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Proposal for Extended/Open Access/Smart Libraries across Middlesex County Libraries: Phase One

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Proposal for Extended/Open Access/Smart Libraries across Middlesex County Libraries: Phase One

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In Accordance With Middlesex County Libraries and The University of Western Ontario

LIS9704: Librarianship and Evolving Technologies

Submitted To Professor Alex Mayhew

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I. Executive Summary

The Middlesex County Library has 15 full-service public library locations within the Municipalities of Thames Centre, Lucan-Biddulph, North Middlesex, Middlesex Centre, Strathroy-Caradoc, Southwest Middlesex and the Village of Newbury (2022). Due to the rising number of inhabitants in each municipality, I propose that Middlesex County Libraries develop and implement a three-phased extended hours/Smart/Open+ access library system to allow for more flexible and useable resources for our growing communities. Due to the brevity of this assignment, this proposal will only discuss the feasibility of Phase One. In order to properly implement Smart Technology into Middlesex Libraries we must first discuss the methods, objectives, budget, and staffing/security requirements for Phase One. Thus, this proposal intends to provide a detailed walk-through of the initial stages of this project which will eventually be a much larger-scale initiative.

II. Statement of Need

Whether referred to as Open Access Libraries, Smart Libraries, or Extended Libraries, the goal is to offer consistent open hours with the purpose of serving more patrons. Most of the sources used in this analysis refer to the term “Smart Libraries” to describe the technological overhaul of open-access library spaces. Due to the economic and housing market crisis, we are seeing an increase of inhabitants residing in Middlesex County but working on-site in larger surrounding cities like London, Kitchener-Waterloo, and even sometimes further like the Greater Toronto Area. Because public library access is provided based on the address and/or municipality location of the patron, and because smaller towns are often, already, providing reduced-access hours than that of larger cities, it seems that extended hour/open access hours for Middlesex Country Libraries at large would benefit a broader range of

community members who are unable to access the libraries in the early evening when many locations close.

III. Project Description

Objectives

Smart Libraries are using innovative ways to provide an increase in functionality, modernized organization, and improve visitor experiences to a wider school of patrons. The resources discussed below will play a part in increasing the popularity of the library resources.

Resource Models

1. Hybrid/Blended Bookshelf (*HCI Group Konstanz*, 2014; *GitHub*, 2018): The hybrid/blended bookshelf project started off with the master's thesis "Blended Shelf" from Eike Kleinert at the Human-Computer Interaction (HCI) department at the University of Konstanz (*GitHub,* 2018). According to the programmers at GitHub "The thesis evaluates a 3D bookshelf metaphor to visualize and interact with books and ebooks in a natural and appealing way and is part of the research project Blended Library. Convinced by the prototype's potential the Kommunikations-, Informations-, Medienzentrum (KIM) library service of the University of Konstanz started the hybrid bookshelf project funded by the MWK Baden-Württemberg. The software startup Picibird which specialized in HCI won the contract and is developing the Hybrid Bookshelf and services around it" (2018).
2. *Bibliotheca* (2022): technological integration and innovation company that partners with libraries around the world to provide systems for Open and Extended Access libraries. Their Open+ Access system can be implemented in a number of different ways: extending access to an entire library or only a section of it, providing full

self-service resources or mainly a holds pick-up area, having full control of the space from one central hub, virtually interact with users, and "allowing libraries the flexibility to extend access in the way that best meets the needs of their community and space" (*Bibliotheca*, 2022).

