# Aggregation and Search: Baskets for Berrypicking

NKOS 2020 Consolidated Workshops

# Agenda

- Assumptions and context of Marcia Bates' "berrypicking" vision
- Methods for exploring large amounts of information

## How


## Where

## Who

***Users switch from one searching mode to another in a physical library.***

## How


## Where


## Who

***Users can switch among or combine searching modes in a digital library.***


About 521,000 results (0.40 seconds)

www.emerald.com › ... › Volume 13 Issue 5

The design of browsing and berrypicking techniques for the ...

May 1, 1989 - First, a new model of searching in online and other information systems, called '**berrypicking**', is discussed. This model, it is argued, is much ...

by MJ Bates - 1989 - Cited by 2370 - Related articles

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***What Marcia Bates did not foresee in 1989 …***

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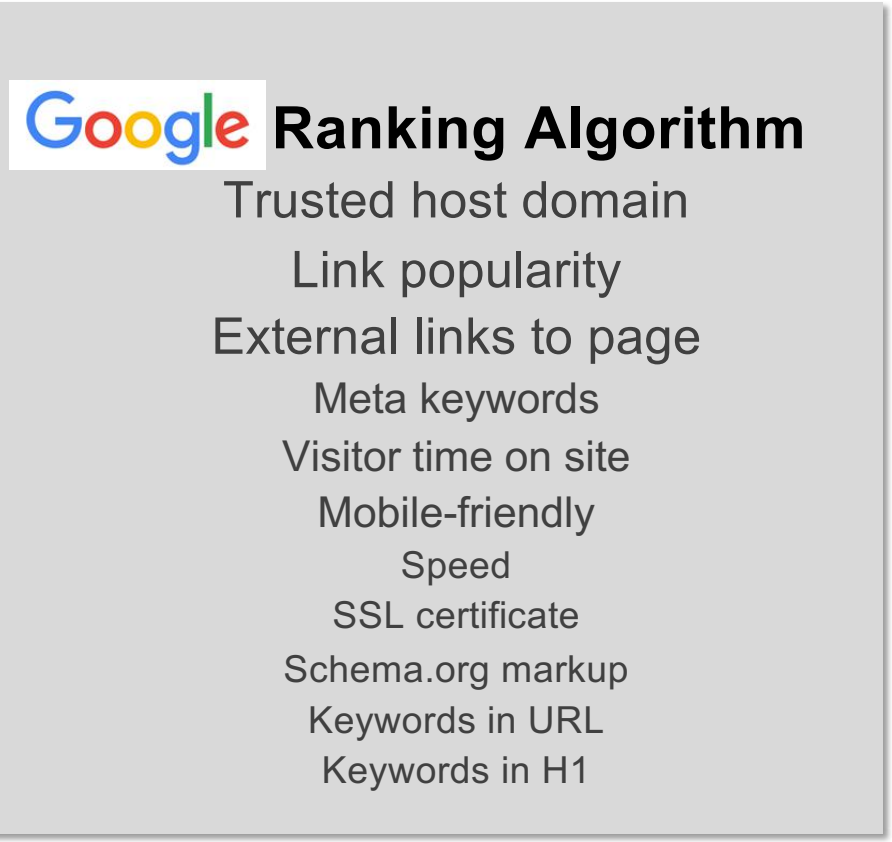
# Methods for exploring large amounts of information

| WWW/Enterprise Search Interfaces | Berrypicking Search Interfaces |
|---|---|
| Natural language processing and analytics | Citation searching |
| Find an expert | Footnote chasing |
| Guided navigation | Subject searches |
| Search results as collections | Area scanning |
| Visualize collections | |
| Knowledge graphs | |

## Natural language processing and especially analytics are Citation Searching on steroids

- NLP is deployed on a massive scale.
  - Identify and index meaningful entities beyond simple term frequency and document length.
- Websites and content are instrumented with usage analytics.
  - Usage analytics rank and promote “popular” information items, similar to citation searching
    - Hyperlinks
    - Visit frequency
    - Other factors

