

# Supporting Cross-Session Searching: Dilex Search & Search Timelines



Dr. Orland Hoerber  
Professor of Computer Science  
University of Regina  
Co-Founder, Dilex Search

Dale Storie  
Associate Dean (Research), Archer Library  
University of Regina





# Research Partnership

- University of Regina migrated to Alma and Primo in 2017
- Opportunity to leverage a robust suite of APIs
- Many academic libraries have designed alternate discovery interfaces but usually with in-house resources
- Partnership with an academic expert in interactive information retrieval (IIR) has created opportunities that are mutually beneficial





# Research Approach & Focus

- Design-oriented research approach
  - identify problems
  - design solutions
  - conduct research with these solutions
- Outcome: Knowledge generation - insights about both the problem and the solution
- Specific focus on the design, implementation, and study of new approaches to support cross-session searching



# Design Pattern for Library Search

- By design, library search has emulated the web search paradigm because it has a **low barrier to entry** and is familiar to users
- Common design pattern:
  - query box
  - search results list
  - facets
  - workspace



# Design Pattern for Library Search

- In Primo:
  - **Advanced Search** options help create a more complex query
  - **Search History, Saved Searches, and Saved Items** are provided, but these features require users to actively manage them

The screenshot displays the University of Regina library search interface. At the top, the University of Regina logo is on the left, and navigation links for 'New Search', 'Journals', 'Browse', 'Databases', and a search icon are on the right. The search bar contains the query 'diamond age' and includes a 'Quick Find' dropdown, a 'University of Regina collections' dropdown, and a 'SWITCH TO ADVANCED SEARCH' button. Below the search bar, there are filters for 'All', 'Articles', 'Books', 'Book chapters', 'Videos', 'Journals', and 'Newspaper Articles'. A blue banner below the filters states: 'The subject headings used in our catalogue contain historical language that may be considered offensive. We will be working with campus and the broader library community to address these issues.'

The main content area shows 'My Folders' with 'Add labels' and a 'My Favorites' section. Below this, there are three tabs: 'SAVED RECORDS', 'SAVED SEARCHES', and 'SEARCH HISTORY'. The search results are displayed in a list format with the following items:

