

Designing a Workspace Reservation System Using ServiceNow

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Technical Project Team Members

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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

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ABSTRACT

Because of changes in the post-pandemic workforce, many workplaces face shifts in office space requirements and a need to transform to digital workforce management. This transition motivated a project to support employees and contractors returning to the office and effectively manage office space for hoteling and remote workforce management.

In the project, our development team leveraged ServiceNow, a low-code development platform, to design and implement a solution enabling employees to reserve an office space to use for a set period of time. The system we developed primarily consists of a web portal where employees can find available spaces meeting a search criterion and request either individual workspaces or collaboration spaces. Users can filter by relevant parameters such as building, floor, type of room and room capacity. Users can then look through available results using a ‘card view’ where each reservable room is represented as a card with an image, name and description of the room. Alternatively, users may view available rooms from a map view which displays a floor plan where the available rooms are highlighted and can be clicked to reserve. Additionally, notifications for reservations are sent to approving officials, managers and requesters so reservation requests can be approved or declined. Furthermore, dashboards display relevant data and statistics for the quantity and type of reservations in a given building.

For employees, the portal provides a simplified method of reserving office space, and for managers it streamlines the workflow approval process. The solution improves upon an existing reservation management system by saving time as well as providing an improved user experience.

1 Introduction and Background

The pandemic largely brought in-person office work to a stop over the past year as companies quickly adopted work-from-home policies. Now, as the pandemic subsides many companies are eager to begin the transition of bringing their employees back into the workplace. This transition has generated challenges as

employers want to ensure that employees remain safe, healthy and happy.

Companies seek to make this a smooth transition back into in-person work, but this is complicated many factors. Many employees are reluctant to return to the workplace both due to health and safety concerns as well as just preferring the convenience of working from home. There might be a shift not to completely in-person work, but rather a hybrid where some employees are regularly in the office full-time, some may work in the office part-time and some may be completely remote. Others may seek to come into the office only for special occasions like an important conference, meeting or presentation. The result of these changes is a shift in office space requirements, especially the need for flexible and reservable spaces. The project intends to assist companies in transitioning back to the office through workforce management and space management solutions and enabling employees to request workspaces on demand.

2 Related Works

Several works relate to the surrounding social factors and inform potential impact of a return to the workplace and what role the technical project might play in a transition back into the office.

The first source is a study titled “The COVID-19 Office in Transition: Cost, Efficiency and the Social Responsibility Business Case.” This study seeks to evaluate the effects of the COVID-19 pandemic on how offices will be designed and function in the future. This informs the technical project because the project attempts to aid in these future workplace changes and transitions.

The second is a study of Microsoft employees over first six months of 2020 titled “The Effects of Remote Work on Collaboration among Information Workers.” This study examines how a shift from in-person to remote work impacted the way employees communicated and collaborated with each other. This is relevant because the negative costs of remote work examined in this work motivated the creation of the technical project.

3 Project Design

The project was designed and implemented by a team of interns using development platform ServiceNow with the goal of fulfilling six key requirements. The end solution resulted in functional solutions for workspace management. The team also encountered several challenges throughout the project.

3.1 Team Organization

The project took place over the course of 10 weeks throughout a summer internship at an information technology consulting and systems integration company. The project team consisted of six members, all interns, three of whom had more technical experience whereas the other three had more functional roles. Additionally, the team was assisted by two full-time members who acted as mentors for the project. The team participated in daily stand-up meetings to divide responsibilities and check in on completed tasks. A project management tool, Jira, was also used to facilitate task assignment and tracking throughout the development process.

3.2 Key Requirements

The following six requirements were stipulated as the key functional objectives for the project:

1. seating maps and space availability with designated use types for different spaces,
2. the ability to reserve a space for use for a set period of time,
3. approvals for various contracting companies and government officials,
4. notifications to approving officials, managers, and requestors,
5. automated or manual approval settings, and
6. workplace and workflow status and reporting.

3.3 Technical Components

The system was primarily developed using ServiceNow, a low-code development platform aimed at helping companies manage digital workflows. Additionally, the user interface of the application was designed using the Angular web application framework as well as markup languages HTML, CSS, and programming language, Javascript.

3.4 Functional Solutions

Users can access the application by logging in with a username and password. The system has two types of accounts differentiated by role: employee or manager. The employee has the ability to request reservations and visitors, while the manager has the same abilities as the employee role, but can also access a page displaying composite workplace reservation data and summary statistics.

