

# Comparing models and costs

Making it easier to create cost models  
and to capture cost data



STATENS ARKIVER

THE DANISH NATIONAL ARCHIVES

## Project Summary

The Collaboration to Clarify the Costs of Curation (4C) project will help organisations across Europe (and beyond) to more effectively invest in digital curation and preservation.

## Vision

The 4C vision is to create a better understanding of digital curation costs through collaboration.

## Mission

Our mission is to provide useful, useable resources which support the process of cost management in digital curation.

## Task 3.2 and 3.3 of the 4C project

- Identify, analyse and compare existing cost models. Analyse user needs and make a gap analysis.
- Build a cost concept model – a standard for understanding costs on a high level and a starting point for building your own cost model.

*The purpose of the tasks – or the 4C project - was not to build another cost model*

# Comparing cost models

## List of evaluated models

ID	Name and acronym	Owner	Type
1	Cost Model for Digital Preservation	National Archives of the Netherlands	Cost
2	The NASA Cost Estimation Tool (CET)	National Aeronautics & Space Administration	Cost
3	LIFE <sup>3</sup> Costing Model	University College London; British Library	Cost
4	Keeping Research Data Safe (KRDS)	Charles Beagrie Limited	Cost, Benefit
5	Cost Model for Digital Archiving	Data Archiving and Networked Services (DANS)	Cost, Benefit
6	Cost Model for Digital Preservation (CMDP)	Danish National Archive; Royal Library, DK	Cost
7	DP4lib Cost Model	German National Library	Cost
8	PrestoPRIME Cost Model for Digital Storage	PrestoPRIME project	Cost
9	Total Cost of Preservation (TPC)	Digital Library of California	Cost
10	Economic Model of Long-Term Storage	Rosenthal, D	Cost

# Comparing cost models

## Example of model summary

Property	Description
ID	9
Name	Total Cost of Preservation (CDL-TCP)
Creator and funding	The model was (and is being) developed by the California Digital Library (CDL), UC Curation Center (UC3) under a Creative Commons Attribution-Sharealike 3.0 license
Status	The latest version of the TCP pricing model tool and whitepaper is rev 2.1 from 2013-08-05
Purpose	Modelling the full economic costs of preservation, the “total cost of preservation” (TCP) over time in order to sustain long-term preservation efforts—effective and affordable curation management. UC3 itself needs a TCP model in order to move many of its core service offerings to a cost recovery operational basis.
Information assets	Any kind of digital asset—the model uses a generic, abstract level
Activities	Ingest, Data Management, Archival Storage, Preservation Planning, Access, Administration, Management
Resources	Total cost; in the tool total cost is refined into subsidiary costs such as capital cost, labour cost; operational cost; one-time, term or annual costs (called scope), fixed cost or marginal cost (proportional cost). Term costs are annualized over their lifespan and adjusted for inflation.
Time	Present, future—10 year scope
Variables	More than 100. For example, for “Migration” there are unit costs for: refreshment, replication, repackaging, transformation. For “Staff” there are 12 kinds of roles with salaries, FTE day rates.
Type of tool	Analysis tool, implemented as a MS Excel spreadsheet
Availability of tools	The tool is available for download at: <a href="https://wiki.ucop.edu/display/Curation/Cost+Modeling">https://wiki.ucop.edu/display/Curation/Cost+Modeling</a>
References	California Digital Library, Total Cost of Preservation (TCP), Whitepaper, 2013, : <a href="https://wiki.ucop.edu/download/attachments/163610649/TCP-cost-price-modeling-for-">https://wiki.ucop.edu/download/attachments/163610649/TCP-cost-price-modeling-for-</a>

# Comparing cost models

## Gap analysis

Example of evaluation of the models' ability to handle different criteria:  
<http://www.curationexchange.org/make-the-case/19-summary-of-cost-models>

	Model									
	T-CMDP	NASA-CET	LIFE3	KRDS	CMDA	CMDP	DP4lib	PP-CMDS	CDL-TCP	EMILTS
Cost variables										
Quantity of assets	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗
Min/max amount of assets	✓	✗	✗	✓	✓	✗	✓	✓	✗	✓
Different types of assets	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗
Quality of activities	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗
Upload/download capacity	✗	✓	✓	✓	✗	✗	✗	✓	✗	✗
Quality of repository	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗

# Comparing cost models

## Recommendations & conclusions

### Recommendations

- Usability & Documentation
- Simplification & Accuracy
- Empirical cost data sets to test
- Standardisation (tend towards it but discrepancies)

