Usability Study

For JupyterLab

Contents

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Executive Summary

This document outlines the results of a usability study of JupyterLab RTC current and future features. This is not a full report but documents the top-level issues that have been uncovered through usability testing so far.

Next Steps

Our Approach

End User Validation - Usability Test

Participants completed a series of real-world scenarios to identify usability and user experience issues with the application. The screen interactions were captured along with voice and facial expressions through a web camera.

Think Out-Loud

The facilitator instructed the participants to think out-loud to capture a verbal record of their interaction with the application.

Task Logging

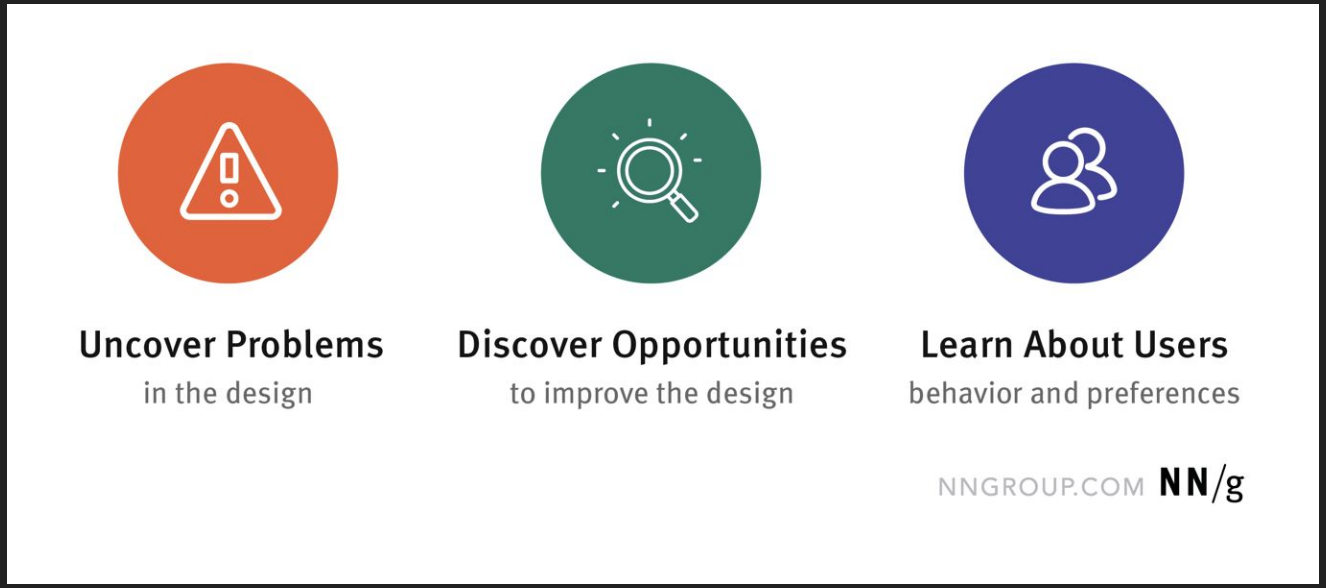
The facilitator entered user behavior, user comments, and system actions to help with analysis.

Benchmarking

We will use the results from this study to measure improvements over time and to compare feedback from different user groups.

What is a usability study?

Why usability test?



Core elements of usability testing

Creating the study

Study Goals

Discover usability issues in existing features of JupyterLab.

Test new cell-level features: toolbar, tag management, add a cell.

Test new sharing features: share a notebook, collaborate on a same cell.

Study Format

Quantitative and Qualitative

Remote

Moderated

The process of designing the study plan

Identify questions we would like to assess

Create tasks for each question

Link each task with a story

Make hypothesis for quantitative tasks

Create a prototype

- How do users expect to access and open a shared notebook?
- How do users expect to know who is working on what within a shared notebook?
- How do users expect to rename an existing tag?
- What action do users intuitively go for when they want to move a cell?
- How do users expect to create a new tag and add it to a cell?
- How do users expect to share a notebook with other users?
- How do users expect to delete an existing tag?

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How do users expect to rename an existing tag?

What action do users intuitively go for when they want to move a cell?

How do users expect to create a new tag and add it to a cell?

How do users expect to share a notebook with other users?

How do users expect to delete an existing tag?

