

Agility in tools can be pretty and deliver significant impact – ScienceDirect Topics

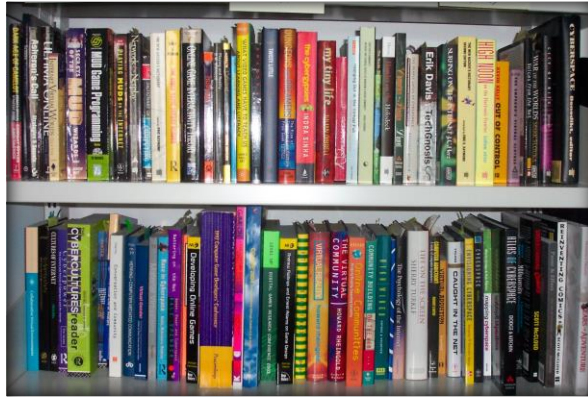
Bryan Davies
VP Product Solutions
Reference Solutions – Books
Elsevier



Agenda

- The problem and understanding the opportunity
- Developing the solution (agile and pretty)
- Where are we now. Results (impact)
- Closing the loop with sales, marketing and editorial

The Problem.....



Book user experience not aligned with user needs

- Researchers often say they don't use, or don't know they are using books
- Books usually associated with static print product
- Use case for books and value proposition not clear



Leading to poor value perception with commercial buyers

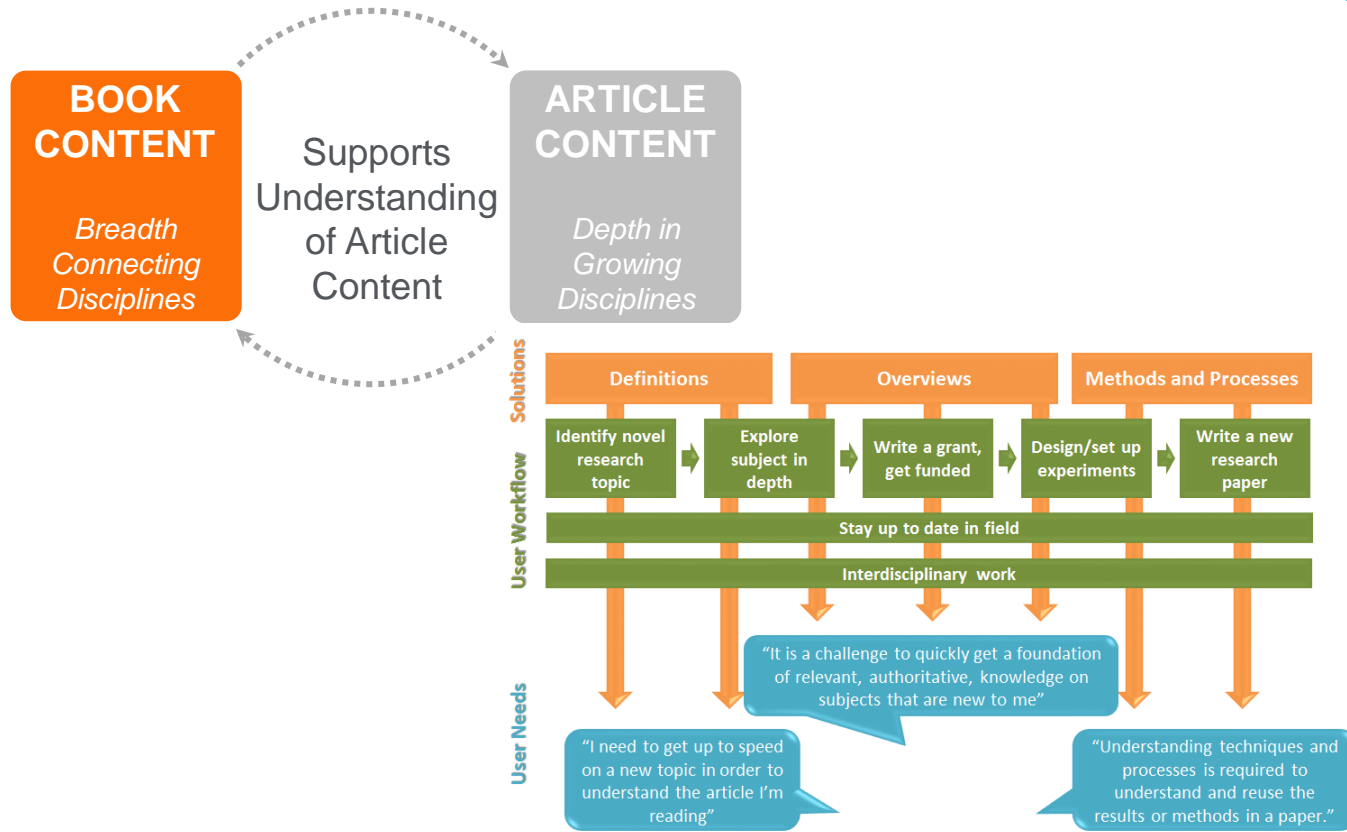
- Book usage data often not compelling
- Faculty recommendations and endorsement low or uneven
- Books 'nice to have' not 'must have'



