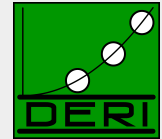


Rethinking the Semantic Annotation of Services

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 {firstname.lastname}@deri.org kat@uom.gr

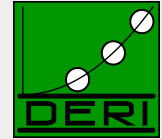


- **Motivation**
 - Beyond SOAs
 - Empowering user participation
- **Contribution**
 - Social annotation of services
- **Prototype**
 - Description
 - Evaluation
- **Discussion**

① Full paper available at:

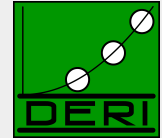
http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-540/ugs2009_submission_4.pdf

Until now...

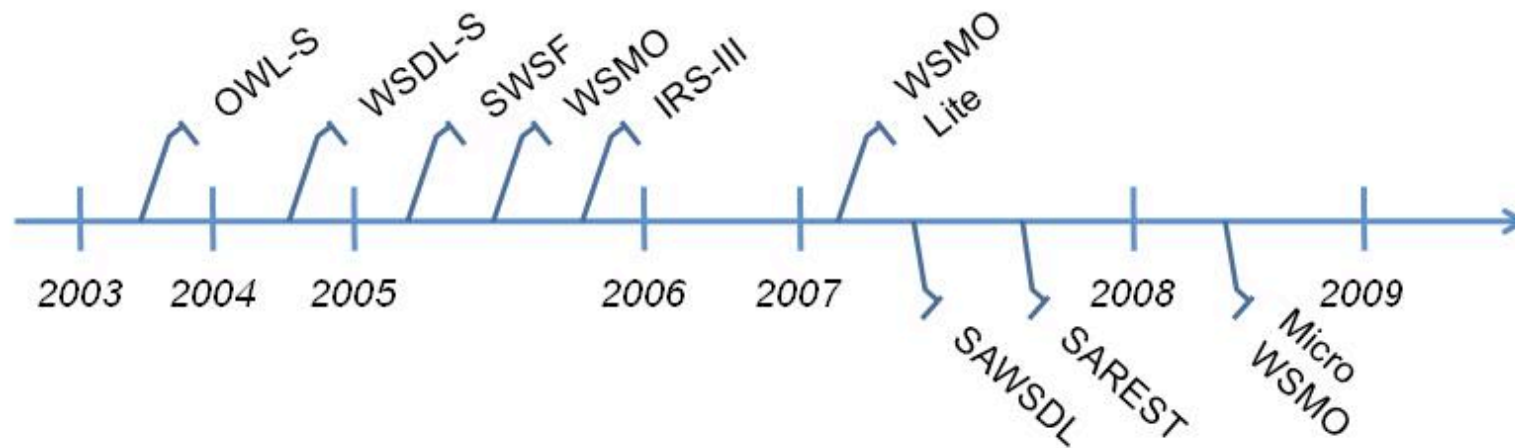


- Services are offered by organizations/businesses, e.g. private companies or governmental agencies.
- The point from which the services are made available is known, e.g. the website of the service provider.
- SOA and Web Services constitute the main paradigm for offering services online.
- The only role of the user is that of the service client.
- The semantic annotation of the services is performed in a top-down manner.

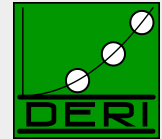
Semantic Service Models today...