3. The Academic Library Model **(**Chan, H.C.Y. & Chan, L., 2018): most academic libraries – Universities and Colleges – are open 24/7 with key-card access (typically the student ID card). Public libraries can and should operate under the same self-serve 24/7 access that academic libraries provide, under the assumption that not all patrons operate on a similar schedule.
4. The Internet of Things' Sensing, Communication, and Application Measures (Kaladhar & Rao 2018): As cited by Kaladhir and Rao (2018), Gartner defined the Internet of Things (IoT) as "The network of things which contains embedded technology for conversation and interact with their internal states or the external environment" (30). Depending on the requirements of the institution, the IoT-based products are "[creating] new capabilities, richer experiences, and unprecedented economic opportunity for businesses, individuals, and countries (Kaladhar & Rao, p. 30, 2018). (See Appendix A.).
5. The Berkely Public Library, California: In 2018, the Berkely Public Library implemented Easy Access Cards for those with no permanent address (Rees, 2018). "Easy Access cardholders will be able to check out three books or other library materials at a time, put holds on three items, use library computers and check out laptops for in-library use" (Rees, 2018).
6. Trois-Rivières Library District in Quebec (Swedburg, 2017): In 2017, 3 libraries in the Trois-Rivières Library District in Quebec installed a Radio Frequency Identification (RFID) System as a way to automate the returning of books when placed immediately

back on the shelf which helps eliminate wait times for those who have placed holds on items or may be searching for the book (Swedburg, 2017).

Methods & Procedures

A three-phased project would need to be implemented, including a test location(s) to establish the positive results of the project. As mentioned above, this proposal will only discuss the procedures for implementing Phase One.

1. We would install Open Access/Smart technology in 3 of the largest Middlesex County locations, based on population and listed here alphabetically: Dorchester (pop. 4,355) (*Census profile*, Dorchester, 2021), Lucan (pop. 3,089) (*Census profile*, Lucan, 2021), and Strathroy-Caradoc (pop. 23,871) (*Census profile*, Strathroy, 2021).
2. Cloud Computing: Accessing accounts through “the cloud” aka The Internet instead of individual devices (Kaladhar & Rao, 2018). In a library setting, cloud computing can be used to share recourses among many accounts from one library account, regardless of your location (from home or in the library space).
3. RFID Technology: Radio Frequency Identification (RFID) is linked to key fobs and cards through electromagnetic fields as a way to automatically identify an individual's library account (Kaladhar & Rao, 2018). RFID barcodes are not only useful for library card access but can be placed on individual books as well as a way to automate the return and check-out of books.
4. Smart Bookshelf: “Returned items available immediately; Automatically detects on-shelve books which can help to eliminate queues with a dedicated returns area; Security is set and [Learning Management System] is automatically updated, items are

ready for circulation immediately; Updates system records immediately and ease for stock take" **(**Chan, H.C.Y. & Chan, L., 2018).

Possible considerations for Phase Two (See Appendix B.):

5. Facial Recognition: With this, library cards are no longer required and therefore allow for more equitable access to unhoused patrons who do not have an ID with a fixed address, phone number, or email address, which is usually required for those to receive library cards. Those with library cards will still be able to access the space using their card and opt-out of the facial recognition software for access, but those who are unable to obtain a library card due to not being able to receive one in the mail (no fixed address) or not being able to obtain one in-person due to the inability to be present during staff-operated hours, will be able to set up their access via facial recognition.
6. Robots: We are seeing an influx of both humanoid AI robots and robots that resemble printers and microwaves, and even a 'chatbot', being able to perform many time-consuming tasks such as readers advisory, placing holds, checking that books are shelved correctly, giving directions, and putting books in order for reshelving (Flecha, 2021). I do believe that while not implemented in Phase One the Middlesex Library should give strong consideration to an emerging technology that comes with having a library robot and this might include partnering with robot vendors.
7. Real-Time Location System (RTLS): Palter (2018) with Real Time Networks outlines the specifics of RTLS as a system made up of transmitters, receivers, and a management portal. "An RTLS transmitter attaches to a person or asset and sends identification and location data to receivers over a wireless signal; receivers positioned around your facility receive signals from tagged assets and pinpoint their location … receivers send the location data they collect to a central management system. Human

operators and connected computer systems can use this central portal to analyze tracking data" (Palter, 2018). Some popular wireless RTLS standards include infrared, blu-tooth, cellular, battery or wi-fi functioning systems (Palter, 2018).

