



Storing records in the cloud

Issues of trust

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Cloud usage

- Anticipated worldwide expenditure on off-premises cloud IT infrastructure to reach \$55.7 billion in 2022 (IDC, 2018)
- ARM professionals are increasingly using the cloud for digital collections
(Brown & Fryer 2014; Oliver 2014; Oliver & Knight 2015; Zander 2014)
- Records are being stored in the cloud by default



Can we trust in cloud service providers to store our records or is it “a leap of faith”?

(Oliver & Knight, 2015)



The research

- Questions

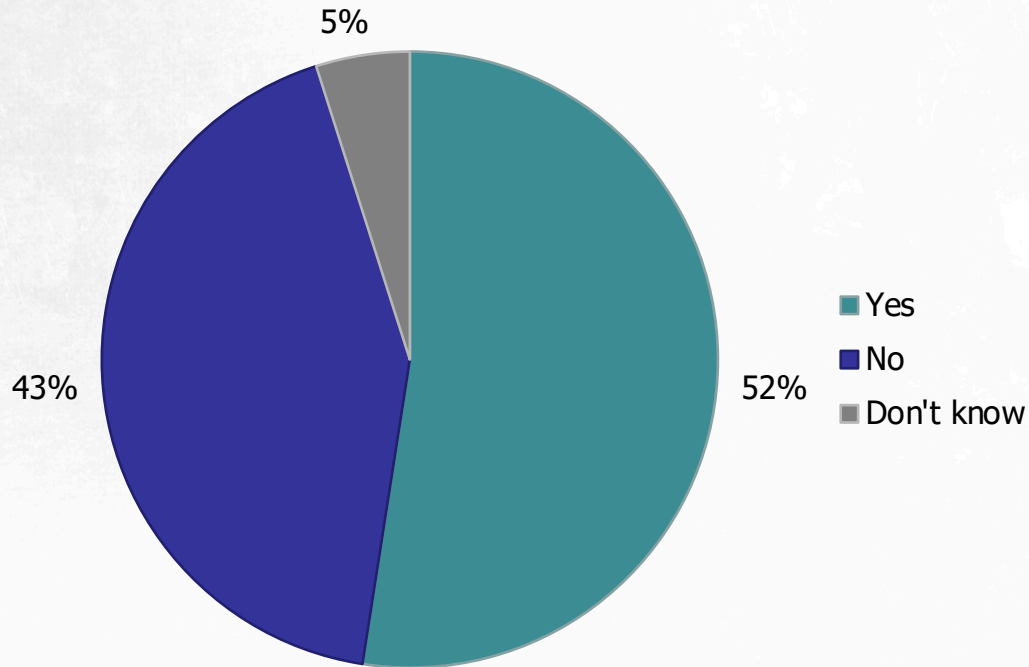
1. Who is involved in the cloud storage decision-making process and why?
2. Are economic models used in practice in the decision-making process or not? Which ones, why and how?
3. What other models are used in the process, why and how?
4. What are the issues of trust in using the cloud for storage and what factors contribute to trust in the decision-making process?

- Methods

- Literature review (economic models), online survey, interviews



Use of Cloud Storage



Why?

