

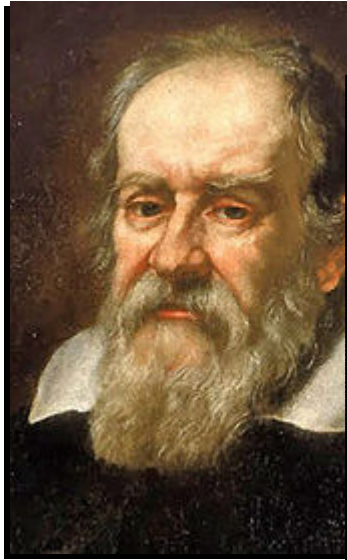


Challenges Facing the STM Industry

Presented By: Martin O'Malley, Elsevier, MD, Corporate Markets

Date: October 19, 2009

Challenges facing the STM community 400 years ago



DISCORSI
E
DIMOSTRAZIONI
MATEMATICHE,

intorno à due nuoue scienze

Attenenti alla

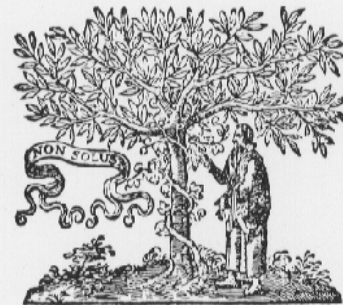
MECANICA & I MOVIMENTI LOCALI,

del Signor

GALILEO GALILEI LINCEO,

Filosofo e Matematico primario del Serenissimo
Grand Duca di Toscana.

Con una Appendice del centro di gravità d'alcuni Solidi.



IN LEIDA,

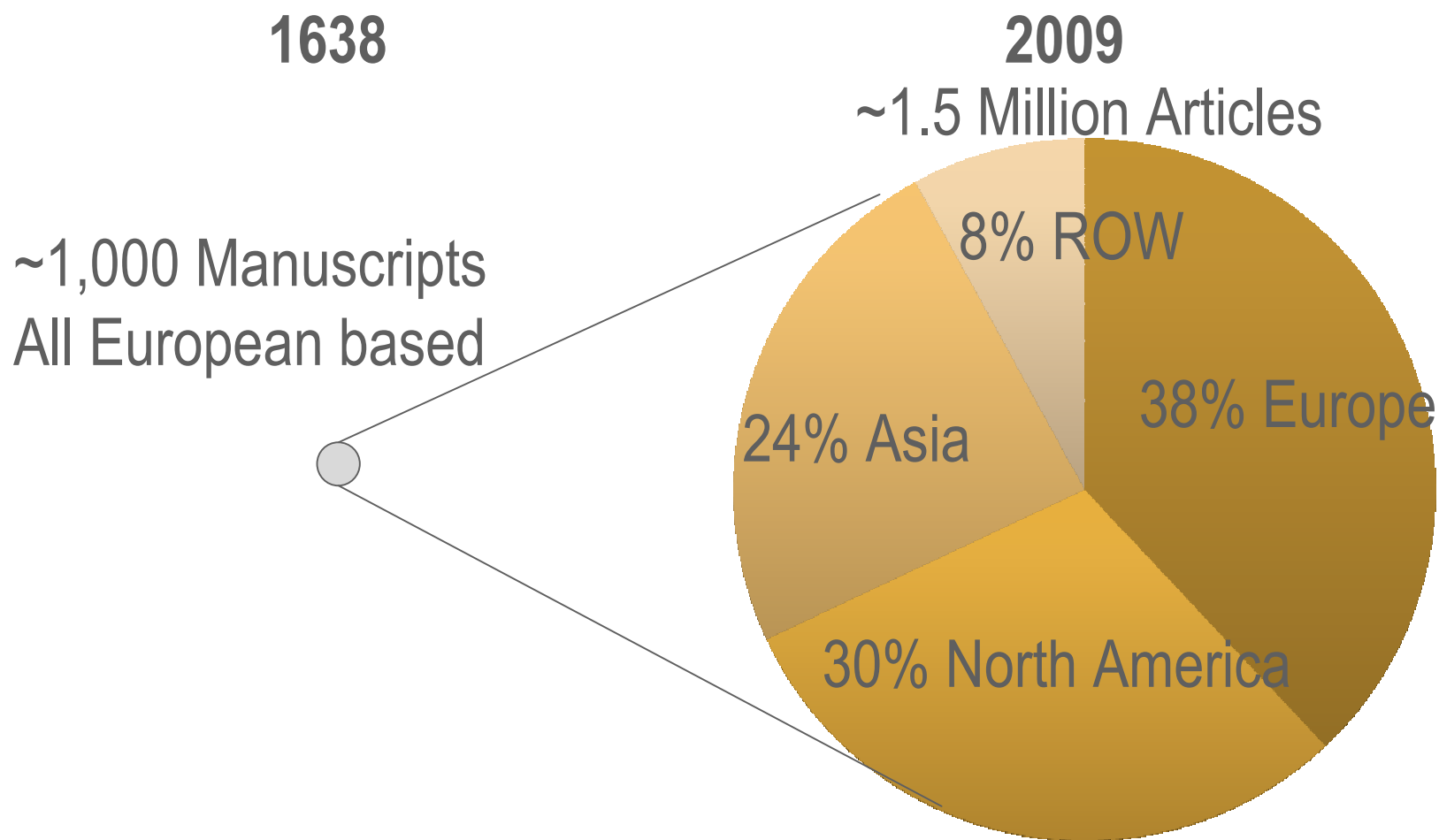
Appresso gli Elsevirii. M. D. C. XXXVIII.

1638, Elzevier published Galileo

Challenges facing Elzevier then

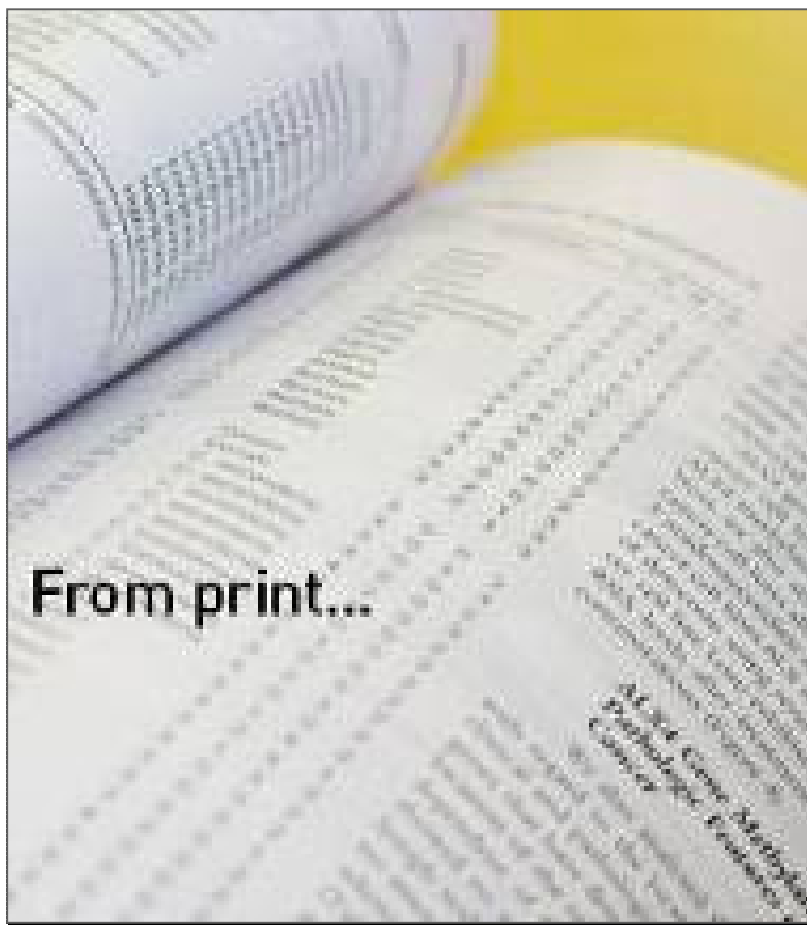
- Identifying and producing **high quality content**
- Operating a **content delivery system**
- **Removing barriers** to information flow