Resulting in poor business outcomes

- Online book revenues stagnating and not offsetting print decline
- Books account for 8% of the content on ScienceDirect but only 3% of the usage
- Only 30% Penetration of books into ScienceDirect accounts

...and understanding the opportunity

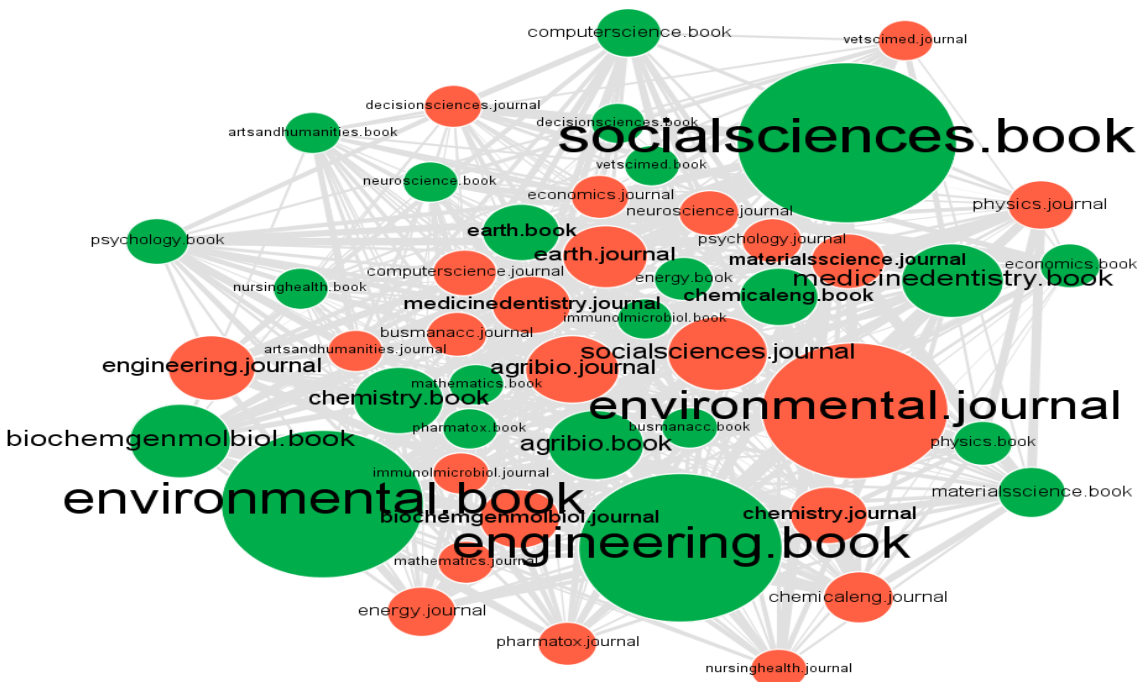


Key themes we hear from customers

- Users are looking for answers – not necessarily journals or books
- Foundational content plays a big role in interdisciplinary research
- Books are a recognized way of quickly getting up to speed in a new subject

What the data tells us

- Usage data confirms what we heard: co-usage of books and journals and interdisciplinary content use



Developing the solution (agile and pretty - MVP)

ScienceDirect Journals Books

Back to previous page > Pyramidal tracts

Pyramidal tracts ¹

The pyramidal tract exits the cortex, and after passing the pyramids of the medulla, the majority of these fibers cross to the opposite side and descend in the corticospinal tract through the spinal cord (Figure 3). Some of the fibers that do not cross over in the medulla travel ipsilaterally down the cord and cross to the opposite side in the neck or upper thoracic region.

From: [Reference Module in Biomedical Research, 2014](#) ⁴

Learn more about Pyramidal tracts ³

Spinal Tracts – Descending/Motor Pathways

Paul Rea, in *Essential Clinical Anatomy of the Nervous System*, 2015.

Pyramidal tracts

The **pyramidal tracts** are comprised of the corticospinal and **corticobulbar** tracts. These are called as **pyramidal tracts** as they crossover at the level of the pyramids in the medulla. They are collections of upper **motor neuron** fibers which go to the **spinal cord** (corticospinal) or the brainstem (corticobulbar) and control the motor function of the body.

The corticospinal tract is comprised of a ventral and lateral tract

Spinal Cord

Gulgun Sengul, Charles Watson, in *The Human Nervous System (Third Edition)*, 2012.

Corticospinal Tract

The corticospinal tract, also called the pyramidal tract because its fibers form the **medullary pyramids**, is found in all mammals with considerable variation between species. The dorsal corticospinal tract is the major corticospinal bundle, found in the **dorsal column** in rodents. In primates, it is highly developed and the major bundle is in the **lateral column**.

The fibers that give rise to the corticospinal tract in adult mammals arise from the **neurons** of the **precentral gyrus** and the **pa**

Related terms ²

RTMS, Motor area, Motor cortex, Cervical spinal cord, Decussate, Motor neuron, Corticobulbar tract, Facial nucleus, Precentral gyrus, Anterior horn cells

¹ Definitions extracted from Elsevier books.

² Related terms with hyperlinks to explore.

