GSoC 2025

Project Proposal

Project II: Workflow enhancements

Joomla CMS

Dileepkumar Adari

Mentors:

Benjamin Trenkle

Christiane Maier-Stadtherr

Google Summer of Code

Table of Contents

1. Introduction

1.1. Project Synopsis

Joomla's publishing workflow feature feels like a powerful component through which users can specify structured content workflows, states, transitions, and permissions. Its present implementation is not intuitive making usage tough, and effecting ease of use for users to create, change, and administer workflows effectively.

The primary objective of this project is to improve the workflow system in Joomla through enhancements in its UI and functionality. The focus will be on streamlining workflows and making them more visually interactive, and intuitive, hence simplifying the learning curve for new users and increasing efficiency for existing users.

1.2. Relevant Work

1.2.1. In Joomla

- I have tried to enhance usability by mitigating the issue #37841 using PR #45106 and PR #45206.
- By implementing the above pull requests, I gained insights how the collaboration works in the joomla Organization and how to manage PRs, testing etc. Also gained insights about different design decisions taken which helped me in understanding the codebase better.
- I have explored the codebase to understand the current implementation of the workflow system and have successfully integrated them into my CMS projects.

1.2.2. Outside Joomla

- I have been working on projects that involve Design Thinking and increasing usability of content management systems. My current research revolves around college institute management system which I am currently working on (Figma).
- I have been doing research on usability and user centered design in Institutional ERPs and management of workflows, states and different usecases of the system.

1.2.3. Task

- The task is to implement the category transition when the state of the article is changed. I have tried to implement all the required functionalities and hope most of it covered.
- The task gave me a over all picture of how the articles are being handled and how to use different attribute and methods of the instances.
- Although I had spent limited time on this task, I was able to implement the category transition when the state of the article is changed.
- I hope to improve the impelementation and make it more robust in the future. Due to my academic this week, I was unable to complete the task fully.
- You can download the plugin from here.
- By Downloading the zip and installing it in your joomla site, you can enable the plugin in plugins or extensions. you will be able to change the default category in the transitions of the workflows. The category transition happens when the state of the article changed.

1.3. Technical Skills

1.3.1. Languages

PHP ○ Javascript ○ SQL ○ HTML & CSS ○ API ○ Bash ○ Python

1.3.2. Theory

Content Management Systems (CMS) ○ Design Thinking ○ Human computer Interaction ○ Human Centered Design ○ Usability and User Interaction ○ Data Structures and Algorithms

1.3.3. Tools

Joomla! CMS ○ Git ○ Linux ○ Docker ○ Figma ○ Latex

1.4. Bio

1.4.1. About

I'm a 3rd year undergraduate student pursuing my B.Tech in Computer Science at IIIT Hyderabad. I am doing my research in Human-Computer Interaction at Software Engineering research Center focusing on Usability enhancement and human-centered design.

1.4.2. Why choose me

- I am well-versed in Joomla Usage, HCI and usability research.
- I have contributed to Joomla which helped me understand its architecture. The contributions are basic but gave me a good understanding of codebase and process of contribution.
- I aim to explore different solutions to get the best way possible and document all the functionality that I will be implementing.
- My research in Human-Computer Interaction (HCI) ensures that the solutions I build focus on ease of use and efficiency.

I chose this project as it is the perfect way to utilize my skill-set, while learning a lot more at the same time and its aligning to my research.

1.5. Contact Information

Name	Dileepkumar Adari
College	International Institute of Information Technology, Hyderabad, India
Degree Program	B.Tech in Computer Science
Time Zone	GMT +5:30
Links	Github - Linkedin
Emails	adaridileep@gmail.com dileepkumar.adari@students.iiit.ac.in
Phone Number	+91 7330701217

2. Benefits to Community

The successful completion of this project will provide the community with a more intuitive and visually efficient tool for managing content publication processes. This improvement will

reduce the cognitive load for the new users and increase productivity for existing users. As the workflows will have a clear representation of how all stages and transitions are setup, users can changes and interpret the workflows easily even in large system. The Documentation further helps in making it more understandable.

3. Deliverables

3.1. Primary Goals

I aim to implement these goals during the course of GSoC this year.

3.1.1. Graphical Workflow Interface

- **Drag and Drop Functionality:** An intuitive interface that allows users to create and modify workflows using drag and drop actions simplifying the process of arranging and connecting workflow stages.
- **Visual Representation of workflows:** A graphical representation of workflows using flowcharts to provide users with a clear overview of the process flow.

3.1.2. Predefined Workflow Templates

- **Default Workflows:** A set of predefined workflows tailored to common use cases uch as content approval proccess, editorial reviews etc. These templates serves as starting points for users, reducing time and effort required to set up standard workflows.
- **Customization:** Users can modify these default workflows to suit their specific needs, providing flexibility while maintaining user friendly setup process.

3.1.3. Documentation

- **Comprehensive Guide:** A detailed documentation covering all the aspects of the workflow system, inclusing setup, customization, stage management, tansitions and troubleshooting.
- **Step-by-Step Tutorials:** Step-by-step tutorials and use-case examples to guide users through various scenarios.

3.1.4. Testing

- **Thorough Testing:** Development of test cases and rigorous testing of the workflow system to ensure stability, usability, and robustness.

3.2. Stretch Goals

If time permits, I would like to enhance the UI for integration of workflows in the article system. Otherwise, I will be implementing these after the completion of GSoC.

4. Project Details

4.1. Codebase

The codebase for this project will be based on Joomla's existing workflow system. It will be the extension for the the GSoC 2017 - Publishing Workflow project enhancing the UI elements and the workflow system. As from the exploration, the workflows works as a component where it can be enabled and used with the categories of articles.

