Integrating Automation Plans into Facilities Planning – Implications and Synergies

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The Goal

- Provide better skills for planning and accommodating present or future automation
- Expand your perspective regarding the inter-relationship between patron self service and streamlined circulation workflow
- Increase the chances of a cost effective and productive solution
Why Automate?

- Accuracy
- Less injury – lifting/repetitive motion
- 24/7 availability
- Compress touches
- Faster turnaround
- Ability to handle volume fluctuation/growth without staff increase
Why self service?

- Patrons already adapted to model
- Privacy
- Faster turnaround
- Adapts to diverse population
- Frees up skilled staff to consult one-on-one
- Can be portable, adapts to shifts
Library Workflow

- Access control/Authentication
- Asset tagging and Identification
- Materials Tracking
- Returns
- ILL/Transit
- Check-out / Check-in
- Sorting
- Technical Services / New materials
- Supply Chain Management
Material Identification

- Barcode
  - Electromagnetic (EM) security
- RF tag security
- RFID
  - Tag only combined ID/Security
  - EM security combination
Self Checks

- Check-out
- Check-in
- Adapted
- Built-In
- Pedestal
Staff Workstations

- Check-in
- Check-out
- Patron Administration
- Material Management (ILS)
- Tagging
- Backroom Processing
- Adapted
- Built In
Security Gates

- Proximity to adjacent equipment
  - Min. 2-3’ (1 meter) separation, over creates dead zones

- Proximity to complete loop frames
  - Antenna interference

- Proximity to door swing and ADA access
  - Allow clear wheelchair access as well as clear door swing
Security Gates

- EM
- RF
- RFID
- Hybrid
Material Return

- Conventional Bookdrop
- RFID Smart Bookdrop
Sorting

- Manual
- Minimal
- Automated
  - Sweep
  - Pop-up
  - Roller Transfer
Dispensing

- Vending
- Robotic
- Mini-load
Transport

- Conveyors
- Inclines/declines
- Elevators
- Lifts
- Monorail
Storage/Archival

- Automate storage & retrieval system (AS/RS) - long term high density storage of reserve, archival or rare collections
Design Planning

- Time invested up front in planning reaps greater returns in the outcome
- Outcome is equal to or greater than the expectations
- The Library understands all of the determinants
Traffic Considerations

- Mapping material flow
  - Material entering library
  - Movement during workflow process
  - Movement leaving the library

- Mapping patron flow
  - Entering/leaving
  - Drive-by/drop-off
Space Considerations

- Structural
  - Floor loading
  - Interferences/restrictions

- Utility access connections
  - Power / Data

- Access/Egress

- Proximity
  - RFID/RF/EM interferences
Building Considerations

- Structural
- Fire - National, local
- ADA - access, vision, hearing
- Utilities
- Aesthetics
Installation Considerations

- Delivery Points
  - Truck / materials / packaging

- Access
  - Floor to floor
  - Hallway / entry
  - Work areas
Sizing / Configuration

- General Rules
- Self Checks
- Sorting Systems
- Dispensing Systems
Sizing - General Rules

- Analyze material, patron & staff traffic patterns
  - Interior and exterior
- Transit materials
- Proximity of self-service to staff
- Choke points
- Determine people & material volumes
- Allow for serviceability
Self Checks

- Determine amount of self service
- Determine locations
  - Proximity to staff
  - Use and location proximity
- Consideration of patron privacy
  - Proximity & orientation
- Allowances for task circumstances
Self Checks

- Balancing queues
  - Centralized location
  - Distributed location
  - Over/under utilization
  - 1 self check per 50-75K circulation average

- Patron staging provisions
  - Check-in & check-out
Self Checks

- Determine type
  - Custom built into millwork
  - Built into wall
  - Free-standing kiosk

- Typical sizing 2’x2’ (600 x 600 mm) to 3’x2’ (900 x 600 mm) dependant upon counter provisions and accessories
Sorting Systems

- Determine inputs and volumes
  - Place automation closest to greatest input
  - Minimize transport when possible

- Define adjacent space requirements
  - Workroom needs

- Staging needs

- Meeting fire code requirements
  - Fire suppression
  - Fire restriction
Sorting Systems

- Determine current and future capacity needs
  - Systems will last 10-15+ years

- Approximate system sizing
  - May vary by vendor
  - As many sort points as library can afford or fit
  - Enough inputs to prevent excess wait lines
  - Single side vs. double side sort
  - Widths from 4’ to 8’ (1200-1800 mm) overall
Sorting Systems

- Visibility to patrons – creating visual identity and patron buy-in, point of interest
Sorting Systems

- Typical sizes by library circulation
  - 100 - 300K  1-5 bins
  - 301 - 500K  5-9 bins
  - 501 - 800K  7-11 bins
  - 801K – 1MM  9-15 bins
- Depends on collection container
  - Bin, Tote, stacking cart
Sorting Systems

- Front end sizing affected by configuration
  - Merges
  - EM or multiple ID requirements
  - Staff return
  - Singulating

- Collector sizing
  - Larger vs. smaller collectors
  - Room for changeover
Dispensing Systems

- Sizing dependent upon use
  - Only dispense
  - Dispense & return

- Sizing dependent upon contents
  - Type/size of lending materials

- Sizing dependent upon staging method
  - Storage container
  - Tray
Dispensing Systems

- Allowance for access
  - Installation
- Replenishment
- Service
- Load requirements with dead loads
- Utility access
Design recommendations

- Work closely with vendors in sizing system
- Look at library’s longer term needs
- Consider impact on entire workflow