Workshop
Monday October 6th 2014
9am – 1pm

Defining a Roadmap for Economically Efficient Digital Curation
a 4C Project Workshop

Neil Grindley – Jisc, UK
Luis Faria – Keep Solutions, Portugal
Katarina Haage – German National Library
Ulla Bøgvad Kejser – Royal Danish Library
A [4C] perspective on the economics of digital curation

The purpose of the 4C Roadmap

The aims of the workshop
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.
Assessment

Tasks
• Assess cost models & strategies
• Examine good practice
• Analyse requirements
• Integrate components
• Produce guidance & briefing materials
• Setup costs exchange

Engagement

Tasks
• Engage stakeholders
• Raise awareness
• Organise meetings
• Promote Research & Innovation
• Build community network

Enhancement

Tasks
Examine and refine related concepts
• Value
• Risk
• Benefits
• Sustainability
• Economic Reference Model

Networking & Coordination

Affiliate Partners & Stakeholders

Outputs

Reports for General Dissemination
Curation Costs Exchange

Jisc
Project Coordination

Tasks
Project meetings
Project reporting
EC liaison
Budget oversight
Outputs QA

Collaboration to Clarify the Costs of Curation

Events, Workshops, Meetings & Reports

Affiliate Partners & Stakeholders

Reports for European Commission
Submission of Roadmap to the EC
Collaboration to Clarify the Costs of Curation

**TIMELINE**

May 2011

Preparation

Nov 2011

Project Kickoff

Apr 2012

Who we are & what we do

Feb 2013

Summer 2013

Contact Stakeholders

Dissemination, legacy, recommendations

Emerging Resources

Summer 2014

Emerging

Resources

Nov 2014

4C Conference

Jan 2015

Project Close

Project Close

Nov 2011

Archiving

Summer 2013

Contact Stakeholders

Investing in Curation Roadmap

Curation Costs Exchange

Nov 2014

Archiving

DCC

iPRES 2013

Participation, debate, emerging findings

April 2012

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Project Close
Why did we choose the ‘cost’ of digital curation as the starting point?

• Understanding costs can support strategic planning.

• Understanding costs can support tactical decision-making.

• Understanding costs can provide evidence of cost-effectiveness and value.

• Understanding the cost of curation may mean we can offer realistic and cost-effective curation services to others.

• Clarifying and publishing the cost of digital curation can be used to enhance our organisation’s credibility. But this must be done along with the context of how the costs were calculated.

• Understanding economic drivers can help to strategically align an organisation.
But what *exactly* needs clarifying ...?

If they *really want to*, organisations can work out how much it costs them to manage their digital assets.
So ... what are the issues?

- The random numbers problem - how do we meaningfully compare the numbers that we end up with? [*cost data*]

- Activity based costing versus financial accounting methods

- Describing what the organisation does [*cost metadata*]

- Describing the amount and type of data that is being looked after [*cost metadata*]

- Complexity - the detail builds up very quickly across different organisations and it doesn’t map together easily

- Sensitivity around data – many (most?) organisations are not comfortable broadcasting what it costs them to manage their data. How do we effectively anonymise costs data?

- We somehow have to make sure that the benefits are presented alongside the costs
Collaboration to Clarify the Costs of Curation

ECONOMIC MODEL
Maintaining stakeholder incentives and the flow of resources to sustain assets

COSTS MODEL
Digital Assets
Activity and Process
Time and Effort

BENEFITS MODEL
Value & Benefits
Risk
Curation as Black Box

Maintaining stakeholder incentives and the flow of resources to sustain assets.
The purpose of the 4C Roadmap & the aims of the workshop

How can organisations working in a variety of different domains more cost-effectively look after and account for the digital assets in their care?

The (Draft) Roadmap tries to address that question by outlining the steps that should be taken over the next five years in order to maximise the efficiency of digital curation and to ensure sustainability.

We want to check whether the community agrees with our proposals.

We want to try and ensure that the Roadmap is a convincing, practical and plausible document and that its recommendations hit the right targets.
But first, we’ll give you a bit more detail about the 4C work ...

Descriptions of:

- Outreach and engagement
- 4C Needs & Gap Analysis
- The Cost Concept Model (CCM)
- The Curation Costs Exchange (CCEx)
- Indirect Economic Determinants (IED’s)
- The Economic Sustainability Reference Model (ESRM)
Quick introduction to the 4C work on cost-related concepts

- Indirect Economic Determinants
- Trust & certification
- Risk

- Sustainability
- Business Models

http://www.4cproject.eu
Institutional objectives will not usually focus on digital curation *per se*. (Digital curation is a ‘derived demand’).