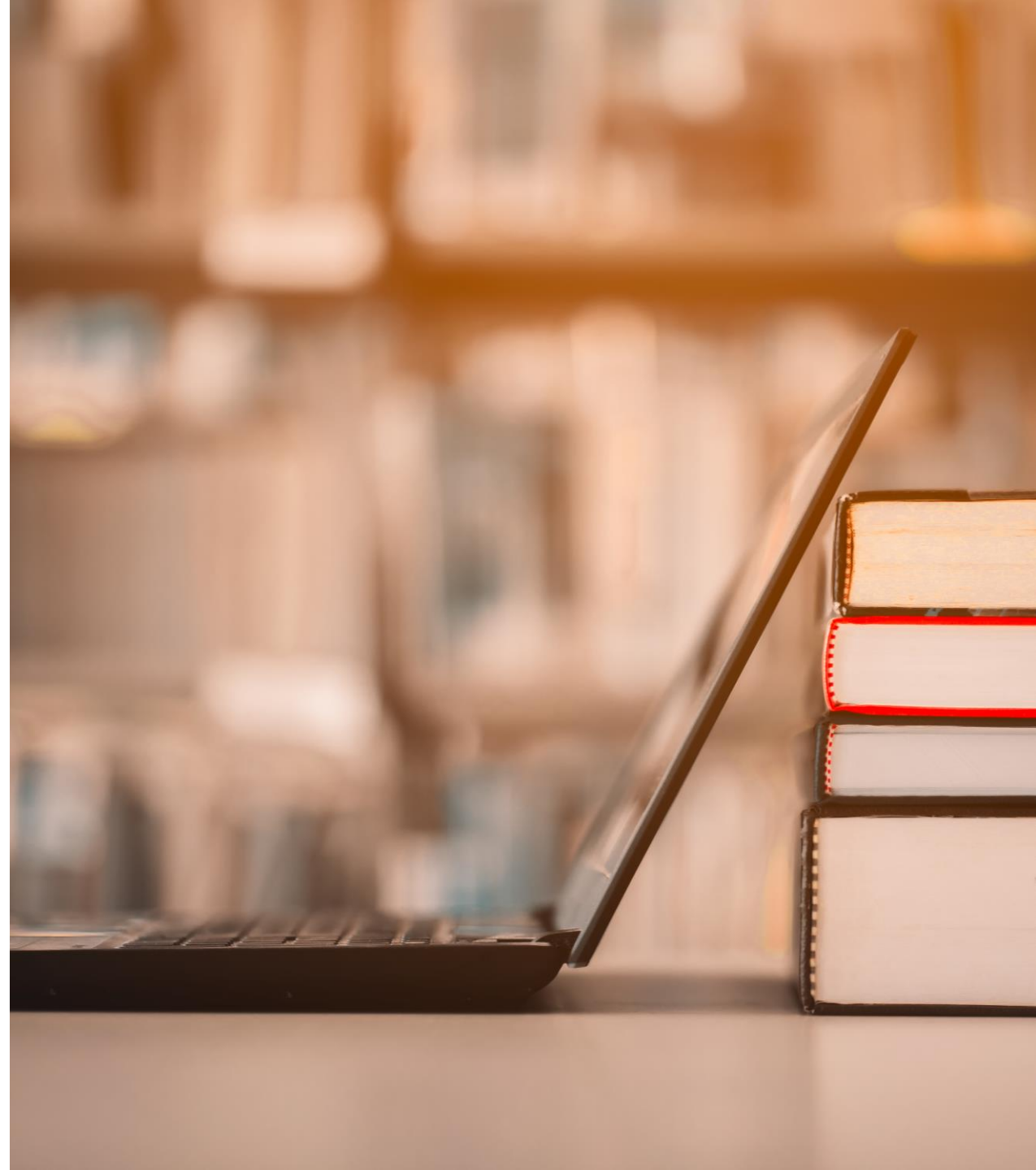
- BOOK**  
**The diamond and the star : an exploration of their symbolic meaning in an insecure age**  
Warden, John.  
2009  
**ONLINE ACCESS**  
Add labels
- BOOK**  
**The diamond age**  
Stephenson, Neal.  
2008  
AVAILABLE AT LUTHER (PS 3569 T3868 D53 2008)  
Add labels
- ARTICLE**  
**On the Spectral Evolution of Hot White Dwarf Stars. I. A Detailed Model Atmosphere Analysis of Hot White Dwarfs from SDSS DR12**  
Bédard, A. ; Bergeron, P. ; Brassard, P. ; Fontaine, G.  
The Astrophysical journal, 2020, Vol.901 (2), p.93, Article 93  
PEER REVIEWED OPEN ACCESS

On the right side of the results, there are options to 'Sort by Date added', 'Labels', and 'Unlabeled items (7)'. Each result item has a checkbox, a book cover image, and icons for linking, emailing, and deleting.



# Design Pattern for Library Search

- Limited support for addressing complex information needs that may span multiple search sessions
- Academic researchers will revisit the same topic many times over the course of their research.





# Challenge: Cross-Session Searching (XSS)

- Cross-session searching occurs when a searcher cannot complete their search task in an initial session and is motivated to continue it in later sessions
- Such searching occurs when
  - the information need is complex
  - the information need is ongoing (rather than transient)
  - the information need is personally important
- How can a search interface support XSS?