- Open a shared notebook
- Review the code written in your collaborator’s cell
- Rename a misspelled tag
- Move the draft cell to the bottom of the notebook
- Tag the uncompleted cells as ‘draft’
- Delete a tag
- Share the notebook with another user

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Share the notebook with another user

Example for task 1: **Open a shared notebook**

"You are a data scientist working on a new assignment.
Your colleague, Sophie, has already started working on that assignment and would like to share her Jupyter notebook with you so you can start collaborating.
Sophie tells you that she has shared a notebook with you.
You would like to open it, how would you proceed? "

The process of designing the study plan

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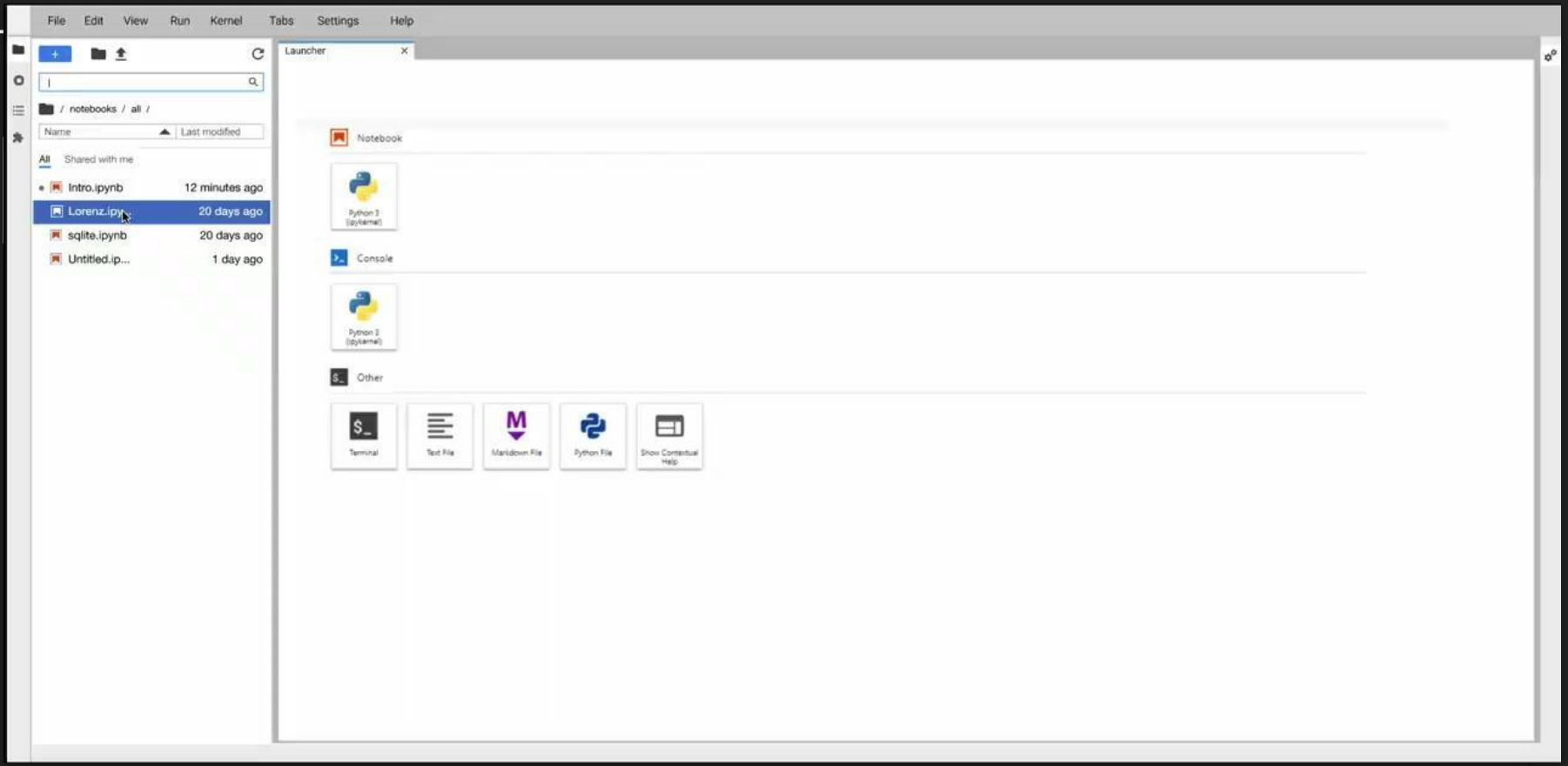
Make hypothesis for quantitative tasks

