Relevance Activity Results

July 2020

Contents

Summary

SWAN is currently in an exploratory research phase to identify potential replacements for our discovery platform. SWAN staff working with ByWater Solutions have implemented a test installation of the Aspen Discovery platform to further evaluate this platform. In the July 2020 meeting of the Discovery and User Experience Advisory Group (DUX), participants conducted side-by-side comparisons of keyword searches in both platforms. The results of this activity showed that Aspen offers improved relevancy and search precision over Enterprise.

Methods

Search relevancy activity

Members of the Discovery and User Experience Advisory Group, joined by several members of the Cataloging Advisory Group, completed keyword searches in both the SWAN Aspen test instance and the SWAN Enterprise consortia-wide catalog, acting as an assigned patron persona.

Both catalogs did not include e-resources, so searches were limited to physical items only. To measure relevancy of known item searches, participants recorded the position of the record on the search results screen. To measure the precision of search results, or the number of relevant results for a given search term, participants recorded the number of relevant results on the first page of results.

Results analysis

Scott Brandwein, Bibliographic Services Manager, and Tara Wood, User Experience Manager, compiled the results using the methods and evaluation tool outlined in the article "Testing Search for Relevancy and Precision" (Ferrara, 2009).[i]

 All search terms were analyzed in the precision analysis; only known item searches were analyzed in the relevancy analysis.

For the relevancy analysis, the record position noted in the participant worksheets was input into the evaluation tool to produce relevancy scores, including the mean, median, and percentage of results in the top 5 and 10 results.

For the precision analysis, each of the first five results for each keyword received a score using the following scale:

- Relevant: The result is exactly right.
- Near: The result is not a perfect match, but it is clearly reasonable for it to be ranked highly.
- Misplaced: The result is relevant to the keyword, but it clearly shouldn't be ranked highly.
- Irrelevant: The result has no apparent relationship to the user's search.

This scale produced strict, loose, and permissive scores:

- Strict: Accept only the results ranked Relevant, for completely relevant.
- Loose: Accept both Relevant and Near results.
- Permissive: Accept Relevant, Near, and Misplaced results.

Results

Relevancy Test

Measure	Enterprise Score	Aspen Score
Mean	11.5	1.9
Median	2	1
Times below 1st	66.7%	39.4%
Times below 5th	25%	6.1%
Times below 10th	19.4%	0%

In the relevancy test, a lower score is desirable. A low score indicates that results are generally higher in the search results. Aspen significantly outperformed Enterprise in all metrics.

The large gap between the mean and median in Enterprise scores is a result of some scores being extremely low on the search results list – in one search, the item was 101 in the search results list.

Aspen offers two advantages over Enterprise that likely lead to these scores. First, Aspen groups multiple formats into one record, where Enterprise displays one record per format. Second, Aspen uses a relevancy boost in the search algorithm that factors in the number of items attached to the record, checkouts, and holds, surfacing more popular items to the top of results.

Precision Test

Measure	Enterprise Score	Aspen Score
Strict	52%	67%
Loose	62%	74%
Permissive	82%	87%

In the precision test, a higher score is desirable as it indicates a higher percentage of the first five results are related to the search term. Again, Aspen outperformed Enterprise in all metrics.

In this instance, Enterprise may have had an advantage over Aspen. Because Enterprise has more records, the top 5 results were sometimes for the same item in different formats, and all items would have received a designation of Relevant. Aspen might have listed the same item with all formats in the first record, and then several items after that that may have received a score of Near or Misplaced. Even with this in mind, Aspen produced more precise results.

Observations

Author searches
- Aspen was overall much better at author keyword searches. From KM, "Aspen shows the novels right away unlike Enterprise which shows other things related to John Grisham or DVDs/audiobooks."

Format-specific issues
- Searches for "newsweek" in Aspen yielded the expected title as the first result. However, finding the most recent issue was more difficult – it is not currently possible to place a hold on a specific issue, which is one of our priority issues.
- In a search for "new switch games" with the intention of finding games for the Nintendo Switch, Enterprise outperformed Aspen with several results on the first page of results, and no relevant results on the first page of results for Aspen.

