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# **The Role of Research for the Development of the Digital Cultural Heritage**

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- There are numerous roles that research in computer science can play for the development of digital cultural heritage
- Two roles are of major relevance:
  - firstly, envisaging new models that can be the basis for designing innovative information management systems, and
  - secondly, evaluating the corresponding information access systems





# Envisaging New Models

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## Why?

Because the aspects of reality of the digital cultural heritage that we approach for digital management are more and more complex

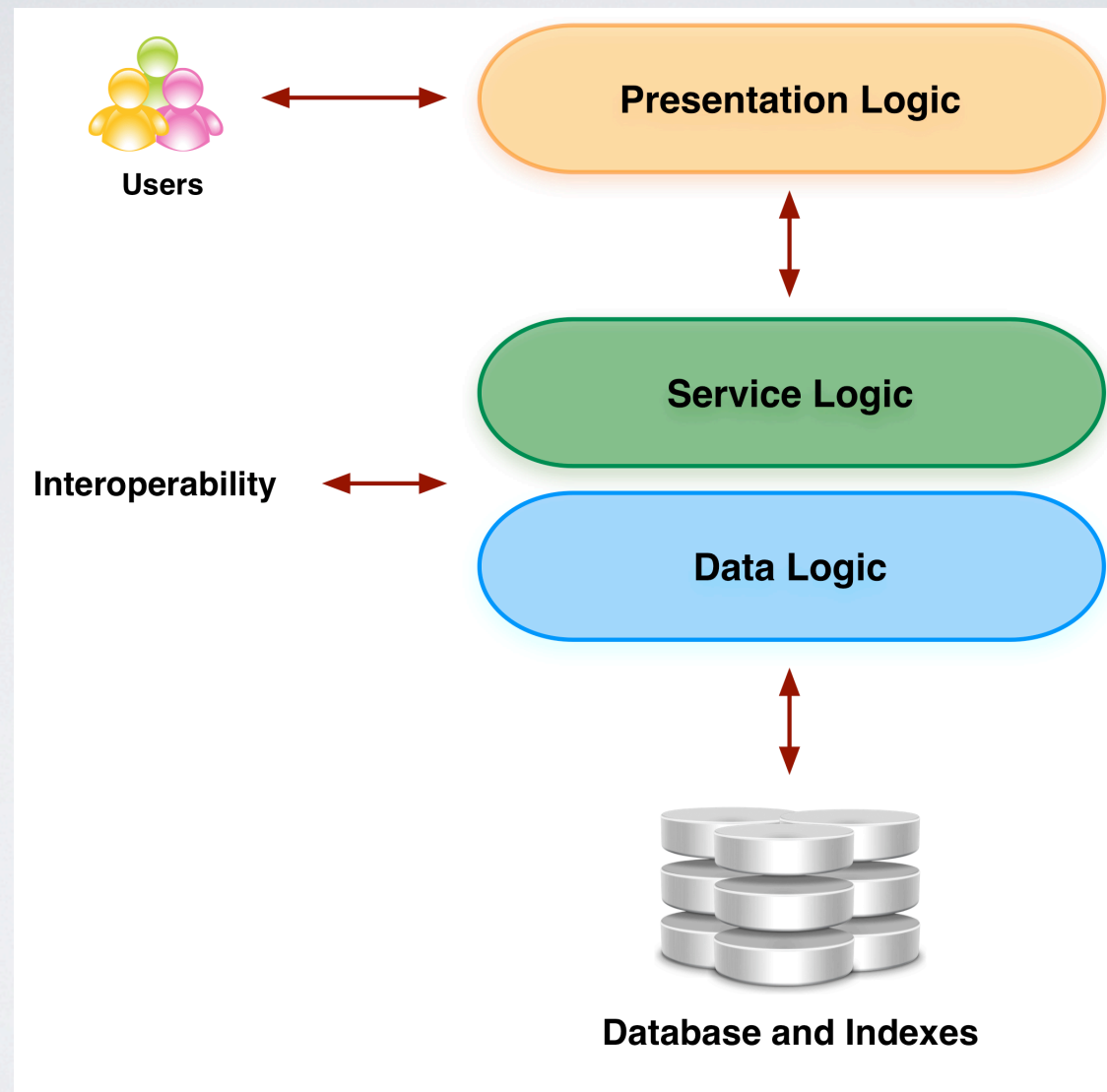


## Consequence

We need innovative information management systems able to face the new challenges