# Critical Issues with XSS

- There are two critical issues with XSS that must be considered in search interface design
  - how are searchers supported in saving what they have found?
  - how are searchers supported in reminding themselves of what they previously found when they return to their search?
- The first of these is already well-supported in many digital libraries: workspaces
- The second is somewhat supported by the workspace, but there is space for improvement





# Fundamental Activity in XSS - Reacquaintance

- When returning to a previous search, there is a fundamental task that must be performed before the search task is resumed: reacquainting themselves with what was previously done
  - if this is done well, the searcher can pick up where they left off
  - if this is done poorly, the searcher will repeat previous search activity, which is a duplication of effort
- With a typical workspace, this reacquaintance can only be done by viewing what was previously saved
- We propose that this can be enhanced with visualization methods and the design of enhanced search interfaces



# Dilex Search

- Dilex Search was designed to support cross-session searching by providing a visual overview of search activities across multiple user-specified tasks
- Ability to quickly find a previous search task and assess how active the search has been as well as the temporal aspects of searching

Start a New Task

Search



Resume a Task

●●● Number of saved documents  
○○○ Number of queries

serendipity in ir

26  
Queries

15  
Documents Saved

15  
Sessions



Created 1 year ago

dyslexia in information retrieval

6  
Queries

7  
Documents Saved

3  
Sessions



Created 1 month ago

user interfaces for search

3  
Queries

1  
Document Saved

1  
Session



Created 6 months ago





# Dilex Search

- Dilex Search also provides session-level summaries of queries, depth of browsing, and number of saved documents
- Ability to identify how to pick-up where the searcher left off
  - re-issue a previously successful query
  - re-issue a query whose search results were only superficially evaluated
  - issue a new query to explore a new aspect of the task
- Added bonus: support for cross-device searching

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University of Regina Dilex Search

Create a new search

Previous Sessions: **serendipity in ir**

●●● Number of Saved Documents  
○ ○ ○ Number of Queries

today 1 wk 2 wk 3 wk 4 wk older

1 Query | 0 Document Saved | Sep 9, 2024 11:54 AM

	Results	Pages Browsed	Documents Saved	Time
Search interface random discovery	198	4	0	11:54 AM

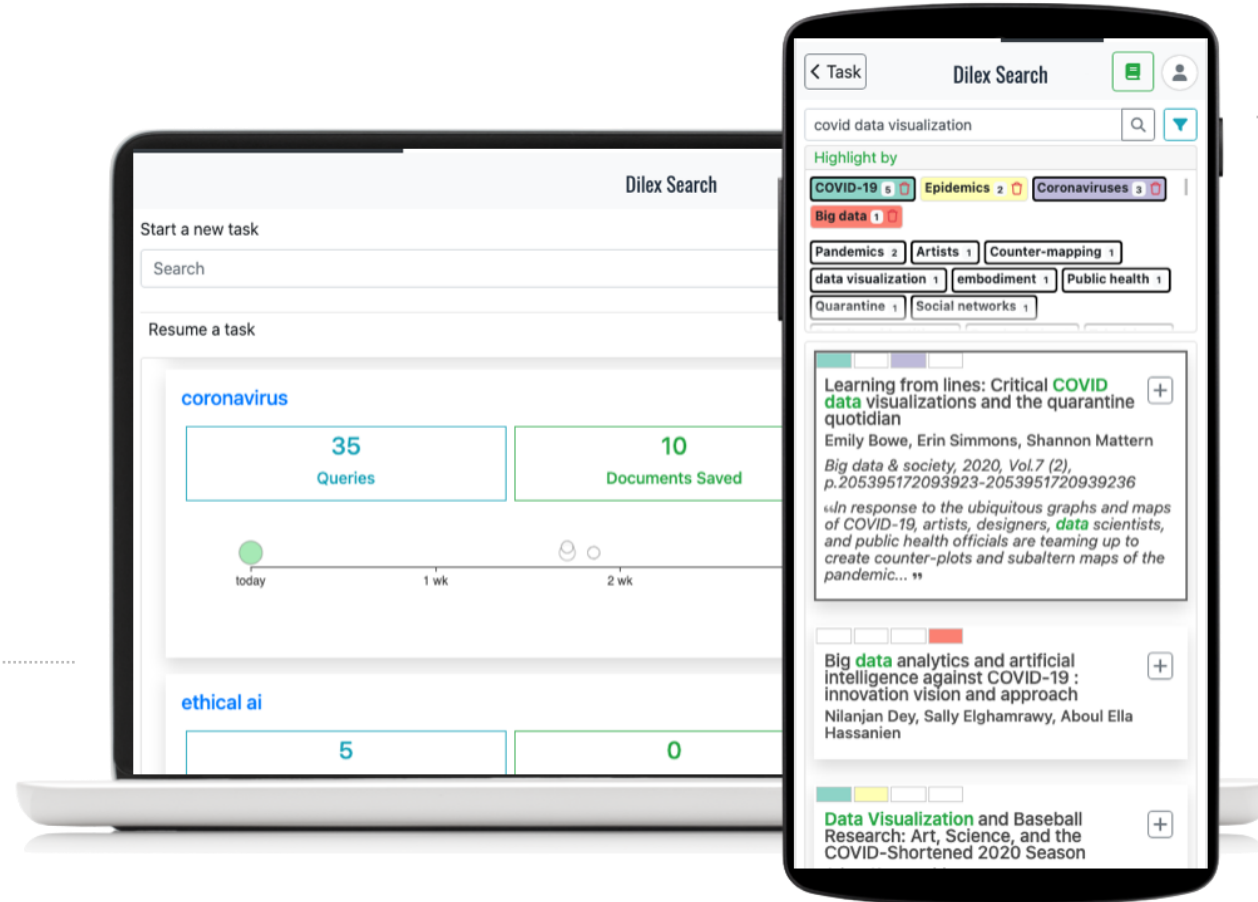
1 Query | 2 Documents Saved | Sep 2, 2024 7:16 PM