³ Short extracts of the most relevant information that are often found deep within book chapters and links to the source books for further exploration.

⁴ Links to the Full Text

⁵ Optimized for SEO

pyramidal tracts

All Images Videos Shopping News More Settings Tools

About 1,800,000 results (0.41 seconds)

The term **pyramidal tracts** refers to upper motor neurons that originate in the cerebral cortex and terminate in the spinal cord (corticospinal) or brainstem (corticobulbar).

[Pyramidal tracts - Wikipedia](https://en.wikipedia.org/wiki/Pyramidal_tracts)
https://en.wikipedia.org/wiki/Pyramidal_tracts

People also ask

- What are pyramidal tract signs?
- What is the difference between pyramidal and extrapyramidal tracts?
- Why is it called the pyramidal tract?
- What is a pyramidal syndrome?

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Structure · Function · Clinical significance · Additional images

[The Descending Tracts - Pyramidal - TeachMeAnatomy](https://teachmeanatomy.info/neuro/pathways/descending-tracts-motor/)
teachmeanatomy.info/neuro/pathways/descending-tracts-motor/
★ ★ ★ ★ Rating: 4.8 - 231 votes
2 Jan 2018 - This article is about the descending tracts of the central nervous system. The descending tracts are the pathways by which motor signals are sent from the brain to lower motor neurons. The lower motor neurons then directly innervate muscles to produce movement.
Pyramidal Tracts · Corticospinal Tracts · Corticobulbar Tracts · Extrapyramidal Tracts

[Pyramidal tracts - an overview | ScienceDirect Topics](https://www.sciencedirect.com/topics/neuroscience/pyramidal-tracts)
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Images for pyramidal tracts

More images for pyramidal tracts

[Pyramidal tracts - SlideShare](https://www.slideshare.net/mannu3411/pyramidal-tracts)
<https://www.slideshare.net/mannu3411/pyramidal-tracts>
31 Jul 2015 - PYRAMIDAL TRACTS INCLUDES: 1.Corticospinal tract 2.Corticobulbar tract * These are aggregations of upper motor neuron. *nerve fibres travel from Cerebral cortex and terminate either in brain stem(corticobulbar) or spinal cord(corticospinal). *Transmit moter impulses that control motor functions of body.

[Pyramidal Tract Pathway - GetBodySmart](https://www.getbodysmart.com/motor-system/pyramidal-tract-pathway)
<https://www.getbodysmart.com/motor-system/pyramidal-tract-pathway>
19 Sep 2017 - Pyramidal Tract Pathway; explained beautifully in an illustrated and interactive way. Click and start learning now!

[What is the function of the Pyramidal Tract? - innovateus.net](http://www.innovateus.net/health/what-function-pyramidal-tract)
www.innovateus.net/health/what-function-pyramidal-tract
The pyramidal tract originates from the sensor motor areas located in the cerebral cortex. It is one of the prominent passages of the central nervous system. It comes down via the brainstem to reach the

Developing the solution (agile and pretty - MVP)

Focus on metrics and a data driven approach leads to success

Article Page

Brain Research
Volume 1672, 1 October 2017, Pages 122-128

Research report
Effect of prenatal exposure to ethanol on the pyramidal tract in developing rats
Michael W. Miller ^{a,*, R. J. ...}

Abstract
Prenatal exposure to ethanol induces a relative increase in the numbers of pyramidal tract axons relative to the number of corticospinal projection neurons in somatosensory/motor cortices in the adult rat. The present study examines the effects of ethanol on the numbers of axons in the developing caudal pyramidal tract, i.e., corticospinal axons. Electron microscopic analyses of the pyramidal tracts of the offspring of pregnant rat dams fed a control diet *ad libitum*, pair-fed a liquid control diet, or fed an ethanol-containing diet *ad libitum* were performed. The pups were 5-, 15-, 30- and 90-days-old. The numbers of axons in control rats fell precipitously after postnatal day (P) 15 and the frequency of myelinated axons rose dramatically between P15 and P90. Ethanol exposure had no significant effect on the numbers of pyramidal tract axons at any age. Moreover, no ethanol-induced differences in the numbers of axons in different stages of myelination, i.e., axons that were "free" of glial associations, glia-ensheathed, invested by 1-2 layers of myelin, or myelinated by 3+ layers of myelin, were detected on P15. Thus, it appears that (a) pyramidal tract axons are lost or pruned during the first two postnatal weeks and (b) postnatal development of pyramidal tract axons (e.g., pruning and myelination) is not affected by ethanol. The implications are that the ethanol-induced increase in the number of axons relative to the number of somata of corticospinal neurons detected in pups and adults results from the effects of ethanol on early stages (initiation) of axogenesis.

