

# Content-Centered Collaboration Spaces in the Cloud

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# Introduction

- ▶ What is content?
- ▶ How have we dealt with content in the past?
- ▶ What do we do now, and what do we need to do?
- ▶ What are Content Spaces.
- ▶ What do we need to do to achieve Content Spaces?
- ▶ Why do we need this new approach?
- ▶ HP Fractal: Realising Content Spaces.
- ▶ Issues to be aware of.
- ▶ Some thoughts.

# Content is an end product?

- ▶ For many organisations content is an end product:
  - ▶ Magazines
  - ▶ Market Research (Argh!)
  - ▶ Advertising
  - ▶ Graphic Art

# Content, it's just a side effect!

- ▶ For others... it is a side effect:
  - ▶ Invoices
  - ▶ Statements
  - ▶ RFPs
  - ▶ Images
  - ▶ Data Sets

However you view it...

*“Organisations seek more efficient ways to create, manage, distribute, archive and re-purpose these artifacts.” [1]*

## Previous generation of knowledge work...

- ▶ Both users and content had to be brought to their tools.
- ▶ Work can't happen if tools aren't available.
- ▶ Organisations have to acquire the tools.
- ▶ Workers can't determine the tools they need.
- ▶ Workers can't “span time and space to share, discuss, collaborate or even publish content as required!”
  - ▶ Whatever that means!

# The current generation...

- ▶ Content-Centered work practices.
- ▶ Communities can access content whenever they need to get work done!
- ▶ *Digital Natives* have seamless, fluid collaboration within these communities.

## But....

- ▶ Current solutions (content management systems etc) are isolated.
- ▶ This makes cross-organisational, content-centered collaboration painful!
- ▶ It requires significant overhead:
  - ▶ Establish ad-hoc channels.
- ▶ Sharing content in a working environment that seamlessly integrates discussions of the work is rare.
- ▶ Today we retrieve data, work on it, and then put the result back in its original location.

## What we need...

- ▶ We can automate some of the tasks previously discussed.
- ▶ So we need to be able to coordinate the automated tasks with the human tasks.
- ▶ The coordination is called *active behaviour*.

# Content Spaces...

- ▶ Are 'Hosted Collaboration Spaces'
- ▶ “greatly enhanced capabilities over today’s online workspaces.”
- ▶ Are unique to immediate requirements:
  - ▶ by adding active behaviours!
- ▶ Users can invite internal and external collaborators (including roles etc).
- ▶ We should be able to store and/or remove these content spaces easily.

# How do we achieve this?

- ▶ Tools to model content-centric processes:
  - ▶ automate repetitive steps.
  - ▶ retain agility to enable process changes on the fly.
- ▶ Policy-driven storage:
  - ▶ control over content preservation.
  - ▶ performance, consistency, encryption, and replication.
- ▶ Innovative application models:
  - ▶ leverage strengths of an extensible cloud-based platform.

# Why do we need new approaches?

We're starting to see key trends:

- ▶ Outsourcing applications and services to the cloud.
  - ▶ Cloud adoption is significant (15 - 26 percent across seven factors) and expected to double by 2011.
- ▶ Increasingly sophisticated web-based applications.
  - ▶ Browsers more interoperable.
  - ▶ Google Native Code, Microsoft Silverlight, Adobe Flex/AIR etc.

# Why do we need new approaches?

- ▶ Collaboration across organisational boundaries.
  - ▶ Businesses are increasingly relying on other organisations to help meet their objectives. So we need to aggregate and share content!
- ▶ Digital Natives: New generations of users enter the work force.
- ▶ The social web.
  - ▶ Social networking websites are massive!
  - ▶ Use them for marketing, product research, market analysis etc.

# Realising content spaces...

The Fractal project at HP:

- ▶ User-Composed Active Behaviours
  - ▶ Should be 'drag and drop', but highly customisable.
  - ▶ Example use case given: HR Hiring Process.
  - ▶ Current prototype implementation: python scripts and a web based uploader.

# Realising content spaces...

- ▶ Applications:
  - ▶ Applications are composed of active behaviours.
  - ▶ Content is no longer a byproduct.
  - ▶ Applications augment the content
  - ▶ Have been researching interactions between user interfaces and active behaviours.
  - ▶ Suggested a template-like interface, but this has proven to be insufficient.
  - ▶ More work still needed in this area.

# Realising content spaces...

- ▶ Cloud-Scale Repository Design:
  - ▶ Scale out for very large numbers of 'tenants'.
  - ▶ Distribute data across multiple storage nodes.
  - ▶ Tolerate node failures (self-healing).
  - ▶ Provide different levels of service on a per-tenant basis and track resource usage.

# Realising content spaces...

- ▶ Platform Security:
  - ▶ Every aspect has security issues.
  - ▶ Cloud-Scale Repository:
    - ▶ Isolation, sandboxing, scaling and usage tracking.
  - ▶ User-Composed Active Behaviours:
    - ▶ Safe execution?

# Summary

*“We believe content spaces are an exciting new way to think about collaboration that emphasises building and sustaining communities around content, tasks and ideas. It will have fundamental implications for society, impacting how individuals and organisations work and collaborate.”*

# References



John Erickson, Michael Rhodes, Susan Spence, David Banks, James Rutherford, Edwin Simpson, Guillaume Belrose, and Russell Perry.

Content-centered collaboration spaces in the cloud.

*IEEE Internet Computing*, 13(5):34–42, 2009.