Beyond the Black Box Taxonomy:

Empirical Approaches to Taxonomy Development

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Empirical Approaches to Taxonomy Development

Three Traps

Chasing your tail

Experts know best

Enclosure

KEEP OUT!!
TAXONOMIST AT WORK

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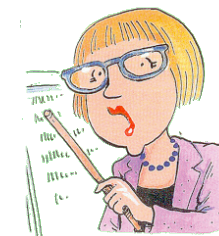
Being Empirical Means...

Warrant - grounding taxonomy in
- Content warrant
- User warrant
- De facto standards in use

Testing
- Open card sorts
- Closed card sorts
- Scenario-based tests
- Load/balance tests

Consultation
- Targeted on gaps, technical accuracy, NOT general opinions
- Transparent, tough issue resolution process

For enterprise taxonomies, unmanaged exposure to unfocused opinions are the Taxonomist's greatest enemy
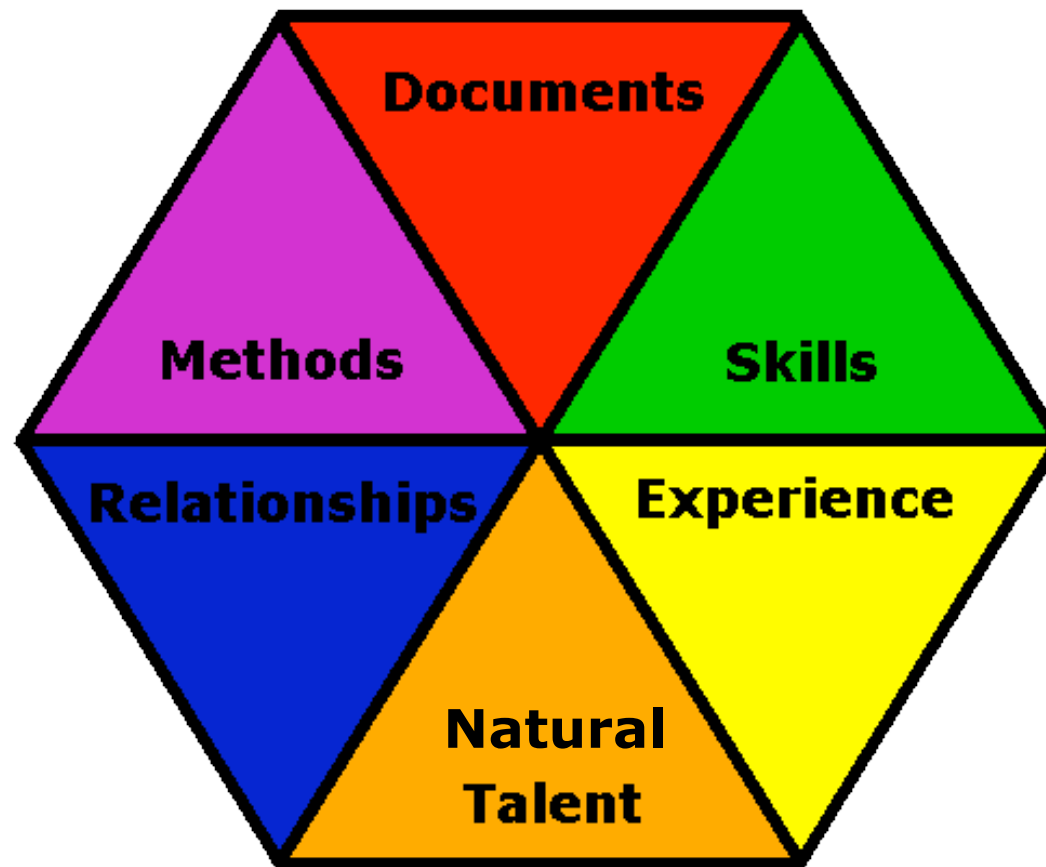
1. Warrant - the role of the knowledge audit

What is a knowledge audit?

More than information….

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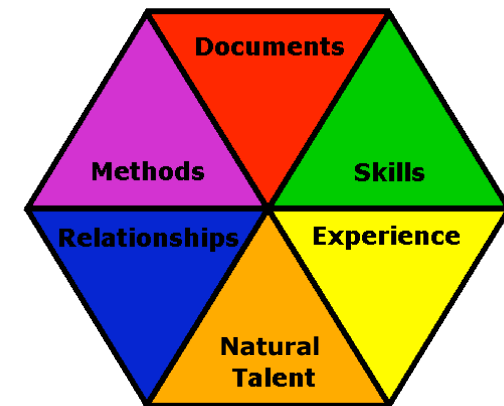
What is a knowledge audit?

A knowledge audit is a survey-cum-inventory of the different kinds of knowledge that are:

- currently in use

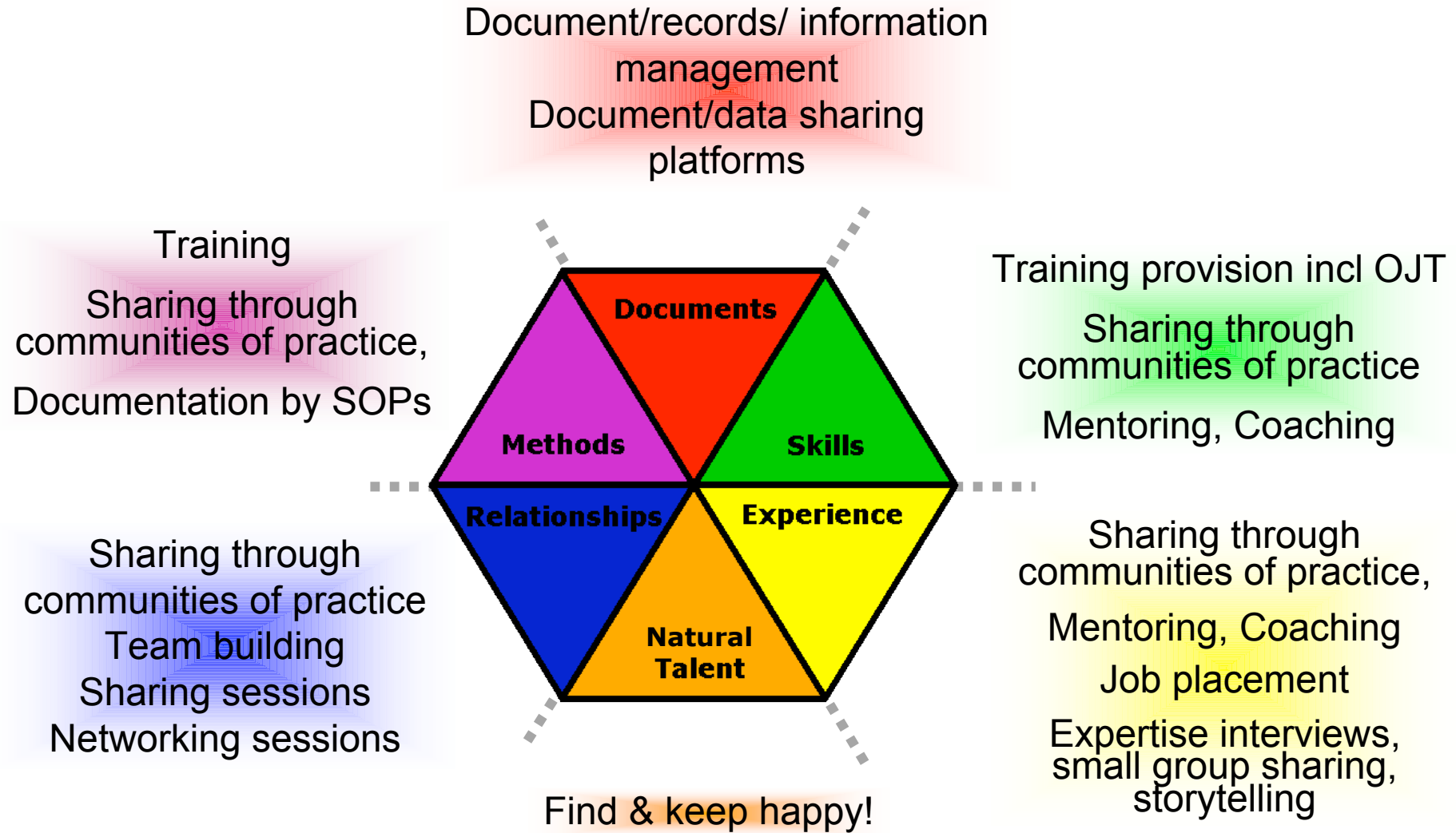- needed but not currently in use (gaps and desired improvements)

…to support the work and strategic objectives of your organisation
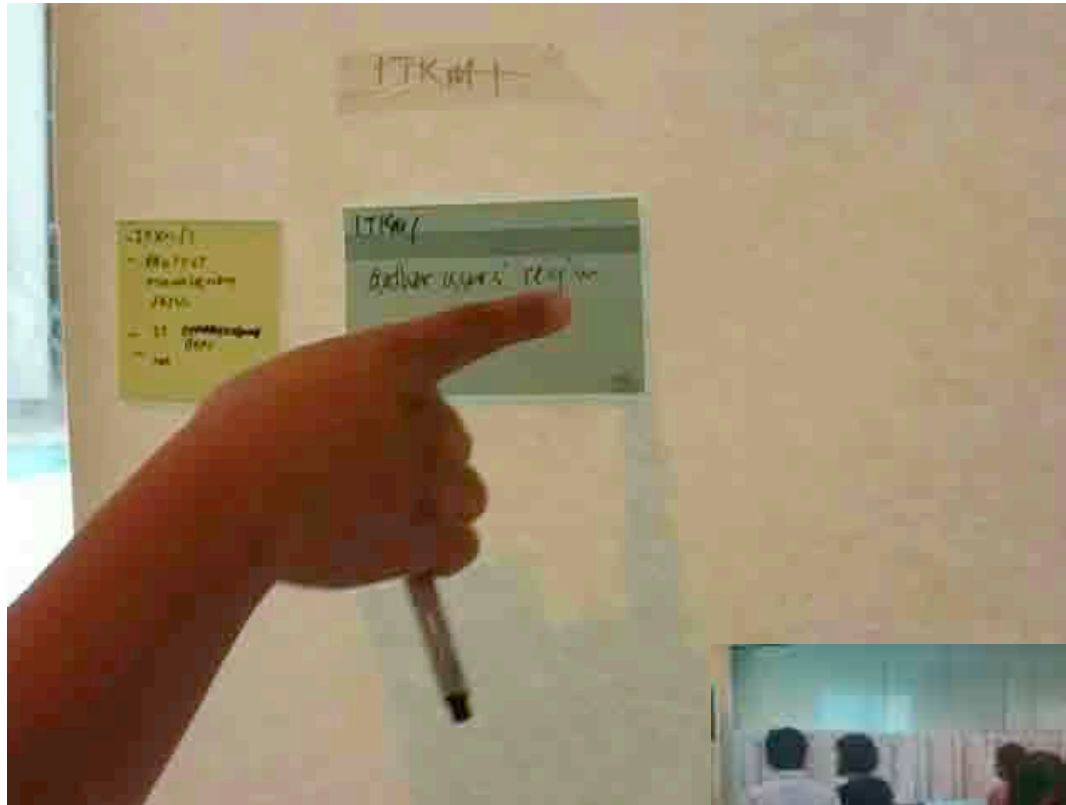

Not the same thing as…

A knowledge management (KM) audit - which is an audit or review of what you are doing in knowledge management as a whole, and perhaps how well you are doing compared with other similar organisations.