Since the 1600s publishing quantities and sources have changed



Plus...~600BLN web documents - 7M new daily, 1000 new books daily

How content is delivered has changed



And it is changing again



- ~1.5M Kindles expected to be sold this year; sales of ~\$700M

Our competitors have changed



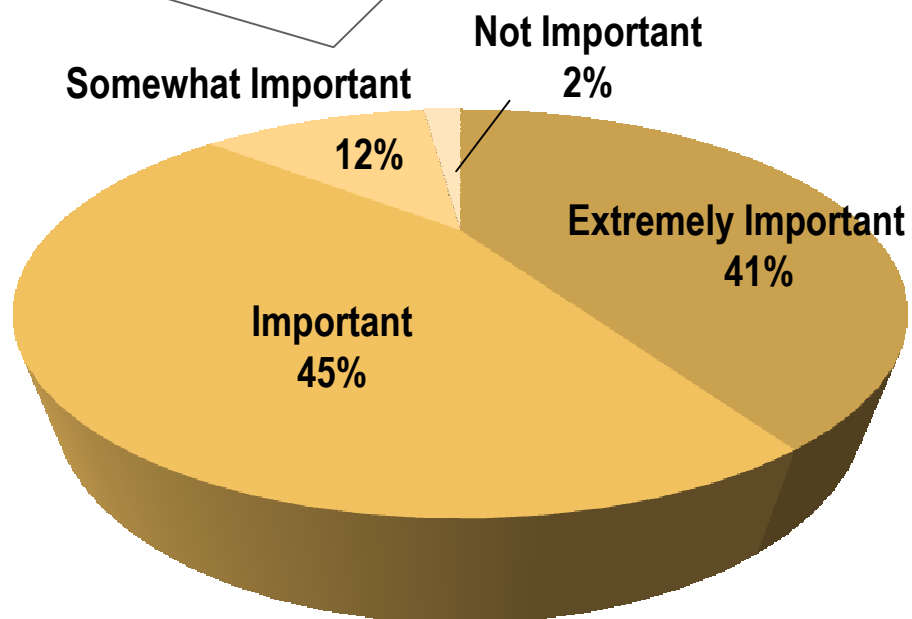
Interaction with content has changed



- 65 million mobile users interact on facebook

The value of information has likely changed

86% of researchers believe premium STM information is “Extremely Important or Important”



* Source: *The Accountability Of ScienceDirect: Users' Perspectives* " Martin Akel & Associates, 2008

The need for information has affected user behavior



Knowledge workers spend **nearly half of their week** on information retrieval and management

* Source: 2007/2008 surveys of 6,300 knowledge workers, Outsell, Inc.

And this has impacted business



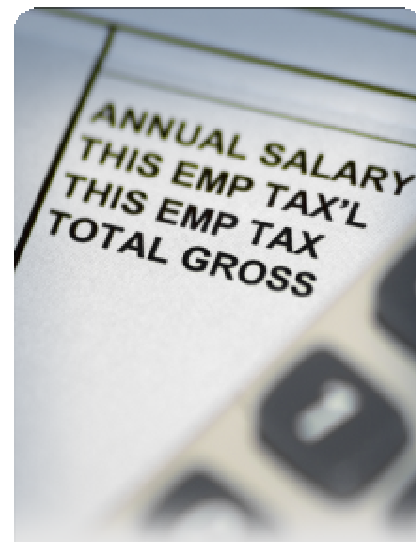
100 people
on staff



9.5 hours a week
per person searching



Working
50 weeks / year



Making \$40 an hour
(\$80,000 a year base)

Approximately **\$2,000,000** in hidden search costs per year

And you?

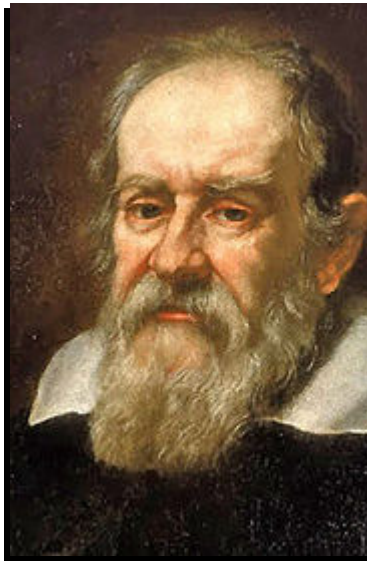


Well you've probably changed too

Compared to 2000

- You are **twice as likely** to book travel online
- You are **four times** as likely to bank online
- You are 50% more likely to be online
- In fact... some of you are probably online right now...?

But have STM challenges changed?



Amid relentless change key challenges remain

- Identifying and producing **high quality content**
- Operating a world class **content delivery system**
- **Removing barriers to information flow**

Keys to identifying and producing **high quality content**

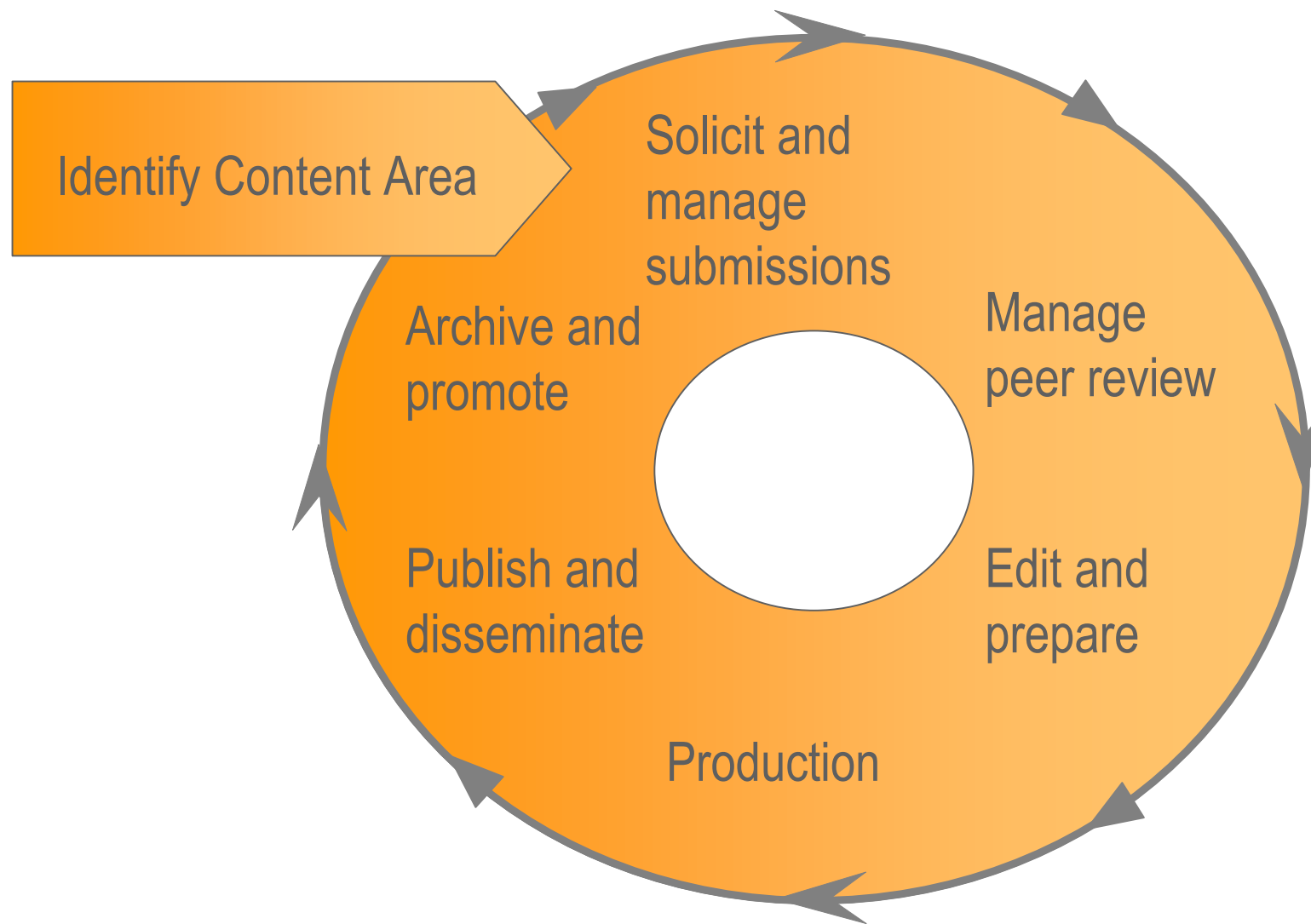
1. Staying close to the research community
2. Maintaining quality assurance
3. Continually improving identification & production processes

