TÉCNICO LISBOA

How can Risk Assessment techniques be used to estimate Costs for Digital Curation?

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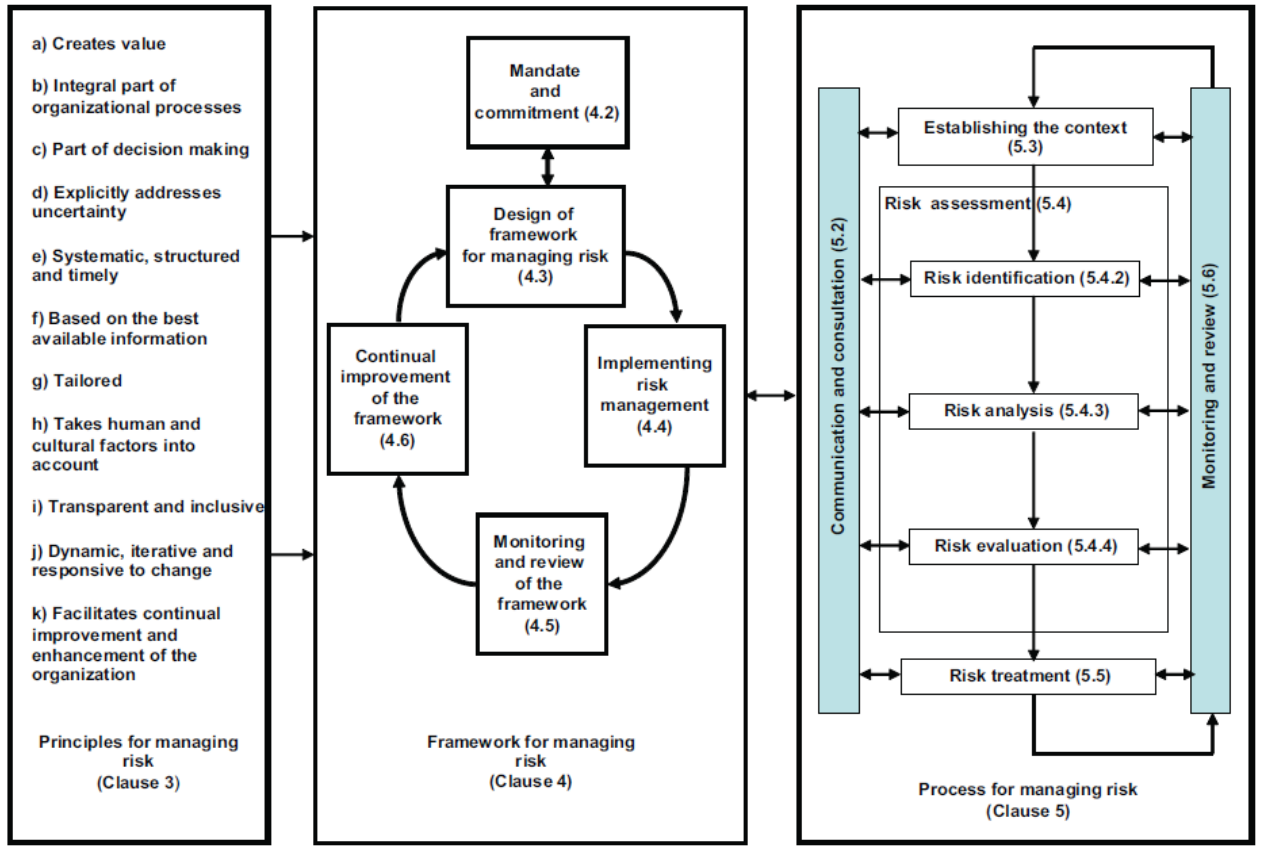
Digital Curation?

- Involves maintaining, preserving and adding value to digital assets throughout its lifecycle;
- The active management of research data reduces threats to their long-term research value and mitigates the risk of digital obsolescence;

- Digital Curation Centre (DCC) - http://www.dcc.ac.uk/

The Challenge:
How can we estimate Costs for Digital Curation?

