

Scorpacuda 2004 Research Project Solution

At the library: we took lots of notes and made floor plan pictures and talked to the librarians.

Investigate the first floor of the library. We decided to just focus on the first floor and not the upstairs which is for junior readers. We Made Measurements: dimensions to create a floor plan; measured ceiling and shelf height; counted number of book shelves; weighed the heavy books (up to 10 lbs).

Investigated Library Sections: Book shelves for non-fiction, fiction, and reference books. Carrousels for paper back books. Audio books on smaller shelves. Videos and CDs and DVDs and cassette tapes on carrousels and small shelves. Photo copy machine. Display cabinets. Magazines and Newspapers. Sofa. 2 Work Tables. Bathroom. Elevator.

When we talked to the Librarian we learned that:

- The library was a converted church in 1992 brought up to Federal ADA codes including ramp, door handles, elevator, bathroom accessibility, and 36 inch aisles between shelves.
- Learned that originally the library was supposed to be big enough for Brookline for 20 years, but it is already 'at capacity' for seating and 'over-capacity' for book storage.
- The top book shelves are now being used and they are too high for people to reach without a step stool.
- Some of the aisles are less than 36" because of the paper back carrousels and the other small shelves.
- The floor is congested space. It is difficult for people with walkers. Most handicapped people can get plenty of help though from the librarian. There are services for vision and for hearing impaired. The library can deliver books to people who are home bound.
- The parking lot is very limited.

We Researched the ADA Specifications for public places and for libraries. We learned that a wheel chair needs a 5 foot diameter to turn around. We learned about Braille and other navigation tools for vision impaired people.

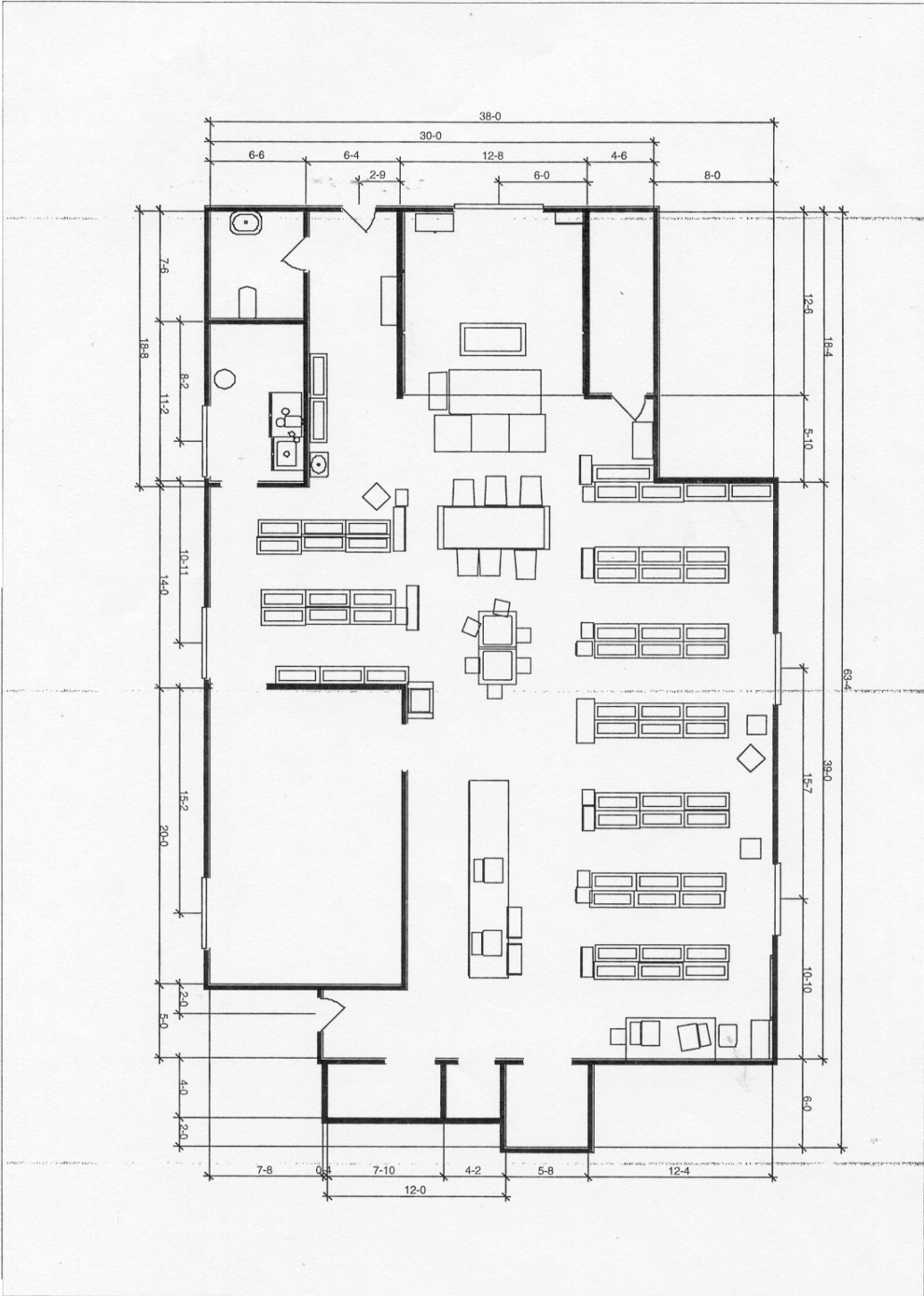
We looked at the on-line information about the Brookline Public Library.