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Knowledge Types and KM Approaches

Straits Knowledge
Redefining corporate knowledge

Document/records/ information management
Document/data sharing platforms

Training
Sharing through communities of practice,
Documentation by SOPs

Training provision incl OJT
Sharing through communities of practice
Mentoring, Coaching

Documents

Methods

Skills

Relationships

Experience

Natural Talent

Sharing through communities of practice
Team building
Sharing sessions
Networking sessions

Sharing through communities of practice,
Mentoring, Coaching
Job placement
Expertise interviews, small group sharing, storytelling

Find & keep happy!

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Knowledge Audit

- Half day workshop
  - *2-3 operational managers per dept*
  - *Knowledge maps, culture analysis, pain points*
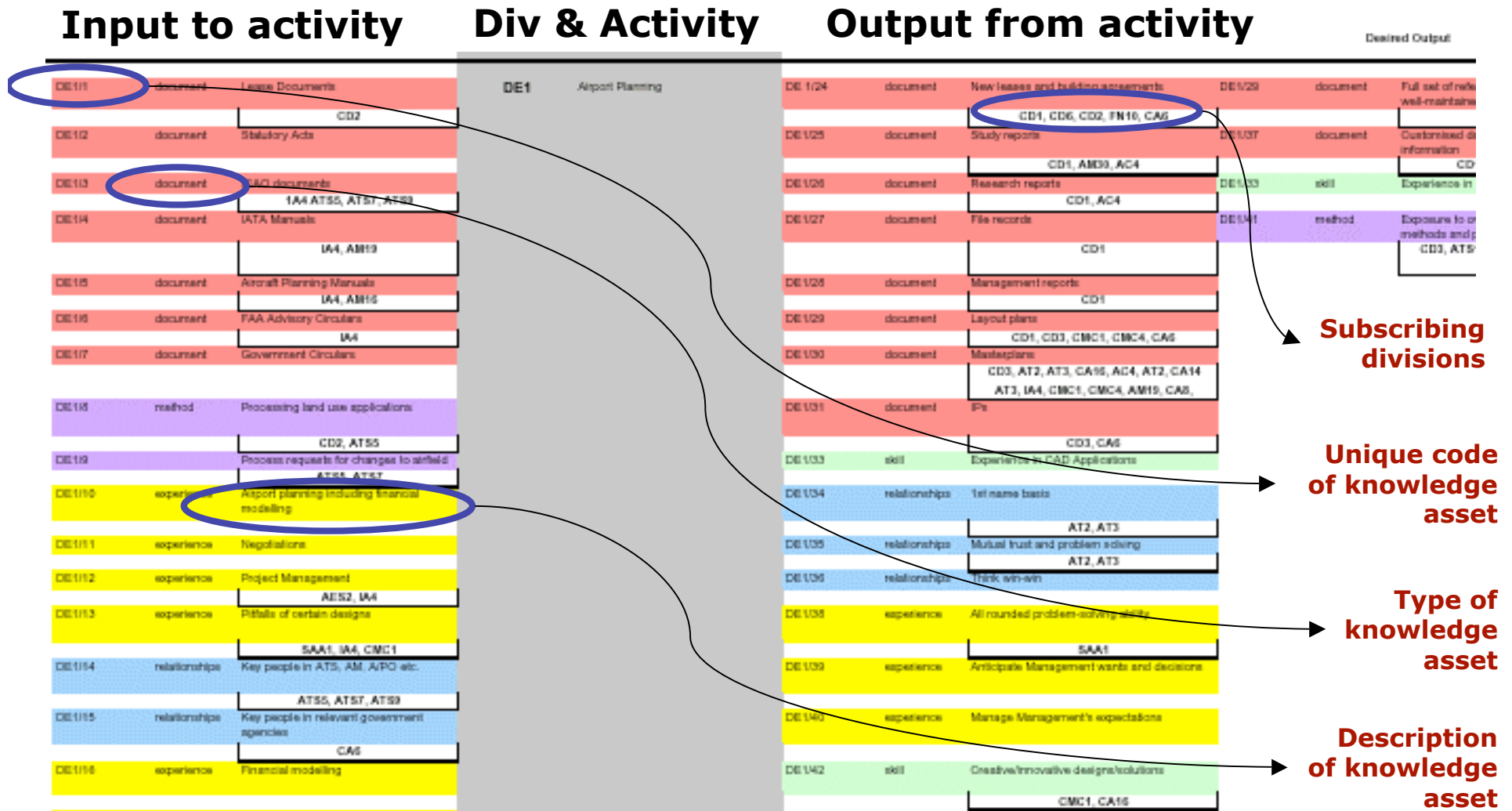- Site visits (previously done)
- Gallery viewing

Example of a gallery viewing exercise

Knowledge Maps

Expected outcomes

Knowledge maps give us:

- Evidence for how people describe their knowledge assets (content warrant)
- Representation linking knowledge assets to activities (context of use - user warrant)

Site visits give us:

- Observational evidence for organising principles in use (user warrant)
- Evidence (printouts, photos) of how folders, physical and digital documents, emails, shared resources are labelled and organised (content and user warrant)