From Article page hyperlinks

Topic Page

ScienceDirect
Back to previous page > Pyramidal tracts

Pyramidal tracts

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From: Reference Module in Biomedical Research, 2014

Learn more about Pyramidal tracts

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FT Chapter Page

The Human Nervous System (Third Edition)
2012, Pages 186-232

Chapter 6 – Spinal Cord: Regional Anatomy, Cytoarchitecture and Chemoarchitecture

Gulgun Sengul^a, Charles Watson^a

Summary
The spinal cord is composed of gray matter and white matter. The white matter is composed mostly of longitudinally running axons and also glial cells. The gray matter is composed of nine distinct cellular layers, or laminae, organized from dorsal to ventral, with the remaining area (area 10) surrounding the central canal. This lamination pattern was first defined by Rexed (1952, 1954) in the cat. Each lamina possesses different physiological, histochemical, and cytoarchitectonic characteristics. Laminae 1-6 constitute the dorsal horn, lamina 7 is the intermediate gray matter, laminae 8 and 9 constitute the ventral horn, and area 10 corresponds to the area around the central canal. There are also several named cell groups (nuclei) within the spinal cord. Most of these are located within the numbered gray laminae of the spinal cord. These are the dorsal nucleus (Clarke's column), the internal basilar nucleus, the central cervical nucleus, the intermediolateral cell column, the intermediomedial nucleus, the lumbar and dorsal commissural nuclei, the sacral precerbellar nucleus, and the sacral parasympathetic nucleus. There are also two significant neuronal groups in the white matter of the lateral columns of the spinal cord, the lateral cervical and lateral spinal nuclei.

Google Search Page

Google
pyramidal tract

About 864,000 results (0.41 seconds)

Pyramidal tract syndrome. Definition: A disorder characterized by dysfunction of the corticospinal (pyramidal) tracts of the spinal cord. Symptoms include an increase in the muscle tone in the lower extremities, hyperreflexia, positive Babinski and a clonus.

Information for Pyramidal tract syndrome - SIDER Side Effect
sideeffects.emsl.de/ise/C1804405/

People also ask
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What is pyramidal and extrapyramidal?
Why is it called the pyramidal tract?
What are pyramidal signs neurology?

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TPs Consistently rank on the first page of Google search

[Pyramidal tracts - an overview | ScienceDirect Topics](https://www.sciencedirect.com/topics/neuroscience/pyramidal-tracts)

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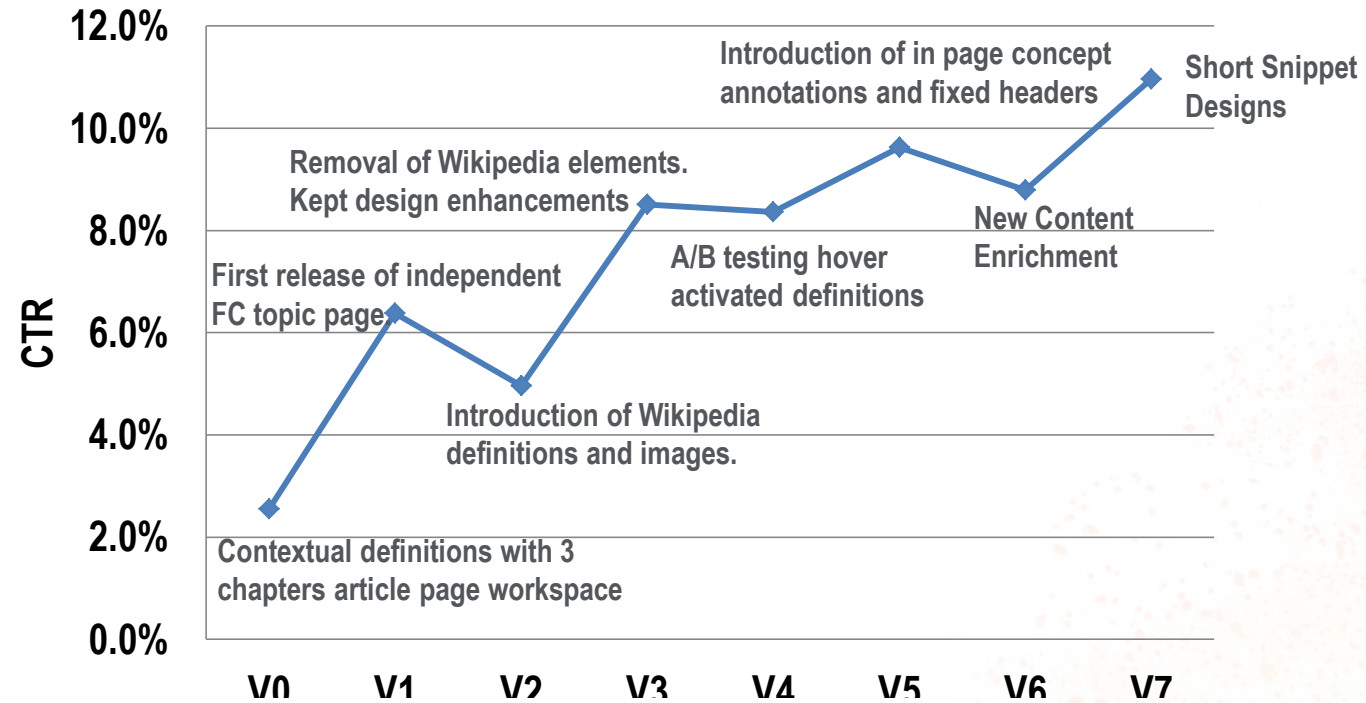
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- Designs were optimized for key metrics: usage, and co-usage.
- 2 streams for driving traffic: ScienceDirect journal articles or Google search
- Free layer of authoritative content = high SEO value = traffic driver
- Topic page elements were tracked and iterative refinements of the POC were made to the design using data driven techniques to optimize user engagement and conversion to ScienceDirect