Cost savings in hardware and software

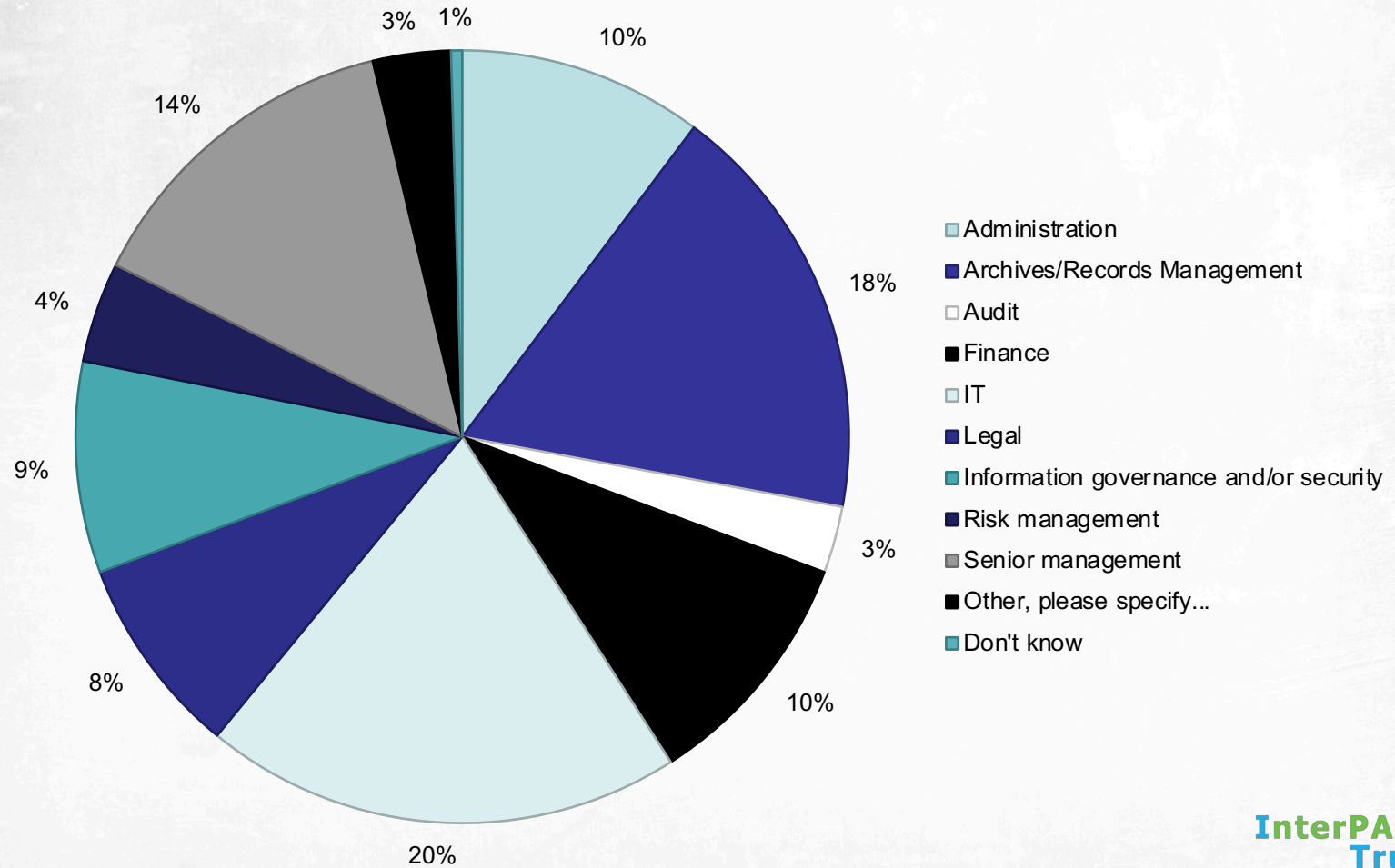
Why not?