But achieving those objectives will require investment and some proportion of it will support digital curation.

These variables are difficult to quantify but may be very significant when an institution tries to clarify or explain its costs. 4C refers to them as ‘*indirect economic determinants*.’

They can also be regarded as conceptual controls to support discussions at a higher stakeholder or organisational management level.
Exercise - Indirect Economic Determinants
To what extent would your organisation regard the following 15 outcomes as an investment priority?

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<th>IED</th>
<th>High</th>
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Indirect Economic Determinants (IED’s)

Business Drivers
Organisational Objectives
Management Tools

They are controls that can be used to adjust outcomes within the organisation and they correlate with raised or lowered costs depending on whether you wish to turn them up or down.
Difficult to Quantify

A desire for a good **reputation, flexibility, and innovation** might be common senior management, policy or funder level goals but may require definition and interpretation before they can be integrated into curation costing calculations.

Measurable with some additional context

**Authenticity** with use of checksums and provenance data. **Impact** might be citations or downloads. **Quality** can be understood at various levels (inc. integrity of retained transformational properties)

Subject to standardised audit and certification

- The ISO9000 series for **quality**
- The ISO31000 for **risk** governance
- ISO27000 for Information Security addresses **authenticity, confidentiality** and **risk**
Understanding Benefits to Underpin Sustainability

If an organisation can clarify and understand its IED’s, (the organisational context in which digital curation takes place) it will be in a better position to communicate the costs and benefits of curation (the curation service) to its stakeholders.

The curation service must sustain a ‘series of actions’ over time to enable value to keep on being delivered to relevant stakeholders for as long as the digital assets are capable of realising value.

This requires **sustainability** planning ...
Introduction to the Economic Sustainability Reference Model (ESRM)

Brian Lavoie

Chris Rusbridge

The ESRM maps out the key elements of the problem space planners face when designing a sustainability strategy for their digital curation activities.

It focuses on the general concept of a sustainability strategy, breaks it down into its key components, and draws planners’ attention to the properties of those components most relevant for economic sustainability.
The ESRM proposes that a sustainability strategy requires consideration of four categories of issues:

- The Economic Lifecycle
- Sustainability Conditions
- Key Entities
- Economic Uncertainties
Collaboration to Clarify the Costs of Curation

- **ASSETS**
- **STAKEHOLDERS**
- **PROCESSES**

Sustainability Strategy

- Value
- Selection
- Resources
- Organisation
- Incentives
- Uncertainty (Risk)

Sustainability
The activity of digital curation is assumed to be the central active component and the engine that will ensure the sustainability of digital assets.
Investment into curation will in turn facilitate use (or the potential for use)
And use (or the potential for use) will realise value, thereby delivering a return on the investment.
This could play out in a linear fashion with assets being created, curated and then deleted according to a retention schedule. But in the context of sustainability, it is more likely to be a cyclical process.
There will be a gap in the cycle where a technical or business issue introduces a threat to the continued viability of the assets. This becomes a decision point ... Do we allocate more resources to tackling the problem?
Five Sustainability Conditions are set out to maximise the prospects for sustaining assets.
Sustainability Conditions

The assets must be understood (or perceived) to have tangible or intangible value
Relevant stakeholders must be sufficiently motivated to support curation
Where resources are scarce then discretion must be used to prioritise curation of the most valuable assets.
The organisation should have an appropriate mandate; a supportive governance structure; and be optimally configured to sustain the assets.
There must be a sufficient flow of ongoing resources (including financial and human capital) to achieve long-term goals.
Key Entities

Three Key Entities are set out which are found in all digital curation contexts. Sustainability requires the nature of these entities to be understood.

- **ASSETS**: Every type of digital asset exhibits various attributes or properties that to a greater or lesser extent may affect the how they are curated.

- **STAKEHOLDERS**: The stakeholder ecosystem for digital assets can be complex and the supply side and demand side should be understood in relation to who is undertaking the curation for the benefit of whom.