### Conclusions

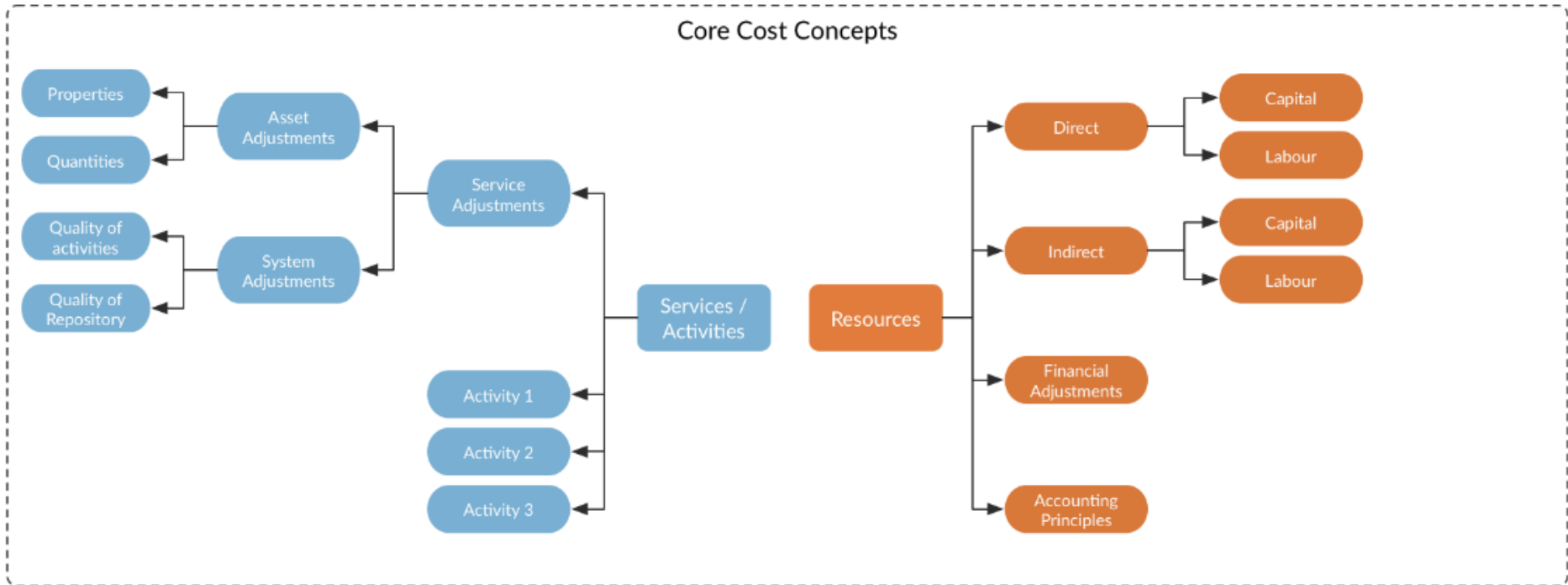
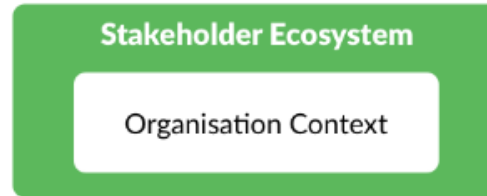
- No typological differences, only 2 models incorporating **benefits**
- Activity-based, OAIS-based, modelling migrations strategies, difficulties re format complexities

The analysis of models allowed for the development of a Cost Concept Model and an Implementation Guide for cost model developers.

What are those?

# Comparing cost models

## Cost Concept Model



# Comparing cost models

## Implementation Guide & Gateway Specification Template

To support the development of a new cost model

- **Support a standardised** approach to developing cost models
  - E.g. define model metadata, cost drivers
- **Recommend cost modelling practices** based on the evaluation of existing cost models
  - E.g. activity-based, usability issues, variables
- **List the drivers for the take-up** of models
  - E.g. taken from a gap analysis: what do users want?