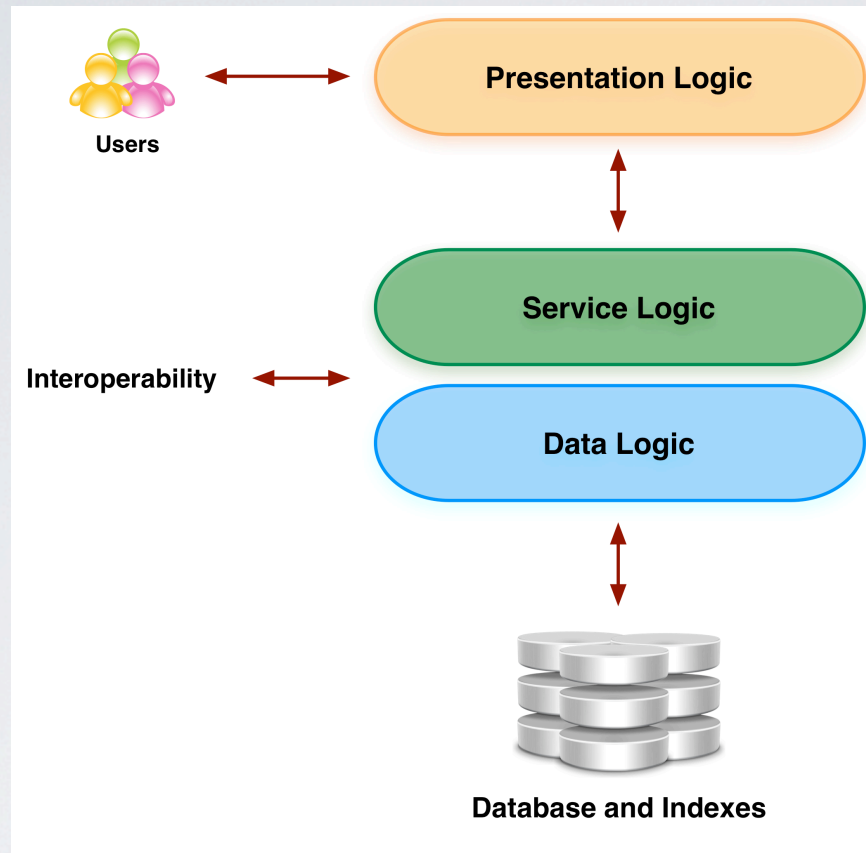


# Models at Different Levels





# An Example: the Relational Data Model



← 1970 !

E.F. Codd. A relational model for large shared data banks.  
*Communications of the ACM*, 13(6), 377-387, 1970.