Reliance on filters and sorting in Enterprise without need to in Aspen
- From AS on "ladies detective agency" search in Enterprise: "Book 2 was difficult to find. I performed the search, decided to click on the series link which reperformed the search. Then I used the book format facet to narrow further. I found the title at the 29th position in large print."
- From AS on "alexander hamilton biography" in Enterprise: "This search did not get to the Chernow title until #51 which is the audiobook. Limiting by book format facet did not improve the results. I then sorted by publication date newest first, and found the book title by Chernow at #54."
- From DT on "pride and prejudice" in Enterprise: "Not on first page and can't seem to limit to graphic novel; used new Genre heading to find it and it came in as 5th and 6th entries."

Grouped records
- From DT on "steven spielberg" in Aspen: "I wish there was more clustering of some of the duplicate records."
- From SB on "paddington movie" in Aspen: "Results 2-5 should be grouped."
- From SB: "Evaluating these may be a little unfair to Aspen. In a couple of instances, where Enterprise may have produced 5 relevant results for a search, Aspen's grouped records meant there were not enough completely relevant results to display, so it transitioned into less-

relevant results at an earlier point, lowering its score but actually providing a better experience."

Relevancy vs. "intuitive" relevancy

In evaluating relevancy, there is sometimes a gap between results that are technically relevant to the search terms and results that are relevant to what a human using those terms might expect.

- From DT on "Malcolm Gladwell" in Enterprise: "Polish copy comes up first, then a redundant listing of titles in different formats. First page all relevant but I would consider only 5/12 unique – all others are same title."
- From MK on "Percy Jackson": "In Aspen, it looks like the results are kind of in series order, but book 5 is #3. Have to know the last book is #5. Enterprise is super unhelpful for this with the various DVD and graphic novel versions showing up before the books. Kevin [persona] isn't searching through multiple pages."
- From AR on "Steven King" in Enterprise: "Hanna doesn't understand why there are no books by him on the first page!"
- From AR on "Steven Spielberg" in Enterprise: "All books on the first page of Enterprise! Oh well! Hanna isn't sure if all of these movies are directed by Spielberg but only movies came up on the first page so she's excited."
- From Scott on "Stephen King": On the first page of results, Enterprise returns exclusively results about Stephen King. Aspen returns exclusively results by Stephen King.
- From Scott: "Although both Enterprise and Aspen scored R's across the board on searches like "Percy Jackson" and "Ladies Detective Agency", Aspen tends to open with the first books in these series on the first page. Enterprise, on the other hand, relies heavily on date and presents much later books in the series and books about the series.
- From MK, a search for "gunpower" with the intention of finding kids books about the invention of gunpowder yielded the expected results in Enterprise. In Aspen, the relevancy boost for popularity put movies and fiction with the word "gunpowder" in the title above the materials the searcher was looking for.

Record-specific

- From GD: "There's some weirdness in Aspen here for the book: *Tentacles: the amazing world of octopus, squid, and their relatives* The availability widget shows checked out, but there's plenty of copies available."
- From AR on "Bardzo glodna gasienica": "Why are there 4 different ones in Enterprise? Hanna [persona] doesn't know what to request! (Thanks to my co-worker Izabel for quickly giving me this title when I asked!)" From SB in Aspen: "Only 1 of 4 records with this title are returned. Why?"

Synonyms

- From AR on "pride and prejudice comic": "With comic as a search term, the results are muddied. But I (Ang) feel pretty sure that lots of patrons don't know to call them graphic novels."
- From JS, in a search for "Mumford and Sons" limited by Author which appears in the catalog as "Mumford & Sons": "when I slowed my typing, I did like that Aspen suggested "Mumford & Sons (Musical Group)" for my search, whereas Enterprise did not. So, if I was slower, then Aspen

would have prevented me from making the mistake. (…) I'm disappointed that Aspen also does not search authority records. The same thing happened for a few other title and author searches. Maybe it doesn't affect or bother many people, but I find it incredibly frustrating the lack of… synonym capability?"

