

Internal Software for More Productive Companies

A Technical Report
presented to the faculty of the
School of Engineering and Applied Science
University of Virginia

by

Nathaniel Gonzalez

May 9, 2023

On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Nathaniel Gonzalez

Technical advisor: Briana Morrison, Department of Computer Science

Internal Tools: Increasing Organization-Wide Productivity with Internally Facing Software

CS 4991 Capstone Report, Fall2022

Nathaniel Gonzalez
Computer Science
The University of Virginia
School of Engineering and Applied Science
Charlottesville, Virginia USA
neg2mhs@virginia.edu

ABSTRACT

Yext is a software company in the search engine optimization space that uses internal tools to mitigate operational overhead, where the tools require consistent improvements to remain useful in practice. In response to UX/UI feedback from employees for Yext's internal Chrome extension tool, I redesigned the login authentication screen and added autocomplete search functionality to a 3,000+ option dropdown. I used CSS, JavaScript, and HTML for both enhancements, with Figma being a unique tool for the login screen redesign. Many employees previously admitted they did not use the tool due to the painful task of sifting through 3,000+ clients in the old client dropdown to find the right one. However, they have now returned to the tool after the autocomplete search enhancement, and the changes have greatly improved the workflow of Yext's consulting organization. Based on employee feedback provided by the UX/UI team, future improvements should include making the chrome extension draggable and redesigning for the ability to customize the order of the tabs within the chrome extension.

1. INTRODUCTION

"If you want it done right, then do it yourself" is the driving force of internal tools. Organization cost cuts while improving output is any company's goal. Expensive, off-the-shelf, enterprise software and repetitive

employee tasks obstruct this goal. In-house tools are the ideal solution, eliminating licensing costs of external software while being built to suit the organization's exact needs. Internal tools are an essential component to streamlining a company's operations.

2. RELATED WORKS

In an article written for budibase, a software company that enables easy creation of internal apps, Johnston (2022) presents substantial and objective arguments in favor of internal tools. This overlaps with my experience working on Yext's internal Chrome extension tool. Internal tools help accelerate digital transformation and supercharge organizational efficiency through increased productivity, cost-effectiveness, improved security, increased control, and improved employee experience [1]. These factors, except for security, similarly served as key drivers for my assigned Chrome extension feature enhancements at Yext.

In his guide to internal tools, Fanchi (2022) notes that most companies use these tools to "handle logistics and make it easier to respond quickly to customers in the case of technical issues" [2]. This is especially true with Yext's Chrome extension as it is designed for the consulting, or professional services, organization where a TEM or Dev can quickly create a JIRA item for a Yext

client's site, all through the Chrome extension. This relieves the employee of the need to navigate through various tabs to create a new JIRA item upon a newly discovered bug on a client site.

3. PROJECT DESIGN

The project began with assessing employee feedback gathered by the UX/UI team on the state of Yext's Chrome extension. Based on the feedback, I then formed actionable development tasks, where I was assigned the two highest priority tasks: redesigning the extension's Okta authentication login screen and adding autocomplete search to one of the extension's tabs.

3.1 Project Overview

The Chrome extension is part of Yext's Professional Services, its consulting, organization. The tool's purpose is to help streamline redundant tasks when managing clients within the consulting organization. The extension offers seven different tabs to achieve this, with each providing a unique feature to improve the consulting workflow.

Before reaching the tabs within the extension, the user must first authenticate at the extension's login screen via Okta – Yext's Single Sign-On (SSO) service for all employees. Redesigning the look of this authentication login screen was the first task assigned to me.

In the "Knowledge Graph" (KG), Yext's client data and intelligence lies behind the scenes and powers Yext's three key services: Answers, Pages, and Listings. The consulting organization is responsible for maintaining the KG, which is vital for the extension because most tabs within the extension pull from KG for quick and easy access to important client information. One tab, enabling easy creation of a JIRA item required the selection of 1 of 3,000+ clients,

which pulled from KG to show all the client options. In this tab I changed the input from a select option dropdown to an autocomplete search, the second task assigned to me.