	Results	Pages Browsed	Documents Saved	Time
exploratory search serendipity	34	1	2	7:16 PM

2 Queries | 0 Document Saved | Jul 31, 2024 12:23 PM-12:28 PM

	Results	Pages Browsed	Documents Saved	Time
exploratory search serendipity + ▾ <sup>1</sup>	01	1	0	12:28 PM
adhd searching	356	1	0	12:23 PM

# Dilex Search



**MOBILE-FIRST  
INTERFACE DESIGN**

**CROSS DEVICE  
SEARCHING**

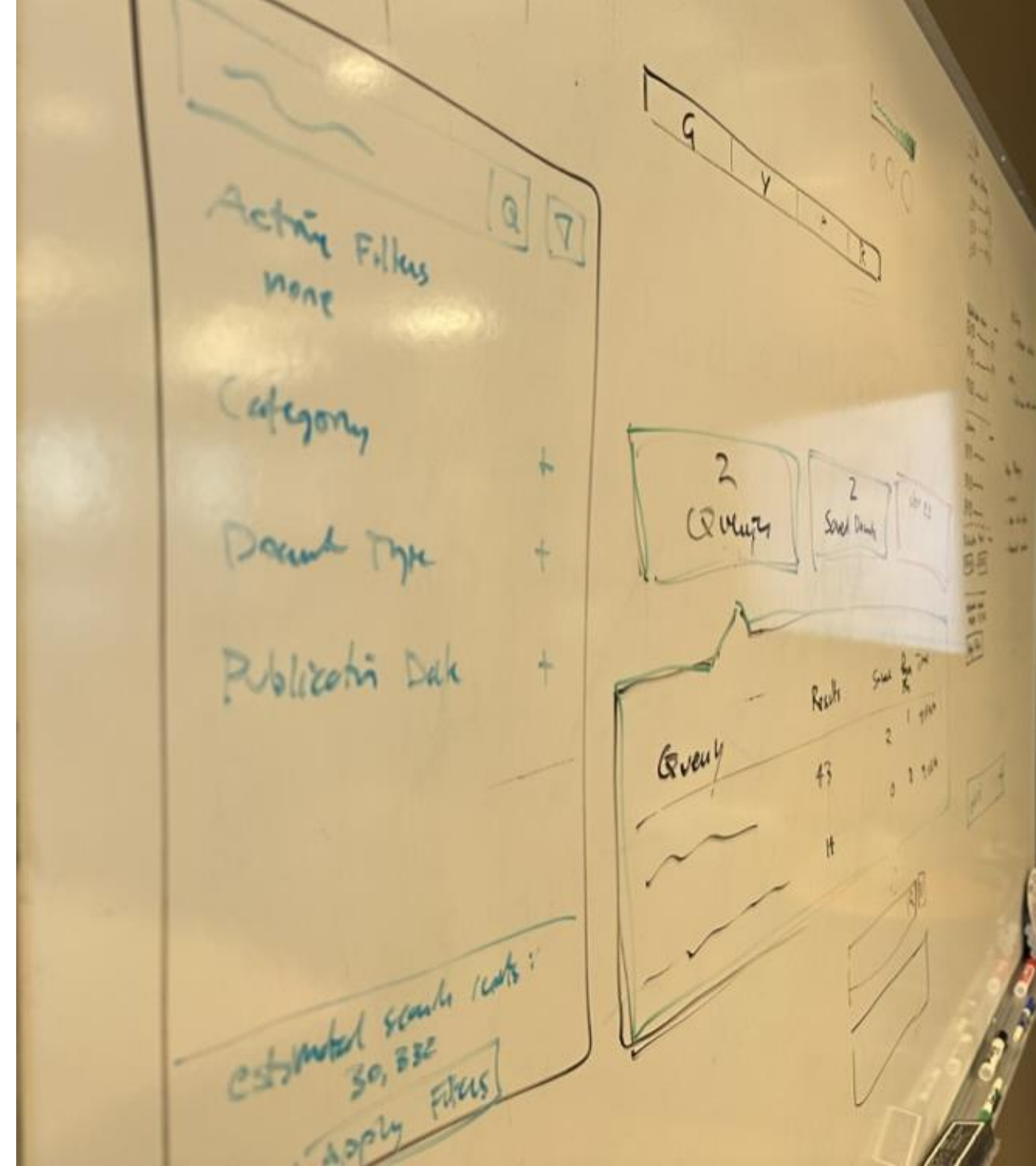




# Dilex Search: From Research to Product

- Goal: Minimize the gap between academic research outcomes and deployment in a product
- Dilex Search
  - partnership with existing technology company
  - rebuild the research prototype into a SaaS product
  - tight integration within Ex Libris ecosystem
  - deployed at the University of Regina
  - in discussions with five other Canadian Universities
- Key benefit: support library patrons in conducting cross-session cross-device searching

<http://www.dilexsearch.com>



# Search Timelines

- Search Timelines was designed to support cross-session searching with the introduction of a timeline of past search activity
  - previous search tasks are provided in a list, along with the date/time of the most recent activity
  - selecting a previous search task shows a timeline of the saved resources and their source queries
  - following fundamental visualization principles, the searchers can see the relationships between queries and saved resources, as well as other metadata (e.g., resource type)