Identifying content to promote requires true engagement with research communities



- Engaged editorial boards
- High community visibility & leadership
- High standards of peer review

From identification through promotion, the STM industry is involved in sustaining a large and intricate process



Evolution is critical: Organizations, companies and products are testing new ways to identify high quality content



PLoS One introduce method peer review, solicits users commentary

Mendeley and Connotea provides tools for article tagging and sharing

Jove Identifies high quality video 'articles'

Organize, share and discover research papers

Like iTunes™ for research papers. Mendeley is a free research management tool for desktop & web.

Share papers cite & create bibliographies
in Word & OpenOffice collaborate
search & annotate PDFs sync across PCs

Evolving to always identify and produce high quality content remains a constant STM challenge.

Keys to operating world class **content delivery**

1. Derived from trusted knowledge sources
2. Delivering to the needs of the user
3. Delivering content within a user's context

Trusted content forms the foundation of databases, tools and applications



Meta-data
extracted (e.g.
authors, title)

Abstract content

Contents lists available at ScienceDirect
Tetrahedron Letters
journal homepage: www.elsevier.com/locate/tetlet

Concise synthesis of the xenibellols core

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Received 22 August 2009
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ABSTRACT
We describe herein a concise synthesis of an intermediate, via 2,3-Wittig rearrangement and Williamson etherification, en route to the natural products, xenibellols A and B.
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In 2005, Duh and co-workers reported the isolation of two novel diterpenoids, xenibellols A (1) and B (2) from the Formosan soft coral *Xenia umbellata* of Green Island, Taiwan¹ (Fig. 1). These natural products were found to exhibit cytotoxicity against P-388 cell with ED₅₀ levels of 3.6 (1) and 2.8 μg/mL (2). In the same year, Xenibellol A (1) was separately isolated from *Xenia florida* samples collected in Taiwan by Shen et al., who assigned it the name xeniolactone A (1).² The researchers found 1 to exhibit mild cytotoxicity against human colon adenocarcinoma (WiDr) and medullocarcinoma (Daoy) tumor cells at 13.6 and 15.3 μg/mL, respectively. The key structural features of the xenibellols include an unusual oxolane linkage between C₈ and C₁₁ in the context of a bicyclo[4.3.0]nonane skeleton, in conjunction with a conjugated (E,E)-dienol moiety. The dialdehyde motif of xenibellol B (2) has been suggested as the precursor to the lactone ring of xenibellol A (1). The gross structure of the xenibellols was elucidated by the analysis of one- and two-dimensional NMR spectroscopy, including COSY, HMQC, and HMBC experimentation. The assignments of the relative stereochemical relationships of 1 and 2 rest on a combination of NOESY correlations and comparison of their spectroscopic data to those of the xenia diterpenes. The absolute stereochemistries of the xenibellols have not yet been established.

We sought to undertake a program directed toward the synthesis of the xenibellols primarily due to their interesting structural features. We report herein a concise synthesis of the common xenibellol core, 7.

Using the logic of pattern recognition³ to guide retrosynthetic analysis,⁴ one could discern a cis-fused hydrindane matrix, with the caveat that the bridgehead is further engaged in a tetrahydrofuran motif. The pattern analysis soon leads one back to the Hajos-Parrish ketone (3),⁵ with its rich and informing history. For the case at hand, we envisioned, as outlined in Scheme 1, that key intermediate 5 could be derived from the Hajos-Parrish ketone.⁵ Under appropriate conditions, it was hoped that 5 would

undergo 2,3-Wittig rearrangement to afford 6, possessing the quaternary bridgehead carbon. We expected that 6 could be converted to the target compound, 7, through a short sequence featuring a Williamson etherification.

The synthesis of proposed intermediate 5 commenced with selective LiAl(O-t-Bu)₃H-mediated reduction of the Hajos-Parrish ketone (3). Silyl protection of the resultant secondary alcohol furnished the α,β-unsaturated ketone 4 in good yield and selectivity.⁶ Elongation of the carbon chain was accomplished through the treatment of 4 with methyl magnesium carbonate,⁶ and the global reduction of the corresponding keto-acid with LAH provided the desired diol, 9. Following protection of the primary alcohol, the 2,3-Wittig rearrangement precursor 5 was obtained through reaction of the secondary alcohol, 10, with nBu₃SnCH₂I (Scheme 2).⁷

Figure 1. Xenibellols A and B.

Scheme 1. Synthetic strategy toward 7.

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doi:10.1016/j.tetlet.2009.08.131

Primary Content:
Full Text Article
(patent, book, other)

Semantically Indexed
Content

Machine-Aided
Human Indexing

Manually Indexed
Content

Content delivery needs to be user centric



Cell | Browse Issues | Search | Share / Save

May 2, 2008 - Volume 133, Issue 3

A Dynamic Pathway for Calcium-Independent Activation of CaMKII by Methionine Oxidation

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Abstract | Introduction | Results | Discussion | Figures (8+) | References (47) | Authors | Comments (3)

Article Highlights

- Oxidation of methionine residues activates CaMKII
- Angiotensin II induces CaMKII oxidation leading to cardiomyocyte death
- CaMKII methionine oxidation is reversed by MsrA
- Elevated CaMKII oxidation impairs heart function and worsens ischemic injury

Author Interview

ABSTRACT

Calcium/calmodulin (Ca²⁺/CaM)-dependent protein kinase II (CaMKII) couples increased intracellular Ca²⁺ to fundamental responses in excitable cells. CaMKII was identified over 20 years ago by activation dependence on Ca²⁺/CaM, but recent evidence shows that CaMKII is also activated under non-Ca²⁺/CaM conditions. Here, we show that the catalytic domain methionine residues are oxidized in the absence of Ca²⁺/CaM. CaMKII is activated by angiotensin II (AngII)-induced oxidation, leading to apoptosis in cardiomyocytes both in vitro and in vivo. CaMKII oxidation is reversed by methionine sulfoxide reductase A (MsrA), and MsrA^{-/-} mice show exaggerated CaMKII oxidation and myocardial apoptosis, impaired cardiac function, and increased mortality after myocardial infarction.