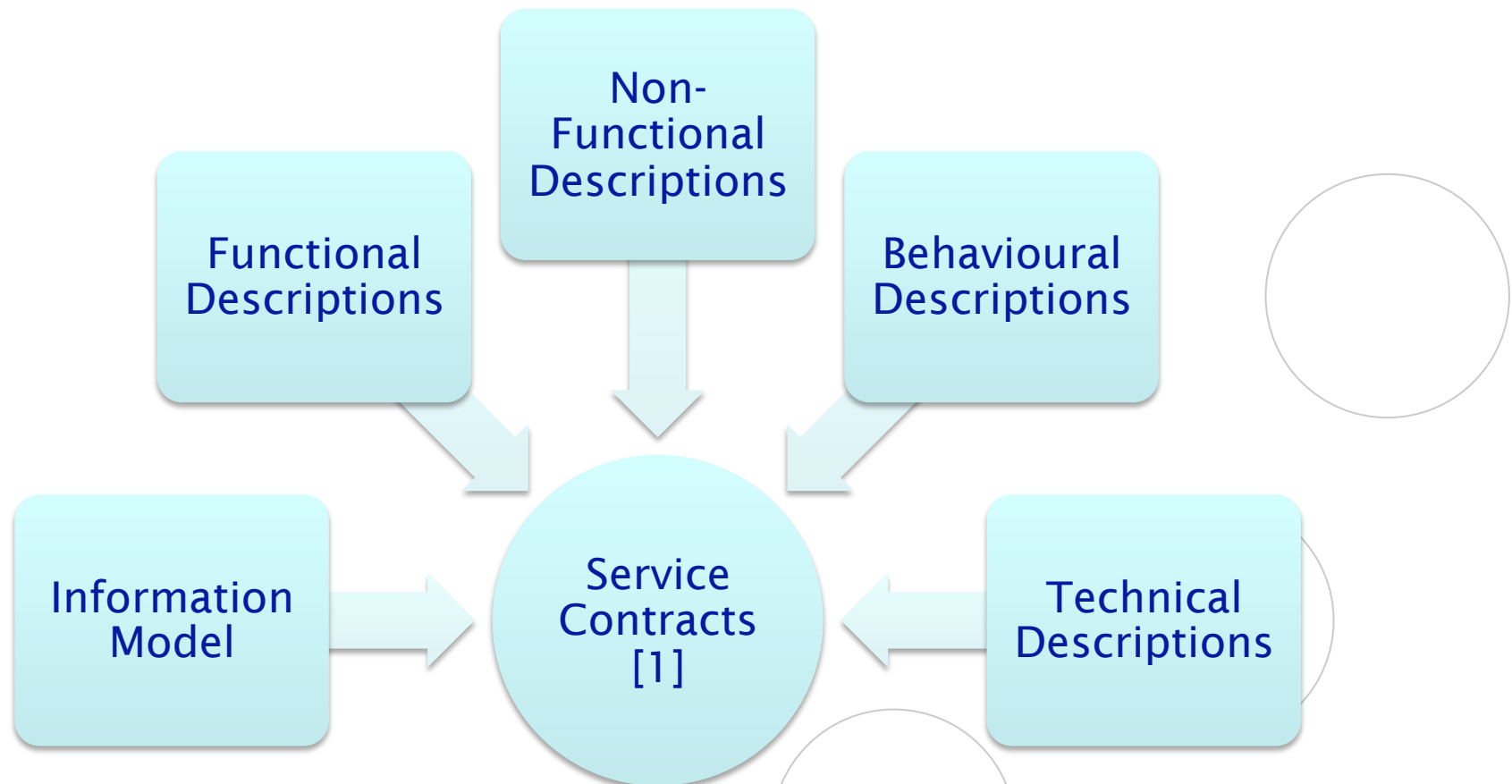
- Various approaches have been proposed in order to semantically annotate services.
- All of them assume that the semantic description comes only from the service provider.
- The user's view is left out of the semantic description of the service.



Semantic Service Models today... (cont'd)

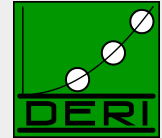


- A service description comprises of five complementary parts [1].



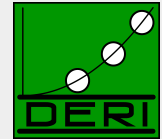
1. Vitvar, T., Kopecky, J., Fensel, D.: WSMO-Lite: Lightweight Semantic Descriptions for Services on the Web. CMS WG Working Draft (2008)

What is changing?



- User participation in the Web is encouraged and has become a fact.
 - User generated services, e.g. mashups, are becoming more and more popular.
 - Users are willing to add meaning to the content/services that they create or use.
- Services are published in a decentralized manner.
 - No service broker.
- Usually the semantic description of the service is a web page (html page).
 - No formal semantic service models used.

Service Social Metadata



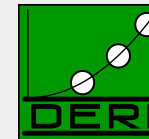
- The activity of the users when using services online creates metadata, e.g. which service I used when, which service I used afterwards or before etc.

