Does Your Mobile Device Need to be *Socially Aware?*
A Semantic Web Perspective

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Question

Does your mobile device need to be *Socially Aware*?

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Absolutely!

Better Questions

What does it mean to be *Socially Aware*?

How do we make it happen?

How does the Semantic Web help?

Definitions

social awareness

= knowledge of <u>you</u> and your <u>social context</u>

social context

= people you interact with + activities + "role" + situational context

Social Mobile Devices

- Mobile phones are in a perfect position to be <u>socially aware</u>
  - always with you, always on
  - "trusted" ⇒ they can know a lot about you
- Mobile phones <u>collect</u> a lot of information about you and your social context
  - call log, message log
  - location (absolute and "associative")
  - more could be collected (activities, behavior, context, ...)
- **Core issue:** information collected
  - is separated into multiple applications
  - has no uniform representational model
  - is <u>not exploited</u> fully

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Social Mobile Devices

- What could we gain?
  - better understanding of the user
  - better knowledge of the user's social network (status, how to connect, recommendations, etc.)
  - easier automation of phone functions

- What do we need?
  - uniform representation
  - shared repository of data (shared with applications, shared with other users)

Original Semantic Web Vision
[Berners-Lee, Hendler & Lassila 2001]

- (Advertised as) the next generation of the World Wide Web

- Make Web content amenable to automated processing
  - <u>interpretation</u> by machines
  - (most content out there is for human consumption)

- Implies the use of
  - artificial intelligence
  - agents

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- Next generation of personal computing
- Computers working on behalf of users
  - (current usage: as tools)
  - more autonomy, handling unanticipated situations

- Implies the use of
  - artificial intelligence
  - agents

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Personal Information Management (PIM)

- PIM increasingly encompasses <u>all of personal computing</u>

- "Old" PIM:
  - address book, to-do list, calendar, notes
  - most content (if not all) created by user herself
  - small amounts of data

- "New" PIM:
  - "old" PIM + media (music, photos, ...), bookmarks, messages (email, SMS, ...)
  - most content not created by the user
  - large amounts of data
  - social dimension <u>very important</u> (e.g., view into friends' PIM data)

- Users typically have multiple systems and devices they use for maintaining (and communicating with) their social network

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Social Awareness and PIM

- Isolated attempts in current applications
  - for example, some email clients are able to say whether sender of message is currently logged in AIM...
  - (typically these are specifically selected and engineered solutions)
- Facebook (etc.)
  - better, but offer poor versions of PIM apps
- Social context intimately linked with
  - context-awareness: e.g., "who is nearby?"
  - policy-awareness: typical policies are expressed in a "social vocabulary"
    - [Toninelli, Khushraj, Lassila & Montanari 2008], later today at SDoW 2008
- **Core issue:** we have no representation of social network that transcends applications

Social Awareness and User's "Roles"

- Our lives are "partitioned"
  - sometimes, the "partitions" need to be kept separate
- Work life
  - colleagues, customers, corporate documents, ...
  - typically stringent security policies
- Personal life
  - friends & family, music, photos, ...
  - need for policies to enable sharing
- Other roles (hobbies, community activism, ...)
- **Core issue:** how to identify and represent roles?

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Policy-Awareness (huh?)

- How do you control the (autonomous) behavior of your device?

- "Everyday" policies are expressed using a social vocabulary
  - "Don't disturb me when I am in a meeting with my boss"
  - "Only allow family members to call when I am in a meeting with my boss"
  - "Only share these pictures with family members and friends"

- **Core issue:** policy articulation is difficult

Semantic Web to the Rescue...

- Wish list:
    1. social awareness for PIM
    2. recognition of (social) roles
    3. policy-awareness

- What's the common denominator in my wish list items?
    - rich representational model of user and her social network