Myocardial infarction

Ion channel activation

H₂O₂

CaMKII activation

Apoptosis

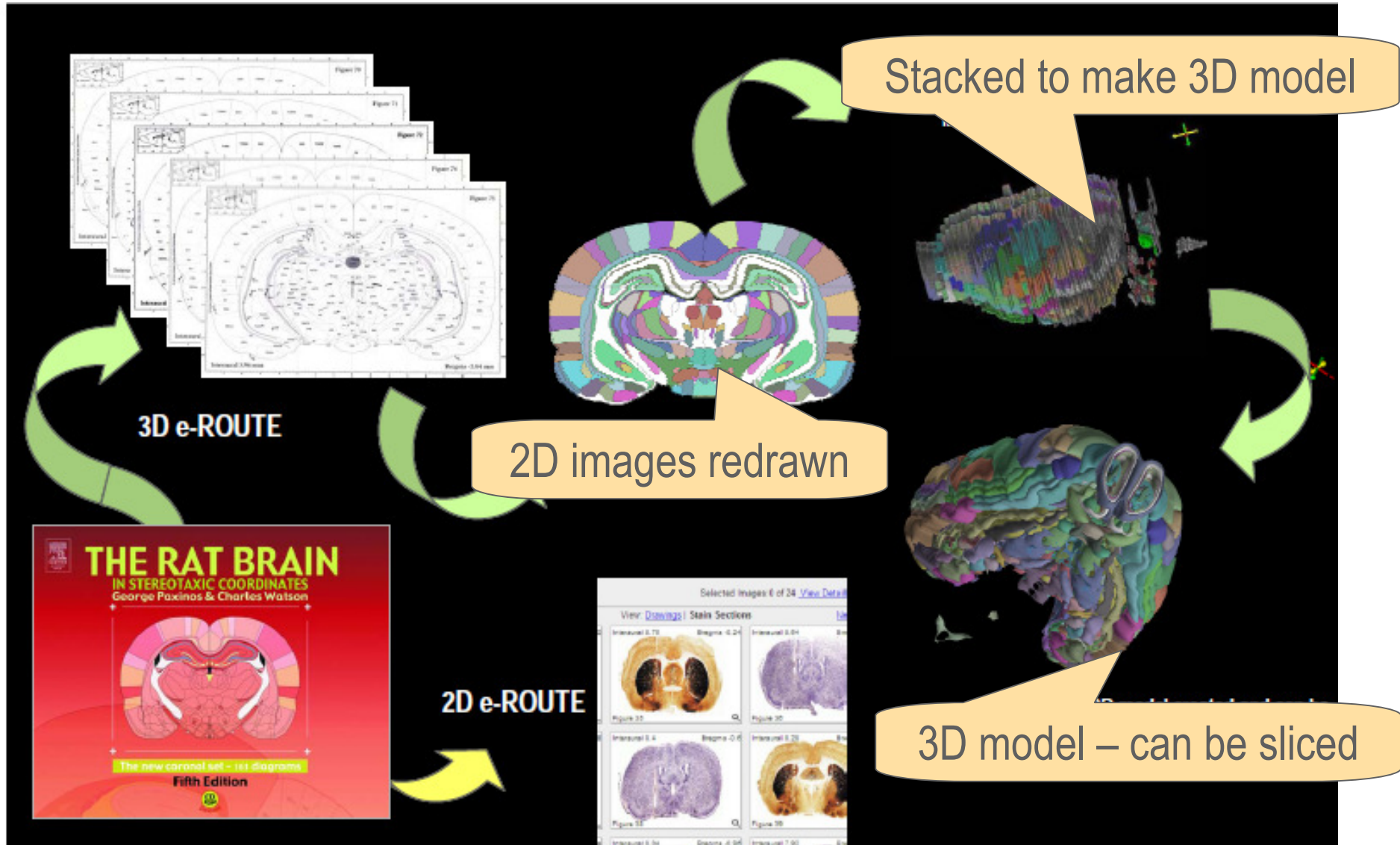
Gene transcription

Tabbed Navigation

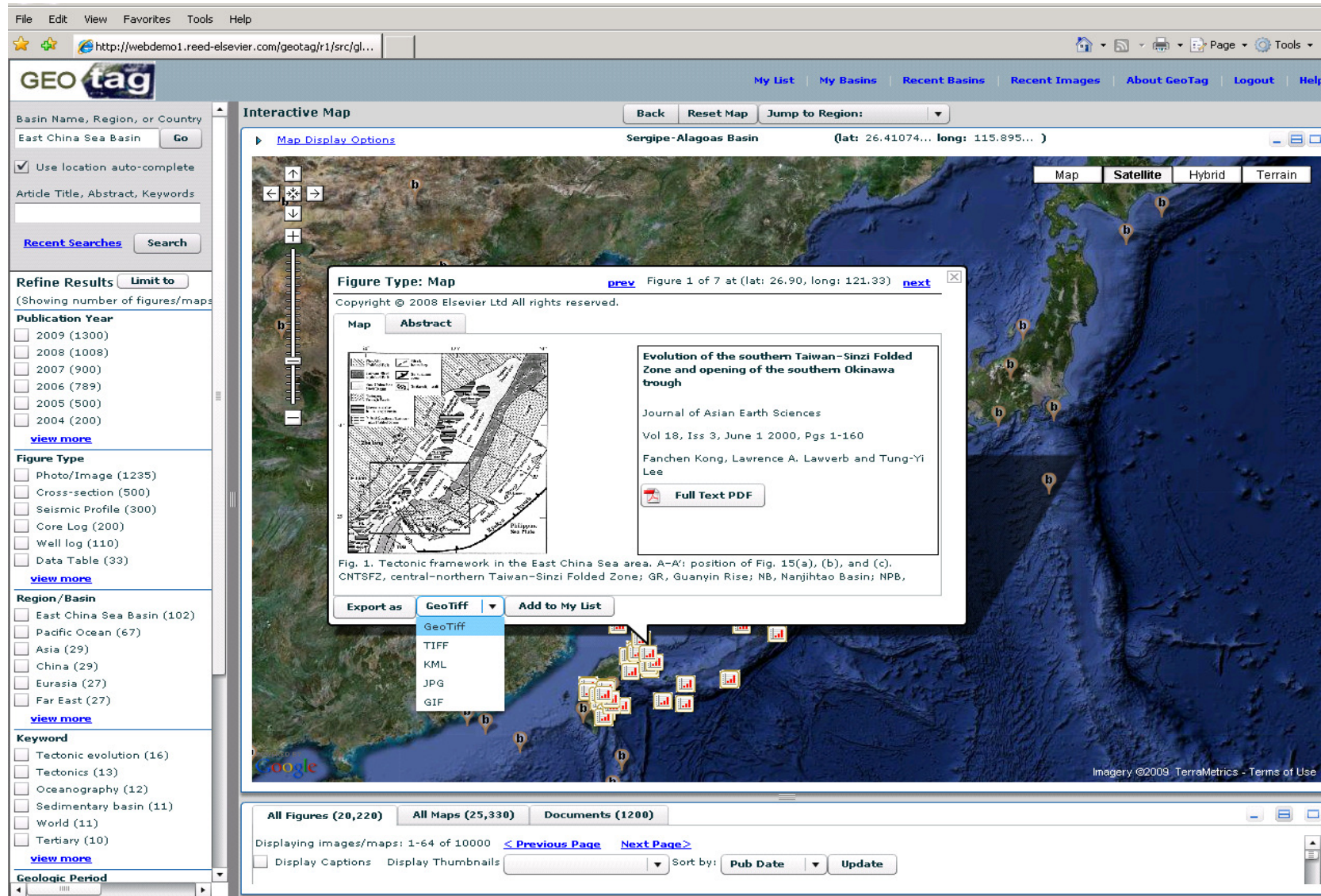
Graphical Abstract

Audio / Video

It should be intuitive and interactive...



...and customized to a community or individual's workflow needs



The screenshot displays the GEOtag web application interface. The browser address bar shows the URL: <http://webdemo1.reed-elsevier.com/geotag/r1/src/gl...>. The application header includes the GEOtag logo and navigation links: My List, My Basins, Recent Basins, Recent Images, About GeoTag, Logout, and Help.

Search and Refinement Panel:

- Basin Name, Region, or Country: East China Sea Basin (Go)
- Use location auto-complete:
- Article Title, Abstract, Keywords: [Input field]
- Recent Searches: [List]
- Search: [Button]
- Refine Results: Limit to [Dropdown]
- Publication Year: 2009 (1300), 2008 (1008), 2007 (900), 2006 (789), 2005 (500), 2004 (200) (view more)
- Figure Type: Photo/Image (1235), Cross-section (500), Seismic Profile (300), Core Log (200), Well log (110), Data Table (33) (view more)
- Region/Basin: East China Sea Basin (102), Pacific Ocean (67), Asia (29), China (29), Eurasia (27), Far East (27) (view more)
- Keyword: Tectonic evolution (16), Tectonics (13), Oceanography (12), Sedimentary basin (11), World (11), Tertiary (10) (view more)
- Geologic Period: [Dropdown]

Interactive Map:

- Map Display Options: Sergipe-Alagoas Basin (lat: 26.41074... long: 115.895...)
- Map, Satellite, Hybrid, Terrain: [Buttons]
- Map navigation controls: [Zoom in/out, Home, Full Screen]
- Map showing the East China Sea area with various basins and tectonic features marked with 'b'.