Staffing & Security

For Smart Libraries to be safe, efficient, and equitable for all staff and patrons – regardless of accessibility requirements – then there must be a smart gate system, fire alarm system, book loss system, security cameras and/or physical overnight security staff, traffic counters, and a patron recognition system.

1. Book Theft System: Combining Security cameras with barcodes and magnetic book alarms to prevent theft. Depending on the security needs of each location, cameras can be placed to either detect theft or monitor patron activity. Regardless, each location should examine their space and need for security cameras with the following questions, as taken from ProTech Security (2019):
    a. What do you consider to be your most critical security problem?
    b. Do you have any valuable or rare pieces in your collection?
    c. What kind of security system do you already have in your library system?
    d. Have you faced any security threats in the previous year?
2. Smart Gate and Patron Recognition System: RFID Technology paired with facial recognition software (details above, potential implementation for Phase Two) will ensure that those entering the space after hours already have a library account. This will act as a further security measure for those wanting to use the space after hours.

Funding, Partnerships & Feasibility

It is understood that due to the budget for staff hours being exponentially reduced since the Covid-19 pandemic, Sundays and oftentimes Saturdays and Mondays, are entirely closed. With a tech-driven extended hours Smart/Open library, no staff is required to be on-desk while patrons are still able to access a large percentage of the resources available from the library, operating in a similar way to that of an academic library.

In regard to the funding that will be required to implement these new advancements, we will have to apply for grants and take advantage of the city's partnerships in order to afford these changes and it may take several years of budget planning before we can confidently say that we have garnered to adequate funds for an initiative this large. Potential city and government partnerships for this initiative include:

- Tech Alliance, London Ontario: https://techalliance.ca/
- Government of Ontario
- Government of Canada
- The Municipality of Middlesex Centre: https://www.middlesexcentre.on.ca/

IV. Evaluation

We would analyze the usage data from each of the three locations to determine whether this feature be included in more locations across Middlesex County. There will be benefits and challenges to this development. Some topics to investigate include the following:

1. How will security be managed and is there a budget for funding all-hours security? While we have discussed the security and staffing concerns above using cameras and RDIF patron recognition systems, the evaluation will be based on the ease of use and how comfortable patrons are with relying on this technology for access.

2. What type of access can be implemented without staff involvement? Some important self-serve technological developments, that can be made to all branches, aside from those discussed above, are:
    a. printers/scanners/fax machines that operate via pre-paid library cards/facial recognition + machines where a patron can re-load their cards using cash and card. Additionally, for those using the space using facial recognition or for those who choose not to load money on their library cards, there will be debit or credit payment options on these machines.
    b. Book checkout and readers advisory machines
    c. Emergency buttons and telephones that offer a direct line to first responders.
3. Traffic Counters: Determine the number of visitors, the time of day and the duration of visors after-hours (ProTech Security, 2017). The services through *Bibiotheca* (referenced above) also have a service that they refer to Open+Count which "uses anonymous people-counting technology to accurately count those entering and leaving the library while broadcasting occupancy levels to visitors and staff via display screens throughout the building" (2022). The Open+Count can be used in multiple places of the library, not only the entrance.

While a number of these features can already be seen in various branch locations – self-checkout machines for instance – what will change is key-card access to the space using one's library card or facial recognition to ensure 24/7 access to these resources.

V. Conclusion

As you can see, there are many strategies related to the Smart/Open Access Library that can be implemented into our public library system, some more urgently needed than others. This

proposal has provided a mix between suggestive methods and notable examples in which to establish Phase One of our Open-Access library, in the hopes that Middlesex County Libraries can be prepared to serve a larger number of visitors.