- Social network representation has to transcend applications
    - (because <u>all</u> applications need it)
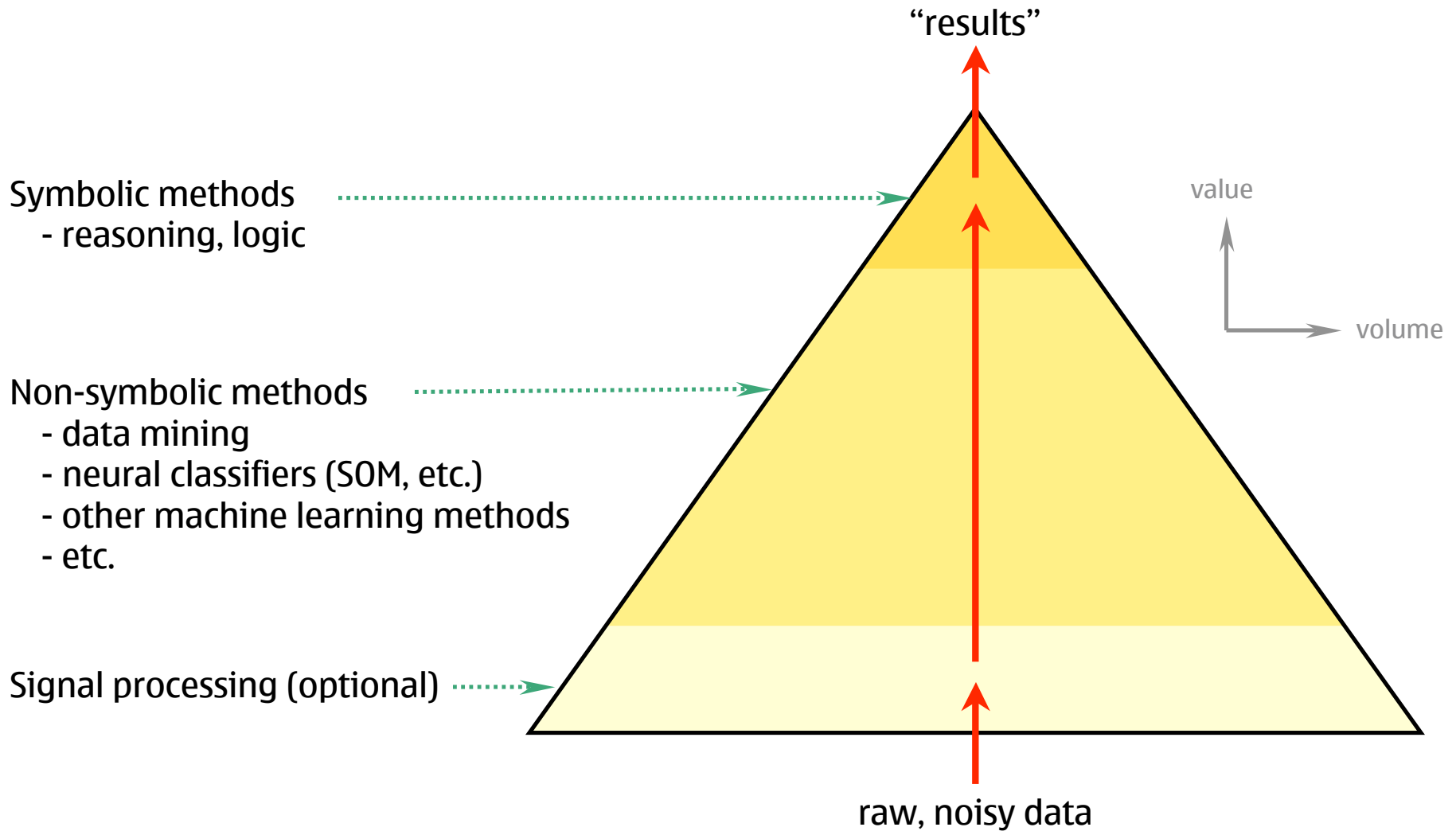   - similar in this sense with context-awareness and policy-awareness

Semantic Web to the Rescue...

- Semantic Web as a "data integration" technology
  - open-ended way of <u>semantically interconnecting</u> data from social sources
  - rich social network representations can – and <u>must</u> – be built by using data from multiple sources (social and otherwise)

- **Core issue:** entity resolution, object identification
  - you have this whether you like the full Semantic Web vision or one of the "diluted" versions (linked data, lowercase semantic web, etc.)
  - how do you "clean up" real world data?

Semantic Web "Data Value Chain"

"results"

value

volume

Symbolic methods
- reasoning, logic

Non-symbolic methods
- data mining
- neural classifiers (SOM, etc.)
- other machine learning methods
- etc.

Signal processing (optional)

raw, noisy data

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Conclusions

- Mobile phones are a perfectly positioned to be socially aware
- Data is collected, but not exploited
- My "wish list" enabled by Semantic Web technologies

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Questions? Comments?