Figure Preview Window:

- Figure Type: Map (prev, next)
- Copyright © 2008 Elsevier Ltd All rights reserved.
- Map | Abstract: [Buttons]
- Evolution of the southern Taiwan-Sinzi Folded Zone and opening of the southern Okinawa trough**
- Journal of Asian Earth Sciences
- Vol 18, Iss 3, June 1 2000, Pgs 1-160
- Fanchen Kong, Lawrence A. Lawver and Tung-Yi Lee
- Full Text PDF: [Button]
- Export as: GeoTiff (selected), TIFF, KML, JPG, GIF
- Add to My List: [Button]
- Caption: Fig. 1. Tectonic framework in the East China Sea area. A-A': position of Fig. 15(a), (b), and (c). CNTSFZ, central-northern Taiwan-Sinzi Folded Zone; GR, Guanyin Rise; NB, Nanjihitao Basin; NPB,

Bottom Panel:

- All Figures (20,220) | All Maps (25,330) | Documents (1200)
- Displaying images/maps: 1-64 of 10000 (< Previous Page, Next Page >)
- Display Captions: | Display Thumbnails: | Sort by: Pub Date | Update

STM challenges in removing barriers to information flow



1. Creating infrastructure

2. Building partnerships

3. Ensuring sustainability

For the free web an information infrastructure is being built



ELSEVIER

The screenshot shows the ProgrammableWeb website interface. At the top, there's a navigation bar with links like 'Sign up/Sign In', 'Add a Link', 'Subscribe', 'Tag Cloud', 'Google Custom Search', 'Advertise on PW', 'Contact Us', 'Press', 'About', and 'FAQ'. Below this is a banner for ProgrammableWeb with the tagline 'APIs? Partners? Developers? Like the missing piece to your puzzle. We connect them.' and a Mashery logo. The main content area is titled 'Web 2.0 API Directory' and includes a search bar, sorting options (Name, Date, Popularity, Category), and a table of APIs. The table lists various APIs such as Google Maps, Flickr, YouTube, Amazon eCommerce, Microsoft Virtual Earth, eBay, Yahoo Maps, del.icio.us, 411Sync, Google Search, Yahoo Search, Twitter, and Yahoo Geocoding, along with their descriptions, categories, and Mashup counts. On the right side, there are several sponsored advertisements for SnapLogic, Dada.net, openkapow, IBM Mashup Center, and APIs from Orange.

API	Description	Category	Mashups
Google Maps	Mapping services	Mapping	1550
Flickr	Photo sharing service	Photos	388
YouTube	Video sharing and search	Video	328
Amazon eCommerce	Online retailer	Shopping	267
Microsoft Virtual Earth	Mapping services	Mapping	160
eBay	Online auction marketplace	Shopping	155
Yahoo Maps	Mapping services	Mapping	122
del.icio.us	Social bookmarking	Bookmarks	121
411Sync	SMS, WAP, and email messaging	Messaging	120
Google Search	Search services	Search	118
Yahoo Search	Search services	Search	115
Twitter	Community site	Community	95
Yahoo Geocoding	Geocoding services	Mapping	82

• Ebay serves 5 Billion API calls a month

Through APIs interoperability is enabled



The screenshot shows the MySpace website interface. At the top, there is a navigation bar with links: Home, Browse People, Find Friends, Local, Music, Video, Games, More, Log In, and Sign Up. The main content area features the MySpace logo on the left and the Twitter logo on the right, connected by a double-headed blue arrow. Below this, the text reads "Sync your status automatically!" with a yellow "Sync Now" button to the right. A "*BETA" label is positioned to the left of the main text. Below the main content, there are two sidebars. The left sidebar is titled "Get Started" and contains a section "Syncing up is easy..." with three numbered steps: 1. Go to the Sync tab within My Account. 2. Set up the desired services that you would like to sync with MySpace. Right now you can sync with Twitter...more networks coming soon. 3. Click Confirm and you're all set. Below the steps, it says: "Once you've synced your account, simply update your status on MySpace as you normally would (from your Home page, Status and Mood page, or mobile phone). When you update". The right sidebar is titled "New to MySpace?" and contains a section "Why Sign Up for MySpace?" with three bullet points: "Stay in touch with friends & family", "Share your photos, albums & videos", and "Find old classmates & co-workers". It also includes a smiley face icon and the text "It's FREE!". At the bottom of the right sidebar, there is a "Sign up now" link. A "Did You Know?" section is partially visible at the bottom of the page.

- **By linking applications through APIs it is possible to query across applications in real time**

And partnerships provide the potential for symbiotic growth



Facebook Platform

- Deep Integration**: Illustration of a 3D box and a computer monitor connected by dotted lines.
- Mass Distribution**: Illustration of a 3D box surrounded by a network of nodes and lines.
- New Opportunity**: Illustration of a 3D bar chart with an upward-pointing arrow.

salesforce.com | Community | Developer Force Choose Your Language

appexchange salesforce.com

Home **Apps** Getting Started | Publishing Login or Register

Find Apps

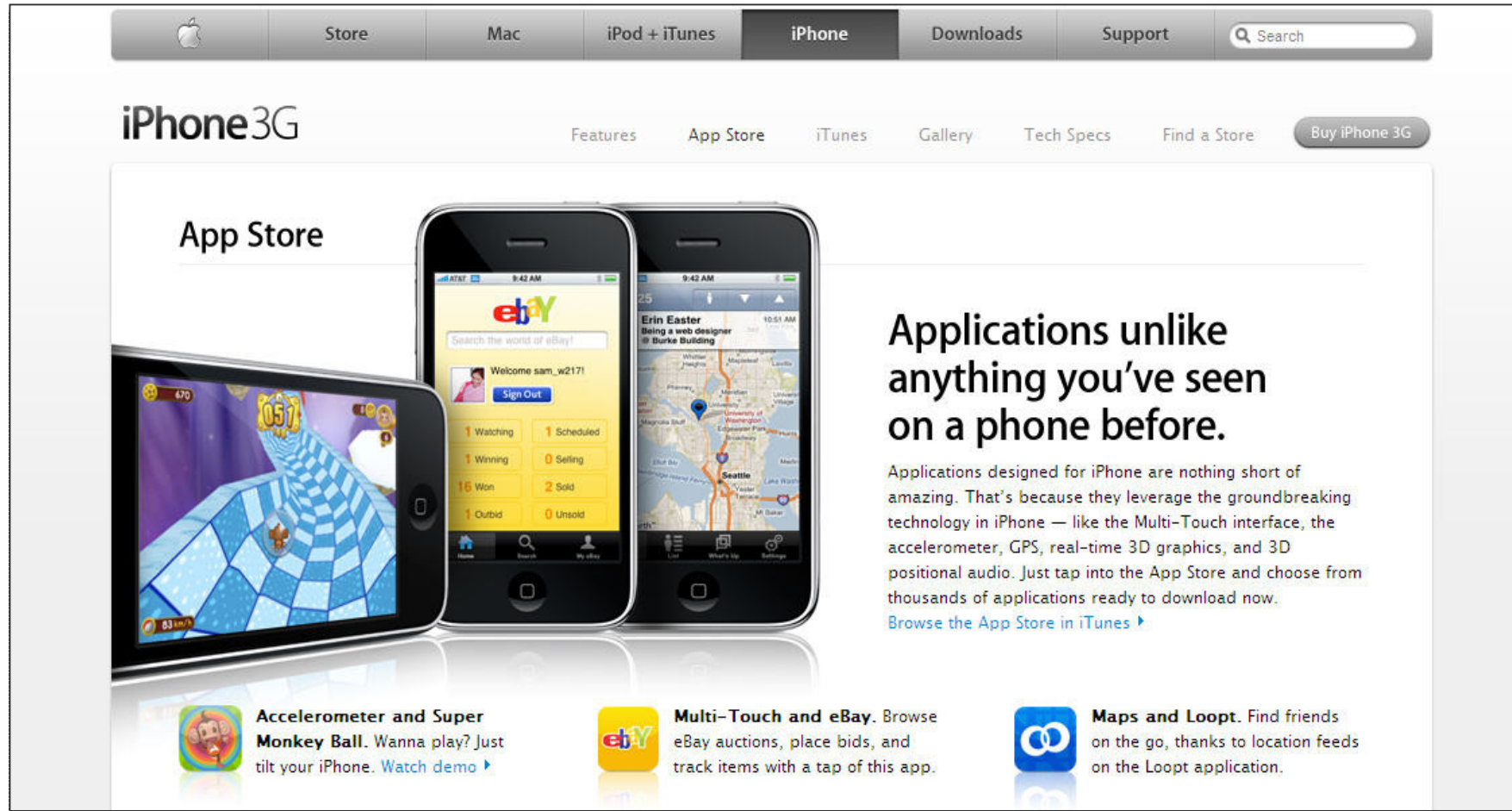
AppExchange has **806 apps** and counting to meet all your business needs including and beyond CRM.