4.1.1. Workflow component

The workflow component (com_workflow) provides functionalities to manage different types of workflows, their stages and transitions from one state to another by shifting stages. It has user permission management where each workflow stage and transition can be asigned user groups to deal with it. This project will enhance its usability by integrating an intuitive graphical editor and visual representation of workflows.

4.1.2. Articles component Integration

The com_content extension integrates with the workflow system, allowing articles with same category to have customizable workflows instead of relying on the default states (Published, Unpublished, Archived, Trashed). The workflows can be seen and updated from the articles with required user permissions.

4.2. Proposed Methods

1. **Graphical Workflow Builder:** Currently, workflows are defined using form-based interfaces, making it difficult for users to visualize transitions between states. A more intuitive and interactive system is required.
   - Implement a drag-and-drop interface for workflows using JavaScript libraries.
   - Allow users to visually connect states and define transitions.
   - Store and retrieve workflow data efficiently in Joomla's database.
   - Implement undo/redo functionality to simplify workflow modifications.
   - To overcome for the challenges for the physically disabled people, we can have solutions like Keyboard-Navigable Controls.
   - Users will be able to reorder workflow stages and transitions using arrow keys and modifier shortcuts (e.g., Space to select, Enter to confirm actions). This ensures compatibility with screen readers such as NVDA and VoiceOver.
   - Screen Reader Support : All workflow elements (stages, transitions) will include ARIA labels and live-region updates to announce changes dynamically. For example, dragging a stage will trigger a voice notification like: **"Stage 'Draft' moved to position 2."**
   - High Contrast Visuals: A color-blind-friendly palette and adjustable contrast settings will ensure clarity for users with visual impairments.
   - For users who cannot use drag-and-drop (e.g., motor disabilities), we will provide a numbered list interface will allow users to rearrange stages via keyboard shortcuts (e.g., Alt+1 to select Stage 1, Alt+3 to move it to Position 3).

3. **Predefined Workflow Templates:** Manually setting up workflows from scratch every time can be time-consuming.
   - Design ready-to-use templates such as Editorial Review, Multi-step Approval, and Automated Publishing.
   - Allow users to import/export templates for easy sharing and migration between Joomla instances.
   - Implement UI for selecting and customizing workflow templates.

4. **Visual Representation of Workflows**
   - Display workflows as interactive flowcharts within Joomla's admin panel.
   - Use color-coded states and transitions to enhance readability.
   - Provide hover tooltips for quick insights into conditions and permissions.

5. **State-of-the-Art & References**

This design is informed by and builds upon several authoritative guidelines and research findings:

- WCAG 2.1 The Web Content Accessibility Guidelines (WCAG) 2.1 define how to make web content more accessible for people with disabilities. These guidelines are the industry standard for accessible design. https://www.w3.org/TR/WCAG21/
- WAI-ARIA Authoring Practices 1.1 This document offers guidance on how to implement ARIA roles, states, and properties—including best practices for drag-and-drop interfaces—to ensure that dynamic content is accessible. https://www.w3.org/TR/wai-aria-practices-1.1/#dragdrop
- The A11Y Project An inclusive resource dedicated to accessibility best practices, this project offers tutorials, checklists, and community insights that help designers and developers create more accessible user interfaces. [https://www.a11yproject.com/] (https://www.a11yproject.com/)

5. Project Schedule

The proposed schedule has been made keeping in mind the GSoC timeline.

At the end of both the coding periods, I have allocated a buffer week. This will be used in case the project would be behind schedule due to unforeseen circumstances. In case the project is on time, the buffer weeks would be used to implement the stretch goals.

5.1. Community Bonding Period

May 8 - June 1: During this period, I aim to

- Decide and set up a weekly status update method with the mentor.
- Review existing workflow system and identify pain points.
- Exploring the state of art to conclude the changes that can be implemented.
- Create wireframes/mockups for the new UI.

5.2. First Coding Period

In the first phase, I will be working on the workflow UI enhancements, their interfaces, documentation and testing. I plan on writing the tests and documentation along with the actual implementations, rather than pushing them towards the end.

June 2 - June 9: Implement basic UI enhancements and initial workflow interfaces.

June 10 - June 16: Implement drag-and-drop functionality and save workflows.

June 17 - June 23: Impelementation of visualization of workflows and its states using graphs.

June 24 - June 30: Enhancing the transitions of the implement UI for smooth experience.

July 1 - July 6: Writing documentation and testing for UI components.

July 7 - July 13: Buffer week

5.3. Midterm Evaluation

July 14 - July 18: Write the mid report and further polish the code and documentation. Since at this point I will know how the code structure would be, it will be a good time to refactor the code.

5.4. Second Coding Period

In the second phase, I will be working on default workflows, along with their documentation and testing.

July 19 - July 25: Deciding on what are the required default workflows and use-cases related to them.

July 26 - August 1: Implementing the intial workflows, their stages.

August 1 - August 7: Implementing the transitions of workflows and user permissions of the stages and transitions.

August 8 - August 14: Adding all these to the default setup.

August 15 - August 17: writing documentation and testing of the default workflows.

August 18 - August 24: Buffer week

5.5. Final Submission

August 25 - September 1: Write the final report and document the process for future contributors

5.6. Availability

I have my summer vacation from 10^{th} May to 1^{st} August, and don't have other commitments over this time period. I will be giving $\approx$ 30 hours per week to this project in this time period, and plan to get the majority of the project done here.

For the remainder of the time period, (2^{nd} August to 26^{th} August), my college will resume and I will be able to give $\approx$ 15 hours per week.

If something does come up that clashes with the timeline, it will be informed in a timely manner and I will ensure that the working hours won't be affected.