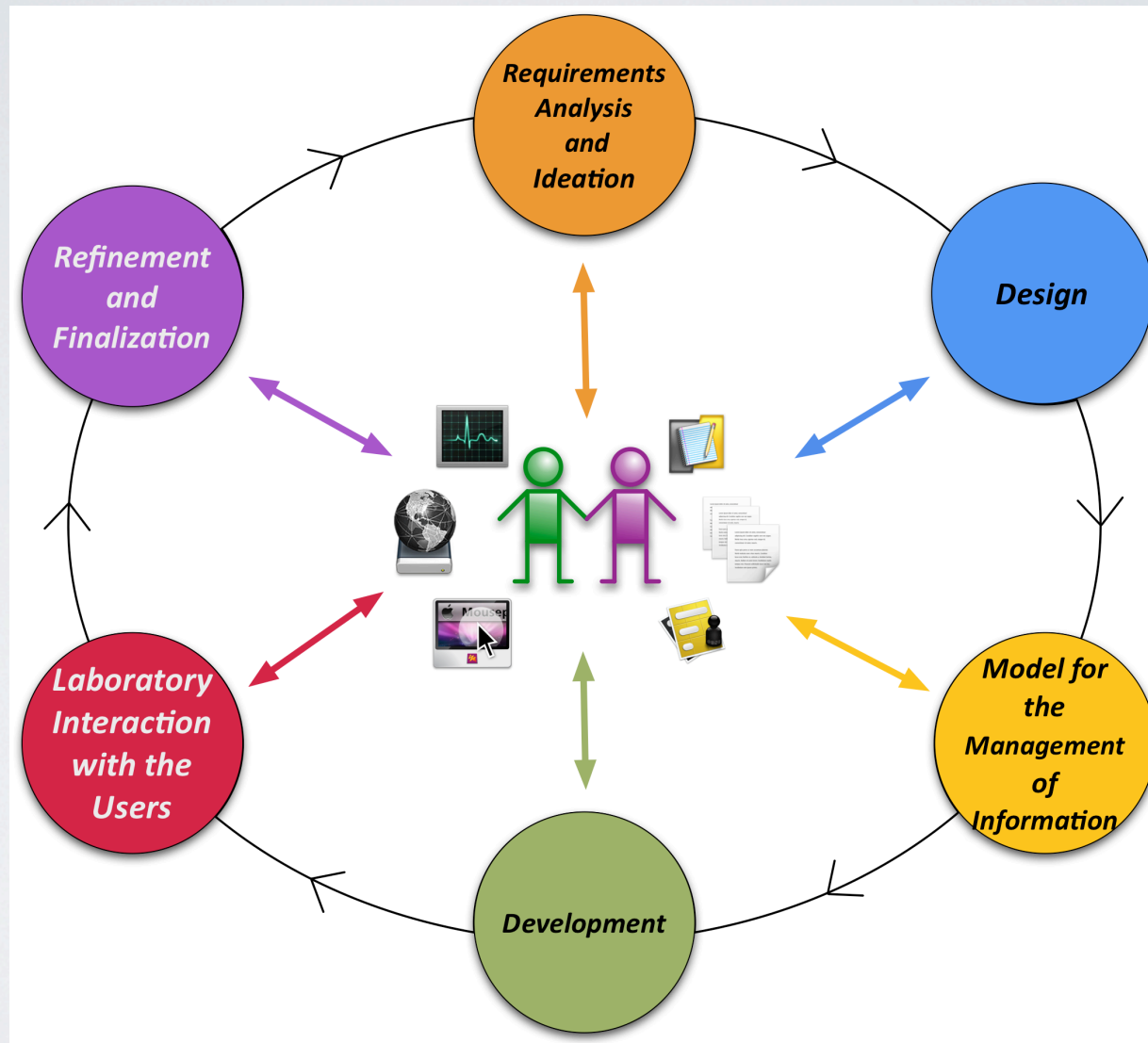
# Envisaging New Models

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- It becomes mandatory to have new models that have to be the basis for designing the necessary innovative information management systems
- The richness of the digital cultural heritage domain requires that the process of envisaging has to be conducted with experts of the specific domains of interest