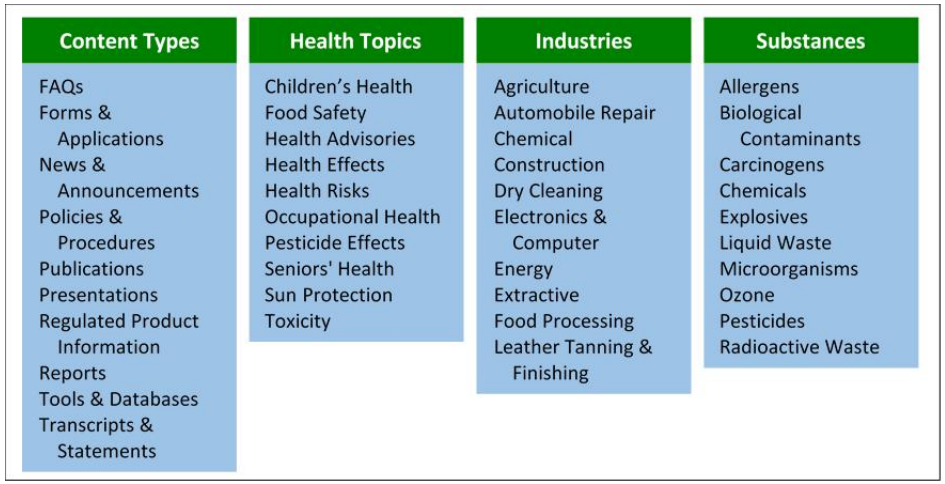


# How do you find an expert? … by footnote chasing


- Assumptions
  - Full-text search
  - Comprehensive collection
- Plan B: Ask an expert
    - Email a colleague
    - Expertise directories
    - LinkedIn, Research Gate, etc.
    - Facebook
    - Chatbots
  - It's like footnote chasing

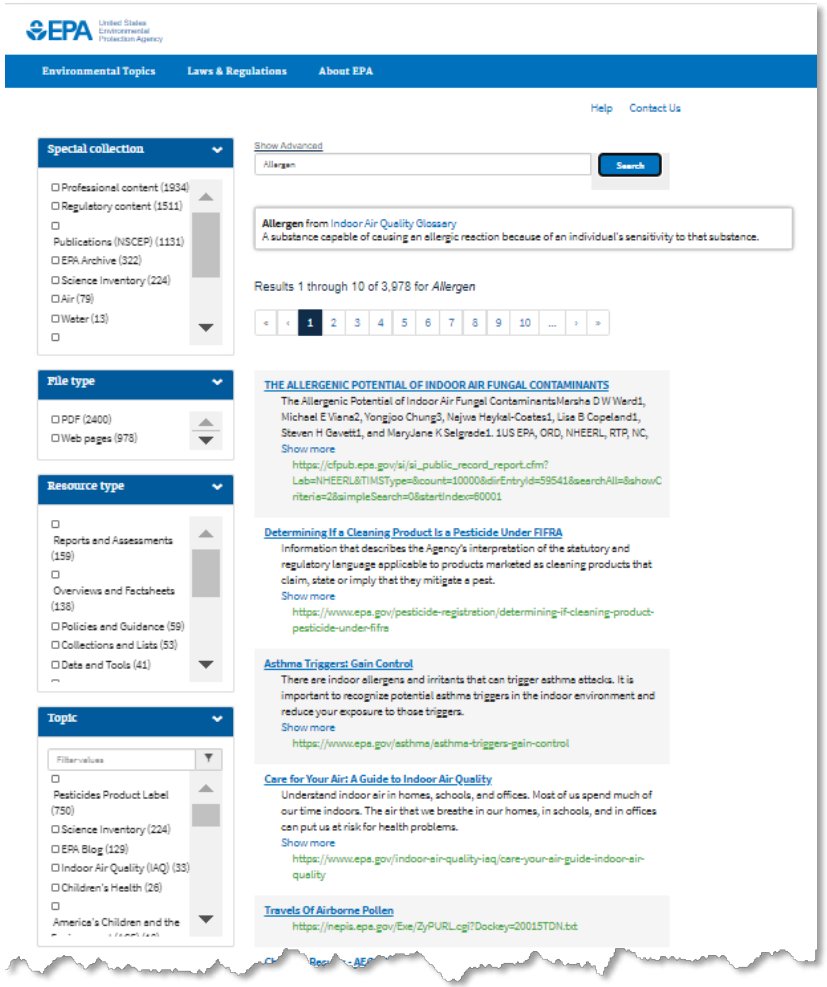
# Guided navigation is the new Subject Searching paradigm