Developing the solution (agile and pretty - MVP)

Focus on metrics and a data driven approach leads to success

Impact of data driven rapid prototyping on TPs POC

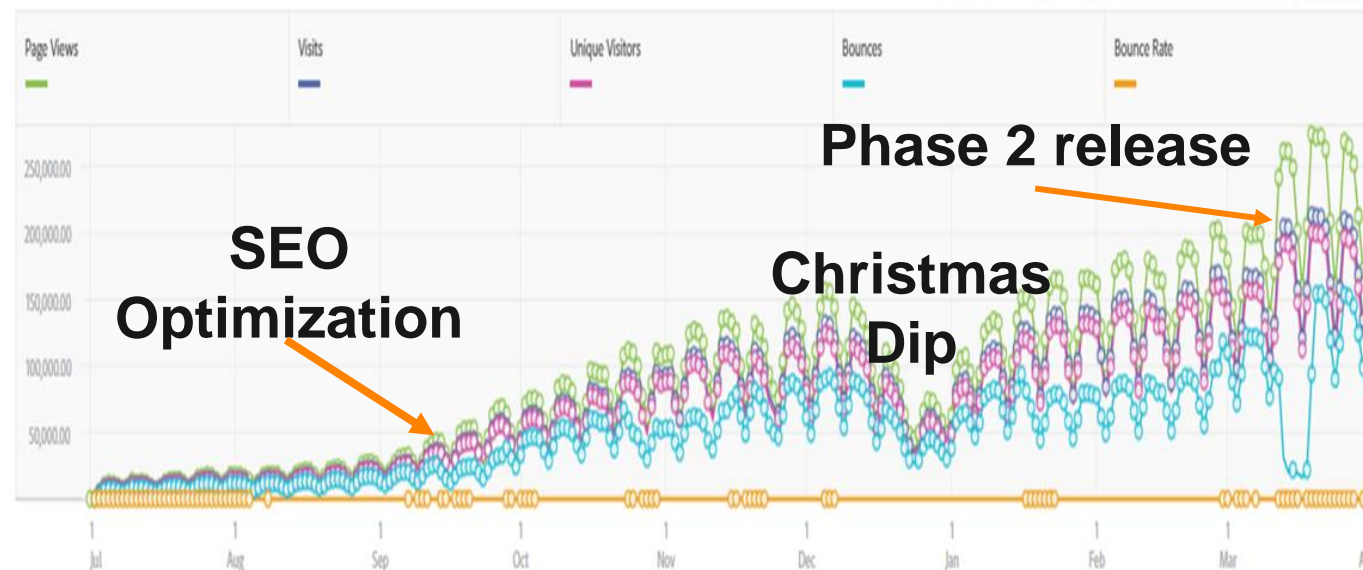


Example 1: Rapid prototyping technique to optimize user engagement

- 2 week sprints to analyse results – iterate and refine
- Agile – learned quickly and failed fast
- A/B testing of different page layouts
- Conversion rates (CTR) grew from 2.5% to 11.0% in the POC
- Production environment - further improved to 27%

Example 2: Iterative SEO design to optimize Google traffic.

- Experimented with FT snippets length to optimize SEO
- 20% of traffic came from Google in POC and has now grown to 80% in production through refinement
- Google average ranking = 8.1 in March



Developing the solution (agile, pretty, scalable)

330,000 Topic Pages created in a fully automated way by combining content, technology & analytics

Automated and Dynamic

- Topic Pages (TPs) use a set of **deep learning (ML) algorithms** to automatically extract relevant information and generate TPs the moment new concepts are added to the taxonomies.
- Topic Pages are updated automatically on a regular basis

Comprehensive and Growing

- We search the entire **Elsevier corpus** of book content to find definitions and snippets.

