Industrial Software Development

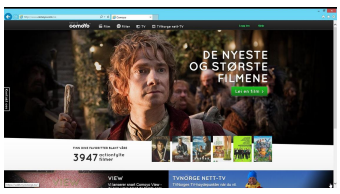
Rolf Michelsen

Background

fast

Microsoft

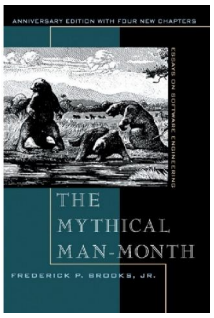
comoYo™



Industrial software engineering

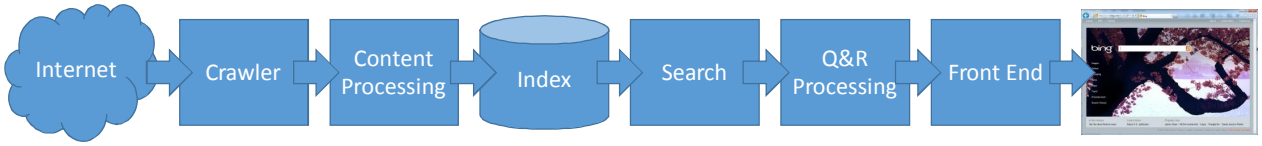
Creating a *platform product* costs an order of magnitude more than creating a *program*.

— Frederick P. Brooks, jr.

