

Autonomous Book Solution (A.B.S)

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PROBLEM STATEMENT

Libraries had to close amid COVID-19 pandemic and services like issuing books discontinued, which affected over 2 million people. Figure 1 shows the ABS Team's analysis for California State Universities book borrowing.

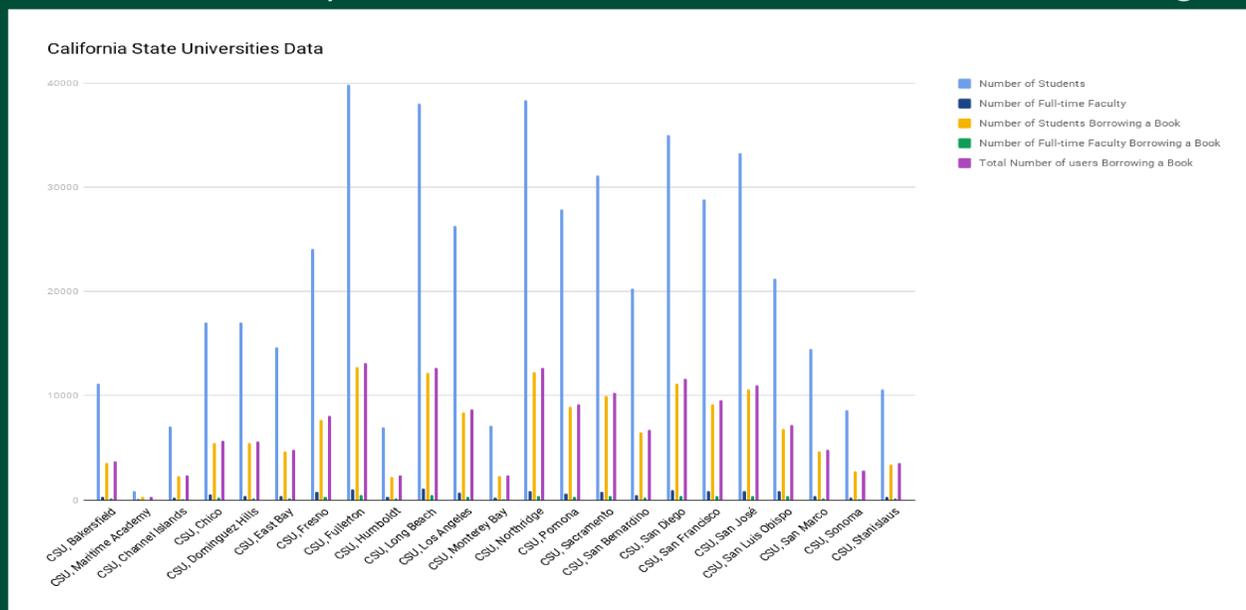


Figure 1: California State Universities Data (created by ABS Team [1][2])
Note: # of books borrowed is based off the Pew Research Center's data[3]

BACKGROUND

Libraries have been affected by the COVID-19 pandemic. According to the American Library Association (ALA), 98% of the libraries in the U.S. had to close due to this pandemic [4]. Only a handful of libraries stayed open with limited services. Keeping the libraries open raise safety issues for the public and the library staff. ALA states that about 74% of the libraries have tried to expand their services online [4]. Online services seem to be a quick solution in the current situation, but a lot of the resources and services like issuing physical books are lost. Converting physical books into e-books takes time and resources that are not available to all libraries, delivering to homes takes 7-10 business days and picking up from lockers increases the users touching the same surface!

SUMMARY OF WORK

We divided our project into two parts, the checkout machine and the website. In the first part, we modified a shelf, then we concurrently worked on belt systems in cells and sliders. Next, we completed the smaller features, tray to carry the book, QR Code Scanner, and sensors (Figure 2). In the second part, we built the website using the Springboot Java framework and React JS. Our website includes the following main features, dashboard, book profile, user accounts, checkout cart, search bar, recommendations, and QR Code generator (Figure 2).

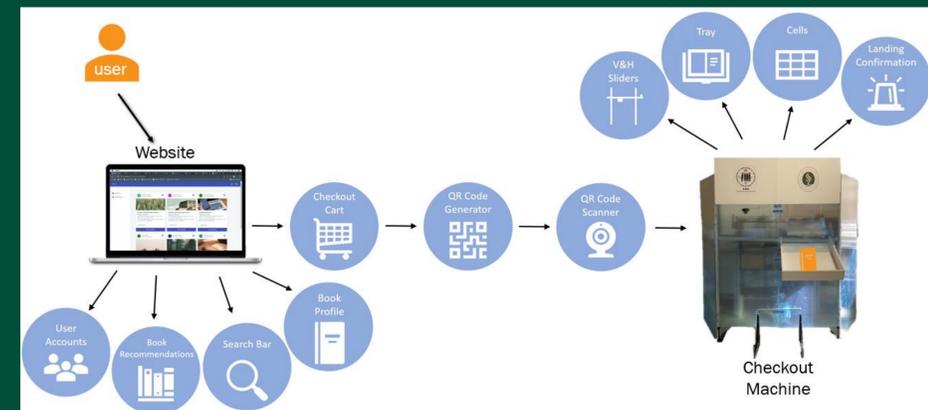


Figure 2: Project Diagram (created by ABS Team)

IMPACT ON COMMUNITY

It is been over a year since the COVID-19 pandemic started, in all this time millions lost access to a vital resource of information and knowledge, especially the service of checking out books. Our Autonomous Book Solution (A.B.S)'s interactive website and checkout machine allows these community members to find and checkout a book from a library all while maintaining the social distancing and avoiding face-to-face interactions! Even after the pandemic, this service can be utilized to further improve library services with 24 hours access to checking out books.