- **PROCESSES**: The processes involved must be capable of (and optimised for) efficiently enhancing the value of the assets.
The inclusion of Economic Uncertainties is an acknowledgement that even the best sustainability strategy cannot accurately predict the future and that some expectation or mitigation of uncertainty (both threats and opportunities) should be built into the strategy where possible.
Sustainability

Strategy

ASSETS

STAKEHOLDERS

PROCESSES

Value

Incentives

Organisation

Selection

Resources

Uncertainty (Risk)

Sustainability

COOPERATION
After the break, we’ll get into groups for some general discussion about the economic issues around digital curation

Questions

• What are your main digital curation challenges?
• What or who could most influentially help to tackle those challenges?
• What current economic inefficiencies do we need to eliminate?
• Is it possible and economically desirable to try and align digital curation practice?
• How can we most effectively invest in digital curation at the institutional, national and international level?
The Draft 4C Roadmap

The vision, its intentions, the key messages and challenges ...
What is a Roadmap? Why do we need one?

A Roadmap is a strategic document for a community of people that are all engaged in a shared undertaking and who want to map a path towards achieving a shared set of goals.

Map - Helps us to understand what the landscape looks like so that we can navigate our way through it and make progress towards shared objectives

Road - Allows us to make quick progress through the landscape and get to our chosen destination
Where do we start?

What question are we trying to answer?

How can organisations working in a variety of different domains more cost-effectively look after and account for the digital assets in their care?
The shape of things to come?

2020

We require proof you are in control of the costs of sustaining your digital assets.

We know we are controlling our costs effectively because we have benchmarks to measure ourselves against.

What are these benchmarks and how trustworthy are they?

They are based on a community agreed alignment of practice and mature business modelling.

Efficiency

Sustainability
Situating the Roadmap in time

- **1995**: What should we do? Cost questions
- **2005**: Are we doing the right things? Cost Models
- **2015**: Are we doing things right? Cost Levels
- **2020**: Who should do what? Market Efficiencies
- **2025**: Rethinking the data explosion
  - Selection & appraisal
  - The dependencies between data and software

Benefits
The Vision

In five years time (2020) it will be easier to design or procure more cost effective and efficient digital curation services because the costs, benefits and the business cases for doing so will be more widely understood across the curation lifecycle and by all relevant stakeholders. Cost modelling will be part of the planning and management activities of all digital repositories.
Stakeholder groups

- Curation Practitioners
- Curation Researchers
- Data Users (and Re-users)
- Managers (and Financial Officers)
- Member Organisations
- Policy Makers (Resource Providers / Data Owners)
Message 1

Identify the value of digital assets and make choices
2 difficult and related problems are referenced here

• How do we go about quantifying or realising the value of our digital assets?

• How do we go about assigning value to each data object (or dataset, data stream, series, collection) when confronted with massive amounts of data?

Lots of different ways to approach all of the messages ...
Collaboration to Clarify the Costs of Curation

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<td>Curation Practitioners</td>
<td>Lobby management into proper resourcing of selection and appraisal practice and focus on cost-effective digital curation activity</td>
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<td>Curation Researchers</td>
<td>Conduct research into automatic appraisal and selection techniques based on codified value criteria</td>
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<td>Data Users</td>
<td>Content experts to work with technologists to establish value criteria and represent ‘designated communities’</td>
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<td>Managers</td>
<td>Incorporate the concept of ‘value’ into strategic and tactical decision-making</td>
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<td>Member Organisations</td>
<td>Help establish relationships between organisations to facilitate the transfer or ‘handoff’ of digital assets</td>
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<td>Policy Makers</td>
<td>Establish requirements for digital asset value assessment as part of data management and curation planning</td>
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<td>Solution Providers</td>
<td>Build on existing tools (e.g. file format registries) to provide automated selection &amp; appraisal tools</td>
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3 Conversation Starters

If we try and preserve everything, we will end up with assets that are hard to find, difficult to understand and complicated to re-use.

If we are resolved and are willing to devote resources to it, it should be possible to design effective semi-automated selection and appraisal methods that will help us cope with large volumes of digital content.

The managers (and policy makers) perhaps have the most difficult job here. To understand that an investment needs to be made to understand the investment they have already made!
Message 2

Demand and choose more efficient systems
3 Conversation Starters

We are asserting that the marketplace for digital curation solutions is not yet fully functional and that it is desirable that it should become so.

From a supply and demand perspective, it is the ‘demand’ side that we can and should focus on.