Enterprise quips

- Misspelling Steven Spielberg's name in a search produced more results for his movies than a search using the correct spelling.
- In a topic search for "tax deductions," Aspen included several titles to choose from while the first 4 results in Enterprise were different editions of the exact same title.

Known limitations

This activity only evaluated physical item results. The results of this same analysis comparing both catalogs with e-resources enabled may produce very different results, which would likely skew in favor of Aspen due to record grouping. At the time of this activity, e-resources were not yet enabled in the Aspen test instance, so a search comparison was not possible.

In addition, this activity only looked at keyword searches. While some participants experimented with using filters, these results were not included in the analysis. Ferrara notes in the comments of his article:

"Functional add-ons (narrower, broader, filters, similar, etc.) are often great additions to a search engine. But not always. They're sometimes implemented as technology crutches without regard to whether they solve any actual problems."

By limiting this analysis to keyword searches only, we were able to evaluate a baseline of relevancy. That said, the functionality of filters and add-ons need additional evaluation.

Conclusions

Relevancy in Enterprise has long been a source of frustration in the SWAN membership. These results show that Aspen may be able to offer an improved search experience that better surfaces the items that patrons and library staff expect to find in the catalog.

That said, this research is by no means conclusive. SWAN staff will continue to configure and improve our test installation of Aspen. In addition, we will conduct an additional relevancy analysis using popular search terms once e-resources have been integrated into our test instance. Research into relevancy in Aspen will also need to be weighed against additional factors and features before the membership decides to enter a pilot phase with Aspen.

Appendix 1: Search strings and scores

Relevancy Scores

Search string	Aspen Rank	Enterprise Rank
alexander hamilton	1	42
alexander hamilton biography	2	51
amoeba school	3	4
assassins creed pirates	1	4
Bardzo głodna gąsienica	1	1
girl dragon	1	8
graphic novel pride and prejudice	2	2
harry potter and the order of the phoenix	1	2
harry potter and the order of the phoenix blu ray	1	1
harry potter order of phoenix	1	2
harry potter phoenix	1	2
Jedi Fallen Order Xbox	1	1
Jennifer L. Holm	4	29
Jurassic World evolution	1	1
kate winslet harvey ketel (misspelled)	1	1
ladies detective agency	2	48
ladies detective agency 2	1	2
ladies detective agency 2 (large type)	1	3
ladies detective series	2	101
Lightning Thief	1	3
missing president grisham	NF	0
newsweek	1	22
newsweek 2020	1	1
newsweek magazine	1	NF
order of the phoenix	1	3
order of the phoenix blu-ray	2	1
paddington movie	2	NF
Percy Jackson	3	34
Pete the cat school shoes	1	1
pride and prejudice comic	4	3
pride and prejudice graphic novel	9	3
pride and prejudise graphic novel (mispelled)	3	2
pride prejudice comic book	6	2
pride prejudice graphic	2	2
Stardew Valley	1	1
Up	1	9

Aspen – Precision Scores

Search string	Result 1	Result 2	Result 3	Result 4	Result 5	Precision - strict	Precision - loose	Precision - permissive