- Enables searchers to readily find a previous search task, assess the context in which resources have been saved, and use this information to decide how to resume the search activity

The screenshot displays the Regina Public Library website interface. At the top left is the library logo, and at the top right is a 'My Account' link. Below the navigation bar, there is a 'Home > Workspaces' breadcrumb. A sidebar on the left lists several search tasks with their most recent activity dates and times: 'Canadian Landscape' (Feb 15, 2023 2:33 PM), 'First Nations' (Feb 13, 2023 10:29 PM), 'becoming a vet' (Feb 11, 2023 10:07 AM), 'North American Culture' (Feb 8, 2023 10:10 PM), 'Halloween' (Feb 7, 2023 10:08 AM), and 'Canadian Mountains' (Feb 4, 2023 10:11 PM). The 'First Nations' task is selected, showing a detailed timeline for that search. The timeline is titled 'Timeline for: First Nations' and includes a 'RESUME' button. It shows two search results from February 13, 2023. The first result is a book titled 'Missing & murdered indigenous people in "Canada" : an inclusionary approach to understanding violence against the original people of Turtle Island >' by MtPleasant\_Jen, published in 2019. The second result is a book titled 'Indigenous people and the criminal justice system : a practitioner's handbook >' by Rudin, Jonathan, published in 2019. Both results include a 'Book' icon, a 'REMOVE' button, and a timestamp of 10:33 PM and 10:31 PM respectively. At the bottom of the timeline, there is a search bar containing the text 'indigenous people' and a timestamp of Feb 13, 2023 10:29 PM.