Analysis of the knowledge maps gives insights into Knowledge gaps, Knowledge risks, Critical knowledge requiring protection, Sharing and collaboration opportunities, Knowledge flows and blockages - and helps identify knowledge priorities, useful in designing the taxonomy

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2. Testing - evidence that people can use the taxonomy effectively

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Testing Techniques

- Open card sorting - to find "natural categories" among users and variance between them - at the start of a taxonomy design
- Closed card sorting - to test usability of top level categories - to test a draft taxonomy
- Scenario based testing - to uncover navigation, predictability issues - to test a completed taxonomy - scenarios are derived from **user warrant**
- Balance/load testing - to analyse the distribution of content across a populated taxonomy in use

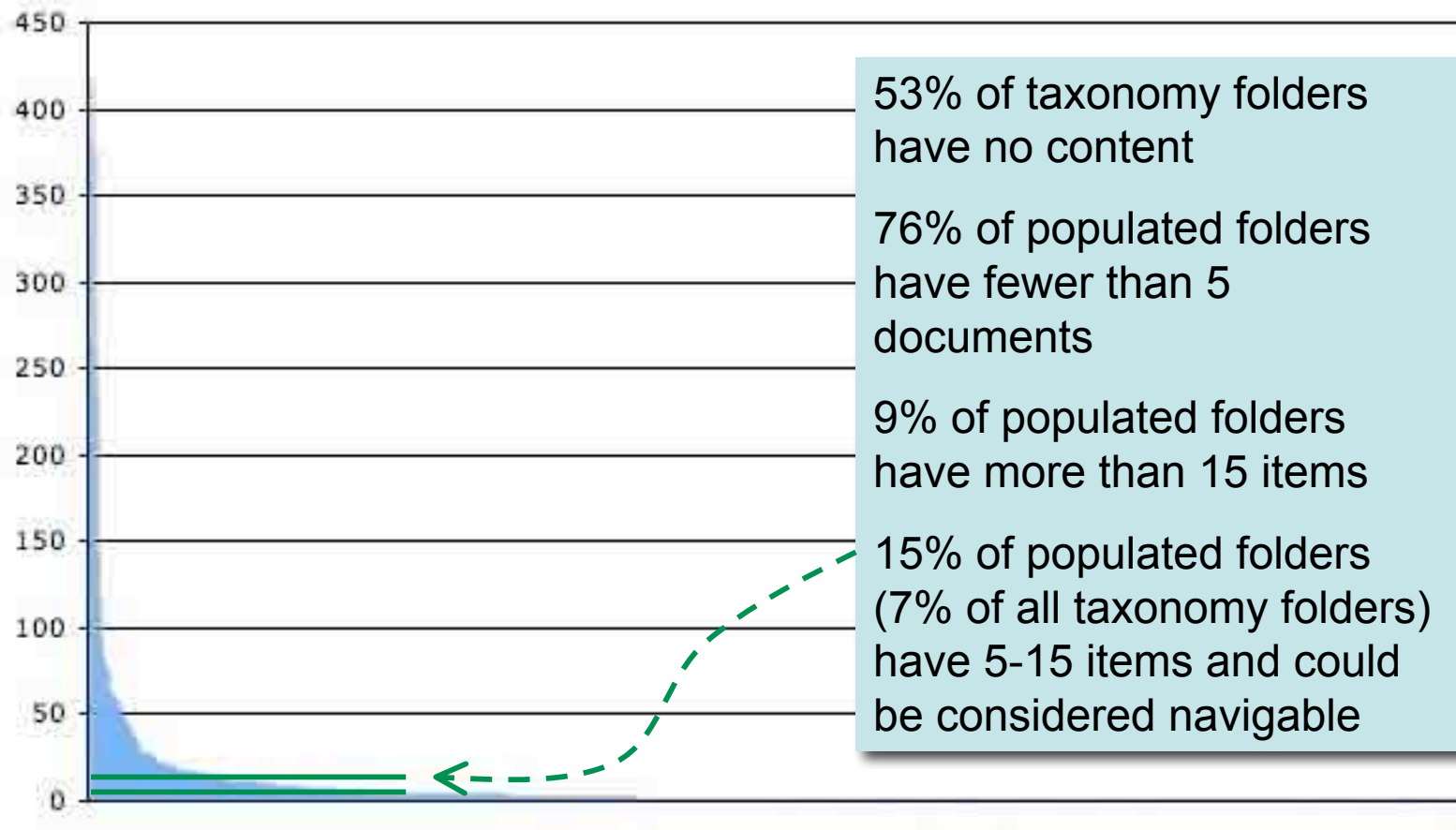**The conversations are as important as the results**

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Case Study 1

Review of existing taxonomy in use

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Balance

53% of taxonomy folders have no content

76% of populated folders have fewer than 5 documents

9% of populated folders have more than 15 items

15% of populated folders (7% of all taxonomy folders) have 5-15 items and could be considered navigable

Balance & Accessibility

Distribution of Documents by Taxonomy Level

Level	Populated Nodes	Docs/ Node
1	0	0
2	11	30
3	39	22
4	471	7
5	190	7
6	133	3
7	76	5
8	47	2
9	7	1
10	7	5
Total	981	7