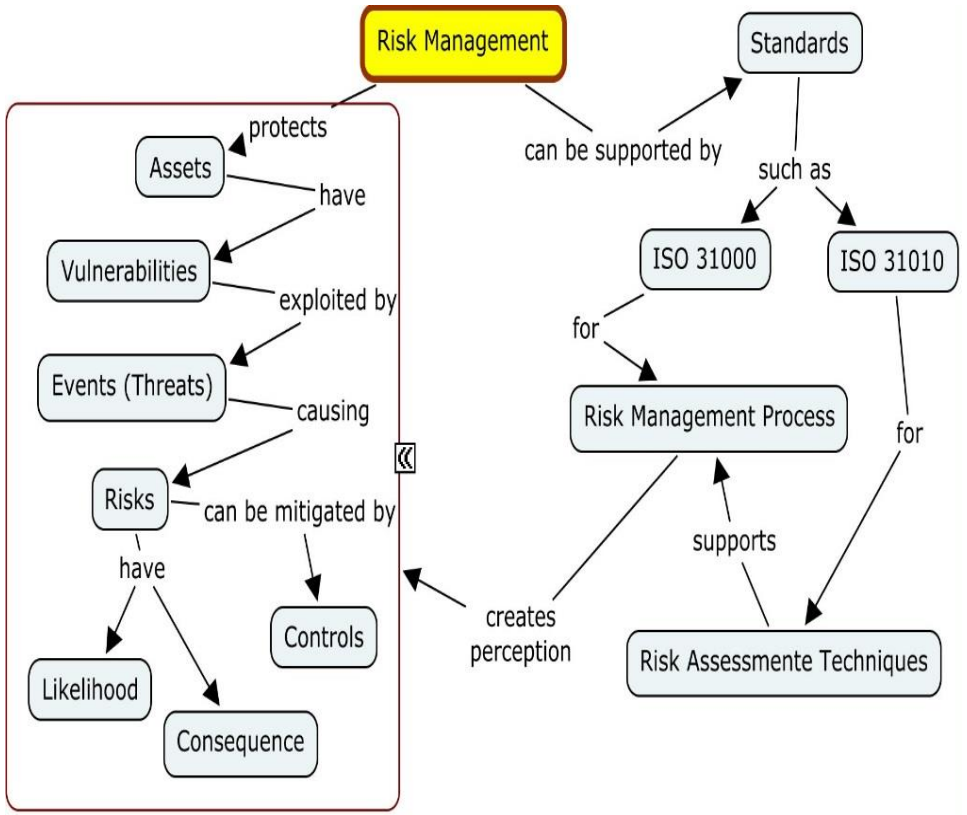
- **Fact:** Decision-making regarding the costs of digital curation is an emerging issue;
- **Problem:** It isn't easy to estimate the costs for Digital Curation – to evaluate which assets the organizations address as important to preserve;
- **Hyphotesis:** We propose that Risk Management can be helpful to estimate the large part of these costs that are related to the controls the organization has to put in place to mitigate the perceived risks.



ISO 31000 - Relationships between the risk management principles, framework and process

Risk Management – what is it?

- RM involves establishing an appropriate infrastructure and culture by applying a logical and systematic method of establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organizations to minimize losses and maximize gains.