⇒ Implicit social annotation of services

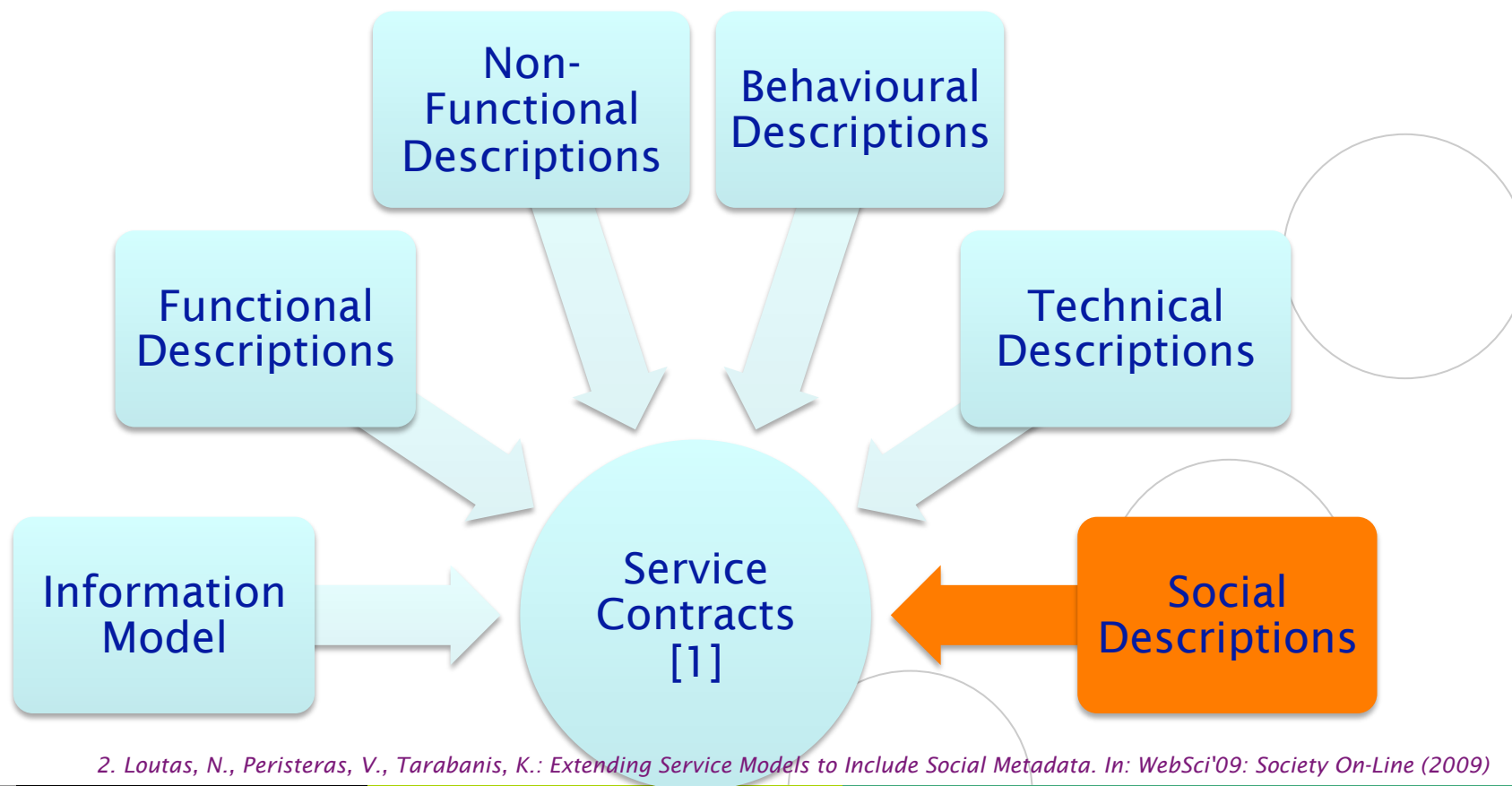
- Then why not also give users the opportunity to describe the services that they use, e.g. using tags as they do for online content?

⇒ Explicit social annotation of services

Rethink Semantic Service Annotation

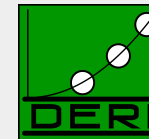


- We need to extend existing semantic service models to include service social metadata [2].



2. Loutas, N., Peristeras, V., Tarabanis, K.: Extending Service Models to Include Social Metadata. In: WebSci'09: Society On-Line (2009)

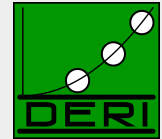
Including the Social Descriptions in existing Semantic Service Models



- ...using non-functional properties in WSMO
- ...using model references in SAWSDL
- ...using the sem-class element in SA-REST



Prototype: social annotation of public service descriptions



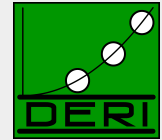
Digital Enterprise Research Institute

www.deri.ie

- Why public services?
 - Public Administration is a heavy service industry.
 - Thousands of services.
 - Millions of users.
 - A little semantics **can** help a lot.