35% of content is 5 or more levels deep

83% of content is 4 or more levels deep
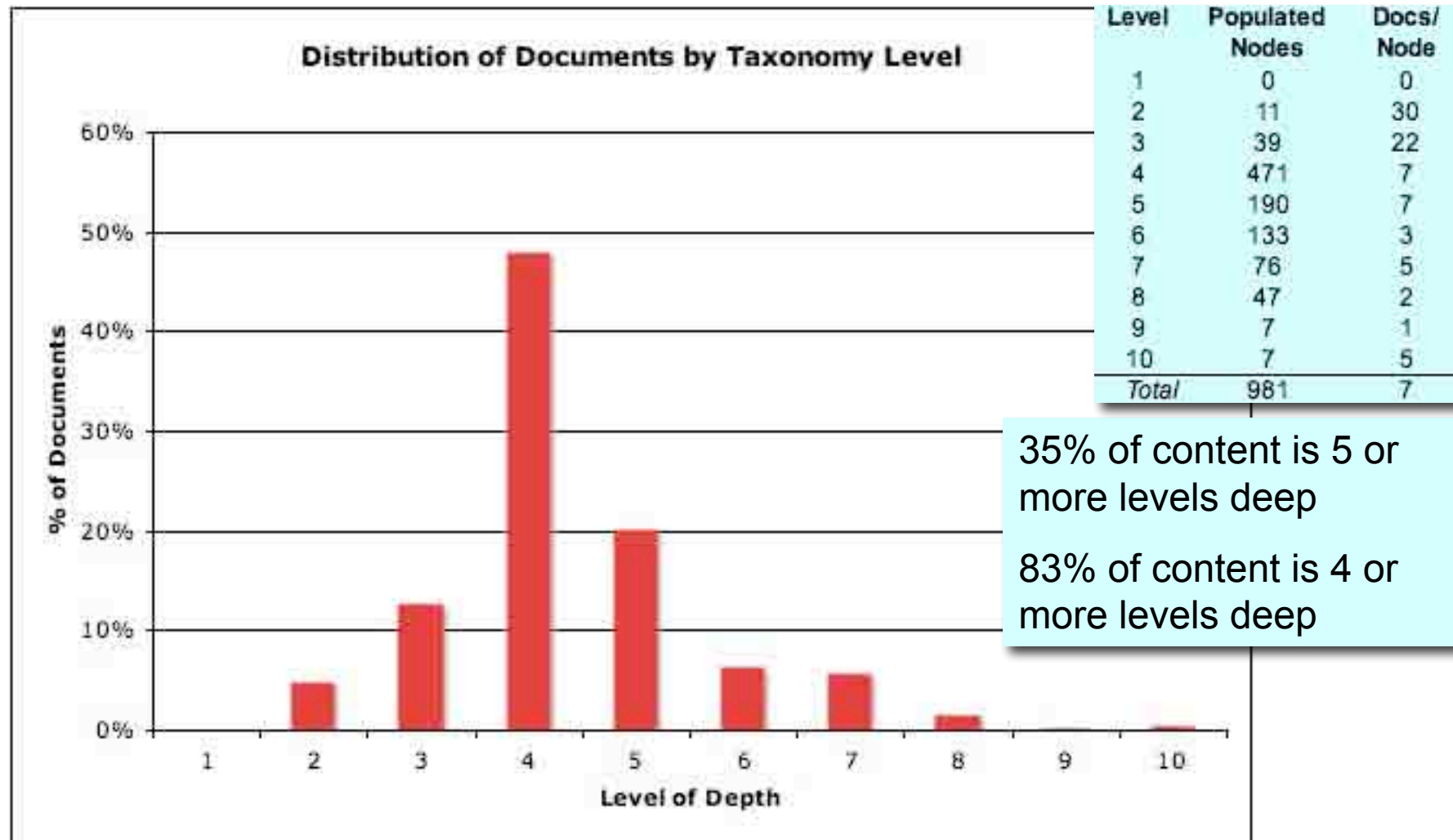
What we found

From the usability tests:

Avge time / task	Avge clicks / task	Avge dead ends / task	Task abandoned	Confident final decision	Consistency of decisions
2.5 minutes	18 clicks	1.5 folders opened	25%	46%	35%

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Taxonomy design issues

As Navigation Tool:

- Too narrow and deep
- Unpredictable, different principles of organisation applied in parallel

As Controlled Vocabulary:

- Same categories repeated across the different parts of the structure - ambiguity
- No overall design principle to govern additions to taxonomy

As Classification Scheme:

- Fewer than half the taxonomy is populated, extreme lack of balance in distribution of content
- Only 35% consistency in usability tests

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Taxonomy Redesign

This combination of facets gave a very big reduction in frustration levels, increased the richness of information captured about documents, and substantially increased consistency and confidence

	Avge time / task	Avge clicks / task	Avge dead ends / task	Task abandoned	Confidence in final decision	Consistency of decisions	# Tags / document	Clicks / Tag
EXISTING TAXONOMY	2.5 minutes	18 clicks	1.5 folders opened	25%	46%	35%	0.85 tags	21 clicks
NEW TAXONOMY	2.5 minutes	9 clicks	N/A	0%	73%	64%*	2.7 tags	3 clicks

Because in a faceted system each document needs between 2 and 3 tags to achieve the same level of precision as in a single hierarchy, we have divided the actual consistency rate of individual tags by 2.5 to make a meaningful comparison.