More alignment and adoption of standards is a big part of the answer but pursuing certification is only appropriate for some organisations. Self-assessment and peer review and other mechanisms are valuable.
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<td>Curation Practitioners</td>
<td>Establish a common understanding of curation. Share experiences and empirical evidence about tools &amp; methods to provide institutions with baseline curation requirements</td>
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<td>Curation Researchers</td>
<td>Undertake research work to minimise subjectivity and clarify &amp; standardise definitions of benefits. Develop tools that facilitate the implementation of standards</td>
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<td>Data Users</td>
<td>Demand better and more standardised interfaces to data and metadata making data more usable and thus demonstrating its value</td>
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<td>Managers</td>
<td>Setup agreements between organisations to share infrastructure for more efficient utilisation of available resources</td>
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<td>Member Organisations</td>
<td>Evangelise for the standardisation of practice across domains and produce advice &amp; guidance that will help organisations to act upon this message. Work with solution providers &amp; customers to translate and improve system specifications</td>
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<td>Policy Makers</td>
<td>Promote good practice and training so that integrated and standardised digital curation tools and services have a higher profile</td>
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<td>Solution Providers</td>
<td>Work with customers and the community to develop, explain and simplify standard practices. Meet customers half-way in specifying solutions and by making pricing models and implementation options clear &amp; understandable</td>
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Collaboration to Clarify the Costs of Curation

Message 3

Develop scalable services and infrastructure
Collaboration to Clarify the Costs of Curation

3 Conversations

Choosing the most efficient and effective curation infrastructure must be based on shared knowledge and expertise.

The assumption is that organisations should aspire towards mature curation services and that this will often result in shared infrastructures and require working in partnership with other organisations and service providers.

Effective collaboration requires investment. It takes time and effort and managerial understanding to collaborate effectively and the motivations to do so must be understood by all parties.
## Collaboration to Clarify the Costs of Curation

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<td>Curation Practitioners</td>
<td>Make realistic assessments of institutional capability to provide scalable services &amp; infrastructure and compare this with the cost effectiveness &amp; suitability of external service provision</td>
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<td>Curation Researchers</td>
<td>Optimise workflows and design procedures that will handle large volumes and complex digital objects</td>
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<td>Data Users</td>
<td>Demand delivery of assets and access to resources that suit the needs of users rather than fit within the constraints of current services and infrastructure</td>
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<td>Managers</td>
<td>Setup agreements between organisations to share infrastructure for more efficient utilisation of available resources. Support practitioners to make realistic assessments of local capability</td>
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<td>Member Organisations</td>
<td>Identify and share lessons learnt relating to the economic benefits of using shared infrastructures and the value of planning for scalability over time. Provide a neutral environment to build trust for the negotiation of sharing agreements.</td>
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<td>Policy Makers</td>
<td>Provide domain-wide shared infrastructures to exploit economies of scale</td>
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<td>Solution Providers</td>
<td>Pay close attention to the need to build scalability into services. Offer solutions that are vigorously tested and provide transparent, benchmarked performance in response to more sophisticated specifications</td>
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Message 4

Design digital curation as a sustainable service
3 Conversations

All organisations should be seeking to mature their digital curation activities. It should be designated as a service that delivers a business function.

As a service, there will be a supply-side and a demand-side and it is important (even if both are internal to an organisation) that the participants in this ‘transaction’ are clear about their roles and responsibilities.

When it is clear who is curating what for whom, it will be easier to declare the business case for curation and to support the arguments for continued investment.
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<td>Curation Practitioners</td>
<td>Work with digital curation service consumers (users) to model the current costs and benefits of digital curation activity</td>
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<td>Curation Researchers</td>
<td>Continue research into sustainable business models and examine how to standardise divergent current practices</td>
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<td>Data Users</td>
<td>Methodically and empirically assert the value of digital assets and work with practitioners and managers to undertake cost/benefit analyses</td>
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<td>Managers</td>
<td>Seek proof that digital curation activity within the organisation is: optimally &amp; sustainably resourced; works within a defined supply &amp; demand framework; is providing an efficient &amp; effective service</td>
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<td>Member Organisations</td>
<td>Provide practitioner advocacy material to promote activities within organisations. Help solution providers to publicise &amp; promote their offerings to enhance the marketplace for services &amp; solutions</td>
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<tr>
<td>Policy Makers</td>
<td>Provide domain-wide shared infrastructures to exploit economies of scale. Design funding constraints to ensure that sustainable digital curation is underpinned by proven cost-effectiveness</td>
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<tr>
<td>Solution Providers</td>
<td>Participate in setting standards and focus on long-term interoperability of design in software &amp; infrastructure. Focus on openness &amp; collaboration and building a sustainable &amp; inclusive market place</td>
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Message 5

Make funding dependent on costing digital assets across the whole lifecycle
3 Conversations

If we make funding contingent on being able to declare plausible cost estimates, this effectively means that organisations will have to engage in cost modelling activity at some level.