- Part of a broader project called **MyPortal.gov**
 - A citizen-centric eGovernment portal

Semantic Annotation of Services in MyPortal.gov

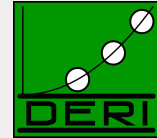


Digital Enterprise Research Institute

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- Public service descriptions (XHTML pages) are semantically annotated using RDFa and elements from SA-REST and the GEA Public Service Model
- Lightweight semi-automatic semantic annotation
- Semantic data of the public service descriptions can be easily discovered and indexed by Semantic Web crawlers and search engines.
- Public service descriptions can be easily connected to the LOD Cloud.

Semantic descriptions in MyPortal.gov



Welcome: test | [logout](#)
You are logged in as:
Authenticated User

Browse the service repository using [ATOM Interface](#)

Who's online
There are currently 1 user and 0 guests online.
Online users
◦ test

My History
◦ Naturalization of adult alien

Navigation Menu
◦ Home
◦ Generic Service
▼ Specific Service
◦ Laws
◦ Public Administration Agencies for the Specific Service
◦ Administrative Document for the Specific Service
◦ Communication Channel for the Specific Service
◦ Follow-up Service

Naturalization of adult alien

Fri, 11/07/2008 - 13:45 — admin

Generic Service:
[Naturalization](#)

Description:
This service is executed when an adult alien wants to acquire the Greek citizenship.

```
E
M <div xmlns:SA-REST="http://knoesis.wright.edu/
S srl/SA-REST"
H
N xmlns:islab="http://islab.uom.gr/gea.owl">
J
C <div about="http://islab.uom.gr/Naturalization">
V
F The Greek Naturalization public service is
J provided by the <div rel="islab:serviceprovider"
a resource="http://islab.uom.gr/gea.owl#Region"/>
r Regional Authorities <div typeof="islab:social"
E rel="SA-REST:sem-class" resource=http://
T islab.uom.gr/DL_social.rdf/> </div> </div>
```

Tags:
citizenship, child, greek, alien, ma
mandatory
marriage

You can see a detailed report of the service [here](#)
Or you can see a visual representation of the service [here](#)

Recommended Tags [adult](#) [citizenship](#)

Related Services [Change Family Name](#)

Keyword search

 [More options](#)

Guided search
Click a term to initiate a search.

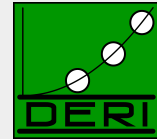
Content type
[Specific Document](#) (33)
[Public Administration Agency](#) (21)
[Specific Service](#) (13)
[Laws](#) (12)
[Generic Service](#) (10)
[Special Document](#) (8)
[Special Case](#) (5)
[Follow-Up Service](#) (3)

Tag
[service](#) (5)
[adult](#) (4)
[mandatory](#) (4)
[certificate](#) (3)
[self](#) (3)
[underage](#) (3)
[kep](#) (2)
[marriage](#) (2)
[permit](#) (2)
[photo](#) (2)
[more...](#)

Service Tags
[child](#) [alien](#) [greek](#) [citizenship](#)

My TagCloud
[identification](#) [self](#)
[representative](#) [photo](#) [birth](#)
[passport](#) [marriage](#) [test](#) [tag](#)

Social Annotation of Services in MyPortal.gov



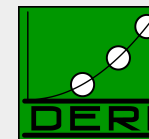
- The activity of the users when browsing through the public service descriptions offered by MyPortal.gov is monitored (anonymity).

⇒ Implicit social annotation of services

- Users can also tag the the public service descriptions offered by MyPortal.gov

⇒ Explicit social annotation of services

Social annotation of services in MyPortal.gov (example)



The screenshot shows a service page for "Issue a marriage permit for adults". The page includes a "Generic Service" section with a "Description" and a "Tags" input field. An orange arrow points from the "Description" to the text "Implicit social annotation of services". Another orange arrow points from the "Tags" input field to the text "Explicit social annotation of services". A sidebar on the right contains a section titled "Users that viewed this service also viewed the following services:" with a list of related services and their percentages: "Register Marriage - 20%", "Change Family Name - 12%", and "Change Home Address - 6%". Below this is a "Keyword search" section with a search box and a "Search" button. Further down is a "Guided search" section with a list of content types: "Specific Document (27)", "Public Administration Agency (18)", and "Laws (9)".