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Case Study 2

Testing and Redesigning a Proposed
Taxonomy we had not Developed

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Taxonomy Design & Testing Process

The taxonomy design process involved:

1. Content analysis of the labels and structures used in existing document/content collections and knowledge audit findings, identifying taxonomy facets

2. Conducting a baseline performance test (Test 1) on the proposed taxonomy based on records file classification using typical document seeking scenarios with representative selection of staff

3. Revising the taxonomy into facets based on the content/user analysis and observations during the baseline text

4. Testing the overall structure of the new taxonomy (Test 2) with a topic sorting exercise using a group of staff (closed card sort), to see if the topics were sorted as predicted in the draft taxonomy

5. Revising the taxonomy based on feedback and observations

6. Conducting a benchmark performance test (Test 3) on the revised draft taxonomy using the same scenarios and similar profile of staff from the baseline test, to see if we can see performance improvements

7. Revising the taxonomy based on feedback and observations

8. Seeking feedback from key stakeholders on technical accuracy of terms, specific technical areas, gaps, or remaining problem areas that needed resolution

9. Final revision of taxonomy based on feedback

1. Baseline Test

8 participants from across the organisation were asked to indicate where they would expect to find 15 different documents within the current file classification structure. This was intended to:

• test the baseline performance of the current structure in terms of speed of use, consistency, and confidence levels

• gather insights about how staff interpret topics and how they think when they classify or search for documents

Avge time per task	Avge # Clicks per task	Avge Dead ends per task	% Tasks abandoned	Median Confidence Level	Max Consistency of Final Decisions
1.68 mins	6.3	1.5	7%	70%	46%

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1. Baseline Test

OBSERVATIONS

The most significant problem is the lack of consistency in filing/seeking decisions - the consistency ranges from 12.5% to only 46%. This means that for every document deposited, the **best consistency** that can be achieved is that one in every two people will put it in the same folder. The median consistency rate was around 40%.

Likely causes for this:

- The folder structure is very large. At 18,000 nodes, and four levels deep, it is difficult to navigate quickly and intuitively, so staff make a "first fit best fit" decision without checking for accuracy or better alternatives

- Because it is so large it is under-populated, which means that in most areas staff cannot see representative content to validate their filing decision

- There are multiple possible locations for a given document - eg SMM appears in multiple locations, meetings and committees do not have predictable and consistent places in the structure, policies and procurement documents appear in multiple places, there is confusion between Computerisation and Admin: IT admin

- Some top level categories are interpreted very widely by staff and have overlaps, the distinctions between them are not well understood - eg Admin and Corporate Matters

- Staff think primarily in terms of the programmes or corporate functions they belong to, and find a folder that is closest to that, to deposit there, without thinking about wider findability concerns

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Design Decisions

Best practice in taxonomy design for electronic content is to use a faceted taxonomy structure. Each facet is a simple one or two-level structure which focuses on just one aspect of the document or content item (eg what type of document it is, what activity it relates to). A document can be tagged a number of times to topics across different facets. This provides:

•Multiple pathways to the same content

•Much simpler and more intuitive topic structures for staff to navigate

The facets we proposed were:

•Document types

•Business activities

•Health topics

•People and groups that the document is about

The categories and subtopics for the four facets were derived from a content analysis of the current file classification, the organisation knowledge maps, topics from the intranet IA review, and existing folder structures within the organisation.

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2. Draft Taxonomy Test

9 participants from across the organisation were asked to participate in a closed card sort to test the draft taxonomy with four facets and give feedback. They were given all the topics from across the four facets on slips of paper, and asked to sort them into the high level facet structure.

Our objectives were:

- to see whether topics would be sorted as predicted

- to monitor the discussions among participants and gather insight into how staff interpret the topics and categories

- to gather feedback about the high level structures of the four facets

Overall results were encouraging with 74% of placements being as predicted (we would expect above 75% for a reasonably performing taxonomy structure).

Problem areas are highlighted in the following detailed tables.

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2. Draft Taxonomy Test

DOCUMENT TYPES	ACCURACY	correct	incorrect
DOCUMENT TYPES	75%	185	63
Activity and Impact Reports	42%	11	15
Agreements	83%	5	1
Clinic records	100%	2	0
Communications documents	75%	9	3
Data management documents	50%	3	3
Finance and procurement documents	83%	15	3
Forms and templates	89%	17	2
Guidelines and Procedures	74%	17	6
Health literature	58%	7	5
Health surveillance documents	17%	1	5
HR documents	89%	25	3
KPIs	75%	6	2
Learning and training documents	79%	11	3
Lists and inventories	50%	2	2
Meetings and correspondence	88%	7	1
Multimedia	83%	10	2
Plans	100%	13	0
Policies and Legislation	83%	5	1
Programme documents	83%	5	1
Project documents	0%	0	5
Public education materials	100%	8	0
Schedules and timelines	100%	4	0
Standards	100%	2	0

RESULTING CHANGES

•Activity and impact reports simplified to "Reports on activity" & co-located with "Reports on health"

•Data management documents removed (Data management exists in the Activities facet)

•Guidelines and procedures changed to Procedures and guidelines

•Health literature changed to Health publications

•Health surveillance documents changed to Reports on health

•Lists and inventories has some clarifications in subtopics

•Project documents removed

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2. Draft Taxonomy Test

	ACCURACY	CORRECT	INCORRECT
PEOPLE AND GROUPS	69%	70	31
Audiences	65%	15	8
XXX people and groups	77%	10	3
Partner agencies and groups	83%	24	5
Partner professionals	50%	14	14
Suppliers	88%	7	1

RESULTING CHANGES

• Audiences changed to Customers (performed reasonably well in benchmark test)