alexander hamilton	r	i	m	r	r	60%	60%	80%
alexander hamilton biography	r	r	r	r	r	100%	100%	100%
assassins creed pirates	r	m	m	m	m	20%	20%	100%
Bardzo głodna gąsienica	r					100%	100%	100%
catering laws	m	i	i	m	i	0%	0%	40%
cephalopods	r	r	r	r	r	100%	100%	100%
chicago bulls: a juvenile book	r	r	r	r	r	100%	100%	100%
graphic novel pride and prejudice	m	r	r	r	n	60%	80%	100%
grisham	r	r	r	r	r	100%	100%	100%
gunpowder	r	r	r	r	m	80%	80%	100%
harry potter and the order of the phoenix	r	r	r	m	m	60%	60%	100%
harry potter and the order of the phoenix blu ray	r	r	m	m	n	40%	60%	100%
harry potter order of phoenix	r	r	m	m	r	60%	60%	100%
harry potter phoenix	r	r	m	m	r	60%	60%	100%
Jedi Fallen Order Xbox	r	r				100%	100%	100%
jet skis	r	n	r	r	r	80%	100%	100%
John Grisham	r	r	r	r	r	100%	100%	100%
jurassic world evolution	r	m	n	m	n	20%	60%	100%
ladies detective agency	r	r	r	r	r	100%	100%	100%
ladies detective agency 2	r	r	i	r	r	80%	80%	80%
ladies detective series	r	r	r	r	r	100%	100%	100%
Lightning Thief	r	r	r	r	r	100%	100%	100%
malcolm gladwell	r	r	r	r	r	100%	100%	100%
missing president grisham	i	i	i	i	i	0%	0%	0%
Mumford and Sons	m	m	m	r	i	20%	20%	80%
new switch games	i	i	i	i	n	0%	20%	20%
newsweek	r	r	n	n	n	40%	100%	100%
newsweek 2020	r	i	i	i	i	20%	20%	20%
newsweek magazine	r	i	i	i	i	20%	20%	20%
order of the phoenix	r	r	m	m	r	60%	60%	100%
order of the phoenix blu-ray	m	r	n	n	n	20%	80%	100%
paddington movie	r	r	r	r	r	100%	100%	100%
percy jackson	r	r	r	r	r	100%	100%	100%
Pete the cat school shoes	r	r	n	r	r	80%	100%	100%
polish romance	i	r	r	r	r	80%	80%	80%
pride and prejudice	r	r	r	m	r	80%	80%	100%
pride and prejudice comic	m	m	i	r	i	20%	20%	60%

	Result 1	Result 2	Result 3	Result 4	Result 5			
pride and prejudise graphic novel	r	n	m	r	n	40%	80%	100%
pride prejudice comic book	m	m	i	m	m	0%	0%	80%
spielberg	r	r	r	r	r	100%	100%	100%
Stardew Valley	r	r	n	n		50%	100%	100%
stephen king	r	r	r	r	m	80%	80%	100%
steven king (mispelled)	i	i	i	i	i	0%	0%	0%
Steven Spielberg	r	r	r	r	r	100%	100%	100%
steven spielberg director	r	r	r	r	r	100%	100%	100%
steven Spielberg movies	r	r	r	r	r	100%	100%	100%
tax deductions	r	r	r	r	r	100%	100%	100%
tony shalloub [misspelled]	r	r	r	r	r	100%	100%	100%
tv series doctors	n	i	i	m	i	0%	20%	40%
Wisconsin day trips	r	r	r	r	r	100%	100%	100%
stephen spielberg (mispelled)	r	r	r	r	r	100%	100%	100%
pride prejudice graphic	m	r	r	i	r	60%	60%	80%
girl dragon	r	r	r	r	r	100%	100%	100%
kate winslet harvey ketel	r					100%	100%	100%
Up	r	r	n	n	i	40%	80%	80%
amoeba school	r	r	r	n	i	60%	80%	80%
Jennifer L. Holm	r	r	r	r	i	80%	80%	80%
quick grill	r	r	r	r	r	100%	100%	100%

Enterprise – Precision Scores

Search String	Result 1	Result 2	Result 3	Result 4	Result 5	Precision - strict	Precision - loose	Precision - permissive
alexander hamilton	n	n	n	n	n	0.00%	100.00%	100.00%
alexander hamilton biography	r	i	m	r	r	60.00%	60.00%	80.00%
amoeba school	r	r	m	r		75.00%	75.00%	100.00%
assassins creed pirates	m	m	n	n	r	20.00%	60.00%	100.00%
Bardzo głodna gąsienica	r	r	r	r	i	80.00%	80.00%	80.00%
catering laws	m	i	i	i	i	0.00%	0.00%	20.00%
cephalopods	r	n	m	n	m	20.00%	60.00%	100.00%
chicago bulls: a juvenile book	r	r	r	r	r	100.00%	100.00%	100.00%
girl dragon	r	r	r	r	n	80.00%	100.00%	100.00%
graphic novel pride and prejudice	m	r	n	n	n	20.00%	80.00%	100.00%
grisham	m	m	m	m	m	0.00%	0.00%	100.00%
gunpowder	n	r	r	r	n	60.00%	100.00%	100.00%
harry potter and the order of the phoenix	r	r	r	r	r	100.00%	100.00%	100.00%

