iTrust Survey

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Nine by Nine

http://www.ninebynine.net/
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iTrust

• “The aim of iTrust is to provide a forum for *cross-disciplinary* investigation of the application of trust as a means of establishing *security and confidence* in the *global computing infrastructure*, recognizing trust as a crucial enabler for meaningful and mutually beneficial interactions.”
  – http://www.itrust.uoc.gr/
  – (my emphasis)
Goals of this talk

- Reviewing iTrust activity
  - exemplified by conference papers
- Looking for multidisciplinary results
  - what are the contributions from non-computing disciplines?
- What is the overall “shape” of new understanding coming from iTrust work
- System implementation perspective
  - what guidance is offered?
Method

- Read through all main papers in LNCS proceedings of first two public iTrust conferences
  - 48 papers
  - Not including short papers
- Summarize content of each paper
  - attempt to reflect content, not evaluate
- Pick out key themes in each paper
  - subjective, subject to differing views
Method (continued)

- Data collected using Notation3 (a variant of RDF)
  - http://www.ninebynine.org/iTrust/iTrust-survey.n3
  
  About Notation3:
  - http://www.w3.org/DesignIssues/Notation3.html
  - http://www.w3.org/2000/10/swap/Primer.html

- Processed using simple CWM rules
  - http://www.w3.org/2000/10/swap/doc/cwm.html

- Reviewed summaries looking for themes
Raw data:
Multidisciplinary themes

- Computing - 39 papers
- Economics - 8 papers
- Legal - 4 papers
- Philosophy - 1 paper
- Logic - 1 paper
- Psychology - 4 papers
- Sociology - 8 papers
- Statistics - 6 papers
Raw data:
Other recurring topics

- Privacy - 4 papers
- Reputation - 12 papers
Raw data:
Computing + topic

- Computing + Economics - 6 papers
- Computing + Legal - 2 papers
- Computing + Philosophy - 1 paper
- Computing + Psychology - 3 papers
- Computing + Sociology - 5 papers
- Computing + Statistics - 4 papers
- Computing + Privacy - 4 papers
- Computing + Reputation - 11 papers
Defining trust

• 23 different definitions found
  – Two economics papers used the same definition!

• Common themes:
  – Subjective
  – Expectation or belief about another’s behaviour
  – Related to specific context
  – Risk of trusting behaviour
  – Basis for decision with incomplete information
  – Based on past evidence
Other observations

- Very few papers without a strong computing element
- Many papers about computing with input from some other discipline(s)
- Reputation/recommendation systems lead use of trust in implemented systems
- A strong strand of economic theory informing reputation systems
More general observations

• Conference papers are not the whole story
• Work in logic of trust is not really connecting with systems using trust
Observations about trust

- Computing with trust necessarily (?) ignores many subtleties
- The 1994 PhD thesis of S. Marsh seems to be seminal in computation of trust
- “First transaction” trust is challenging
- Reduced importance of specific identity
- Recommendation/reputation systems
  - consensus to separate trust in some action from trust in recommendation
Some specific observations (1)

• The social aspect of trust is only lightly acknowledged by computing systems
  – cf. Incs2995_266_276, Incs2995_146_160
  – Modelling goodwill, community vs individual benefit?

• Different approaches to trust with and without 3rd party participation
  – cf. Incs2692_17_32, Incs2692_46_58
Some specific observations (2)

• Increased trust may come at the cost of privacy
  – cf. Incs2995_108_119, Incs2995_108_119

• Empirical data concerning human trusting behaviour is patchy
  – cf. Incs2692_165_178, Incs2995_206_220
On the Web

- **This presentation (PPT and PDF)**
  - http://www.ninebynine.org/iTrust/iTrustSurvey.ppt

- **Raw survey data (Notation3 and HTML)**
  - http://www.ninebynine.org/iTrust/iTrust-survey.n3

- **Survey processing rules (Notation3)**
  - http://www.ninebynine.org/iTrust/TrustRules.n3

- **Processed survey data (Notation3)**
  - http://www.ninebynine.org/iTrust/TrustResults.n3
Discussion

• Are there other major themes?
• Most results directed to computing professionals?
• Is trust more than just another technique for achieving security?
• Economic/sociological input seems focused on reputation/recommender systems?
• Can/should computing with trust recognize its social subtleties?