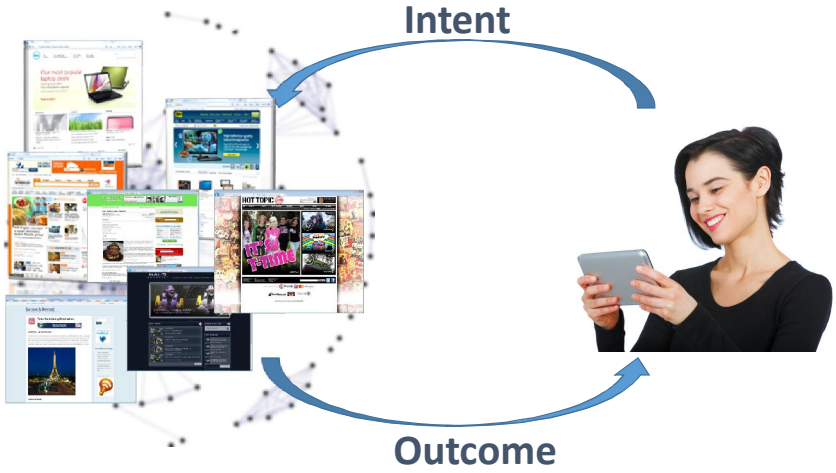


Large Scale Web Search

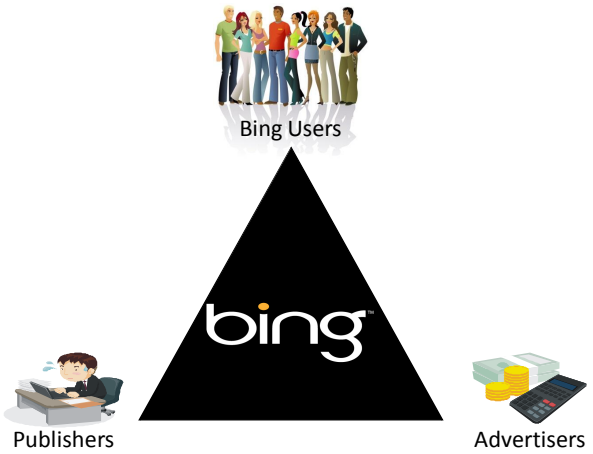
Web search — system



Web search — application



Web search — business model



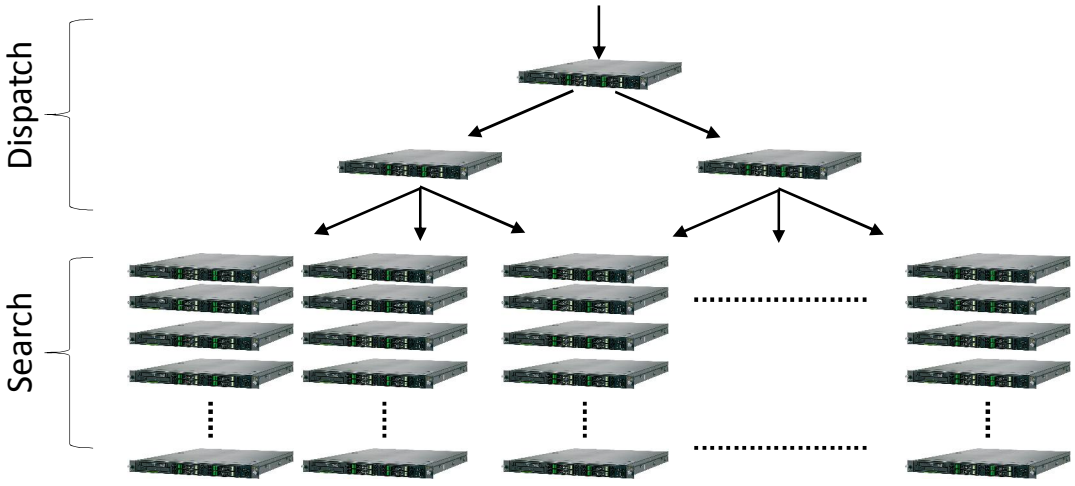
Technical Challenges

Engineering complex systems

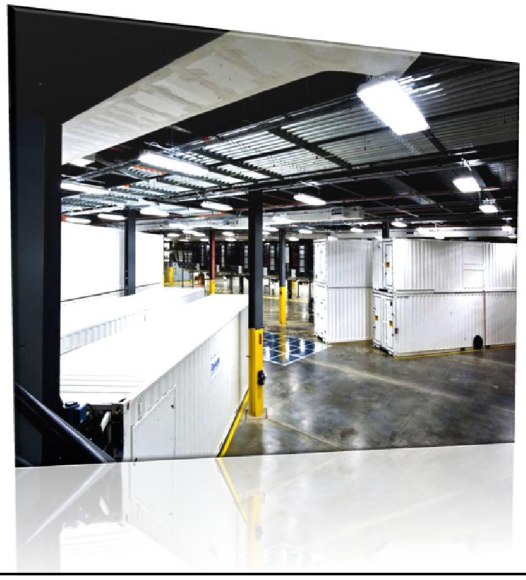
«Anyone can build a fast CPU. The trick is to build a fast system.»

— Seymour Cray (1926-1996)

