Very helpful
- ◯ Moderately helpful
- ◯ Neutral
- ◯ Moderately unhelpful
- ◯ Very unhelpful

Please specify the reason for your answer

Q12

Do you agree that the combination of the three features of the SPRINT tool simplifies issue management?

- ◯ Completely agree
- ◯ Somewhat agree
- ◯ Neutral
- ◯ Somewhat disagree
- ◯ Completely disagree

Q13

How responsive is SPRINT in providing suggestions for the three features?

- ◯ Very responsive
- ◯ Moderately responsive
- ◯ Neutral
- ◯ Slightly slow
- ◯ Very slow

Q14

What additional functionality/feature (if any) would you like to see in SPRINT in the future?

- [ ] Developer Recommendation: Recommend a suitable developer for resolving a reported issue
- [ ] Issue Report Content Identification: Identify different contents of the issue report (e.g., observed behavior, expected behavior, and steps-to-reproduce) automatically
- [ ] Issue Report Quality Assessment: Assess the quality of the contents of issue reports
- [ ] Issue Report Quality Improvement: Improve the quality of the contents of issue reports
- [ ] Automatic Bug Fixing
- [ ] * Others

Q15

Please provide any (other) recommendations to improve SPRINT

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Participant's Background and Experience

Q16

Please choose your highest degree obtained.

- ○ High School
- ○ Bachelors
- ○ Masters
- ○ PhD
- ○ * Other

Q17

How many years of experience do you have in programming?

Q18

How many years of experience do you have in using GitHub?

Q19

How many years of experience do you have in managing and solving issue reports?

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End of Survey

We thank you for your time spent taking this survey.

Your response has been recorded.