Select any of the categories or subcategories below to find the apps you need. You will be able to further filter your results later.

Key Attributes	Type of App	Industry Solutions
Free (312)	Applications (90)	Communications (14)

Your Saved List
See apps you've saved and compare them side-by-side

Companies, like Apple, have engaged a community in its own development



The screenshot shows the Apple website's iPhone 3G section. At the top, there's a navigation bar with links for Store, Mac, iPod + iTunes, iPhone, Downloads, and Support, along with a search bar. Below this, the 'iPhone 3G' title is followed by links for Features, App Store, iTunes, Gallery, Tech Specs, and Find a Store, and a 'Buy iPhone 3G' button. The main content area is titled 'App Store' and features three iPhones displaying different apps: Super Monkey Ball, eBay, and Loopt. To the right of the phones, a headline reads 'Applications unlike anything you've seen on a phone before.' Below this, a paragraph describes the capabilities of iPhone apps, mentioning Multi-Touch, accelerometer, GPS, and 3D graphics. A link 'Browse the App Store in iTunes' is provided. At the bottom, three app-specific descriptions are shown: 'Accelerometer and Super Monkey Ball', 'Multi-Touch and eBay', and 'Maps and Loopt'.

App Store

Applications unlike anything you've seen on a phone before.

Applications designed for iPhone are nothing short of amazing. That's because they leverage the groundbreaking technology in iPhone — like the Multi-Touch interface, the accelerometer, GPS, real-time 3D graphics, and 3D positional audio. Just tap into the App Store and choose from thousands of applications ready to download now.

[Browse the App Store in iTunes](#)

Accelerometer and Super Monkey Ball. Wanna play? Just tilt your iPhone. [Watch demo](#)

Multi-Touch and eBay. Browse eBay auctions, place bids, and track items with a tap of this app.

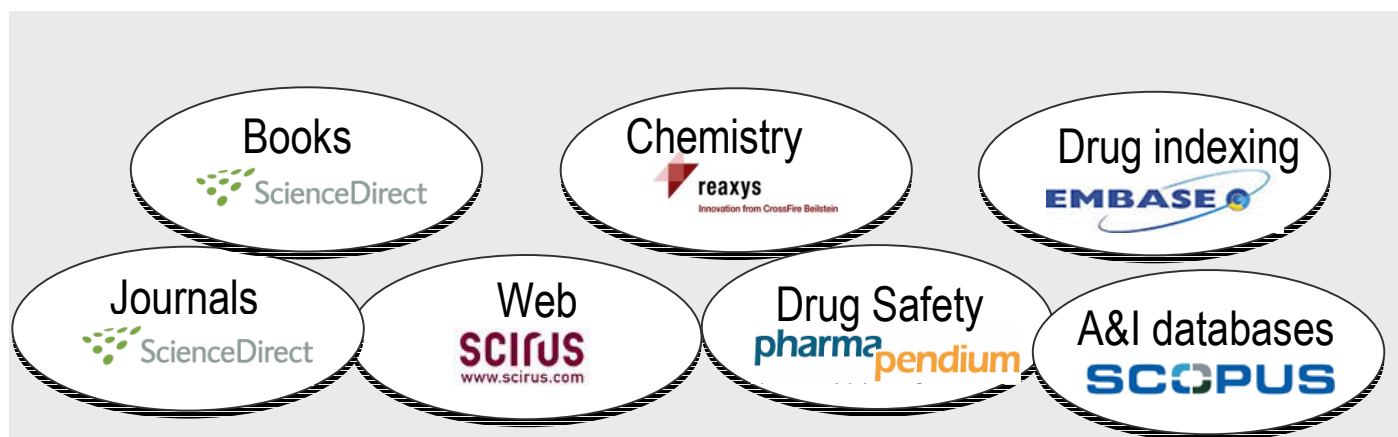
Maps and Loopt. Find friends on the go, thanks to location feeds on the Loopt application.

- 85,000 Applications
- Over 2,000,000,000 downloads

Elsevier wants to play a key role in removing barriers

Content & Delivery

Communities



- We **publish over 2,000 journals**
- We index over **14,000 STM journals** and large numbers of patents
- We extract **millions of facts** from the published literature to serve a range of communities
- We index over **350 million science related documents** on the web



