Invenio v2.0: A Pythonic Framework for Large-Scale Digital Libraries

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Invenio v0 → v1
What is Invenio?

- digital library and document repository software
  - mature platform: first public release v0.0.9 in 2002
  - rich data: articles, books, notes, photos, videos, data, code

- originated in high-energy physics
  - institutional repository: CERN Document Server
  - integrated library system: CERN Document Server
  - disciplinary repository: INSPIRE

- nowadays co-developed by an international collaboration

- participating in and collaborating with EC and non-EC projects
Invenio v2
Sharpening the saw

- developer community growing
  - 4 developers and contributors in 2002
  - 48 developers and contributors in 2012

- adapting tools and processes
  - custom MVC → mainstream MVC
  - touching all ~60 modules and ~350k LOC
Invenio v1

- home-grown CSS (custom)
- fast but niche template engine (Python)

Invenio v2

- mainstream CSS (Twitter Bootstrap)
- mainstream template engine (Jinja)
Example: REST API

- Google search trends: XML API vs JSON API

- Standardising upon /api structure

  \[(\text{GET|POST}) \ /\text{api/}<\text{service\_family}>/<\text{service\_verb}>/<\text{mandatory\_arg}>?\text{optarg1=val1}&\text{optarg2=val2}\]
Example: Trac → GitHub

tickets · pull requests · code reviews · kwalitee · coverage · builds
Technologies

- **front-end:**
  - jQuery
  - Bootstrap
  - Redline.js

- **back-end:**
  - Python
  - Flask
  - Jinja

- **persistence:**
  - Solr
  - Xapian
  - Elasticsearch
  - SQLAlchemy
  - MySQL
  - MariaDB
  - MongoDB
  - Redis
Phosphorus and Nitrogen regulate arbuscular mycorrhizal symbiosis in Petunia hybrida

Nouri, Eva; Breuillin-Sessoms, Florence; Feller, Urs; Reinhardt, Didier
Phosphorus and nitrogen are essential nutrient elements that are needed by plants in large amounts. The arbuscular mycorrhizal symbiosis between plants and soil fungi improves phosphorus and nitrogen acquisition under limiting conditions. On the other hand, these nutrients influence root colonization by mycorrhizal fungi and symbiotic functioning. This represents a feedback mechanism that allows...

Herbicide and fertilizers promote analogous phylogenetic responses but opposite functional responses in plant communities

Pellissier, Loic; Witsz, Mary S; Strandberg, Beate; Damgaard, Christian
Throughout the world, herbicides and fertilizers change species composition in agricultural communities, but how do the cumulative effects of these chemicals impact the functional and phylogenetic structure of non-targeted communities when they drift into adjacent semi-natural habitats? Based on long-term experiment we show that fertilizer and herbicides (glyphosate) have contrasting effects on...
Source Code Modularisation

- separated developed Flask extensions
  - Flask-Registry
  - Flask-Breadcrumb
  - Flask-Menu
  - Flask-SSO
  - Flask-Ratelimiter

- separated independent components
  - intbitset

- separated internal components
  - invenio.base
  - invenio.ext
  - invenio.utils
  - invenio.modules

- separated demo service overlay
  - invenio_demosite
Abstraction of records

- abstraction of record fields:
  - metadata fields, e.g. author
  - derived fields, e.g. number_of_authors
  - virtual fields, e.g. number_of_citations

- abstraction of record formats:
Abstraction of storage

record store

JSON Alchemy

linked data

document store

file storage abstraction layer

AFS  Box  Ceph  CASTOR  Drive  EOS  S3

annotation store
OAIS preservation practices

SIP = Submission Information Package  ·  AIP = Archival Information Package  ·  DIP = Dissemination Information Package
Intel’s mobile plan: Zero to Hero

Intel CEO Paul Otellini showed off Orange’s new phone at MWC.

The hottest smartphone maker at this year’s Mobile World Congress in Barcelona isn’t iPhone.

You didn’t know Intel designed phones? Neither did most people until the chipmaking behemoth designed a top-of-the-line smartphone for the global telecom giant Orange.

It all started about a year ago, when extremely frustrated top brass at Intel decided that its chips would work on mobile phones—a field dominated by mobile chip design firms. In presentations, no matter how impressive, just weren’t persuading phone makers.

So Intel hired several hundred engineers from all over Silicon Valley and opened up a studio inside the company.

Late last year, Intel began to show off the fruits of its labors to the same folks who used to laugh at Intel’s Santa Clara headquarters—then called Gaer (GOOG, Fortune 500). Android operating system, and look and feel.

That shouldn’t be surprising. Intel’s head of mobility, Mike Bell, worked at Apple (AAPL, iPhone project before leaving for Palm.

“Our device is fully full-size compliant,” said Bell in an interview on Tuesday. “Intel is a becoming handheld computers. It’s natural for us to get into this space.”

Intel finally ups the ante in mobile

Intel built a few thousand of the phones and started handing them out to any and all paste PowerPoint couldn’t: In addition to Orange, Indian carrier Airtel is planning on shipping a quarter, and Lenovo launched a similar phone last month.
- developed Invenio ↔ GitHub bridge
- archive software automatically upon release; mint it with a DOI
Example: ZENODO

Search 1193 records for

Showing records 1 to 10 out of 1193 results.

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[Image: The Effective Use of “Research Tools” and Resources – Training of Trainers (TOT)]

Ale Ebrahimi, Nader

With the increasing use of information and communications technology (ICT), researchers are able to use computer software tools to find, organize, analyze, and share relevant information. However, there are hundreds of such tools to select from, for ...

Uploaded by Nader Ale Ebrahimi on 28 January 2014.
Conclusions
Conclusions

- Invenio v2: major technology update
  - to meet growing user and developer community
  - to answer rising customisation needs
  - to modernise and refresh technology stack

- technology and process standardisation
  - Python, Flask, Jinja, Twitter Bootstrap, REST API
  - GitHub, Travis, Coveralls, Read the Docs

- Invenio v2: timeline
  - two years of efforts are now finished
  - already in production on BlogForever, B2SHARE, ZENODO
  - official release happening later this summer

See 14 more Invenio talks at OR2014
http://invenio-software.org/

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