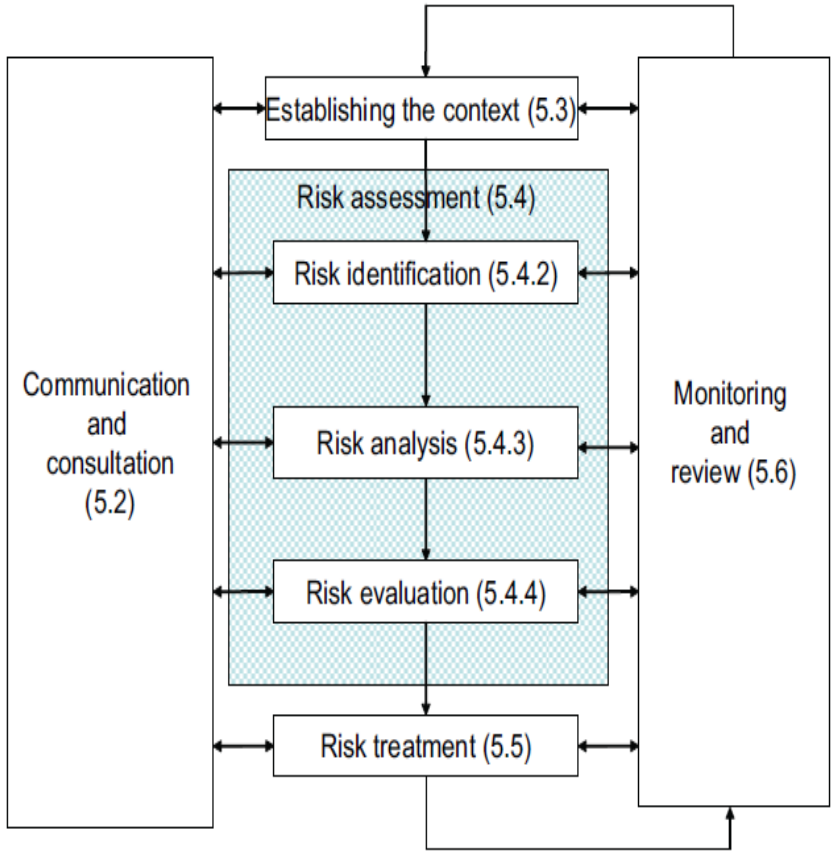


Conceptual map relating the most relevant concepts in Risk Management

Risk Management – what is the purpose?

- RM aids decision making by taking account of uncertainty and the possibility of future events or circumstances (intended or unintended) and their effects on agreed objectives;

- **Idea**: A established body of knowledge on Risk Management (RM) can be valuable for the domain of curation!



ISO 31000 – Risk Management Process

Risk Management and Digital Curation

Organizations of all kinds face internal and external factors

→ Influences making it uncertain whether, when and the extent to which, they will achieve or exceed their objectives

The effect that this uncertainty has on the organization's objectives is risk

Controls are measures implemented by organizations to modify risk that enable the achievement of objectives

→ Controls can modify risk by changing any source of uncertainty

Costs are what we have to give up for controls, which are the measures that we have to put in practice to minimize loss (digital preservation) or also to maximize gain (digital curation in a broad sense).

A control is anything we are considering to apply either to minimize negative impacts or to take advantage of opportunities to produce value and thus bring gains

Example of Risks and applied Controls

Risk Categories	Risks	Controls (e.g.)
Organisation Management	Loss of trust or reputation	Seek all available and relevant certifications to publicly demonstrate the repository's operational effectiveness.
		Promote organisational transparency to reveal suitability and extent of coverage of policies and procedures.
Acquisition and Ingest	Structural non-validity or malformation of received packages	Develop definition for submission package structure.
		Establish list of acceptable formats for submission.
	Archival information cannot be traced to a received package	Record appropriate provenance information, detailing interactions undertaken during receipt and ingest process.
Preservation and Storage	Loss of availability of information and/or service	Ensure policies and procedures are conceived with due consideration of any service levels that the repository has committed to.
		Ensure software and hardware systems and preservation strategies are capable of meeting service levels.
	Preservation plans cannot be implemented	Aim to reflect the extent of technological, financial and human resources available within the repository as well as its organisational objectives when conceiving preservation plans.

Proposed guidelines to estimate Costs:

- **Identify the fundamental cost determinants for the case under analysis** (this must be done with the major stakeholders of the repository, or using references as explained in the next section);

- **Execute a Pragmatic Risk Assessment**: Use a risk repository, or consult risk experts (such as a specialized archivist), in order to identify relevant risks associated to the identified determinants;

- **Understand Actual Risk Treatment:**
  - Consolidate the risks identified (mainly, to detect repetitions and overlaps) ;
  - Use your internal information, eventually also consulting a risk repository or experts, in order to identify the controls you actually are applying for the consolidated risks;

- **Estimate the Costs**: Acquire conscience of the costs for these controls (the ideal is to calculate these costs precisely, but ultimately the best estimation also can provide to be useful).