• Partner agencies and groups simplified to Partner groups

• Partner professionals changed to Partner individuals

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2. Draft Taxonomy Test

	ACCURACY	CORRECT	INCORRECT
HEALTH TOPICS	75%	9	3
Allergies	NA	0	0
Cancer	100%	3	0
Chronic diseases	71%	5	2
Community health	50%	1	1
Disabilities	NA	0	0
Environmental pollutants	NA	0	0
Family planning	NA	0	0
Health literacy	50%	1	1
Healthy lifestyle	100%	2	0
Infectious diseases	100%	7	0
Injury prevention	NA	0	0
Maternal health	NA	0	0
Mental health	60%	3	2
Myopia	100%	1	0
Nutrition and diet	100%	1	0
Oral health	NA	0	0
Physical exercise	100%	1	0
sexual health	100%	2	0
Stroke prevention	NA	0	0
Substance abuse	100%	2	0
Workplace health	NA	0	0

MAJOR CHANGES

• Hygiene added

• Physical exercise incorporated into Healthy lifestyle

• Other inconsistencies in Chronic diseases, Community health, Health literacy, Mental health look like errors from a lack of technical knowledge - the sample size for topics sorted is too low to warrant revision

• Feedback that Infectious diseases should now be "Communicable diseases" and that "Family planning" may be an outdated legacy topic

**Note that the sample size of topics for Health Topics was low, so this facet was not tested to the same extent as the other three. However, this is the simplest facet and the one least subject to subjective interpretation and variability - most topics can be verified on the basis of technical accuracy.

2. Draft Taxonomy Test

	ACCURACY	CORRECT	INCORRECT
ACTIVITIES	78%	63	18
Admin services	41%	7	10
Audits and investigations	80%	12	3
Corporate communications	67%	6	3
Facilities and asset management	100%	19	0
Financial management	90%	19	2
Health promotion	100%	3	0
Health research	38%	5	8
Health services	100%	11	0
Health surveillance	100%	3	0
Information and knowledge management	80%	8	2
IT management	74%	17	6
Partner and supplier management	83%	5	1
People management	80%	8	2
Project management	50%	4	4
Strategic management	38%	5	8

RESULTING CHANGES

• There is confusion between Admin services, Facilities and Asset management - we separated out Asset management from Facilities and rationalised topics across Admin, Asset Mgmt and Facilities Mgmt

• Corporate communications inconsistencies arose from simple technical mistakes in the meaning of the items - no change required

• Health research clarified to Health research methods

• IT management subtopics clarified

• Project management is not understood and little used - removed this category

• Strategic management subtopics modified and clarified

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Straits Knowledge
Redefining corporate knowledge

3. Benchmark Test

In the **baseline test**, 8 participants were asked to indicate where they would expect to find 15 different documents within the current file classification structure in Objective.

In the **benchmark test**, 8 participants of similar profile to the first test (one manager fewer) were asked to tag the same documents to the proposed faceted taxonomy "in a way that would make them easily findable by staff".

	Avge Time per Task	Avge # Clicks per Task	Avge # Clicks per Tag	Avge # Tags per Doc	Avge Dead ends per Task	% Tasks aband oned	Median Confidence Level	Max Consistency of Final Decisions
BASELINE TEST (old)	1.68 mins	6.3	6.8	0.9	1.5	7%	70%	46%
BENCHMARK TEST (new)	1.70 mins	11.1	3.9	3	1.2	3%	70%	74%

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3. Benchmark Test

TEST RESULTS

Both time and confidence remain at the same levels with the new structure (although we can expect confidence levels to improve as staff become familiar with the simplified structure). The new taxonomy actually increases the number of clicks required to perform a task, largely because a document can now be tagged several times instead of just being placed in one location, and people can navigate the simplified structure much faster.

There is a marginal reduction in "dead ends" where a staff member tries one section of the taxonomy and then decides it is not appropriate and navigates away again.

However there are significant improvements in performance in the most important areas. The improved structure gives dramatic improvements in the:

- Consistency levels in tagging (from 46% to 74%)

- Number of clicks required to attach a tag/assign a folder (almost halved)

- Number of tags attached to a document (each tag provides another pathway to find the content) (from 0.9 to 3)

- Number of tasks that are abandoned without any tag/folder being assigned (from 7% to 3%)

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3. Benchmark Test

POST-TEST IMPROVEMENTS

The "XXX people and groups" category within the **People and Groups Facet** produced confusion between whether the tag should be assigned because the document is *about* that group, or because it is intended *for* that group. We have removed this category and propose to address the need to tag with metadata for XXX affiliation using another auto-assigned metadata element, not within the main taxonomy.

In the **Health Topics Facet** we have changed "Infectious diseases" to "Communicable diseases" based on participant feedback

Other improvements within the **Document Types Facet** include:

- Creating a separate subtopic for "Workplans" under "Plans" (people do not intuitively associate workplans with Corporate planning documents)

- Changing "Clinical service protocols" to the more transparent "Clinic procedures and guidelines"

- Separating "Procurement" from "Finance", creating a separate category (staff do not intuitively look under Finance) ("Procurement" is also broken out as new category in the **Activities Facet**)

- Moving Incident reports to "Clinic records" from "Reports of activity"

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3. Consultation - transparent but rigorous issue resolution process

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Consultation Means…

"We'd like you to examine and comment on the following sections of the taxonomy because of your expertise area"

> Focus the feedback on the areas of the taxonomy where testing indicates that you need advice

"We do not want your opinions, we want targeted feedback on:
- Gaps
- Accuracy of language
- Accuracy of structure and relationships
- Consolidating and simplifying categories"

> You'll get these anyway - but you've made it possible to Say "no" to opinions without warrant

"Please give reasons for your suggestions, based on how people will actually use these categories"

> Try to ensure that all suggested changes have some warrant underpinning them - labels in use, standards in use, situations requiring this language; and that feedback represents the general user not the specialist user

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Redefining corporate knowledge