Brainstormed things people do at a library including finding books, returning books, reading, taking notes, etc.

We voted to combine several activities: first searching a catalog for a book then retrieving the book from a shelf. The challenge really is to be able to get a book down from a shelf. Handicapped people might have difficulty doing that at the Brookline Public Library.

The Problem:

A handicapped person has difficulty locating books and getting them off the book shelf.



This is what the library looked like when we visited.







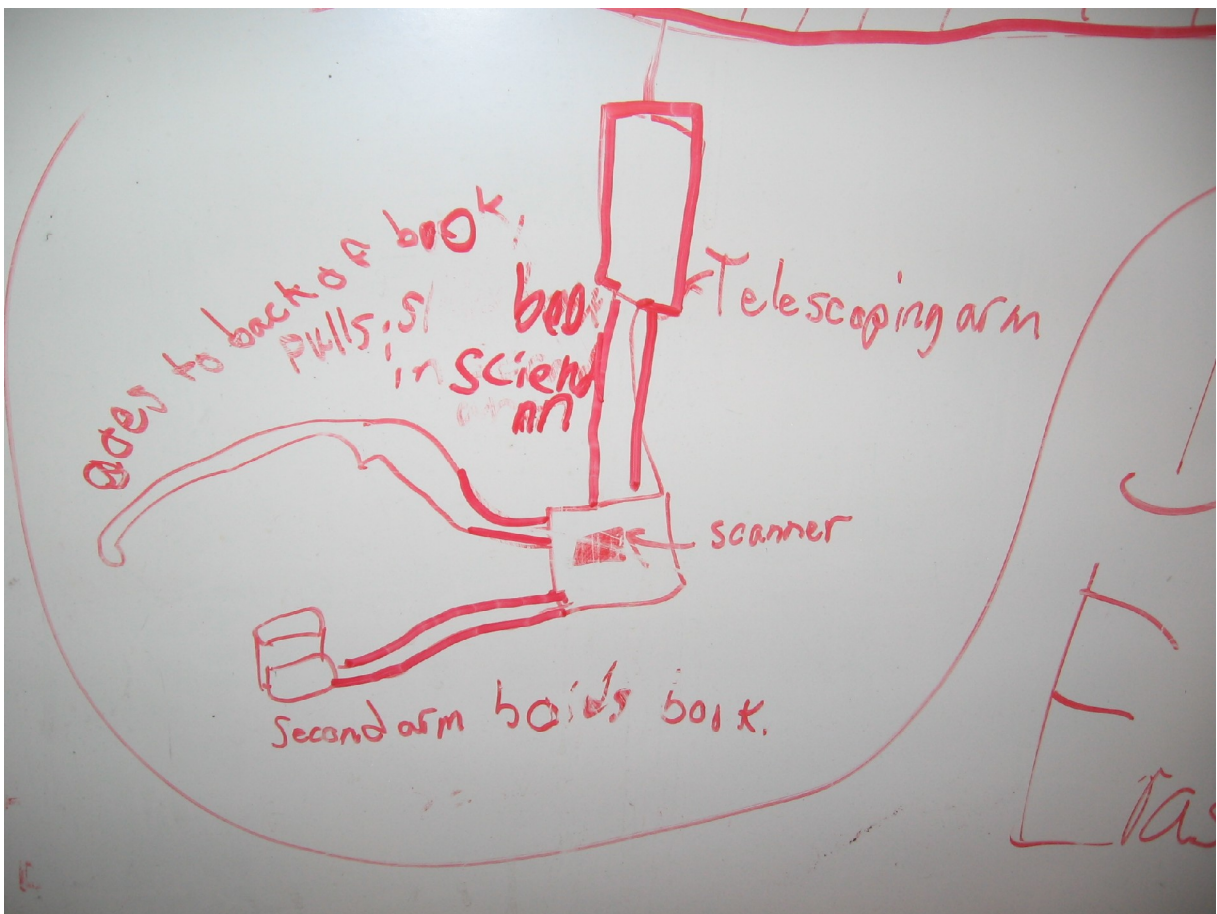




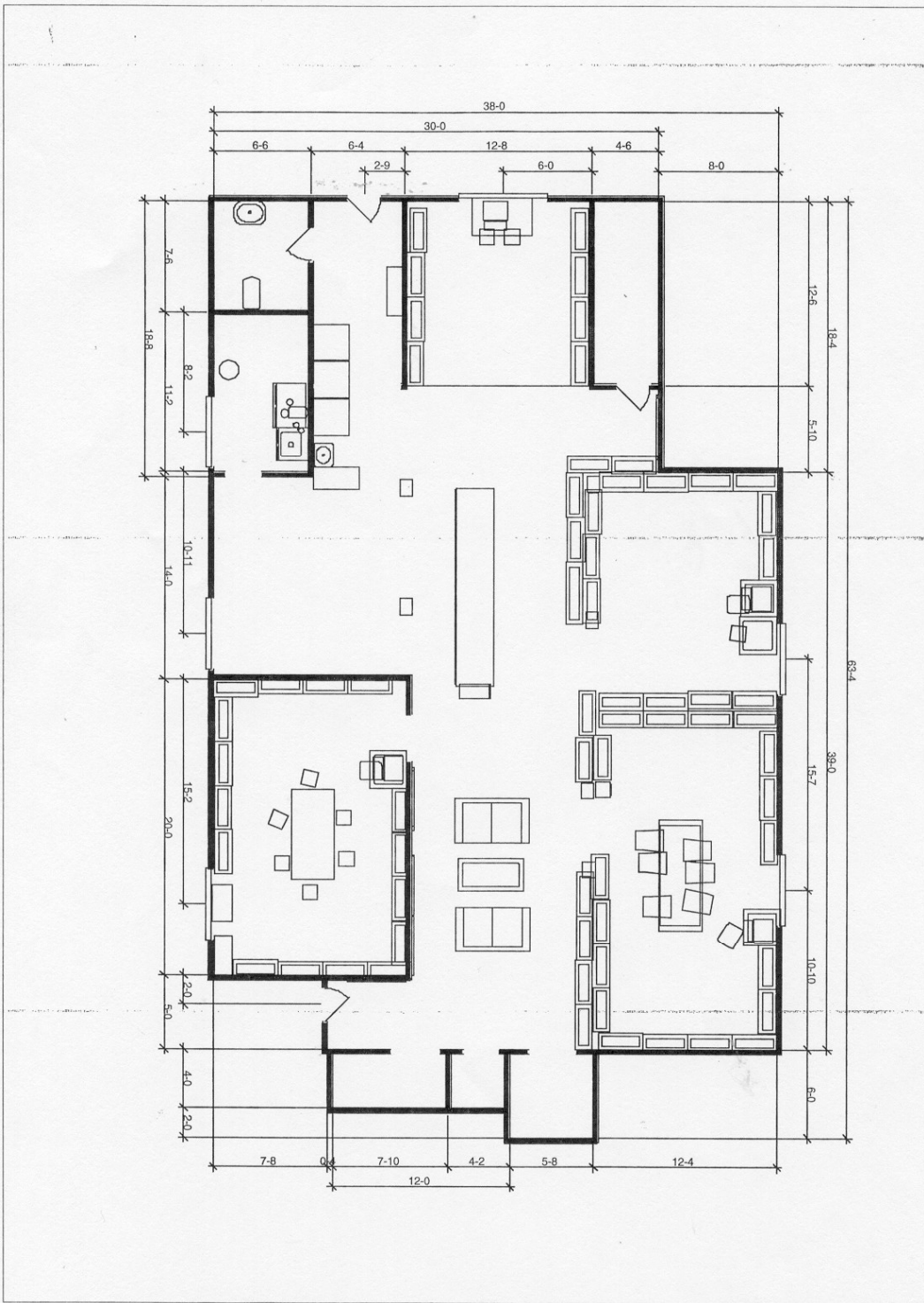


The Solution:

Our Pick-N-Give is a robot that will find a particular book on a shelf and deliver it to a computer workstation. At the computer, a handicapped person can search for books. The computer and the Pick-N-Give can interact with people who are vision impaired, hearing impaired, or lack the motor skills to operate a computer the way most people do. The library will be designed to accommodate the Pick-N-Give and give access to all people to the computer workstation.



The robotic arm is on a track. The team suggests a new layout for the library based on having a robot arm running on a track to get to books. This new layout also makes it easier to move around in a wheel chair. There are just as many book shelves as the original layout.



Here is the proposed Pick-n-Give library layout. Workstations in each room are where a person can interact with the Pick-n-Give and where books can be delivered.