# Search Timelines

- The visual timeline is also included in the primary search interface
  - compact visualization of the timeline
  - dynamically updated as new queries are issued and resources are saved
- Benefit: supports planning and monitoring of current search activity in real-time, rather than having to view the workspace to see what has been done

The screenshot displays the Regina Public Library search interface. At the top left is the library logo, and at the top right is a 'My Account' link. Below the navigation bar, the search results are shown for the query 'indigenous people', with 2398 results. The results list includes:

- Indigenous people and the criminal justice system : a practitioner's handbook** by Rudin, Jonathan, author. 2019. Availability: 1 of 1. Includes a 'REMOVE' button.
- Missing & murdered indigenous people in 'Canada' : an inclusionary approach to understanding violence against the original people of Turtle Island** by MIPleasant, Jen, author. 2019. Availability: 5 of 5. Includes a 'REMOVE' button.
- Law and order for Canada's indigenous people : a review of recent research literature relating to the operation of the criminal justice system and Canada's indigenous people**. 1985. Availability: 2 of 2. Includes a 'SAVE' button.
- In honour of our elders : essays by the children of Curve Lake and quotations from elders**. 1991. Availability: 3 of 3.

On the right side, there are three search topic timelines for 'First Nations':

- Feb 13, 2023**: Timeline showing 'Missing & murdered indigenous people in 'Canada' : an inclusionary approach to understanding violence against the original people of Turtle Island' at 10:33 PM and 'Indigenous people and the criminal justice system : a practitioner's handbook' at 10:31 PM. Search input: 'indigenous people'.
- Feb 13, 2023**: Timeline showing 'Aboriginal leaders of Canada : crusaders for equality and treaty rights' at 10:27 PM and 'Treaty rights in the historic treaties of Canada' at 10:22 PM. Search input: 'Treaty rights'.
- Feb 13, 2023**: Timeline showing 'Canadian Geographic Indigenous peoples atlas of Canada. Volume 2, First Nations' at 10:17 PM, 'Nelson literacy 6 Teacher's resource : First Nations and Early Explorers' at 10:15 PM, 'A concise history of Canada's first nations' at 10:12 PM, and 'Gathering strength : Canada's aboriginal action plan : a progress report.' at 10:10 PM.



# Search Timelines: Current Status

- Research conducted in 2022 and 2023
- Very promising results from a user study – high user engagement and usability measures
- Research paper for the top academic conference in the field (CHIIR) will be submitted in October
- The approach has been implemented within a public library search context (Polaris API); we will consider integrating this work into Dilex Search (Primo API)



# Conclusion

- Not every search can be completed in a single search session
- When information needs are complex, searchers may need to extend their search across multiple sessions
- New search interface features are needed to help searchers to reacquaint themselves with their prior search activities so that they can more effectively resume their search
- We presented two approaches:
  - Dilex Search
  - Search Timelines





# Conclusion

- Archer Library partners with academic researchers on many projects
- This partnership has allowed us to support students and faculty in a different way
- Focus on design-oriented research rather than research-oriented design
- Primo Search API is a great option for both prototyping and production.



# Questions?

- Orland Hoeber  
[orland.hoeber@uregina.ca](mailto:orland.hoeber@uregina.ca)  
[orland@dilexsearch.com](mailto:orland@dilexsearch.com)
- Dale Storie  
[dale.storie@uregina.ca](mailto:dale.storie@uregina.ca)