This clearer and more insistent focus on the cost of curation may result in some organisations rethinking their current digital asset stewardship arrangements. It could mean that affording long-term preservation doesn’t actually align with their business objectives.

The question of trust is critical to underpin an effective ownership chain where digital assets can be passed over to organisations that are better placed to curate assets into the future.
# Collaboration to Clarify the Costs of Curation

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<tbody>
<tr>
<td>Curation Practitioners</td>
<td>Collaborate with peer organisations and engage with tools to establish the cost and benefits of digital curation. Be prepared to clarify whole lifecycle costs for managing digital assets</td>
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<tr>
<td>Curation Researchers</td>
<td>Further develop resources that will simplify cost modelling &amp; comparison for digital curation. Engage in additional pathfinder research to refine methods &amp; decrease costs</td>
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<td>Data Users</td>
<td>Work with practitioners, researchers &amp; policy makers to establish a better understanding of the variable asset value across the digital lifecycle &amp; the impact of digital curation on that value</td>
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<tr>
<td>Managers</td>
<td>Establish clarity within organisations about roles &amp; responsibilities for costing curation &amp; resource it appropriately. Provide additional training for finance &amp; accounting staff to understand digital asset management budgeting issues</td>
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<tr>
<td>Member Organisations</td>
<td>Help establish relationships between organisations to facilitate the transfer or ‘handoff’ of digital assets. Promote tools &amp; methods for whole lifecycle costing and disseminate good practice</td>
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<td>Policy Makers</td>
<td>Identify where the maintenance of digital assets is a priority &amp; design clauses in support agreements that require an estimation of the whole lifecycle costs of sustaining the assets for as long as they may be needed</td>
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<td>Solution Providers</td>
<td>Work with practitioners and researchers to build accounting and budgeting modules into curation systems</td>
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Be collaborative and transparent to drive down costs
3 Conversations

Comparing operational costs and effort with peers is essential for identifying where efficiencies and savings can be made. This comparison can only happen if people are prepared to share.

The Curation Costs Exchange provides this mechanism but will need support from the community, not only in the first instance to populate the Exchange with data, but ongoing support to keep it valid as a community resource.

If those who provide digital curation services can be contextually descriptive about their products and transparent about their pricing structures, this will enhance possible comparisons, drive competitiveness and lead the market to maturity.
## Collaboration to Clarify the Costs of Curation

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<tbody>
<tr>
<td>Curation Practitioners</td>
<td>Devote resources to clarifying the costs &amp; benefits of curation and then share the findings with the wider community. Ask for reciprocal information from others</td>
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<tr>
<td>Curation Researchers</td>
<td>Examine, evaluate, assess and report on the impact of being collaborative and transparent about costs and benefits information</td>
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<td>Data Users</td>
<td>Understand the role and purpose of the ‘designated community’ for curation and ensure that managers &amp; policy makers include users in consultation and steering groups for digital curation initiatives</td>
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<tr>
<td>Managers</td>
<td>Ensure that curation activity within organisations is aligned with organisational objectives and that curation practitioners are correctly identifying &amp; emphasising curation benefits when they are outlining curation costs</td>
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<td>Member Organisations</td>
<td>Synthesise &amp; disseminate the data on costs &amp; benefits and adopt a neutral &amp; universal approach to help all organisations drive down the costs of curation. Foster a culture of trust among members</td>
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<tr>
<td>Policy Makers</td>
<td>Foster a culture of collaboration to understand the costs and benefits of digital curation</td>
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<tr>
<td>Solution Providers</td>
<td>Come up with good descriptions of the benefits frameworks and the curation objectives that systems &amp; solutions support to complement clear pricing &amp; costs information</td>
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Breakout Groups to Discuss the Roadmap

Do you share the vision outlined in the Roadmap?

For each message ...

• Is the message meaningful to you?
• Do you agree with the message?
• If the message applies to you, are you prepared to act on it?
• Is this message aimed at the right audiences?