Case study – using the proposed method

- In the 4C project it was conducted a survey to understand which are thee indirect economic factors in Digital Curation;
- The indirect economic factors were ranked accordingly to their importance;
- For each indirect economic factor, a list of risks was identified, as well as the respective controls to be applied in order to avoid de occurence of those risks.

http://www.4cproject.eu/

4C Collaboration to Clarify the Costs of Curation

4C - Example of Risks and applied Controls

Determinant	Related risks (possible consequence in case of hazard)	Generic controls (source of costs)
Authenticity	Loss of reputation and trust	Preservation plan
Benefit	Ability to deliver	Business plan
Confidentiality	Exposure to competitors	Security auditing Security certification
Efficiency	Exposure to financial uncertainty	Performance assessment Re-engineering / Change management Operations Maintenance Infrastructure
Flexibility	Inability to explore new opportunities	Re-engineering / Change management
Impact	Loss of reputation and trust	Marketing plan
Reputation	Reputation	Marketing plan
Skills	Loss of efficiency if key staff leave	Staff assessment Staff training Staff salaries/benefits
Trustworthiness	Loss of reputation and trust	Trustiness auditing Trustiness certification
Innovation	Exposure to obsolesce Uncertainty of early adopter Inability to explore new opportunities	Research and development Re-engineering / Change management

Case Study – Result

- Helping the management of a repository to gain conscience of the controls it already applies or must apply due to Risks ;

- Is a valuable contribution to help to model the Costs of that Business!

Risk Expert: Role and Responsabilities

- A person with knowledge of principles, processes and techniques to: **identify, analyse, evaluate and treat any Risk**;

- Should be **consulted** in all steps of the RMP;

- This is were we identify and **opportunity for Archivists.**

Proposed skills for a Risk Expert:

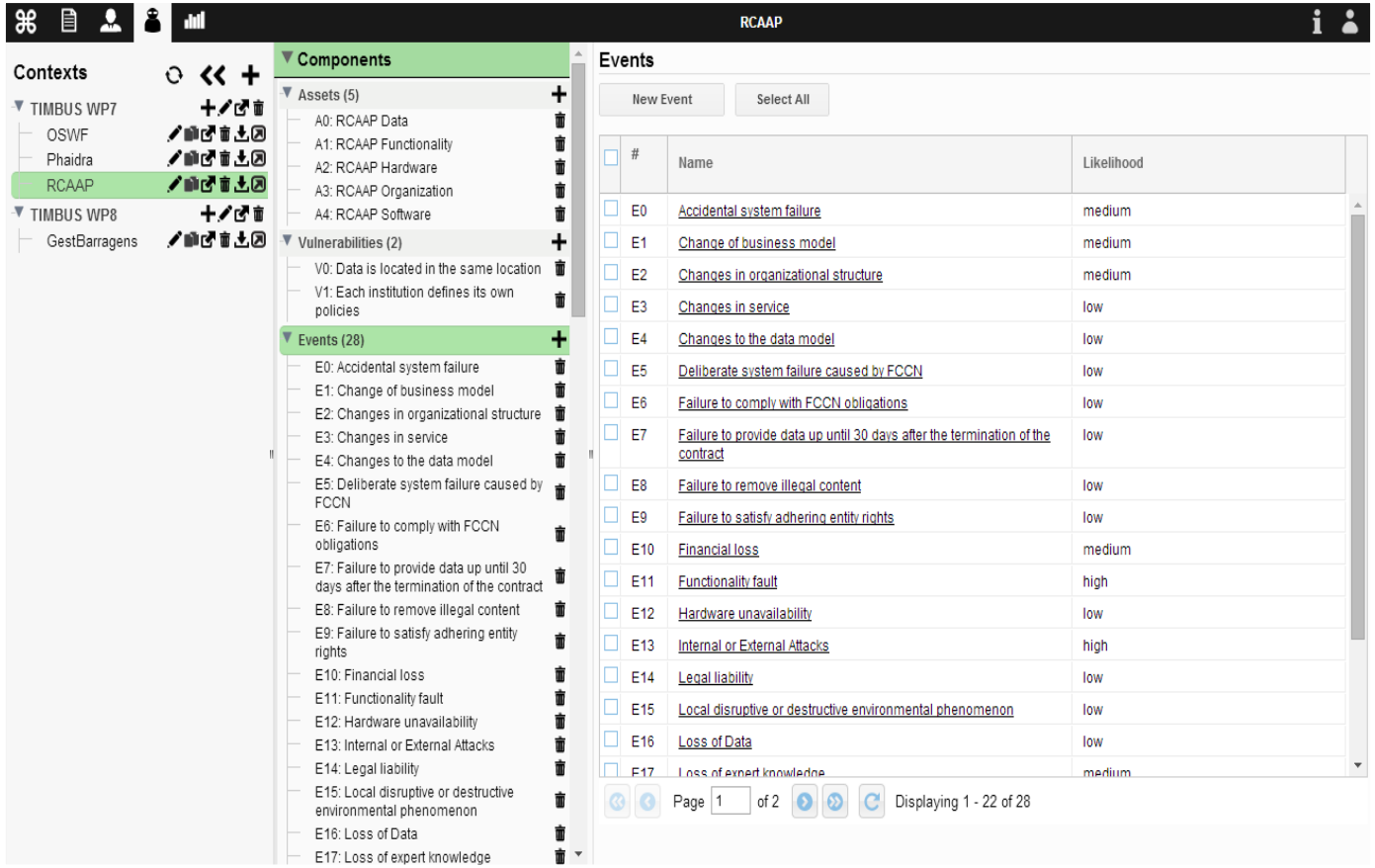
- **Core**:
  - **Risk Management**: know the process on how to identify, analyze, evaluate and treat risks;
  - **Metadata**: Know how to produce, collect and secure metadata;
  - **Advocacy, copyright and intellectual property rights**: to mitigate risks concerning data dissemination;