Scalable architecture



Large scale systems

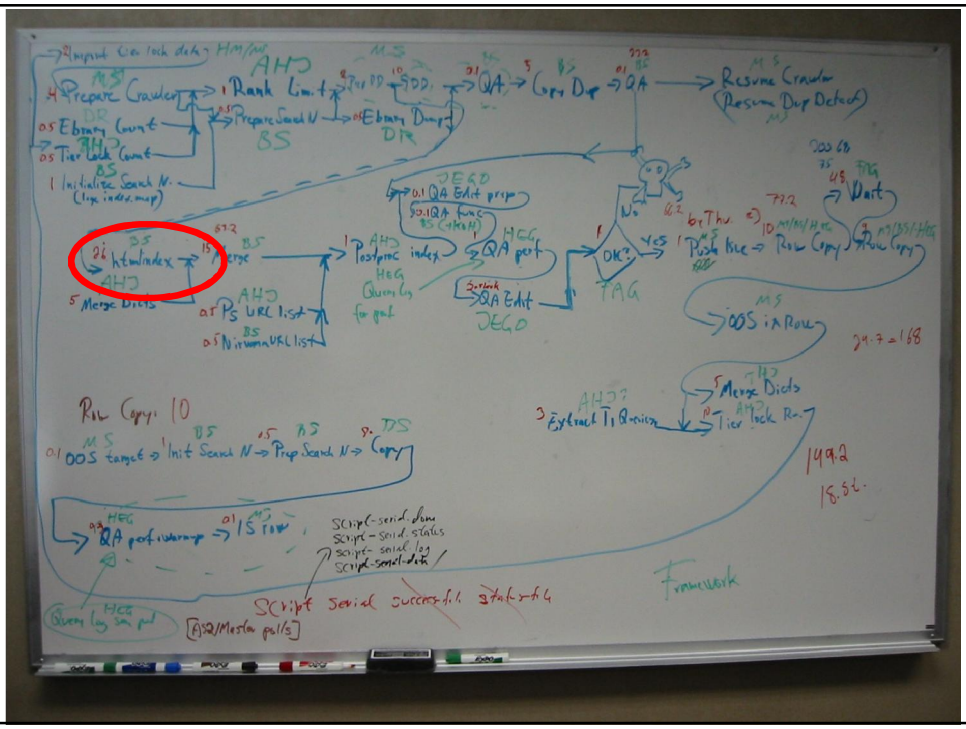


The cloud opportunity

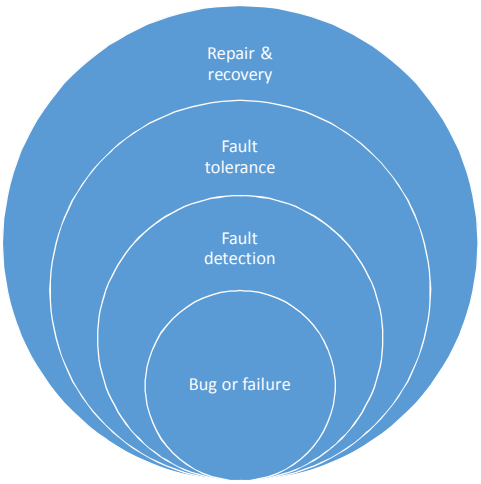
Windows Azure

amazon web services™

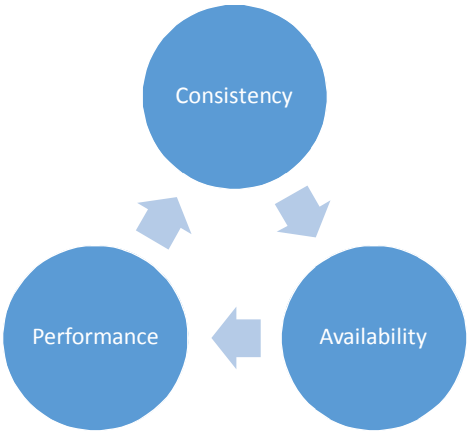
heroku


Prepare Crawler
Rank Limit
Copy Dup
Resume Crawler
Ebrary Count
Tier Lock Count
Initialize Search N.
Merge Dicts
Postproc index
QA perf
QA Edit
Push live
Row Copy
Wait
Merge Dicts
Tier lock Ro.
Row Copy: 10
Copy
Framework
Script serial successful status-file

Engineering for failure



The CAP Theorem



Premature generalization

Premature optimization

- InternalAndWithABAB
- InternalAndWithABAB
- InternalAndWithANAB
- InternalAndWithABAN
- InternalAndWithABAN
- InternalAndWithANAN
- InternalAndWithZBAN
- InternalAndWithABCN
- InternalAndWithABCN
- InternalAndWithANCN
- InternalAndWithABAN
- InternalAndWithABAN
- InternalAndWithANAN

- InternalAndWithACCB
- InternalAndWithABCB
- InternalAndWithANCB
- InternalAndWithABAB
- InternalAndWithABAB
- InternalAndWithANAB
- InternalAndWithABAN
- InternalAndWithABAN
- InternalAndWithANAN
- InternalAndWithABAN
- InternalAndWithABAN
- InternalAndWithANAN

25 Variants!!!

Technical debt

Industrial Software Development

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Quality

What is quality?