# Process of Envisaging New Models







# New Models

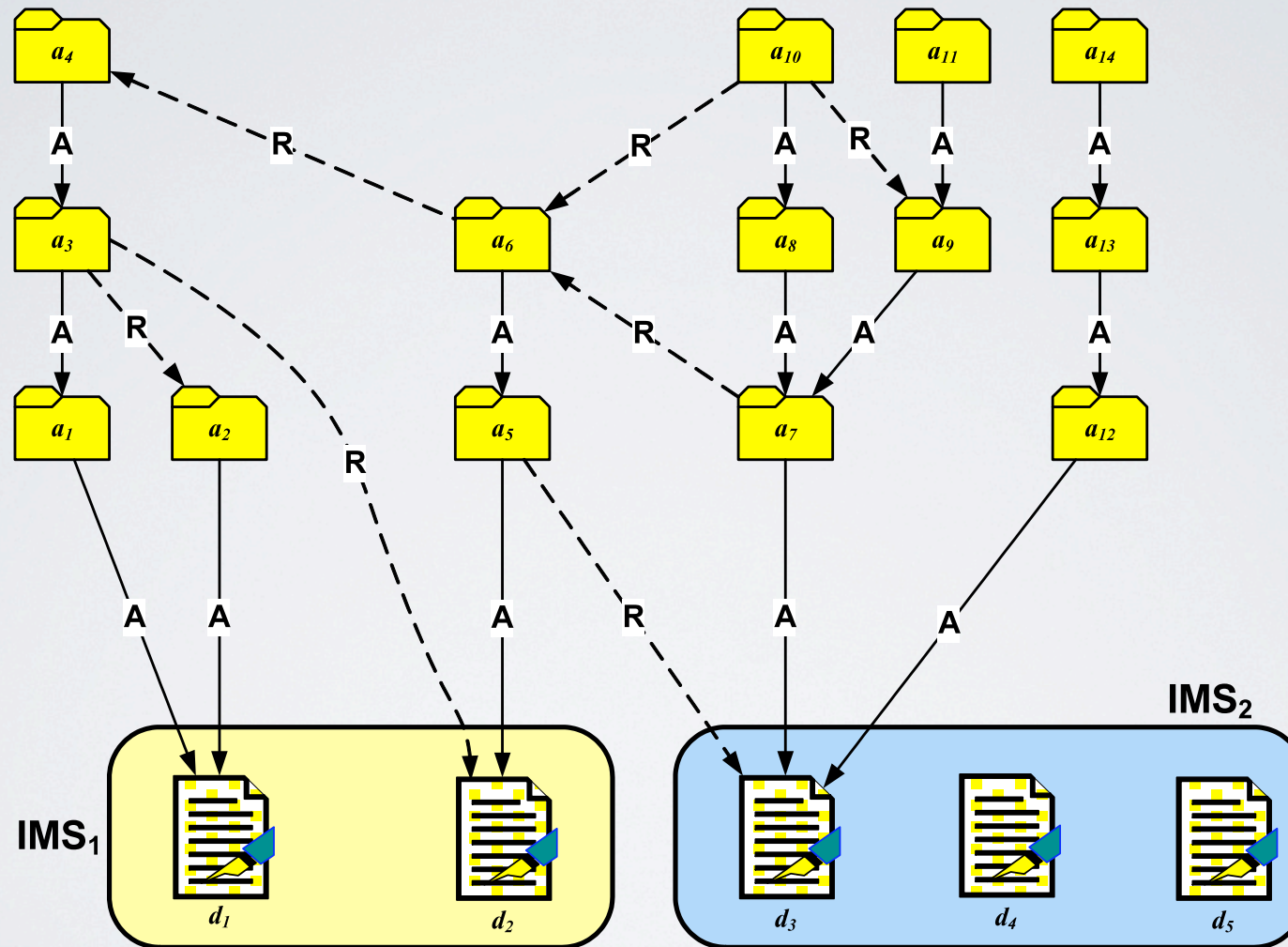
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- A new sort of knowledge can be incorporated in the model
- The model combines the contribution and competence of both the expert of the cultural heritage domain together with the expert of the computer science domain
- The model has to be well founded





# Example: A Document-Annotation Hypertext Model





# Evaluation

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- The information access systems that can be built over these new types of models have to be evaluated in terms of efficiency and in terms of the capacity to produce results of interest for the different categories of users of interest
- The evaluation phase is useful not only for the evaluation of the newly designed and constructed systems but also for collecting indications for envisaging future models