Issue Resolution

#	Date Received	Facet and Term being discussed	Category	Term	Acme Corp Comment/Suggestion	Comment from (person/dept)	Taxonomist Response	Status (open/closed)	Acme Corp Response	Taxonomist Response	Status (open/closed)
1	####	Activities	Project Planning and Design	Block Breakdown Planning	Remove "planning" so it becomes Block Breakdown	ABC	Done	Closed			Closed
2	####	Activities	Project Planning and Design	-	Add in the term "Panel Breakdown"	ABC	Done	Closed			Closed
8	####	Activities	Construction and Delivery	Inspections and Testing	Remove because inspections and testing can come under several of the other terms under this Category	ABC	So how do you suggest inspections and testing-related documents be captured?	Open	Each activity will have their own inspections and tests. Therefore, such documents should be categorized by the activity.	Remember that documents will have multiple tags, so "Inspections and testing" tag will be combined with another activity tag to specify what kind of inspection/testing activity it is. This was retained in the final list for Construction and delivery (see #117 below) so I have retained it.	Closed
9	####	Activities	Construction and Delivery	Machining	Remove because this is not a major activity	ABC	Please confirm that there will likely be no documents that need to be tagged and retrieved under this category?	Open	Yes please remove this term. It has been verified by several people, including Production	Done	Closed
10	####	Activities	Construction and Delivery	Material Control and Traceability	Should split this into 2 terms. "Inventory Control" and "Material Management and Traceability"	ABC	We already have Inventory control under Project planning and design; it can be in only one place. OK with Inventory control there and Material Mgmt and Traceablity in Construction and delivery?	Open	Ok.	Done	Closed
15	####	Activities	Construction and Delivery	-	Add in the term "Electrical installation"	ABC	We have reached the recommended usability limt of 15 terms in a list. Do we need this term, can we include in "equipment and electircal installation" or can we consolidate some other terms?	Open	Please add it in.	Done	Closed
31	####	Activities	Financial Management	Tax	Can be put under "Financial Reporting"	ABC	Is this how staff would normally interpret this? Even in the budget planning stage? We do not have provision for a third level of the taxonomy for usability reasons, so the terms must be very transparent to staff.	Open	Ok keep this term but change it to "Taxation"	Done	Closed
34	####	Activities	Procurement	-	Replace with "Commercial"	ABC	"Commercial" is a department name, not an activity name. This is NOT a departmental classification, but deliberately a function/activity based classification. This is so that other departments can	Closed			Closed

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Being Empirical Also Means...

- Being better equipped to manage the politics of taxonomy development

- Being able to establish credibility for the taxonomy development process and products - including being able to justify denying requests

- Reducing the risk of project delays resulting from claims on the taxonomy from narrowly informed special interests

GET NOWHERE FAST

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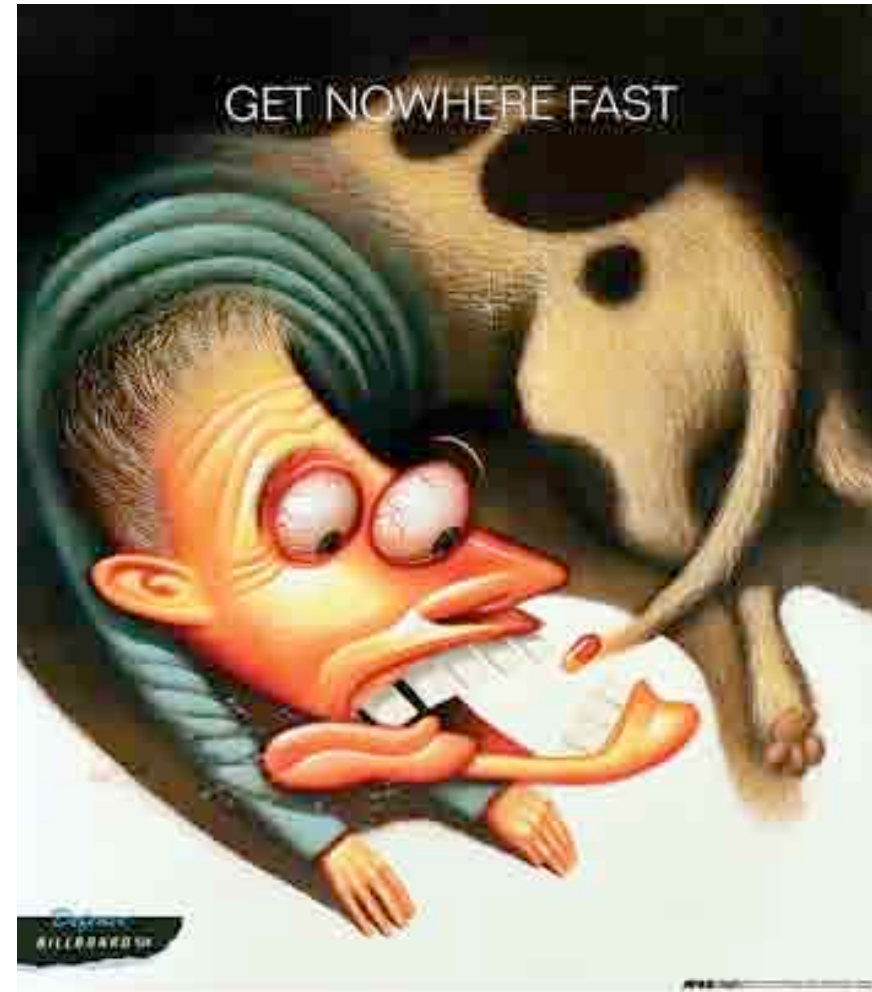
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Redefining corporate knowledge

Any Questions?

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