- Take advantage of ubiquitous search as an entry point for browsing
- Break the paradigm that the relevant result must be near the top of the results
- Guided navigation is a model for refining a very large text search collection in a few clicks




***Busch's Golden Rule: Four metadata-controlled vocabularies of 10 values each have the same discriminatory power as one taxonomy of 10,000 values.***

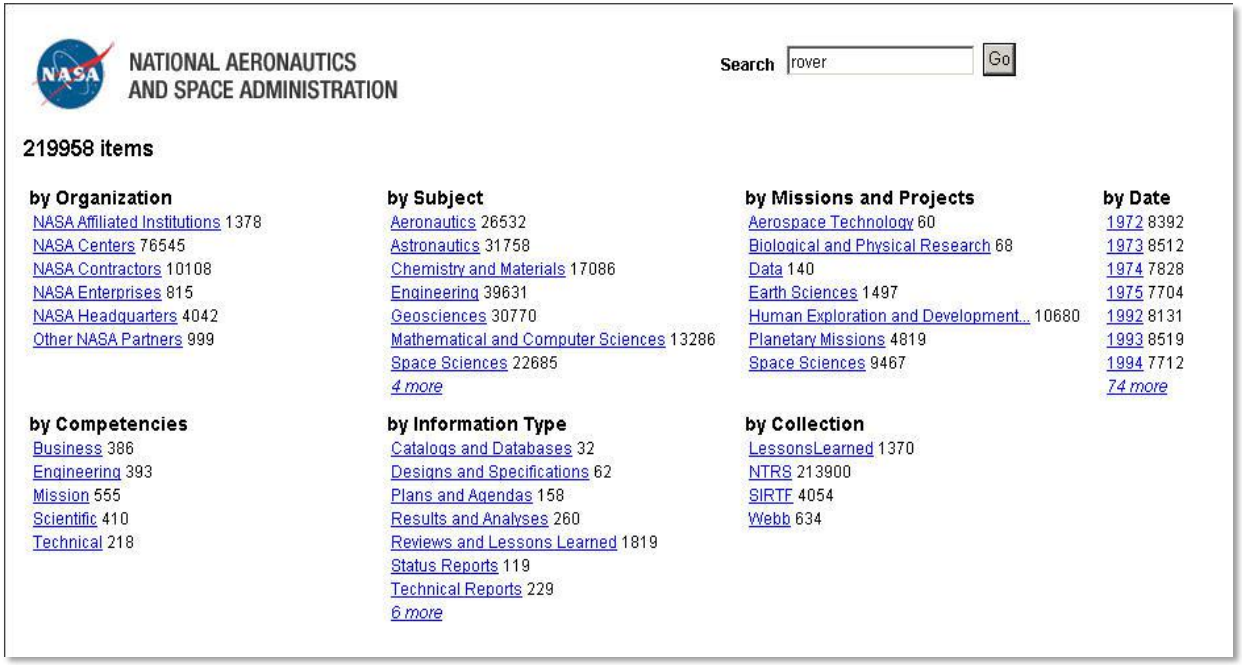
# Guided navigation on a content website




***Guided navigation applied on a content site epa.gov.***

# Search results as collections: A type of area scanning

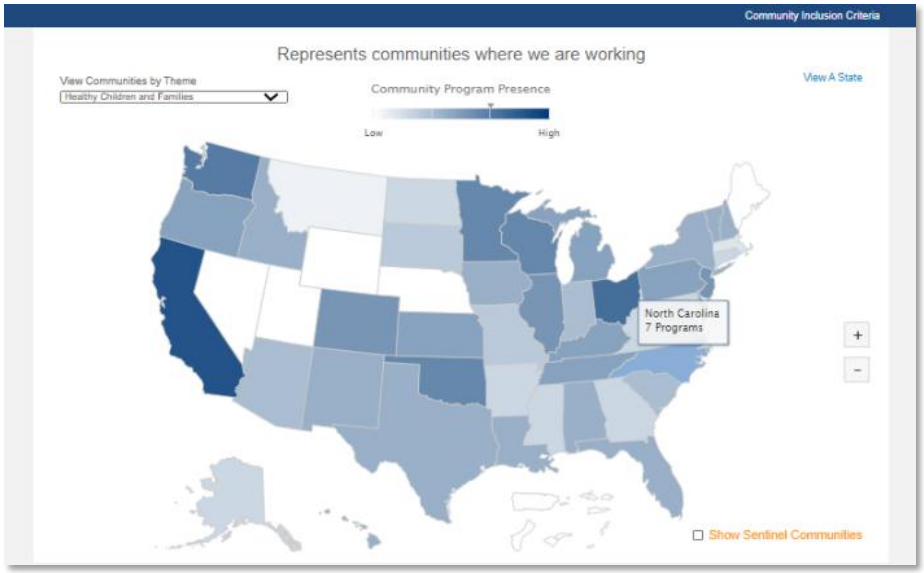
- Every search should be thought of as a collection of results, instead of presenting text search results as a list of references.
- Provide the user with an overview of the available information, and invite them to refine or start with a new search.