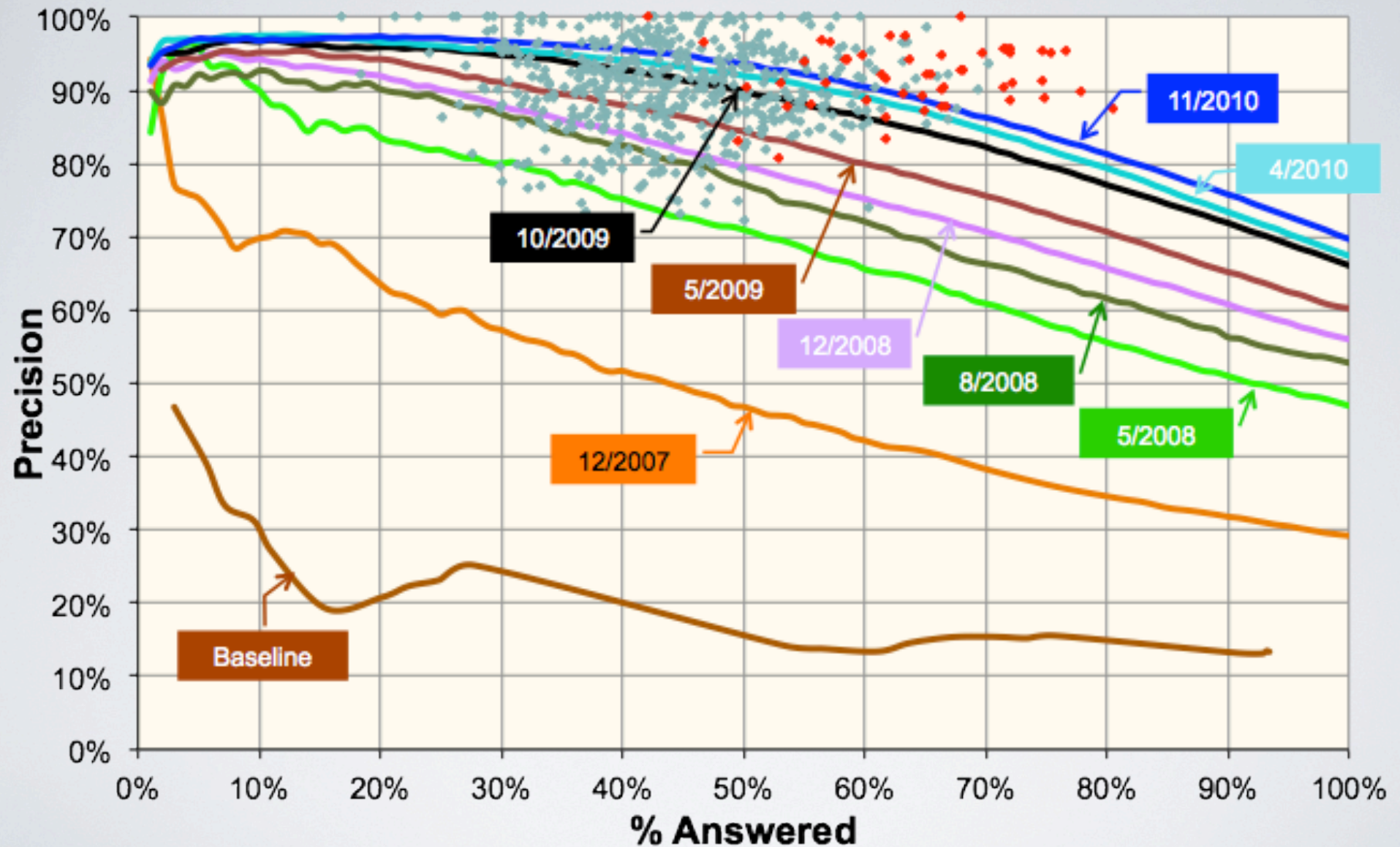


# Large Scale Evaluation Campaigns

- Large scale evaluation campaigns that are conducted at international level for the evaluation of information access systems:
  - **TREC** (Text REtrieval Conference), USA, from 1992
  - **NTCIR** (NII Test Collection for IR Systems), Japan, from 1999
  - **CLEF** (Cross-Language Evaluation Forum), Europe, from 2000
  - **FIRE** (Forum for Information Retrieval Evaluation), India, from 2008
- All campaigns are based on the **Cranfield paradigm**



# An Example of Improvements over the Years







# Impact of the Evaluation Campaigns

- Qualitative and quantitative evidence on methods and technologies that give better results
- Production of scientific data that constitute a common ground on which to base future research
- Building of a research community with multidisciplinary competences
- Results of a study conducted in 2010 on the economic impact of TREC: “for **every \$1** that NIST and its partners **invested** in TREC, at least **\$3.35 to \$5.07 in benefits** accrued to IR researchers”



# Thank You for Your Attention

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## Questions?