VI. Additional Resources:

- ALA Centre for the Future of Libraries: https://www.ala.org/tools/future
- ALA TechSource Blog: https://www.ala.org/tools/publications/techsource/blog

VII. Reflection

Because I currently work at an academic library, I chose to discuss how the 24/7 operation of libraries can be implemented into public libraries, and that the public deserves the same ease of access to these materials as students do. I decided to work with Middlesex libraries simply because I am familiar with Middlesex Country having grown up in Lucan, and I have noticed first-hand the lack of resources that are available for people with disabilities, people with economic challenges like houselessness, or those not working on a 9-5 schedule; there are traditional learning and living situations among these small towns that greatly need to focus more on equitable access for all. I also believe that city public libraries already do a lot for ease of access for patrons of all statuses and that it is the smaller towns and cities that need to do more to ensure that people will want to continue to move there and promote their economy overall.

The challenge I had with writing the proposal was that the further along I got with the project, the more the technology seemed more suitable for a city. I provide a terrific reason for why open access technology is important for small-town community members, but when I dug deeper, it seems that the funding it would require to implement such a major overhaul would be better suited for cities with a larger population, where more funding opportunities are

present and it can seem like am ore feasible cost. The hypothetical nature was also a struggle for writing this paper. I provide many examples – though there were many I omitted as there are several worldwide – that bolstered the claim for why Smart Libraries are necessary, and yet the assignment felt like it was becoming a research paper rather than a faux proposal. I think I walked that line between providing research and still making it look or sound like a proposal, but I have more experience with research papers and I fear it took that shape more than anything.

While I do think that the concept of a Smart Library would be better suited for a city with a larger population, I do think that implementing this technology into library spaces is undoubtedly important, especially the shelf-organizing robots that could be operational in some of the larger public libraries. I think the main barrier is receiving funding and having access to expert companies and partners who can physically install the technology and train all of the staff to use it efficiently.

Citation Style Used: APA 7th Ed.