Home

Issue a marriage permit for adults
Thu, 09/25/2008 - 14:42 — admin

Generic Service:
[Issue a marriage permit](#)

Description:
This service should be executed in the case when two adults wish to get married.

Here you can tag the service

Tags:
Insert a comma-separated list of terms describing this content.

Recommended Tags [marriage](#)

Users that viewed this service also viewed the following services:

- Register Marriage - 20%
- Change Family Name - 12%
- Change Home Address - 6%

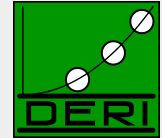
Keyword search

 [More options](#)

Guided search
Click a term to initiate a search.

Content type
[Specific Document \(27\)](#)
[Public Administration Agency \(18\)](#)
[Laws \(9\)](#)

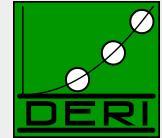
So why all the fuss?



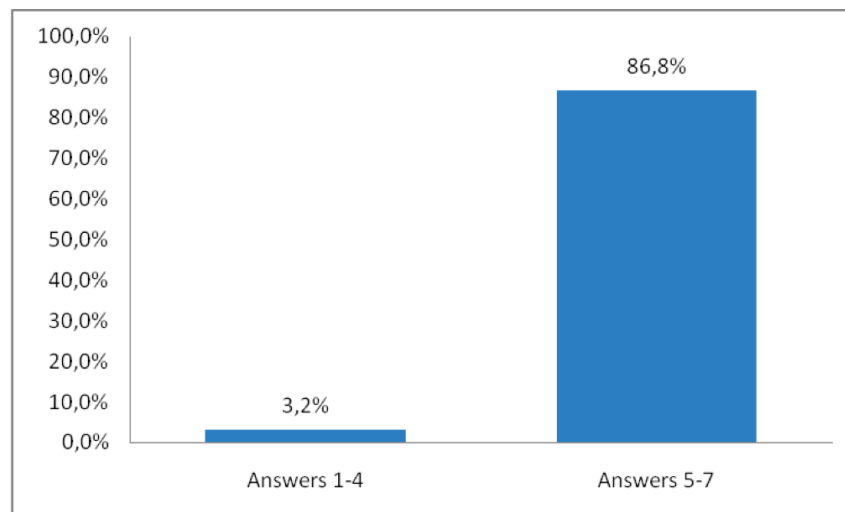
- Harvesting the social metadata of services allows users to:
 - Express their view of the services they use
 - Personalize their service searches, thus bridging the service discovery gap [3].
 - Get recommendations about related services.
 - Facilitate the development of user-centric services (mashups).
 - Form communities of interest and/or practice.
- Service providers can exploit the service social metadata to:
 - Improve/automate service classification and grouping.
 - Get feedback and improve the quality of their services or design new ones to cover emerging customers' needs.

3. Fernandez, A., Hayes, C., Loutas, N., Peristeras, V., Polleres, A., Tarabanis, K.: Closing the Service Discovery Gap by Collaborative Tagging and Clustering Techniques. In: International Semantic Web Conference, Workshop on Service Discovery and Resource Retrieval in the Semantic Web (2008)

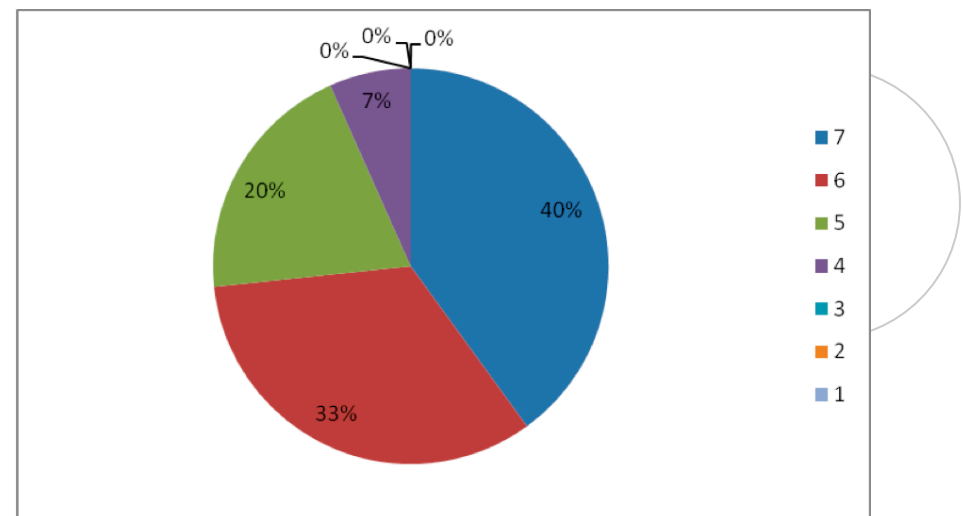
...and what do the users think?