Extensible and Scalable

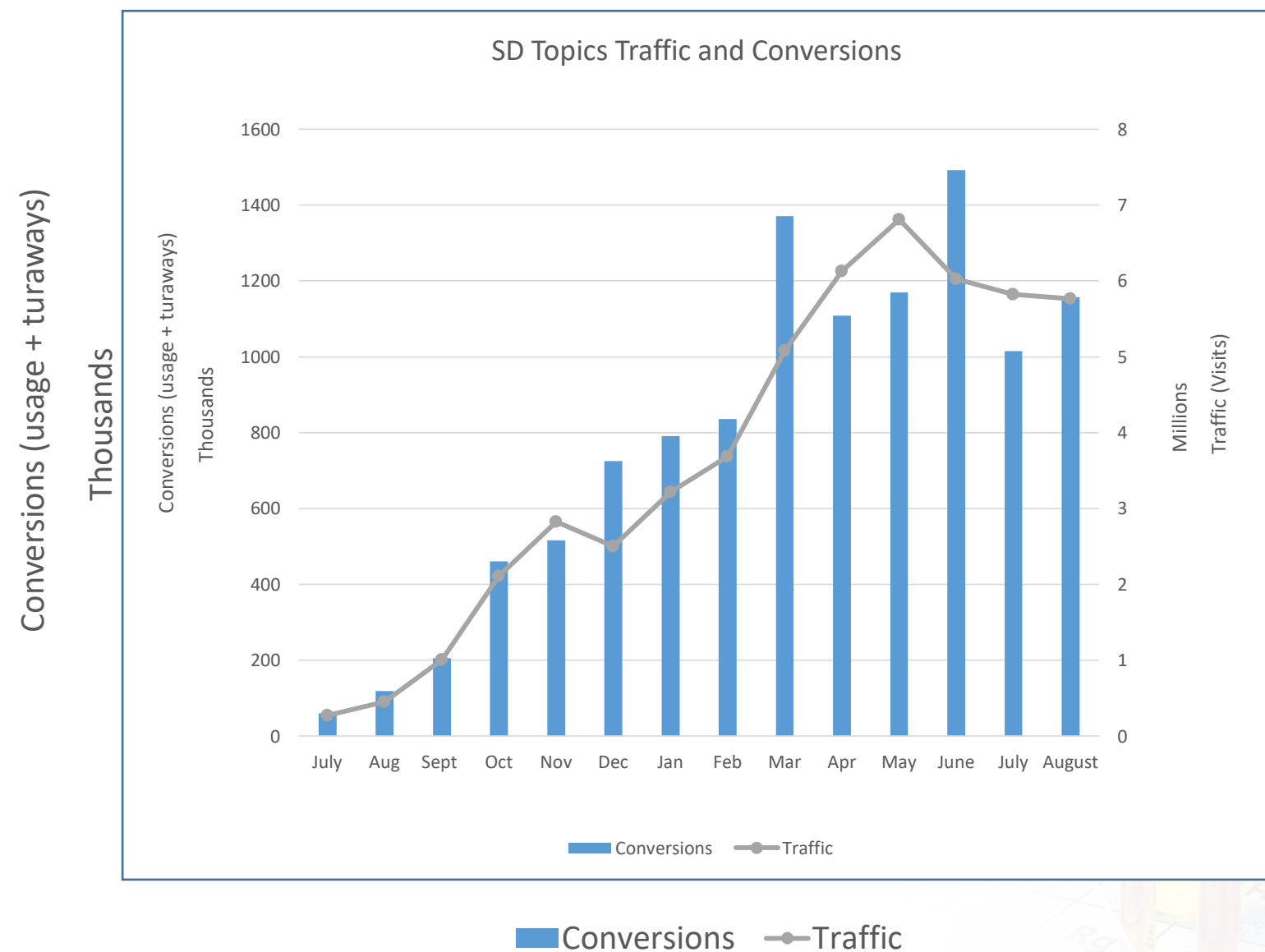
- The algorithms can be trained against other content, concept types and other domains

E2E Business Value

- We use the **analytics data** collected from TPs to feed **Sales enablement tools**. We

Where we are now: Impact

SD Topics Traffic and Conversions



- **330K** - Topic Pages (TPs) in production
- **8.1** - average result ranking in Google
- **7.5M** - visits/month – 15% of all traffic to ScienceDirect
- **5.8M** - unique visitors in March = 10% of all Science Direct unique users
- **60%** - Return Visits
- **28%** - Book usage growth YTD
- **48%** - growth in co-usage YTD
- **85%** - users find Topic Pages useful

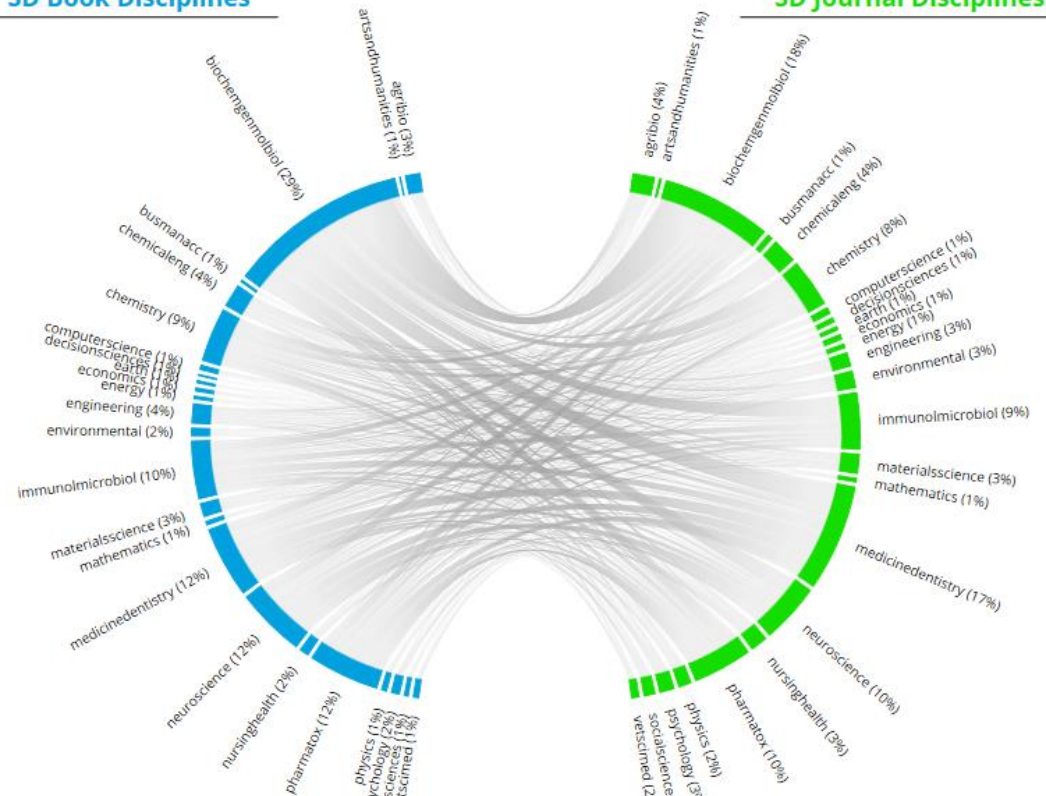
Closing the loop with sales, and editorial