harry potter and the order of the phoenix blu ray	r	i	i	i	i	20.00%	20.00%	20.00%
harry potter order of phoenix	r	r	r	r	r	100.00%	100.00%	100.00%
harry potter phoenix	r	r	r	r	r	100.00%	100.00%	100.00%
Jedi Fallen Order Xbox	r	i	i			33.33%	33.33%	33.33%
Jennifer L. Holm	m	r	r	r	r	80.00%	80.00%	100.00%
jet skis	r	i	i	i	r	40.00%	40.00%	40.00%
John Grisham	m	m	m	m	m	0.00%	0.00%	100.00%
jurassic world evolution	r	r	m	m	n	40.00%	60.00%	100.00%
kate winslet harvey ketel	r					100.00%	100.00%	100.00%
ladies detective agency	r	r	r	r	r	100.00%	100.00%	100.00%
ladies detective agency 2	r	r	r	i	i	60.00%	60.00%	60.00%
ladies detective series	r	r	r	r	r	100.00%	100.00%	100.00%
Lightning Thief	m	m	r	r	r	60.00%	60.00%	100.00%
malcolm gladwell	r	r	r	r	r	100.00%	100.00%	100.00%
missing president grisham	i	i	i	i	i	0.00%	0.00%	0.00%
Mumford and Sons	m	m	i	r	i	20.00%	20.00%	60.00%
new switch games	r	r	r	i	i	60.00%	60.00%	60.00%
newsweek	m	m	m	m	m	0.00%	0.00%	100.00%
newsweek 2020	r	n	i	m	m	20.00%	40.00%	80.00%
newsweek magazine	i	i	i	i	i	0.00%	0.00%	0.00%
order of the phoenix	r	r	r	r	r	100.00%	100.00%	100.00%
order of the phoenix blu-ray	r					100.00%	100.00%	100.00%
paddington movie	m	m	m	m	m	0.00%	0.00%	100.00%
percy jackson	r	r	r	r	r	100.00%	100.00%	100.00%
Pete the cat school shoes	r	m	r	r	r	80.00%	80.00%	100.00%
polish romance	r	r	r	r	n	80.00%	100.00%	100.00%
pride and prejudice	r	r	r	n	r	80.00%	100.00%	100.00%
pride and prejudice comic	m	r	r	n	m	40.00%	60.00%	100.00%
pride and prejudise graphic novel (mispelled)	r	m	n	n	i	20.00%	60.00%	80.00%
pride prejudice comic book	r	r	n	r	n	60.00%	100.00%	100.00%
pride prejudice graphic	m	r	n	r	n	40.00%	80.00%	100.00%
quick grill	r	r	r	r	r	100.00%	100.00%	100.00%
spielberg	m	m	m	m	m	0.00%	0.00%	100.00%
Stardew Valley	r	r	r	i	n	60.00%	80.00%	80.00%
stephen king	r	r	r	r	r	100.00%	100.00%	100.00%
stephen spielberg (mispelled)	r	r	i	r	r	80.00%	80.00%	80.00%
steven king (mispelled)	i	i	i	i	i	0.00%	0.00%	0.00%
Steven Spielberg	m	m	m	m	m	0.00%	0.00%	100.00%

steven spielberg director	r	r	r	r	r	100.00%	100.00%	100.00%
steven Spielberg movies	i	i	i	i	i	0.00%	0.00%	0.00%
tax deductions	r	r	r	r	r	100.00%	100.00%	100.00%
tony shalloub [misspelled]	i	r	i	i	r	40.00%	40.00%	40.00%
tv series doctors	m	i	i	i	i	0.00%	0.00%	20.00%
Up	m	m	m	m	m	0.00%	0.00%	100.00%
Wisconsin day trips	r	r	r	r	r	100.00%	100.00%	100.00%