3.2 Authentication Login Redesign

The JIRA item for the authentication login redesign task contained a figma file for the look of the new authentication screen. I inspected the fonts, colors, spacing, margins, and buttons of the figma file to obtain the exact values I would eventually change the extension's HTML and CSS files to.

The old login screen had the tabs visible at the top with the tab content below blurred out and non-interactable. At the center of the extension was a white rectangle overlaying the blurred-out tab content with a red exclamation point SVG centered at the top. Underneath were two messages explaining that Okta authentication is required and to login by clicking the button below.

The new login screen removed the visible tabs at the top and the blurred tab content and instead had the overlaid rectangle fill the entire extension space. To make this change I created a u-hidden CSS class containing "display: none," and applied this class to the HTML responsible for displaying the tabs and tab content. I then matched the width and height of the overlaid rectangle to that of the extension. The new login also replaced the exclamation point with the Yext logo, changed the text message of the login screen, and changed the color of the "Login with Okta" button to blue. To make these changes, I replaced the old SVG with a Yext Logo SVG, changed the text to match that of the new screen, and changed the color of the button.

3.3 Autocomplete Search

The "MS Item" page responsible for creating new JIRA items through the extension

required the selection of a client for whom to create the item. Previously, it was greatly inconvenient to sift through a 3,000+ long select option dropdown and select the correct client by hand. To change the select option from a dropdown to an autocomplete search, I changed the HTML code to make use of a datalist, which automatically supports autocomplete search of its options. This required some behind the scenes adjustments to the JS code that handled pulling the 3,000+ clients from the KG. I had to adjust the value that was being stored following a selection of a client and make sure that this value properly mapped to the correct JIRA client ID to create the JIRA item with the right client.

3.4 Challenges

The biggest challenge for the authentication login change was accounting for the edge case when Okta authentication times out. This posed an issue of leaving the extension screen blank, rather than having the login message re-appear. The solution was to move where I was applying and removing the u-hidden utility class to a different area of the JS code for the login. I also had to make use of JavaScript's `setTimeout` function to guarantee the order that function calls were being made for the login screen to appear and disappear appropriately. The second biggest challenge was debugging the JS code to handle the JIRA item creation correctly. Standard debugging techniques such as printing out variables and inspecting http requests helped reveal the issues.

4. RESULTS

After having deployed my changes to production and giving a presentation of my changes to the consulting organization, many employees stated that the autocomplete search was enough to bring them back to using the Chrome extension. This was the most complained about issue from the UX/UI feedback report, so many employees were

happy to see this change finally happen. Going from scrolling through 3,000+ clients by hand to being able to search for the exact client in less than 2 seconds is a drastic improvement, likely saving at least 10 minutes of time per search. The authentication login screen change also simplifies the login experience, making it less intimidating to jump in and use the extension. In all, these changes were significant enough to bring employees back to the tool, and thus became the difference maker between an unusable tool and a usable tool for some.

5. CONCLUSION

This project illustrated the critical role internal tools play in boosting workflows within an organization. Redundant and cumbersome tasks are streamlined to improve operational efficiency, with the success of these tools largely contingent upon their usability. Looking at the autocomplete search enhancement, even small features, or lack thereof, can dictate whether a tool is worth using. With my work being pushed to production, my changes are cemented as steps toward achieving Yext's ambitious goal of making their internal Chrome extension tool useful for the entire company, and not just the consulting organization.

6. FUTURE WORK

In the effort of making the Chrome extension a more robust and usable tool, the next steps should be to implement the remaining suggested changes from the UX/UI employee feedback: making the chrome extension draggable, and redesigning for the ability to customize the order of the tabs within the chrome extension.

REFERENCES

[1] Johnston, J. 2022. What are internal tools?: The definitive guide to internal tools in 2022. (April 2022). Retrieved September

23, 2022 from <https://budibase.com/internal-tools/>

[2] Fanchi, C. 2022. What Are Internal Tools?: The Ultimate Guide. (January 2022). Retrieved September 23, 2022 from <https://backendless.com/what-are-internal-tools-the-ultimate-guide/>