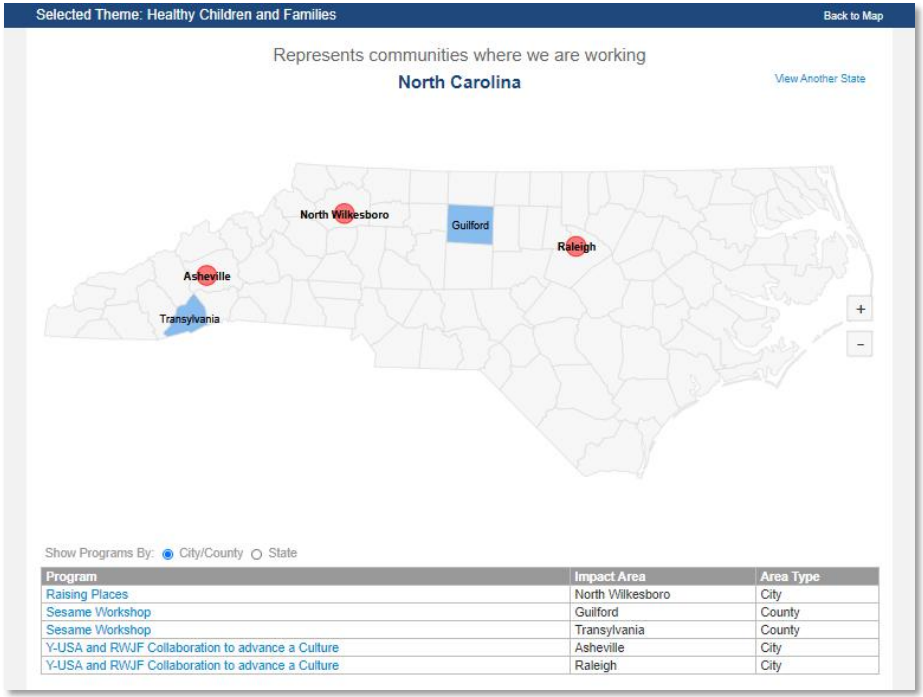



***Collection of more than 200,000 search results for [Mars] rover in the top occurring categories of the NASA Taxonomy, a faceted KOS.***

# Visualizing collections

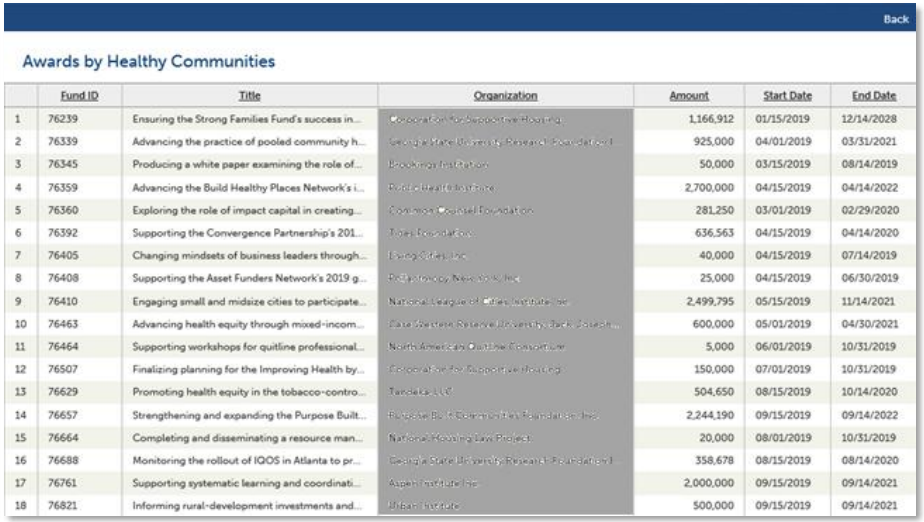
- Visualize collections of search results with maps and charts instead of lists of references.