- Use a "shared with me" tab
- Expect to view name tags on cells
- ?
- ?
- ?
- Hover on the tag and click on the cross
- Use an 'add' action next to other user's tag

Create a prototype


File
Edit
View
Run
Kernel
Tabs
Settings
Help
Launcher
/ notebooks / all /
Name
Last modified
All
Shared with me
Intro.ipynb
12 minutes ago
Lorenz.ipy...
20 days ago
sqlite.ipynb
20 days ago
Untitled.ip...
1 day ago
Notebook
Python 3 (ipykernel)
Console
Python 3 (ipykernel)
Other
Terminal
Text File
Markdown File
Python File
Show Contextual Help

User testing

Who we talked to

2 Personas

The beginner user

The experienced user

Who we talked to

The beginner user

Country	France
Age	18-25
Profession	1st and 3rd year students
Subjects	Mathematics and computer science
Experience using JupyterLab	Frequent: at least every week

Who we talked to

Country	France
Age	Over 40
Profession	University teacher
Subjects	Mathematics and computer science
Experience using JupyterLab	Expert: since at least 10 years

The experienced user

Who we talked to

Typically, 5 participants per each user role is enough to uncover ~85% of usability issues in a system (Nielsen & Landauer, 1993*).

The beginner user

7 participants

The experienced user

2 participants

Study Protocol

- Introduction to myself and the process of user testing
- Study context
- What is expected and what is not expected from participants
- **User testing**
  - **Prototype**
- Questions and feedback

Limitations

- Poor attractivity for students
  - Low voluntary rate
  - Participation rate different from filling the form rate

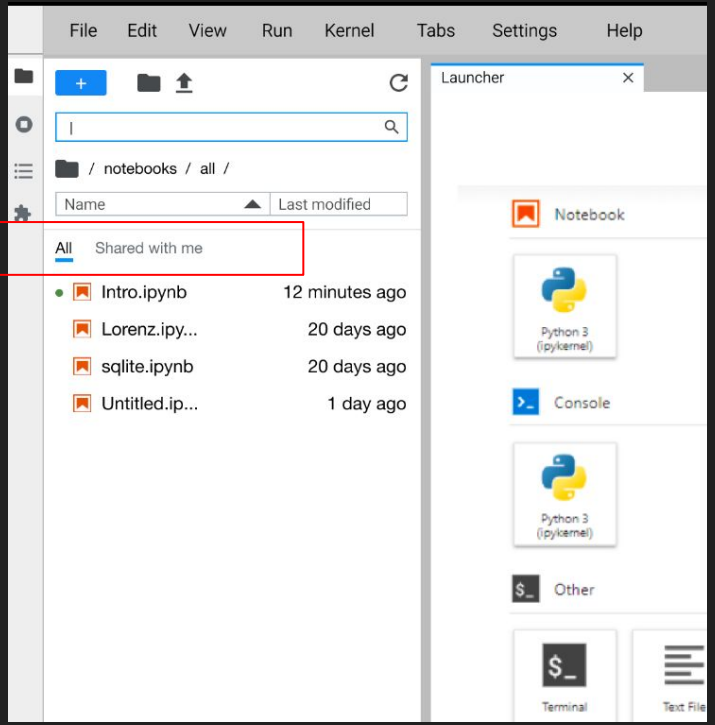
- Students tend to want to do things *right*

  “If I understand well?”

- Only 2 participants representing the experienced persona

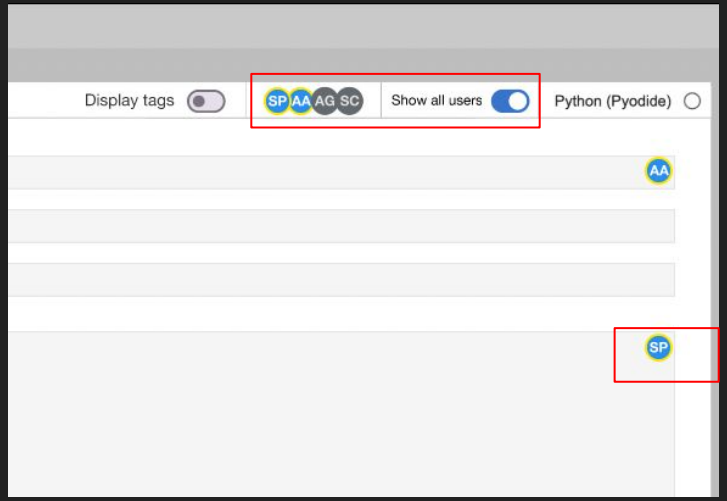
- Prototype is not fully clickable and can create confusions