What is quality?

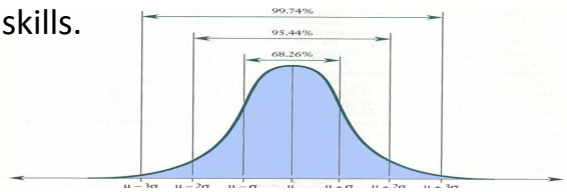
Measuring quality

«When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be.»

— Lord Kelvin (1824 – 1907)

Performance measurements

- Statistical models.
- Lab setup.
- Load generation tools and data.
- Measurement tools and reporting.
- Diagnostics to identify bottlenecks.
- System skills.

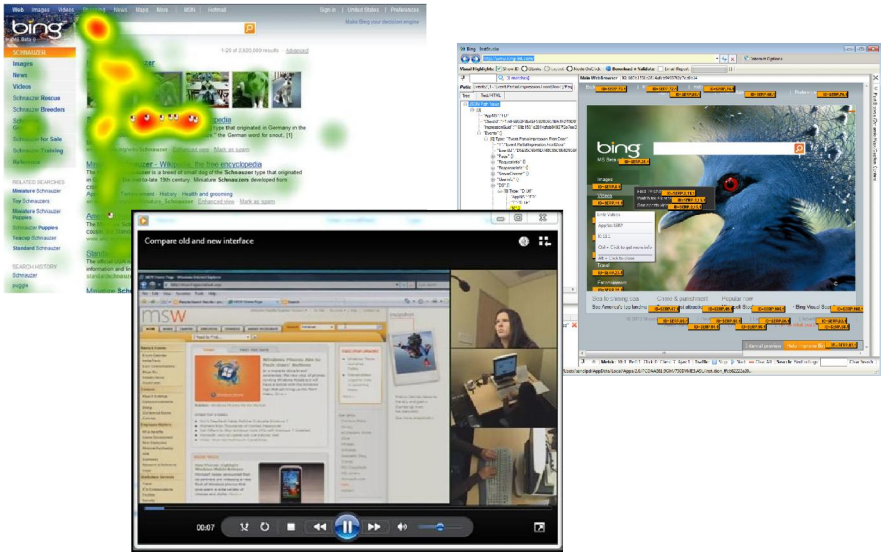


Metrics

Hard metrics