***A map visualization of search results that displays themes (topics) for U.S. states, and a drill-down to a state with county/city items.***

# Visualizing collections with charts and drill-downs

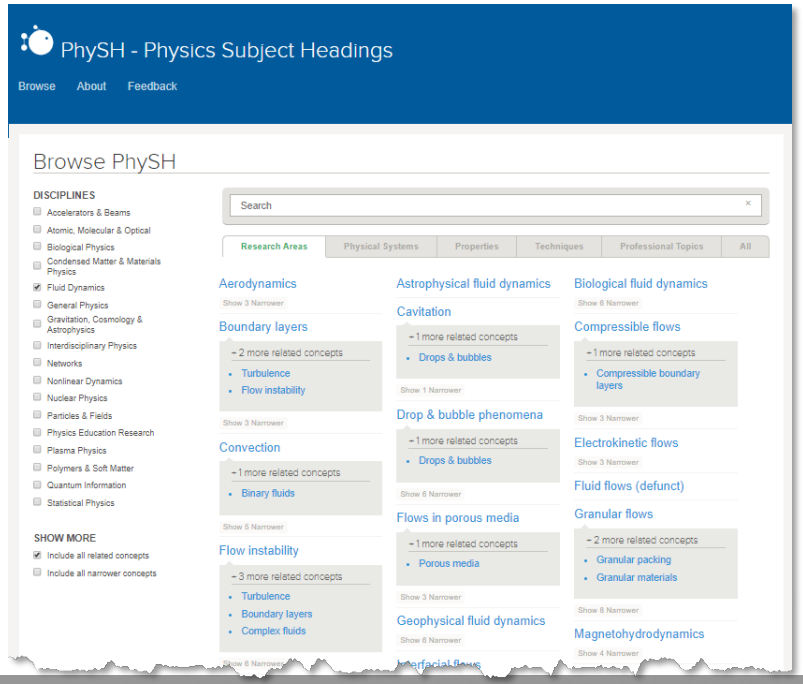



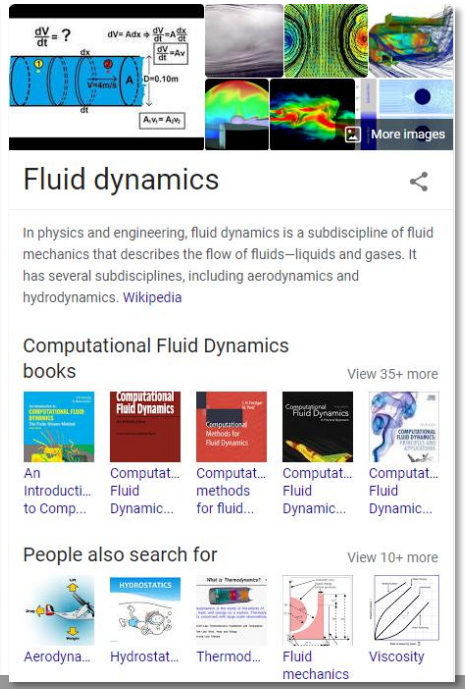

| | Fund ID | Title | Organization | Amount | Start Date | End Date |
|---|---|---|---|---|---|---|
| 1 | 76239 | Ensuring the Strong Families Fund's success in... | [redacted] | 1,166,912 | 01/15/2019 | 12/14/2028 |
| 2 | 76339 | Advancing the practice of pooled community h... | [redacted] | 925,000 | 04/01/2019 | 03/31/2021 |
| 3 | 76345 | Producing a white paper examining the role of... | [redacted] | 50,000 | 03/15/2019 | 08/14/2019 |
| 4 | 76359 | Advancing the Build Healthy Places Network's i... | [redacted] | 2,700,000 | 04/15/2019 | 04/14/2022 |
| 5 | 76360 | Exploring the role of impact capital in creating... | [redacted] | 281,250 | 03/01/2019 | 02/29/2020 |
| 6 | 76392 | Supporting the Convergence Partnership's 201... | [redacted] | 636,563 | 04/15/2019 | 04/14/2020 |
| 7 | 76405 | Changing mindsets of business leaders through... | [redacted] | 40,000 | 04/15/2019 | 07/14/2019 |
| 8 | 76408 | Supporting the Asset Funders Network's 2019 g... | [redacted] | 25,000 | 04/15/2019 | 06/30/2019 |
| 9 | 76410 | Engaging small and midsize cities to participate... | [redacted] | 2,499,795 | 05/15/2019 | 11/14/2021 |
| 10 | 76463 | Advancing health equity through mixed-incom... | [redacted] | 600,000 | 05/01/2019 | 04/30/2021 |
| 11 | 76464 | Supporting workshops for quitline professional... | [redacted] | 5,000 | 06/01/2019 | 10/31/2019 |
| 12 | 76507 | Finalizing planning for the Improving Health by... | [redacted] | 150,000 | 07/01/2019 | 10/31/2019 |
| 13 | 76629 | Promoting health equity in the tobacco-contro... | [redacted] | 504,650 | 08/15/2019 | 10/14/2020 |
| 14 | 76657 | Strengthening and expanding the Purpose Built... | [redacted] | 2,244,190 | 09/15/2019 | 09/14/2022 |
| 15 | 76664 | Completing and disseminating a resource man... | [redacted] | 20,000 | 08/01/2019 | 10/31/2019 |
| 16 | 76688 | Monitoring the rollout of IQOS in Atlanta to pr... | [redacted] | 358,678 | 08/15/2019 | 08/14/2020 |
| 17 | 76761 | Supporting systematic learning and coordinati... | [redacted] | 2,000,000 | 09/15/2019 | 09/14/2021 |
| 18 | 76821 | Informing rural-development investments and... | [redacted] | 500,000 | 09/15/2019 | 09/14/2021 |