Lack of trust in cloud service providers

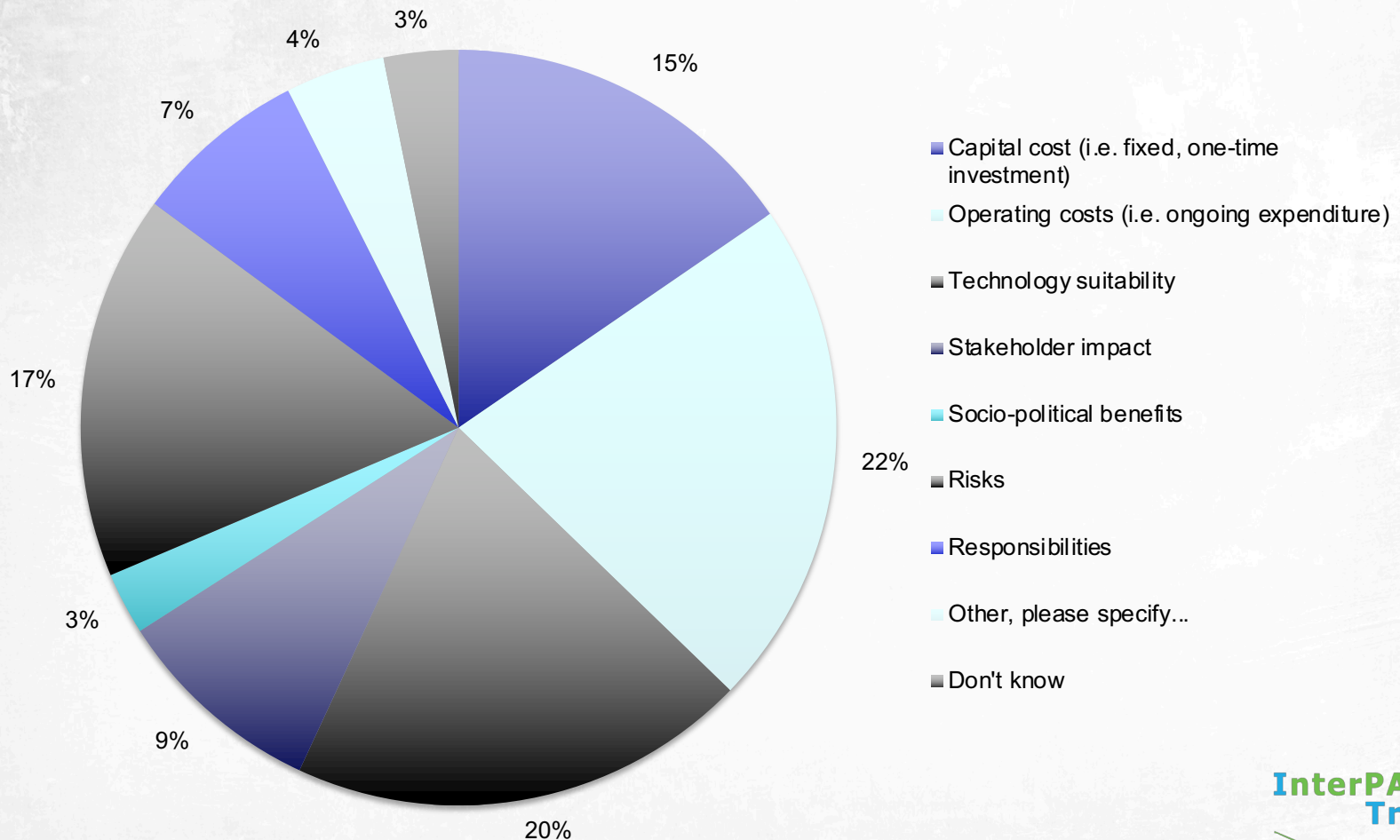