Soft metrics

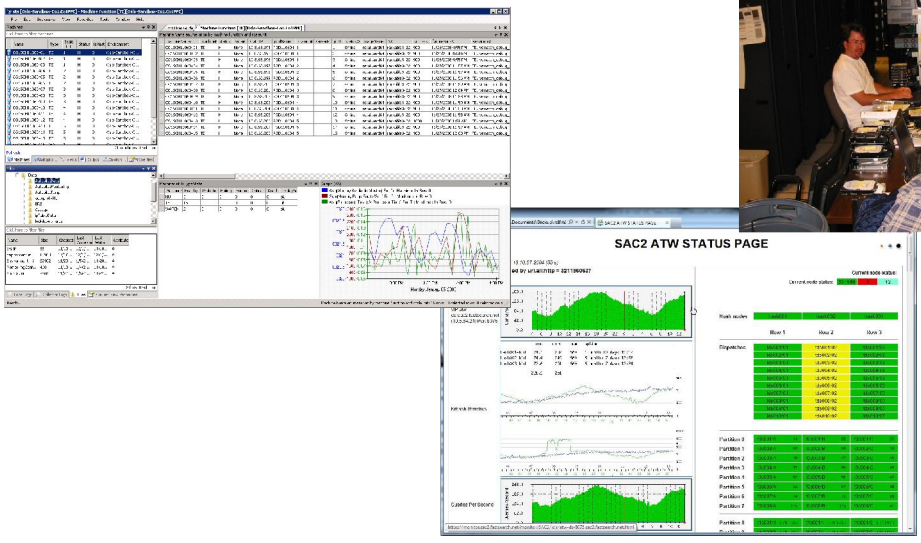
User studies

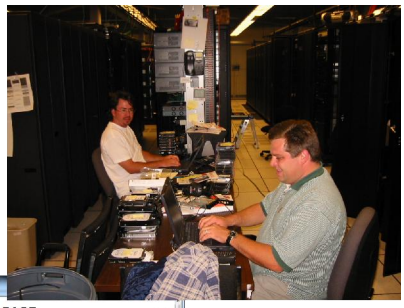


The future

- Task completion
- Intent detection
- Personalization

Operations



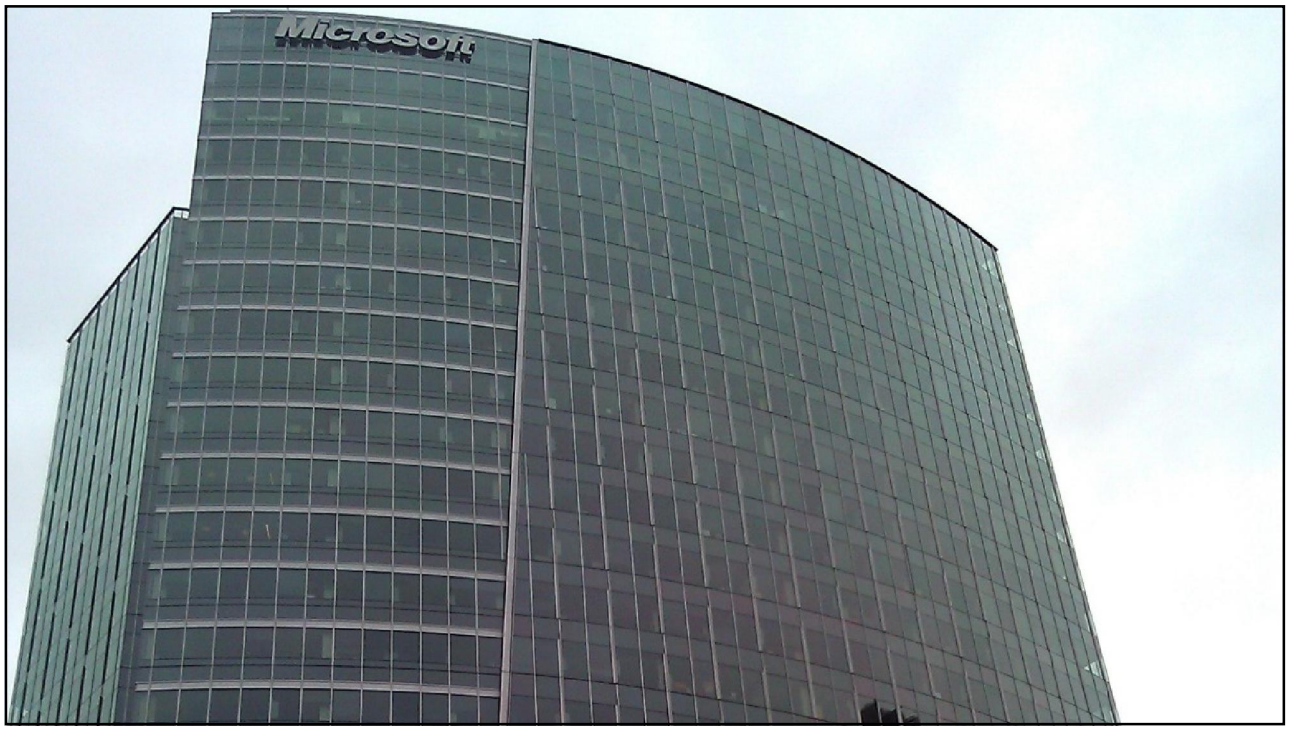


The Environment

1
2
3
CLEAR
4
5
6
7
8
9
*
0
#
SEND

SPAM
Classic
NET WT
340g
Hormel
foods

Organizational Challenges


Microsoft

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