Task 1 - open shared notebook



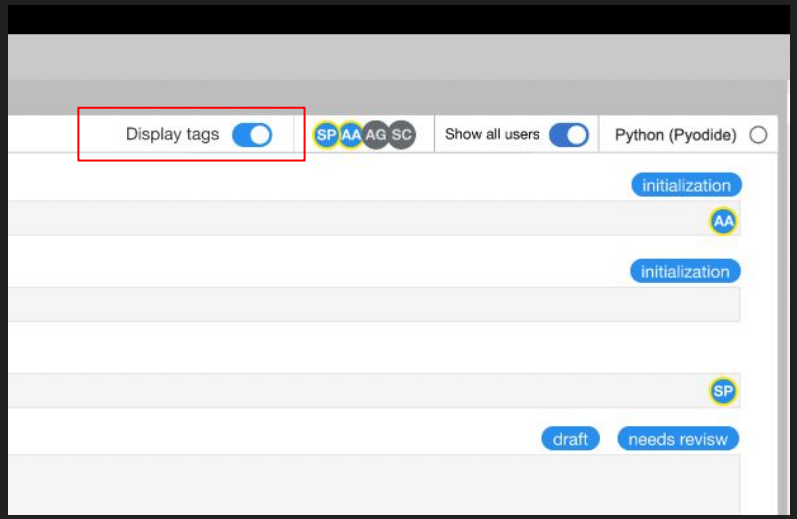
Results	Suggestions
Unclear what the difference between “all files” and “shared files” is	Test another UI for shared files
Unclear if files are on the personal computer or online, users expect to open the email and save the file locally	
Users expect ‘All’ to include the ‘shared with me’ items	Remove the 2 distinct columns

Task 2 - Navigate to a collaborator’s active cell



Results	Suggestions
The name tags at the top of the document were understood	
Expect to see the name tags by default, without having to activate them	Activate the name tags by default
Expect that clicking on the name tag would take them to the cell where that person is active	Continue user research on the use of this feature
The UI of the tags indicating if the person is actively working on the notebook was understood	
The “view all users” tab button was understood	

Display tags

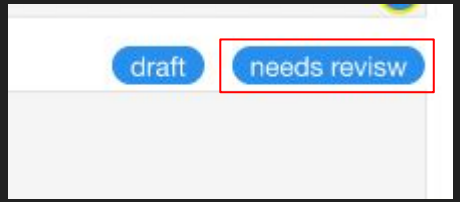


Results	Suggestions
Unclear if tags were created by the system or by other users	Create a tag management system and a UI to navigate to it
Clear that tags are assigned to each cell	
‘Display tags” button is clear and found intuitively	

Task 3 - create a new code cell

Results	Suggestions
Experienced users use keyboard shortcuts	
“Raw” is unused and does not answer a use case	Remove this option
Users do not use these buttons	Continue research on this topic with other UI designs
Confusion about the existing add above and add below icons	Research UI design for these icons
The “add cell” buttons were confused with tags showing the cell type	Add a ‘Plus” icon the the buttons and test again