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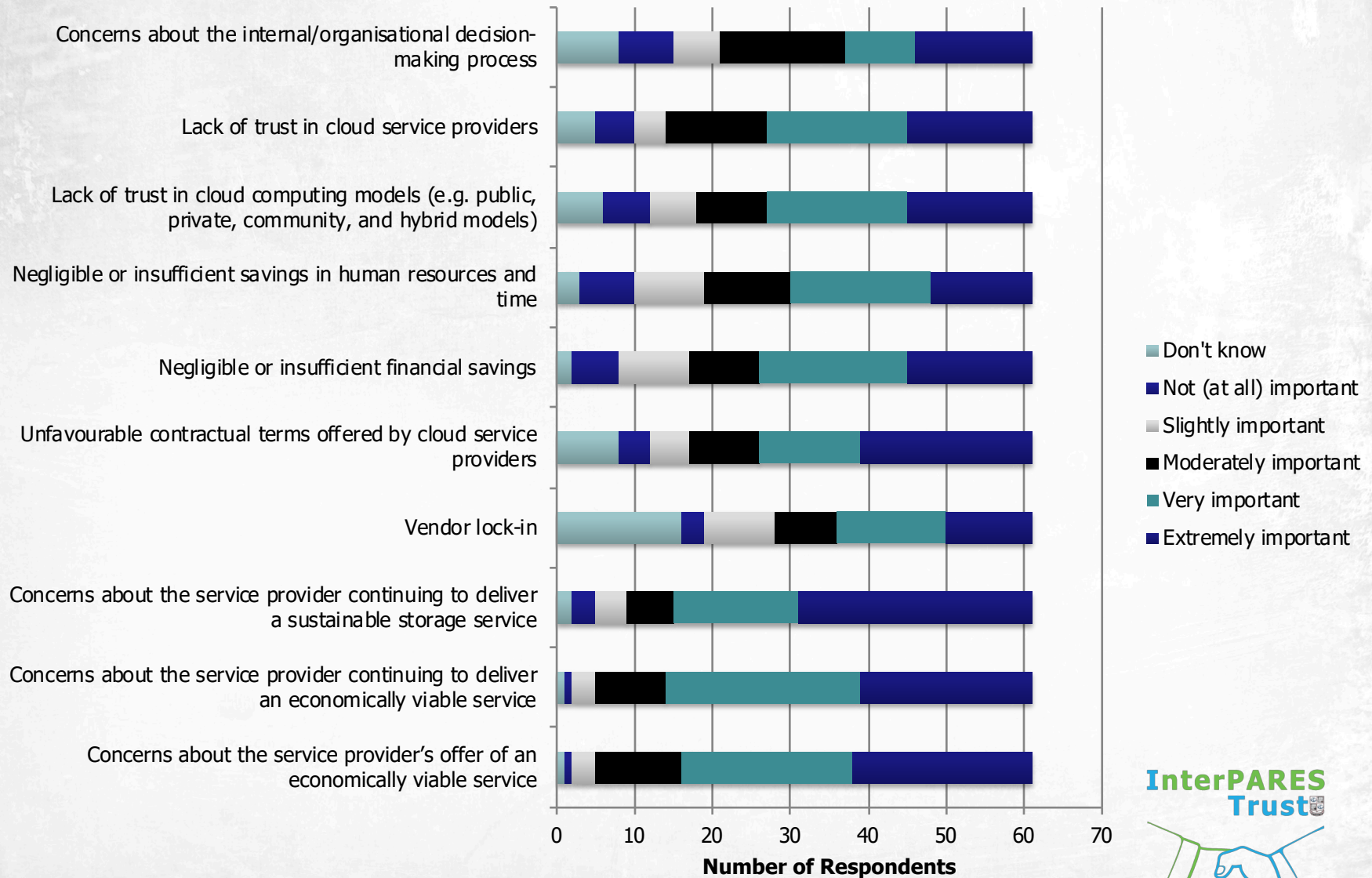
Decision-making departments