VIII. Appendix A

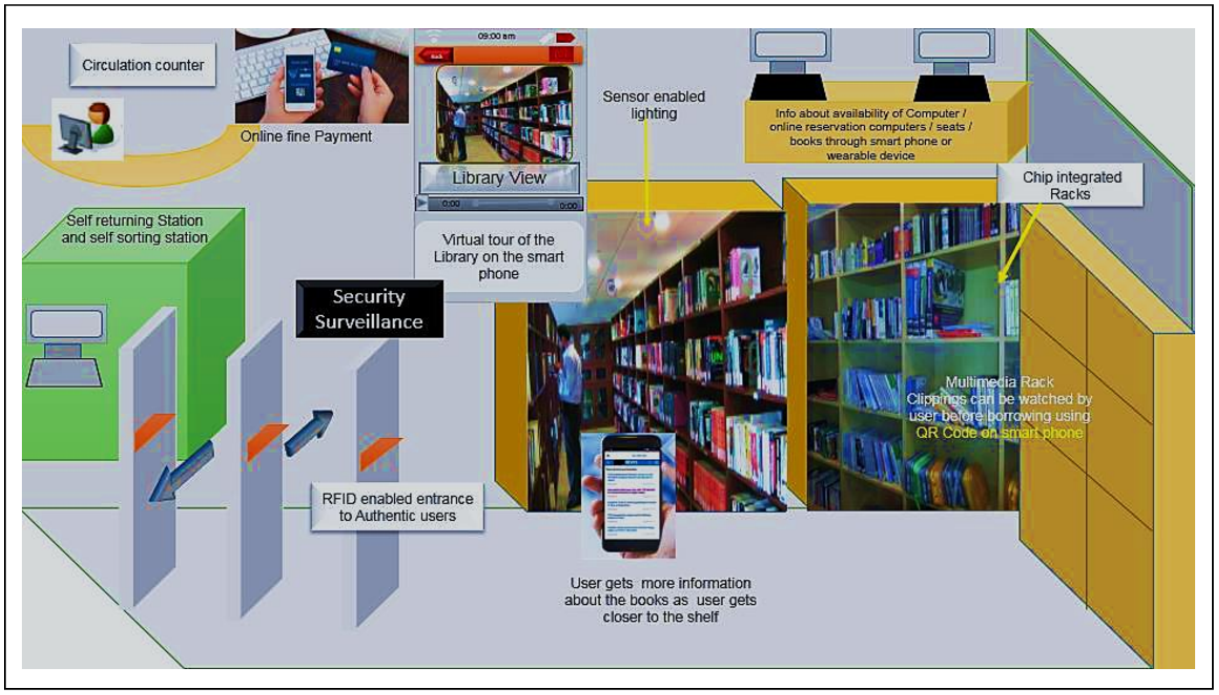

Fig 1. Applicability of Internet of Things in Libraries (Kaladhar & Rao 2018)

IX. Appendix B.

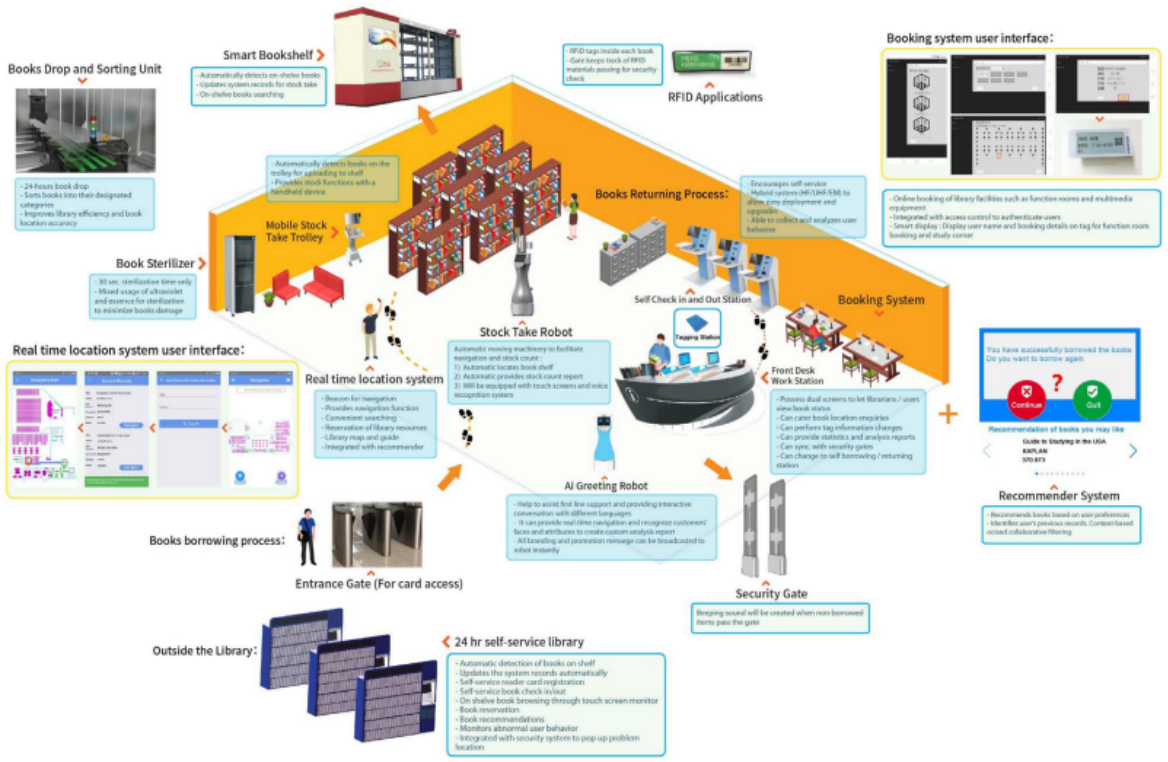

Fig 1. Smart Library **(**Chan, H.C.Y. & Chan, L., 2018)

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