# Comparing costs

- The Cost Comparison Tool – Purpose: Gather past costs and make them comparable

Putting cost figures into a machine

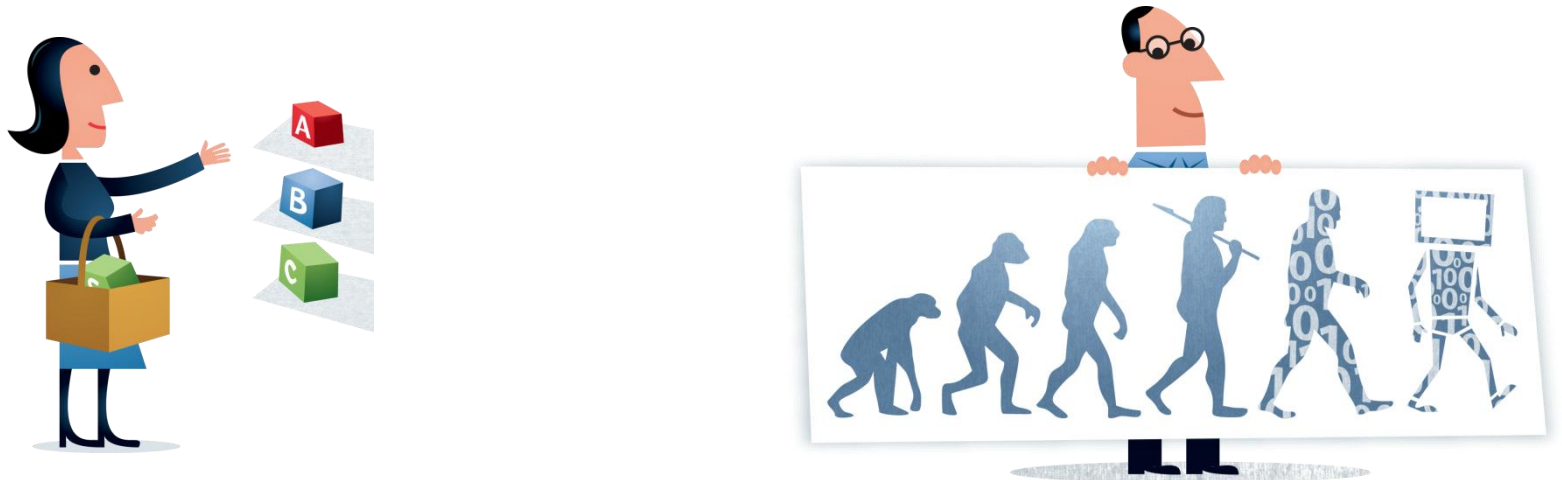


Where they don't necessarily fit

# Comparing costs

## – The Cost Comparison Tool: Purpose

In order to make them comparable – even though the results are not a 100 % accurate



So that we all become better and make progress in our businesses

# Comparing costs

## – Method: Acquiring information

Ask people who they are, e.g.

### Organisation

Organisation name\*

Organisation type\*

University, Government agency, Big data science, Digital preservation vendor, Small or medium enterprise, Memory institution or content holder, Publisher or content producer, Research funder, Industry, Other.

Description, purpose and mission

Country\*

### Collection(s) profile

Scope of the cost information\* (organisation, department, collection or project)

Size of staff working within the scope\*

Data volume\*

Number of copies\*

### Asset types\*

Unformatted text, Word processing, Spreadsheet, Graphics, Audio, Video, Hypertext, Geodata, E-mail, Database,

### Currency definitions

Euro, dollar\*

# Comparing costs

## – Method: Acquiring cost data

Ask people what they spend, e.g:

Cost unit information		
Name: Migration project	Description	Cost (€)
Pre-project	Project planning	137.290,00 €
Preparation	Preparation of archival records	76.645,00 €
Scanning	Preparation for scanning	69.631,00 €
Registering		13.548,00 €
Development of main programmes		160.172,00 €
Development of test programmes		42.796,00 €
Initial migration		68.086,00 €
Migration of databases and ERMS		904.860,00 €
Migration of audiovisual material		221.347,00 €
Project Management		171.957,00 €
Learning and knowledge management		68.086,00 €
Equipment		46.247,00 €

# Comparing costs

– Method: mapping cost data units

And to map these cost units unto 4C categories made for comparisons: (<http://www.curationexchange.org/>)

Cost mapping				
An organisation's cost units			4C activity cost categories	
Cost unit name	Cost	Share %	Category	Cost (€)
Pre-project	137.290 €			
Preparation	76.645 €			
Scanning	69.631 €		Pre-Ingest	19.953€
<b>Registering</b>	<b>13.548 €</b>	<b>25/75%</b>		
Main programmes	160.172 €			
Development of test programmes	42.796 €		Ingest	32.774€
Initial migration	68.086 €			
Migration of databases and ERMS	904.860 €			
Migration of audiovisual material	221.347 €		Storage	46.247€
Project Management	171.957 €			
<b>Skills/Education</b>	<b>68.086 €</b>	<b>33%</b>		
<b>Equipment</b>	<b>46.247 €</b>	<b>100%</b>	Access	22.695€

# Goodbye and thank you EUDAT 2014 – any questions?

All information to be found at  
[curationexchange.org](http://curationexchange.org)



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