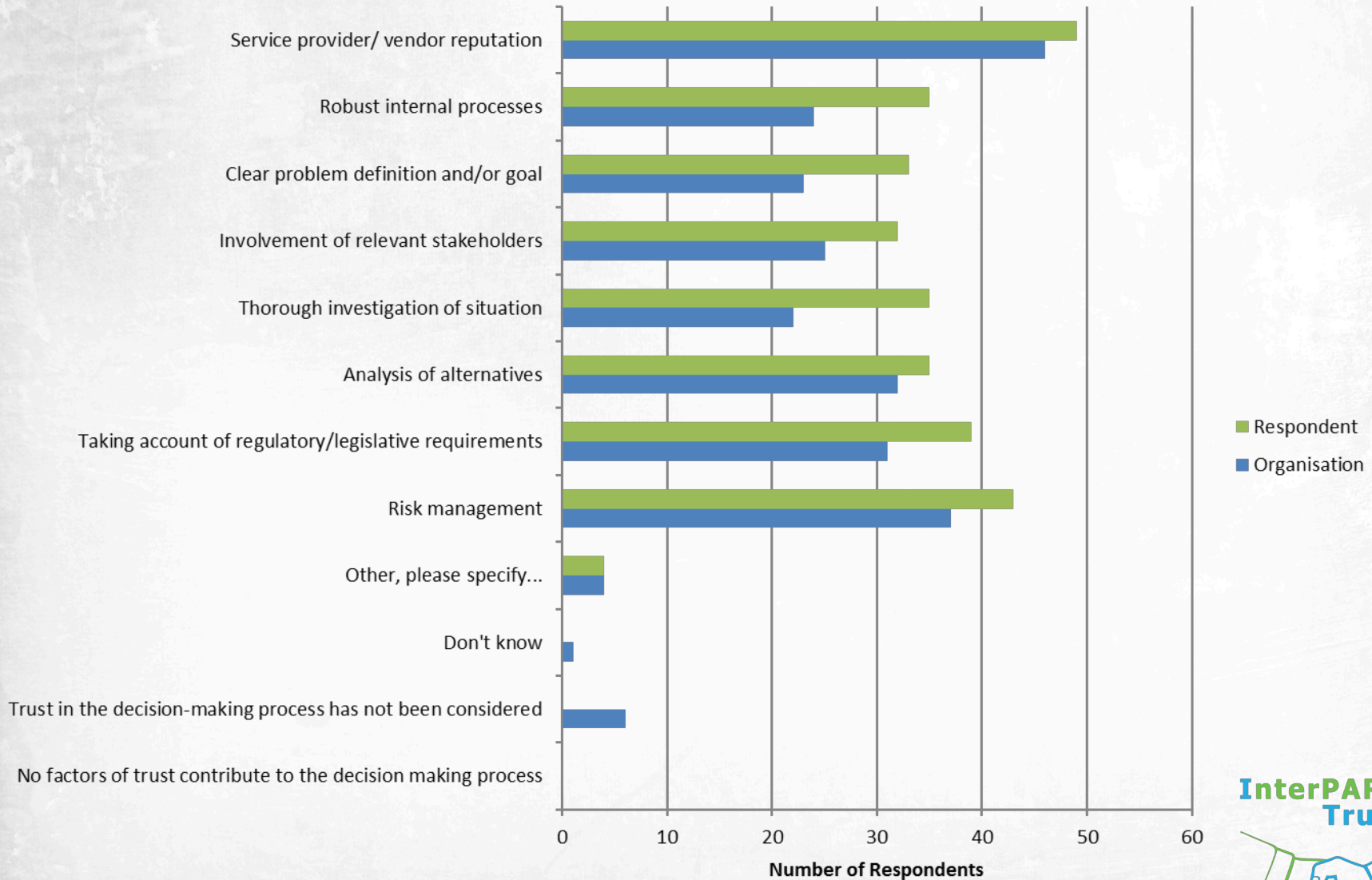
Factors considered



Issues of Trust



Factors Contributing to Trust: Survey

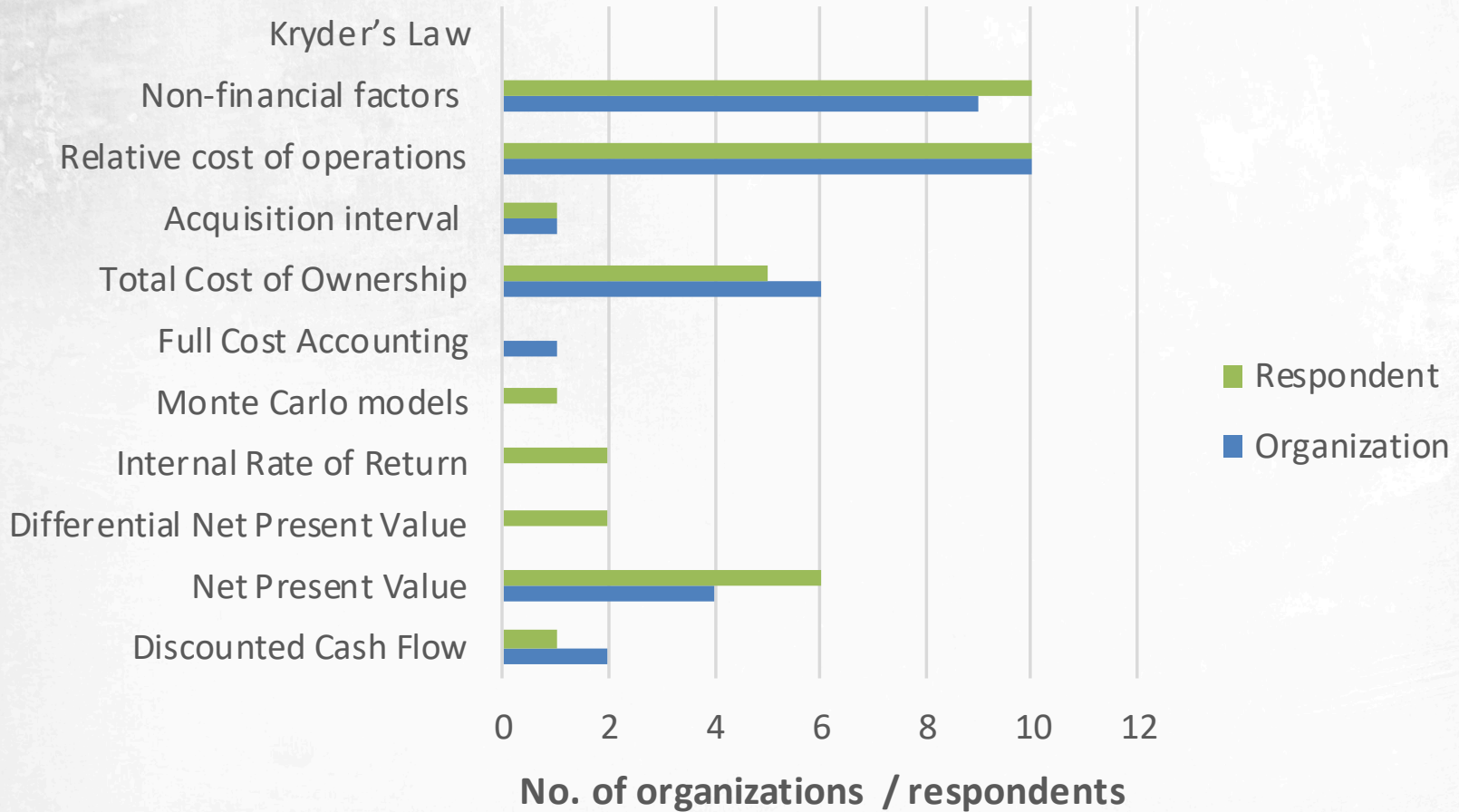


Economic models for cloud storage

- Literature
 - Underpinning theory and assumptions
 - net present value (or variations thereof); total cost of ownership; statistical probability
 - Irrespective of economic model, cost efficiency of cloud storage depends on several factors
 - e.g. public/private storage pricing difference; charging period; storage acquisition interval; growth; predictability of demand



Use of Economic/Costing Models: Survey



No. of organizations = 15; No. of respondents=11



Key findings

- Lack of widespread use of economic models in practice
 - unexpected given cost of using cloud services and cost savings were so important
 - are cost assessments done in informal, unsystematic ways?
 - case examples identified models can be effective in the business case but may not be adequate for longer-term predictions & importance of identifying *all* costs, not just technical ones
- Issues of trust in cloud storage services
 - Sustainability: assess & manage risk
 - Ability to meet records requirements: RK professionals to define & communicate requirements
 - Economic viability: better cost assessment



Implications & actions

- Use of cloud services means records creation & storage 'by default'
- **If** cost is a primary driver for cloud adoption then
 - for organisations modelling & monitoring costs is important
 - for RK professionals economic viability is an important part of a wider range of trust issues, especially sustainability
- Environmental imperative
 - data centres estimated to use 2% of world's electricity
 - Google using machine learning to improve power usage effectiveness
- RK professionals have an opportunity to play a more important role



References

- Adams, WM. (2018). Power consumption in data centers is a global problem. <https://www.datacenterdynamics.com/opinions/power-consumption-data-centers-global-problem/> Accessed 29 Jan 2019.