Life Sciences



Chemistry



Physical Sciences

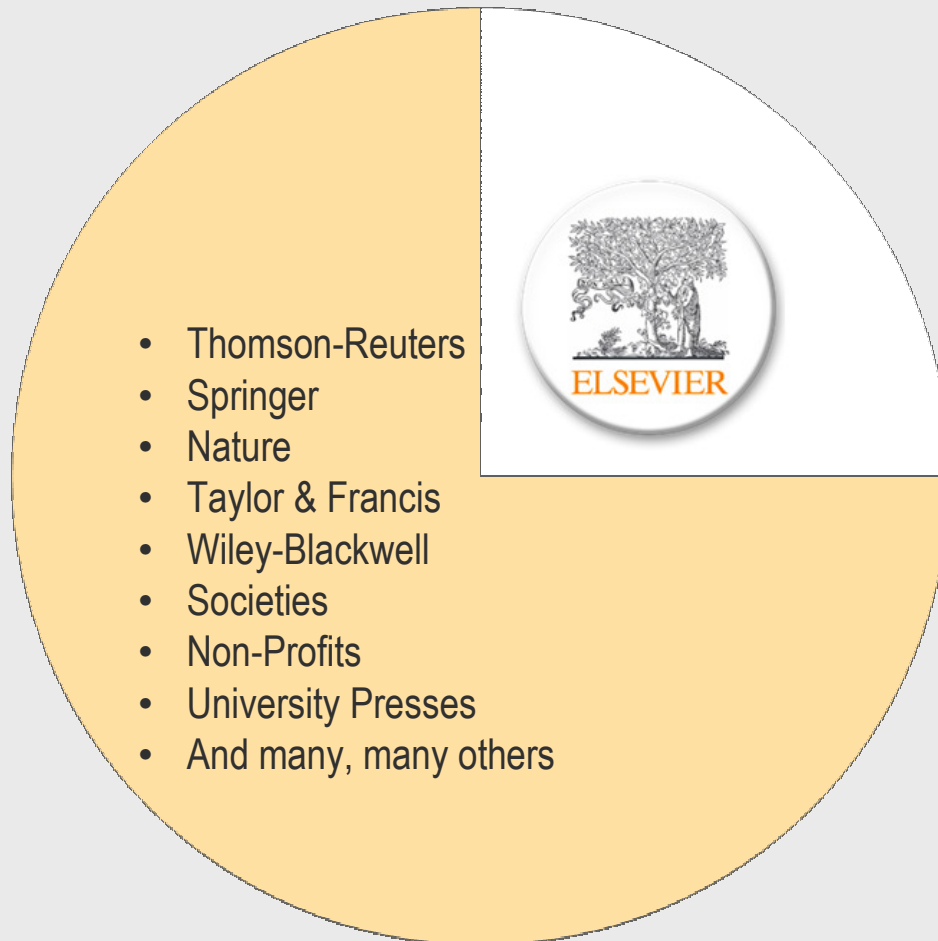


Other disciplines

But we are also only just part of the industry



Content & Delivery



Communities



Life Sciences



Chemistry



Physical Sciences



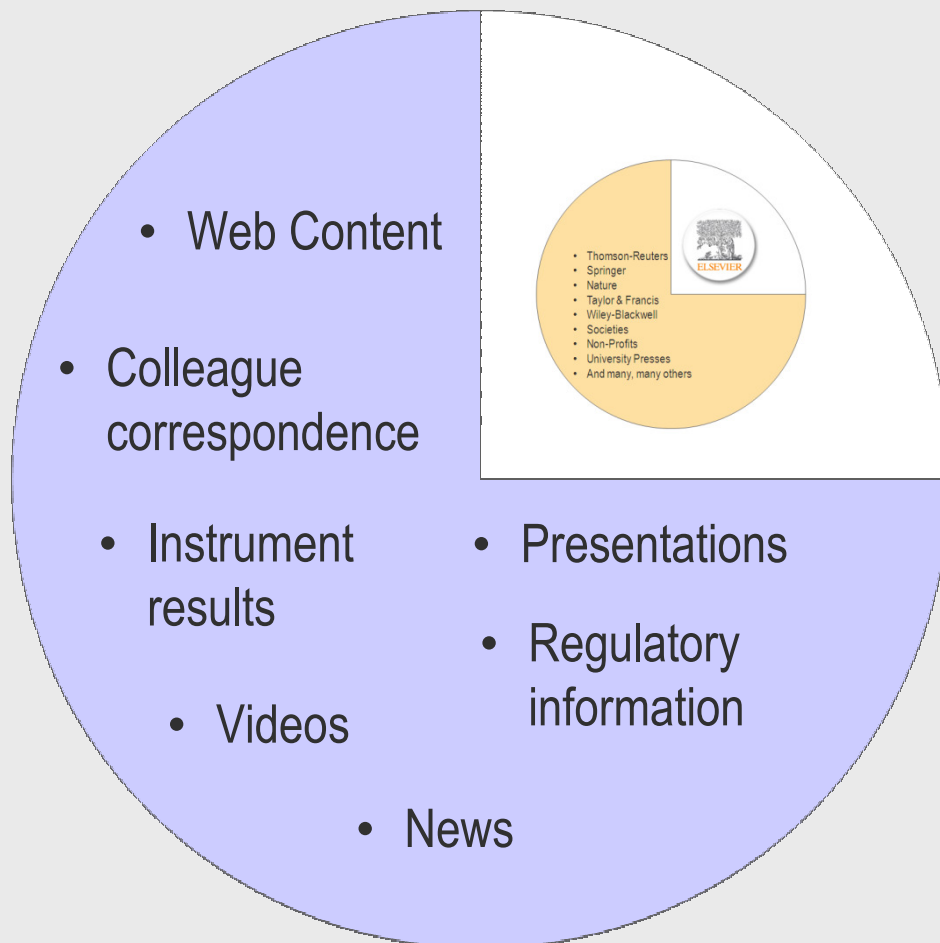
Other disciplines

And all of us, are just a fraction of the content and media that our communities turn to for their information needs



Content & Delivery

Communities



Life Sciences



Chemistry

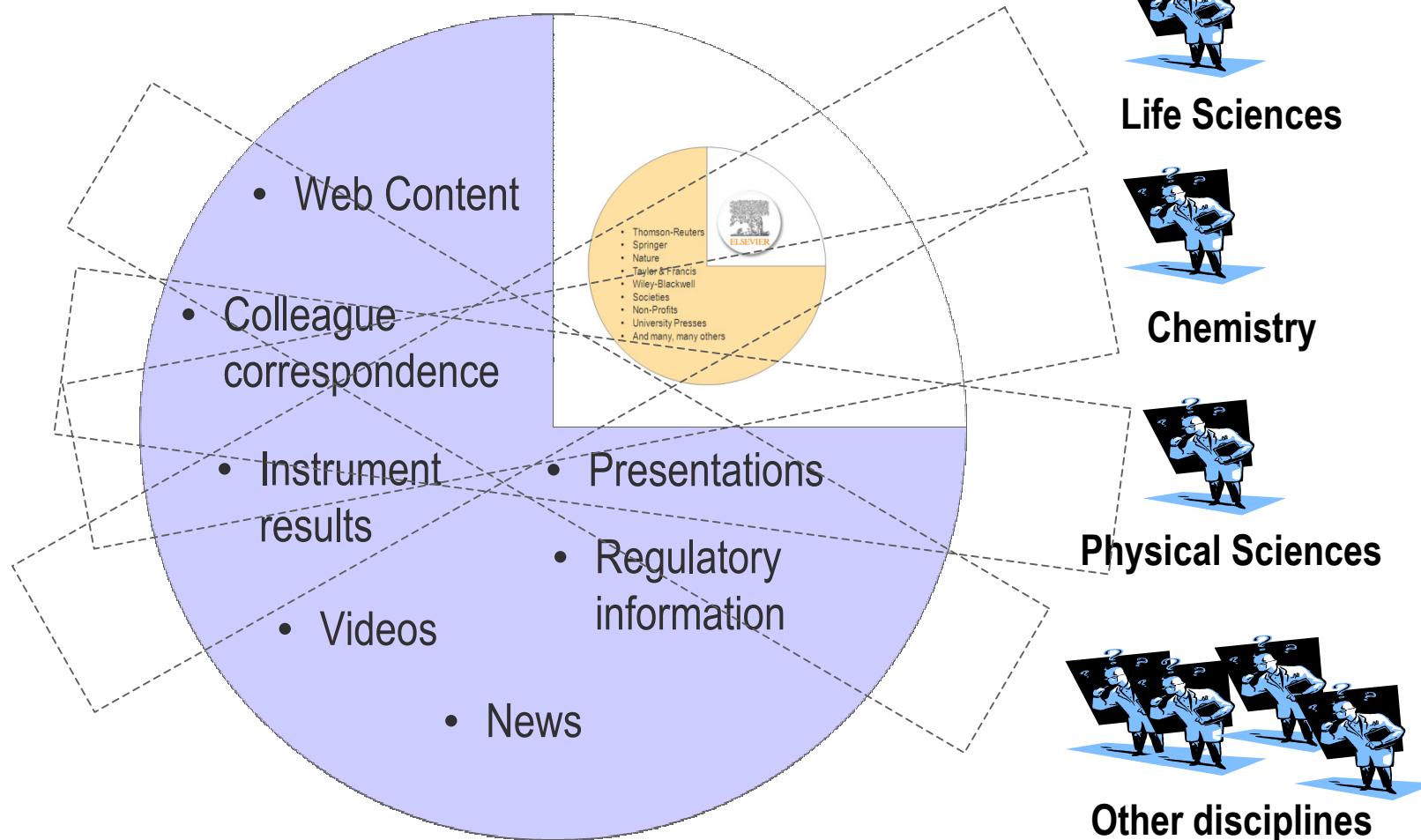


Physical Sciences



Other disciplines

Users want to have their own “lenses” to view all relevant content



- Provided users trust the content, they are source agnostic
- They do not want to be impeded by barriers to information flow