Once users log in, the primary function of the web application is to allow them to request reservations. They can do so by first selecting the 'Make a Reservation' tab from the header menu. Then the user is taken to a page where they can fill in a search query. Users select the building, floor, room-type, date, start-time and end-time for their reservation. They can also select to make a recurring reservation which consists of a set of repeating daily or

weekly reservations. Additionally, there is an optional sidebar with more filters to specify including room capacity and room amenities. The results are then populated based on these characteristics. The default view is a 'card view' wherein each matching reservable space appears as a card with the name, location, image and description of the space is displayed. Users can click the 'Reserve' button on one of these cards to reserve the space at the requested time. Alternatively, users can select the 'Map View' tab to view the resulting spaces on a map. The spaces on the map are color coded where green spaces are available and match the search criteria while grey spaces are not. Users can hover over any green space to see a label with the spaces name and can click on an available space to reserve it.

Users can review their upcoming reservation by selecting the 'Reservations' tab in the header menu. Here a list of all active and future reservations is displayed. Users can click on a reservation to see further information for the reservation such as date, time and location or to edit or cancel the reservation.

A visitor sign-up process was also configured to allow employees to register non-employees to come into an office building. This can be done by selecting the 'Request a Visitor' link on the application's homepage. Then the employee is redirected to a form where they enter the date, person and company for the visit. A user with the manager role can then approve the request.

A workflow was configured to generate notifications. Email notifications are sent when a visitor is requested as well as when reservation for a space of type conference room or presentation room is requested. The manager can then view the date, time, location, and recipient of the request and select a button to either approve or deny the request. Reservations for low-capacity spaces such as individual desks or offices are automatically approved by the system.

Workflow and workflow status and reporting was also incorporated into the project. Statistics were generated from the database tables containing reservation information. A page titled 'Facilities Dashboard,' available to managers, displays several tables figures including a pie chart showing the breakdown of reservations by room type, a bar chart of the number reservations made each day and a list of all the upcoming reservations for a selected building.

3.5 Challenges

The team faced several challenges in designing and developing the solution. One challenge was trying to design the system so that it would be intuitive and easy to understand for new users or users without prior experience and familiarity with similar systems. We attempted to solve this by getting outside feedback on the design and user interface. Another challenge was team organization because in addition to the project, team members had outside work to consider. We attempted to solve this by meeting and checking in frequently and maintaining open lines of communication among the team members.

4 Results

The web application is intended for use by a client company and its employees to modernize their system for workspace reservations. The system can save time and resources by streamlining this workspace reservation process. The time spent by employees making reservations is reduced since they can quickly filter, select and reserve a desired workspace with a minimal number of steps. This could boost the productivity of workers by allowing more time for other tasks. The system is reliable and consistent and can reduce potential errors and delays in the reservation by automating the process and minimizing manual inputs needed.

The system is also cost efficient because it requires minimal maintenance and can be deployed on a large scale. Economies of scale allow a company to easily expand the scope of the system to maintain the reservations for all of its campuses and buildings. It also provides valuable metrics about building space usage which could be leveraged by a company's facilities management to maximize building efficiencies. Additionally, it allows employees to make reservations from any location. Employees could reserve a space for a later date and time without having to be in the office to fill out a physical sign-up sheet or form. This allows primarily remote employees to easily reserve a workspace for the day so they can come into the office as needed.

5 Conclusion

The newly-designed system provides an intuitive user experience which allows employees to easily reserve workspaces. The application reduces potential conflicts and confusions over who has reserved a space and simplifies the reservation process. The platform also provides valuable data about workspace usage to the client to allow them to maximize efficiencies in office space usage. The system simplifies the process of returning to work in a post-pandemic world.

6 Future Work

The project could be improved or expanded upon in several possible ways. The project was primarily a proof of concept of a space reservation system with demo or sample data. In the future the system could be filled in with a more complete set of data in order to be used in a real-life situation. At present, the system only contains data for a sample building and floor so this could be expanded.

Additionally, more features could be added to the system to expand its capabilities especially into task management. For example, more aspects of facilities managements could be incorporated into the project, such as generating and assigning cleaning tasks for spaces that have been reserved. The system could be further customized based on a client's needs. For example, a company's logo, branding and colors could be used to customize the appearance of the application. Other custom features could be also added and there is potential for the system to be integrated with 3rd party platforms.

7 UVA Computer Science Program Evaluation

My computer science program at the University of Virginia helped to sufficiently prepare me to complete the project. The class

'Programming Languages for Web Applications' was particularly useful, as many of the topics discussed in the class were applied in this project.

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