- Did you like using a social portal for public services (i.e. MyPortal.gov)?

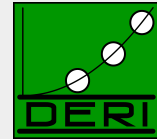


- Did you like being able to tag public services?

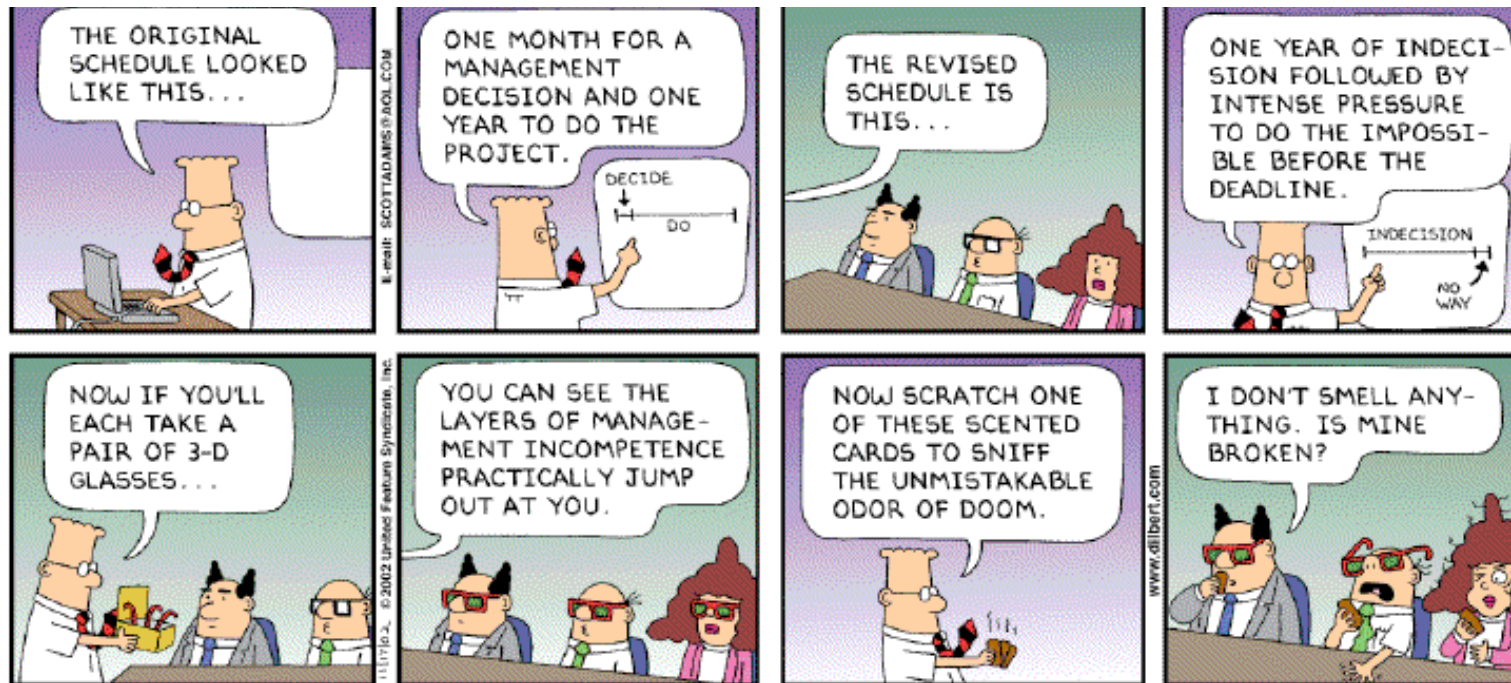


- ✓ Two evaluation cycles by actual users in Greece and Cyprus.
- ✓ Interesting conclusions drawn from the service social metadata collected.

Questions

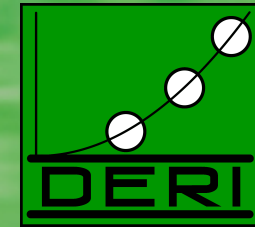


■ Confused?



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