Appendix 2: Relevancy activity worksheet

YOUR NAME:

Instructions

In this activity, you will use your persona to conduct searches in Enterprise and Aspen and compare the relevancy of your results. As you work through the searches, internalize your persona and think about how they would search, what their interests are, and what they might like or dislike about the results they are seeing.

For the purposes of this activity, all searches will be **keyword searches** and they will fall into two categories: known item searches or author/topic searches. In a known item search, your persona is looking for a specific item and format. In an author/topic search, your persona is looking for something slightly broader and a few different items could meet their needs.

You will have prompts for the first few searches, and then you will choose your own adventure! Pick known items, topics, or authors of interest to your persona.

For each search:

1. Based on the item and the persona, select your keywords
2. Search in both Aspen and Enterprise using your keywords – having one in one tab and one in another is helpful
3. If this is a **known item search**
   a. Record the **position** of the record on the search results screen (results are numbered).
   b. For Aspen, record the grouped record position and for Enterprise record the item record position.
4. If this is an **author/topic search**:
   a. Record the **number of relevant results** on the first page of search results.
   b. For Aspen, count grouped records, for Enterprise count item records.
5. Finally, as your persona make any notes on what you liked, didn't like, found frustrating, etc.

Searches & Notes

Search 1 - Known Item, Movie

I'm looking for: Harry Potter and the Order of the Phoenix on BLU-RAY

Keywords:

Position in Results:

Aspen	Enterprise

Notes:

Search 2 – Author

I'm looking for: Books by Stephen King (Author/Topic)

Keywords:

Number of Relevant Results:

Aspen	Enterprise

Notes:

Search 3 – Known Item, Series

I'm looking for: Ladies Detective Agency- 2nd book in the series

Keywords:

Position in Results:

Aspen	Enterprise

Notes: I did find it in Enterprise when I searched for ladies detective agency 2

Search 4 – Known Item, Graphic Novel

I'm looking for: Pride and Prejudice graphic novel version

Keywords:

Position in Results:

Aspen	Enterprise

Notes:

Search 5 – Known Item, Popular and Missing Details

I'm looking for: A biography of Alexander Hamilton – that one that's really popular (you know it is by Ron Chernow but your persona doesn't).

Keywords:

Position in Results:

Aspen	Enterprise

Notes:

Search 6 – Known Item, Serial

I'm looking for: Newsweek most recent editions

Keywords:

Position in Results:

Aspen	Enterprise

Notes:

Search 7 - Author

I'm looking for: Find movies directed by Steven Spielberg using a keyword search (Author/Topic)

Keywords:

Number of Relevant Results

Aspen	Enterprise

Notes:

Now, do 4-5 more searches based on your persona. Be creative! Embrace your persona and think about what they are looking for and how they would search for it.

Search 8
I'm looking for:

Keywords:

Position in Results OR Number of Relevant Results

Aspen	Enterprise

Notes:

Search 9
I'm looking for:

Keywords:

Position in Results OR Number of Relevant Results

Aspen	Enterprise

Notes:

Search 10
I'm looking for:

Keywords:

Position in Results OR Number of Relevant Results

Aspen	Enterprise

Notes:

Search 11
I'm looking for:

Keywords:

Position in Results OR Number of Relevant Results

Aspen	Enterprise

Notes:

Search 12
I'm looking for:

Keywords:

Position in Results OR Number of Relevant Results

Aspen	Enterprise

Notes:

[i] Ferrara, John, et al. "Testing Search for Relevancy and Precision." A List Apart, 2 Apr. 2019, alistapart.com/article/testing-search-for-relevancy-and-precision/.