Task 4 - rename an existing tag



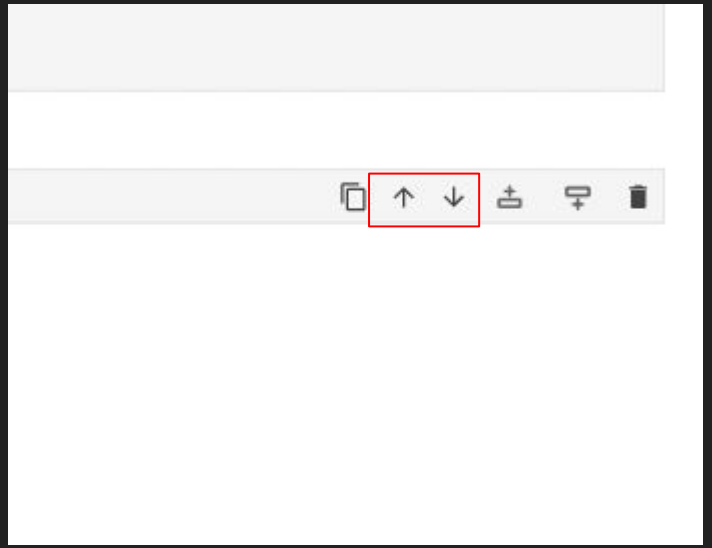
Results

Users expect to double click on the tag and enter an editing mode	
The second expectation is to right click->rename	
Unsure if it will apply to all tags or only the active cell	Research how to include a tag management system for global tag control

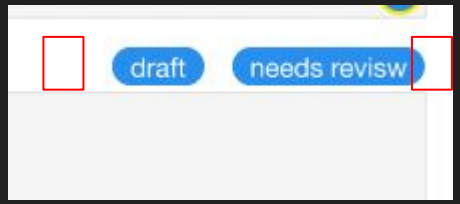
Task 5 - move a cell

Results

- Experienced users use the keyboard shortcuts first
- All users use the cell-level toolbar



Task 6 - add a tag to a cell



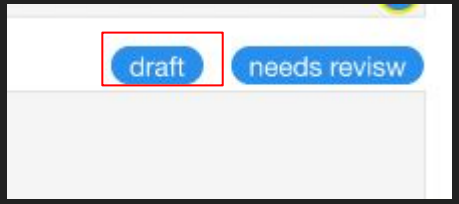
Results

Expect there to be a ‘plus’ button on the right of the existing cells (top right of the cells) Expect it to be a cell option Expect to right click->add	Maybe test these 3 options together?
Confusion about the tags on the right panel: only for the active cell, or for the whole notebook?	Research how to include a tag management system for global tag control

Task 7 - delete a tag

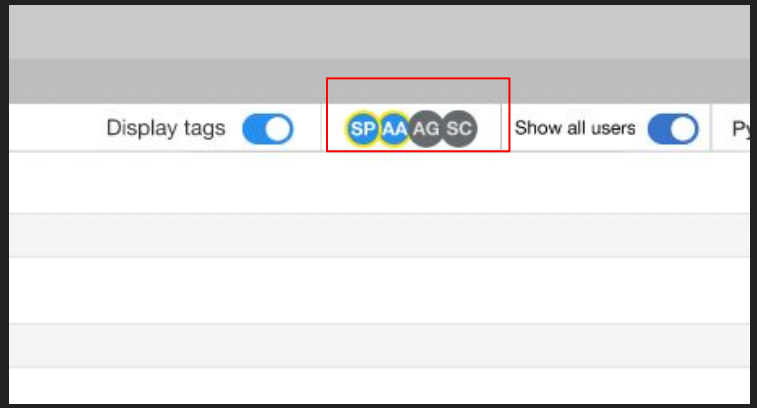
Results

Users all expect to right click->delete



If the prototype had a ‘delete’ icon that appeared on the tags on hover, would it have changed the results?

Task 8 - share a notebook



Results	Suggestions
Users expected to right click on the folder name and be able to share	Have a ‘share’ button on the top bar that would enable you to have a link or add people using their email address

Further user comments and feedback

Navigate to a collaborator's active cell

- Interesting in webinars to know who is or is not following you/or just to know how many people are following you
- Notebook could scroll automatically following the presenters focus

Share a notebook

- Have a 'share' button on the top bar that would enable you to have a link or add people using their email address

Display tags

- Currently it is very hard to know what tag is assigned to a cell as you have to click on the cell every time

Delete a tag

- Removing the text from a tag would be ok but shouldn't be the only way to do it

Create a new code cell

- If there was an add code or add markdown button in the middle of the cell it would be helpful, because code is mostly on the left of the cell, never on the right
- Add a 'plus' icon might make the button clearer

Other

- "I don't know who has edited my cell"
- "I can't add comments to communicate with collaborators"
- "Tag system is great and answers many use cases"
- "I want to be able to use a tag to say 'follow me at this cell' "
- When a tag exists, to be able to filter the cell per tags
- Tags would be very useful for multilingual notebooks (to be able to filter on languages)
- Tags could also be multi-kernel (filter on the kernel language)