- **Complementary**:
  - **Technical skills**: determine technology or infrastructure risks and controls;
  - **Data value**: assess the value of the data objects worth protecting.

HoliRisk Tool

- Is a flexible generic framework, originally developed by the INESC-ID in the TIMBUS project, to support the steps of risk assessment, which was designed taking in consideration the principles from ISO31000.

http://www.timbusproject.net/



HoliRisk User Interface

HoliRisk Overview

- Is a framework primarily designed to support a Risk Management process considering the needs of the following business stakeholders:

Stakeholders	Description
Strategic Manager	Stakeholder with governance concerns, responsible to determine the strategic direction of the organisation and for creating the environment and the structures for risk management to operate effectively.
Risk Expert	Stakeholder responsible to assist the organisation in establishing a risk management process by providing risk management expertise. Responsible for keep up to date with developments in the field.
Risk Manager	Stakeholder responsible for developing the risk management policy and coordinate all risk management activities across the enterprise, including the collaboration and consensus required to support enterprise risk management (ERM) activities and decisions.
Risk Operator	Stakeholder responsible for understanding, accepting and implementing risk management processes. Responsible for reporting inefficient controls, loss events and near miss incidents.

HoliRisk Users

- Risk Experts;
- Risk Operators.

	Strategic Manager	Risk Expert	Risk Manager	Risk Operator
Risk Metamodel Definition of core risk concepts	- - - *Informed*	**Responsible** **Accountable** - -	- - - *Informed*	- - - -
Risk Models Definition of domain specific risk concepts	- - - *Informed*	**Responsible** **Accountable** - -	- - **Consulted** -	- - - *Informed*
Risk Context Definition the Risk Management context	**Responsible** **Accountable** - -	- - - *Informed*	- - - *Informed*	- - - -
Risk Instances Implementation of the Risk Management Process	- - - *Informed*	- - **Consulted** -	- **Accountable** - -	**Responsible** - - -

Risk Stakeholders and respective responsibility roles

Conclusions

- Performing a proper RMP is a desirable scenario, although it can be too expensive and only affordable by large organizations with fair resources;

- With the proposed method, we have a simple and pragmatic way to estimate the costs of Digital Curation within the Organization;

- The information resulted by the applicability of the proposed method can be used by Archivists when engaging in communication with stakeholders in order to have a common base language to negotiate possible refunding or future investments regarding data preservation.

Thank you!
Questions?

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