- IDC. (2018). Spending on IT infrastructure for deployment in cloud environments is forecast to grow 10.9% in 2018. Press release 10 Apr, 2018. <https://www.idc.com/getdoc.jsp?containerId=prUS43727818> Accessed 29 Jan 2019.
- Jones, N. (2018). How to stop data centres from gobbling up the world's electricity: The energy-efficiency drive at the information factories that serve us Facebook, Google and Bitcoin. *Nature Hews Feature*, 12 Sep 2018. <https://www.nature.com/articles/d41586-018-06610-y> Accessed 29 Jan 2019.
- Oliver, G. (2014). Digital preservation in the cloud (AA01), InterPARES Trust project. *2nd Annual Conference of the International Council on Archives, Girona, Spain, 11–15 Oct, 2014*.
- Oliver, G & Knight, S. (2015). Storage is a strategic issue: digital preservation in the cloud. *D-Lib Magazine*, V21 (3/4). <http://www.dlib.org/dlib/march15/oliver/03oliver.html>



Publications

- McLeod, J & Gormly, B. (2018). Records storage in the cloud: are we modelling the cost? *Archives & Manuscripts*.
<http://dx.doi.org/10.1080/01576895.2017.1409125> Also at:
<http://nrl.northumbria.ac.uk/??>
- McLeod, J & Gormly, B. (2017). Using the cloud for records storage: Issues of trust. *Archival Science*, V17(4), pp 349-370.
<http://dx.doi.org/10.1007/s10502-017-9280-5> Also at:
<http://nrl.northumbria.ac.uk/31867/>
- McLeod, J. & Gormly, B. (2016). *Economic models for cloud storage decision-making: An investigation into the use of economic models for making decisions about using the cloud for records storage*.
https://interparestrust.org/assets/public/dissemination/EU20_20160609_CloudEconomicModels_EUWorkshop8_FinalReport.pdf
- McLeod, J. & Gormly, B. (2015). *Economic models for storage of records in the cloud (StaaS). A critical review of the literature*.
https://interparestrust.org/assets/public/dissemination/EU18_20150713_CloudEconomicsLitReview_FinalReport.pdf