Elsevier intends to play a leadership role



- ✓ 1. Creating infrastructure
 - *APIs, taxonomies, nomenclatures,..*

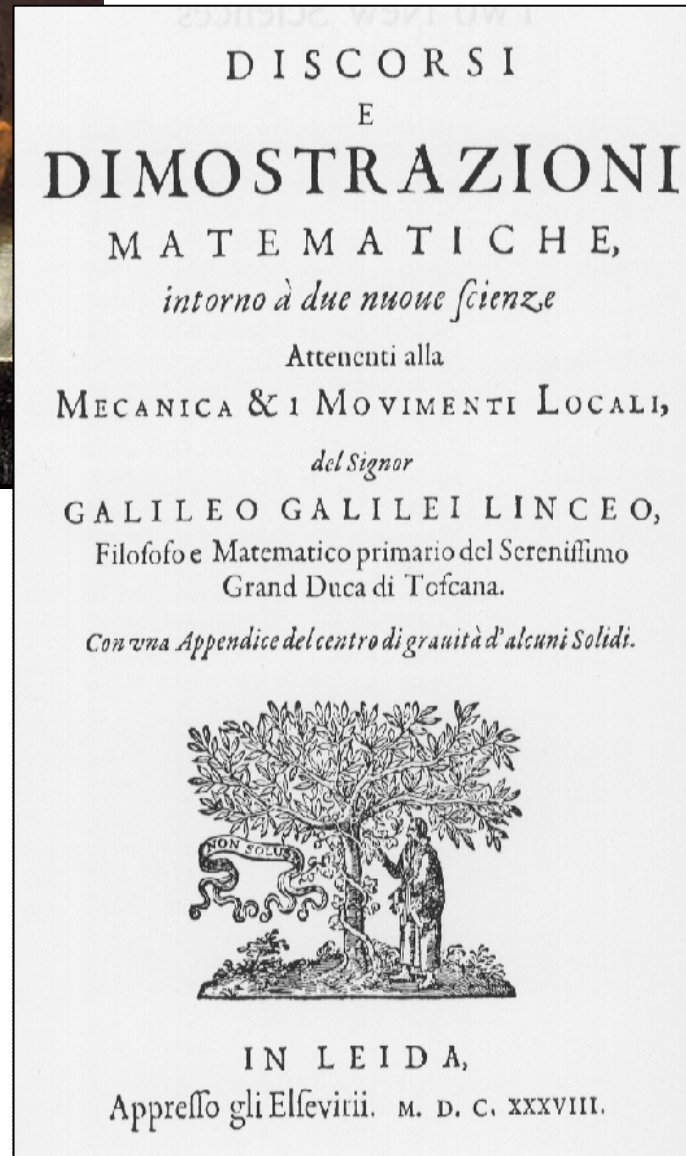
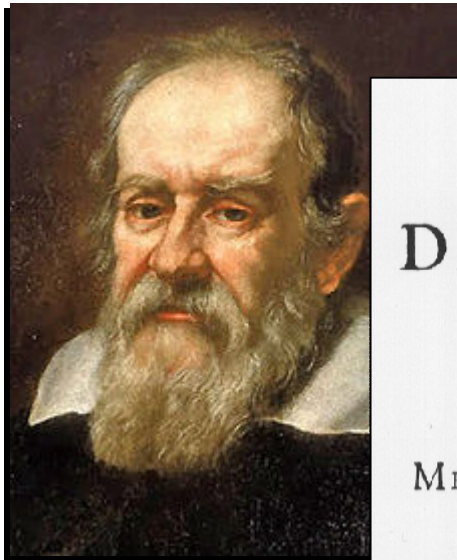
- ✓ 2. Building partnerships
 - *Netbase, Nextbio, ...*

- ✓ 3. Ensuring sustainability
 - *Science, Commercial viability*

Openness is imperative

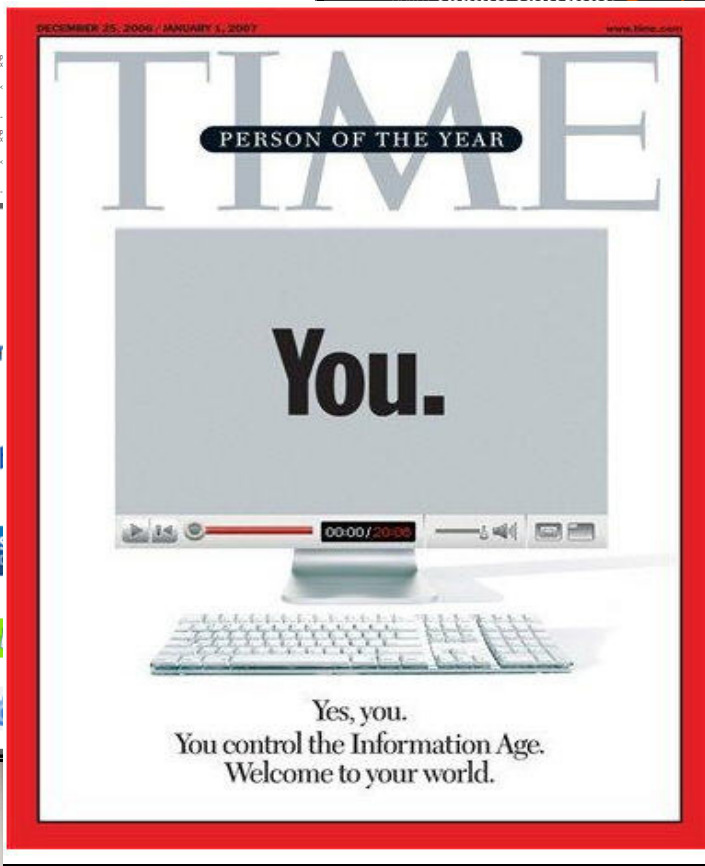


Over 400 years, key challenges stand the test of time



- Identifying and producing **high quality content**
- Operating a world class **content delivery system**
- **Removing barriers to information flow**

We just need to execute in a world that has fundamentally changed



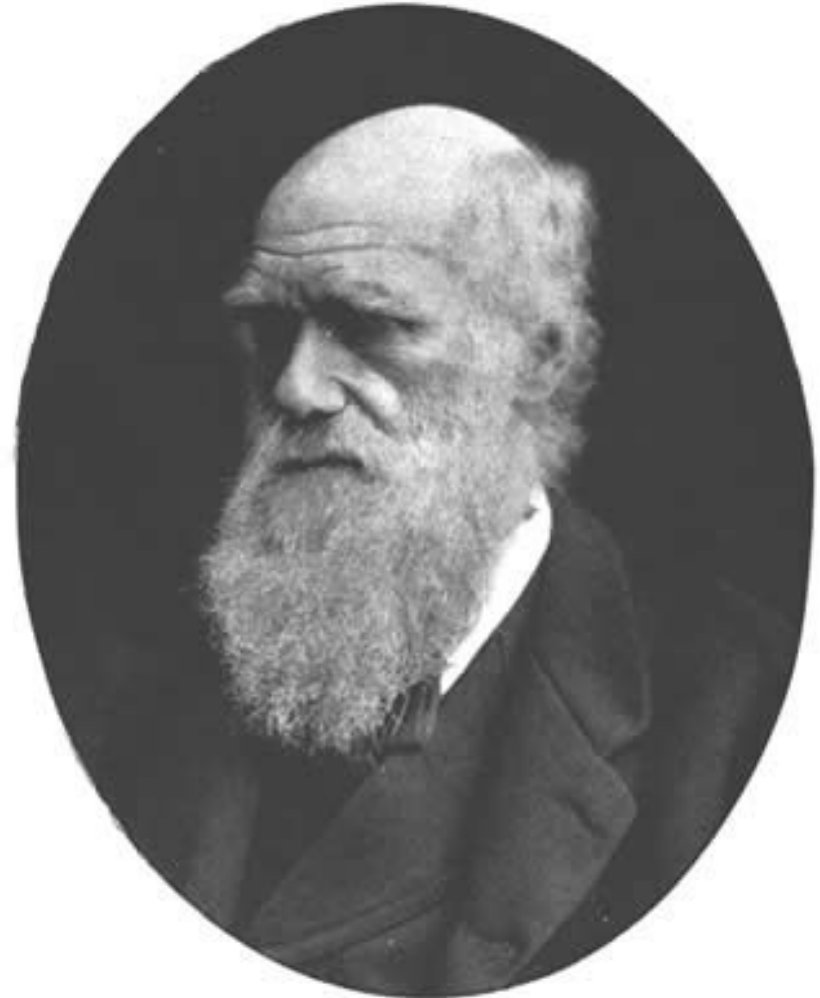
× 9.5 hours a week per person searching × Working 50 weeks / year × Making \$40 an hour (\$80,000 a year base)

...and adapt!



“It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.”

- Charles Darwin



Thank you