***A chart visualization that shows total and KPI amounts awarded by lines of business and in summary for the whole enterprise.***

# Knowledge graphs

- Representations of an organization's knowledge assets, content, and data—people, places, documents, multimedia, data, etc.—and how these things are related to each other.
- Typically, this is an ontology that defines classes for the things, properties for the things, and relationships between the things.




***An ontology for the physics domain with the knowledge graph for the same concept designed to be presented on the search results page.***

## KOS are the baskets for gathering “berries”

- The purpose of KOS is not to find items or answers, but to group or aggregate content into collections for review or further refinement.
- Consider the search results user experience when designing KOS .

## Resources


- M. Bates. “The design of browsing and berrypicking techniques for the online search interface.” 13(5) *Online Review* 407-424, and in: M. Bates. *Information Searching Theory and Practice: Selected Works*. Vol. 2. Berkeley: Ketchikan Press, 2016. pp. 257-278.
- V. Bush. “As we may think.” *The Atlantic* (July 1945). https://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881/. Last checked: 6/8/2020.
- S. Papa. “The faceted navigation and search revolution.” *KM World* (March 23, 2006) https://www.kmworld.com/Articles/White-Paper/Article/The-Faceted-Navigation-and-Search-Revolution-15378.aspx. Last checked: 6/8/2020.
- *NASA Taxonomy*. Last updated: 05/08/2012. https://vocabularyserver.com/nasa/. Last checked: 6/9/2020.
- *PhySH – Physics Subject Headings*. American Physical Society. https://physh.aps.org/. Last checked: 6/11/2020.

## Summary

The goal of search is to reliably find what you are looking for, to be able to type in a highly variable query and return the most relevant result or the right answer every time. These days, effective search relies to a large extent on natural language processing and analytics. The purpose of KOS is not to find items or answers, but to group or aggregate content into collections for review or further refinement. This can be pre-search to build a collection to search on rather than the whole universe, or it can be post-search to characterize the search result set, or refine the results. It's important to consider the kind of search result user experience when the KOS is designed. The aggregation scenario means a broad and shallow scheme with discrete categories is needed. The focus needs to be on designing the baskets for gathering "berries" rather than the berries themselves that users will be picking. This paper lays out some use cases for this aggregation scenario and presents some examples.