ScienceDirect co-usage visits for books and journals

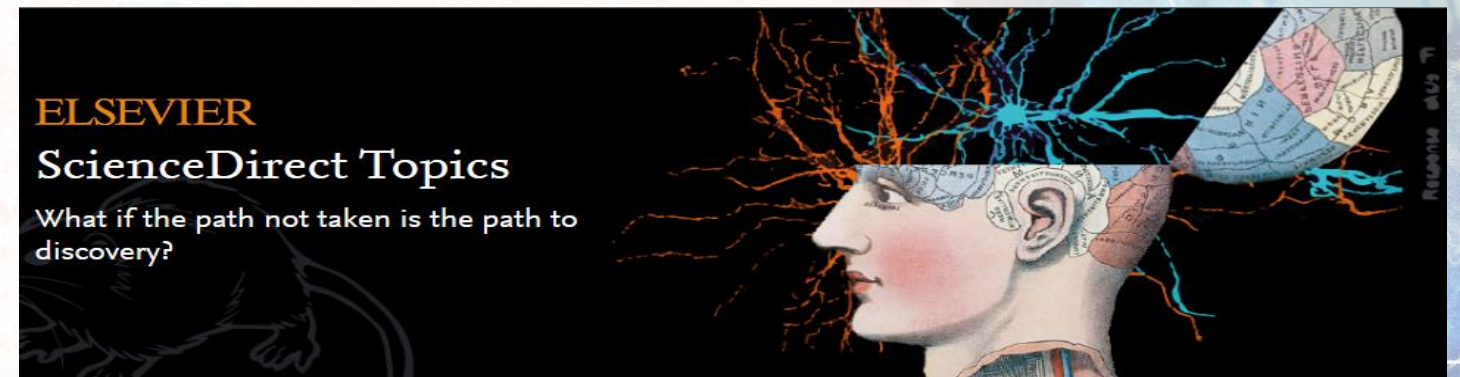
In 32 % of book visits, books are used together with journals (based on visits in the recent three years).

SD Book Disciplines

SD Journal Disciplines

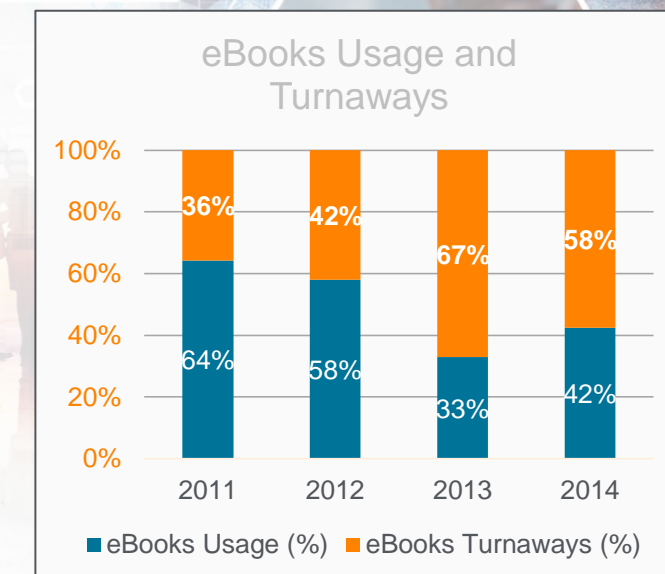
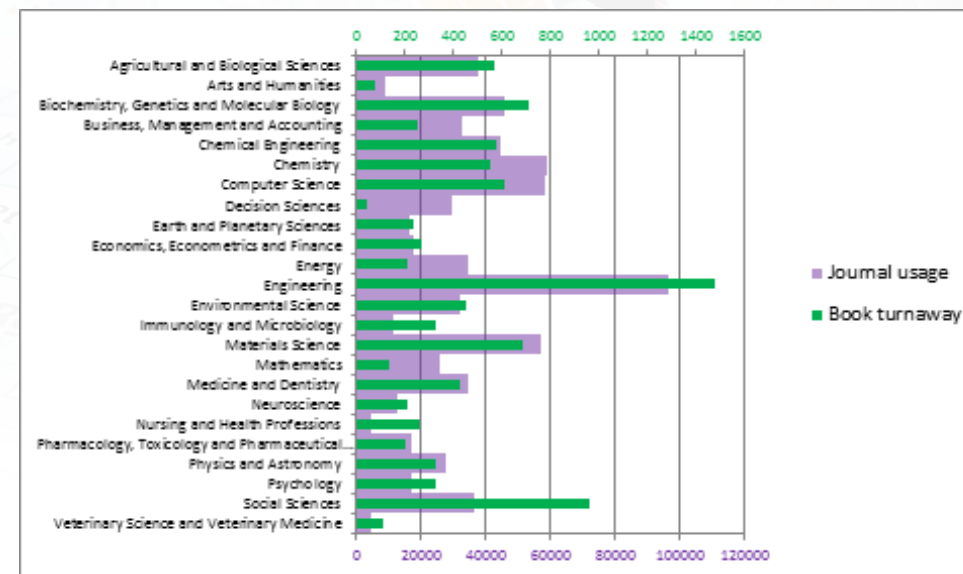
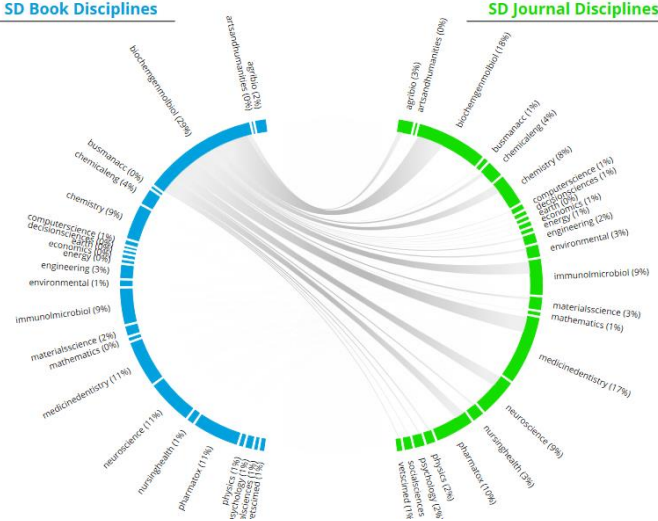


- Developing sales enablement 'value capture' tools: Gap tool, co-usage tool
- Use Topic Pages to enhance the books value proposition
- Usage data to drive commissioning strategy

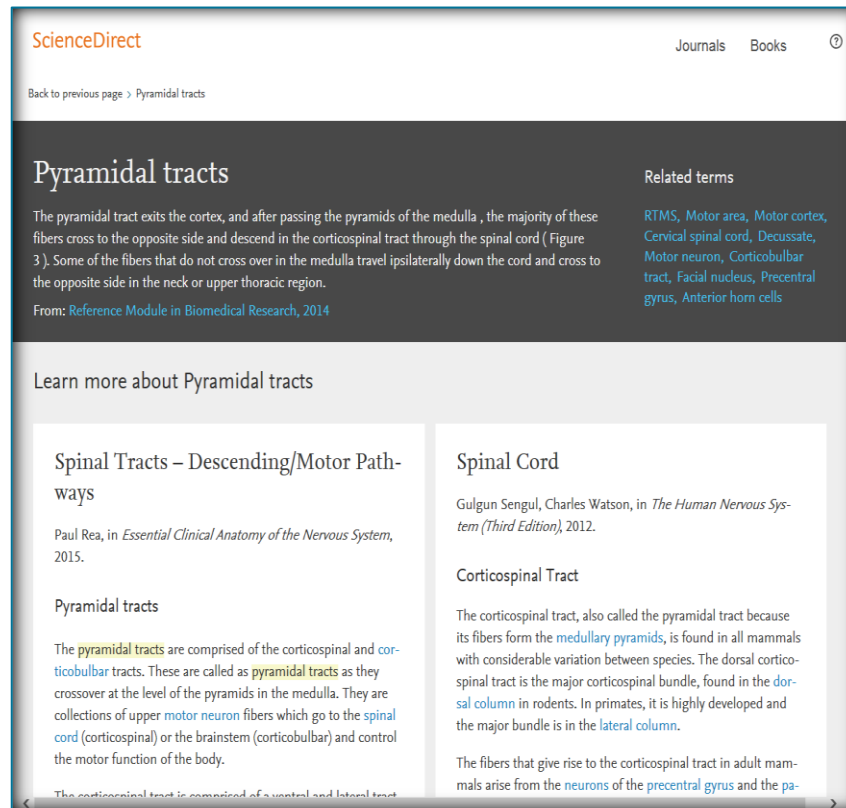


SD Book Disciplines

SD Journal Disciplines



Pull up a Topic Page via Google search



The screenshot shows a ScienceDirect article page for 'Pyramidal tracts'. The page includes a title, a brief description, related terms, and several sub-sections with detailed text and references.

ScienceDirect Journals Books

Back to previous page > Pyramidal tracts

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- pyramidal tracts
- lower motor neuron lesion
- event related potential
- wallerian degeneration
- ammonification
- matric potential

Thank You