A CULTURAL-REASONING ARCHITECTURE AND LEARNING

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The internationalization of corporate, humanitarian, and military work presents the second major challenge for computational modeling. Because complex missions sometimes span national borders, practitioners need computational models that encompass an array of mission-critical cultural differences among relevant national, regional, and ethnic groups. A group's worldview depends on a unique set of experiences, priorities, and expectations. Teamwork, for example, with its negotiation, compromise, and problem solving, is affected by differences in language, customs, social roles, values, and cognition. Cultural barriers can be daunting given the inherent complexity of humanity. Representing culture in domains such as military coalitions, international commerce, and multinational organizations is especially difficult because one's own unique experiences, priorities, and expectations can mask cultural differences that must be recognized and accommodated.

Dimensions of Cultural Differences. Computational modeling has begun to acknowledge critical cultural differences, and modelers are going after low-hanging fruit. These include national differences in equipment, command structure, and the catch-all concept culture. Researchers trying to represent language and communication differences have identified a myriad of possible translation problems driven by language elements, such as pronunciation, abbreviations, and declension. They're also driven by community-related elements such as date/time formats, titles, physical values, icons, graphics, and signs.

Differences in tolerance for uncertainty can create tension among allies during multinational operations. This difference extended to many operations, creating frustration and hindering coordination. Models of allies and adversaries will be more predictive and useful as they more accurately represent tolerance of uncertainty. Modeling national differences in decision- making speed using both power distance and uncertainty avoidance is a good starting point to describe the cognitive nature of the social decision making process. However, it's also important to consider the basis, valence, and nature of the decision itself. Etiquette expresses the behavioral/ social differences among national groups that moderate and direct the flow of social information in organizations during teamwork and negotiations. This captures a critical element for predicting and anticipating decision making. Efforts are under way to address the problems associated with cultural differences in behavior, social roles, and values. These present formidable problems during multinational interchanges. Such efforts are necessary and productive directions for computational modeling. Still remaining are the differences in cognition that play a critical role in sense making, decision making, negotiation, and planning.

Technique realization. Multimedia is used more and more throughout our daily life. The volume of multimedia information is massive when compared to traditional, textual data. The various codec and protocols used for multimedia communications each have their own potential vulnerabilities – Fig. 1. The content being transmitted could be extremely valuable or sensitive, or it might be freely available. Security schemes could overburden networks or reduce the received quality. Approaches to ensuring the confidentiality, integrity, and authenticity of multimedia depend on three key variables:

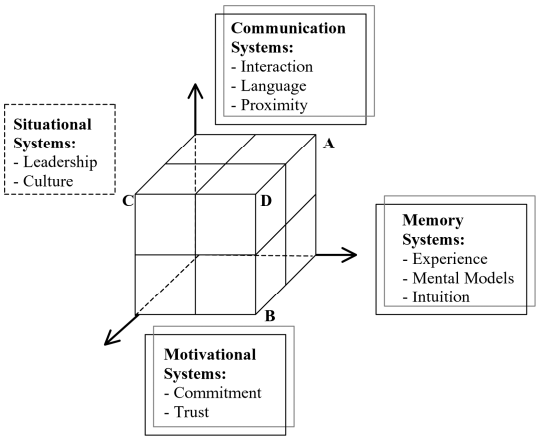

Figure 1 – Basic components

• *Value* - The content's value has a direct impact on the investment expended to secure it. Valuable content might require a sophisticated digital rights management (DRM) scheme, robust watermarks, and encryption that eliminate any perceptually distinguishable elements.

• *Resources* - Some security methods aren't practical, given the resources available (both computational and economic). For example, encryption might not be feasible if bandwidth is limited.

• *Time* - If the media is to be broadcast live, encoding time might be a consideration.

Below is my taxonomy of social networking data, which I first presented at the Internet Governance Forum meeting – Fig. 2, Fig. 3.

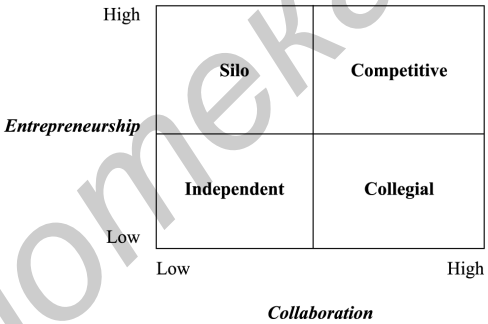

Figure 2 – Learning and reasoning processes

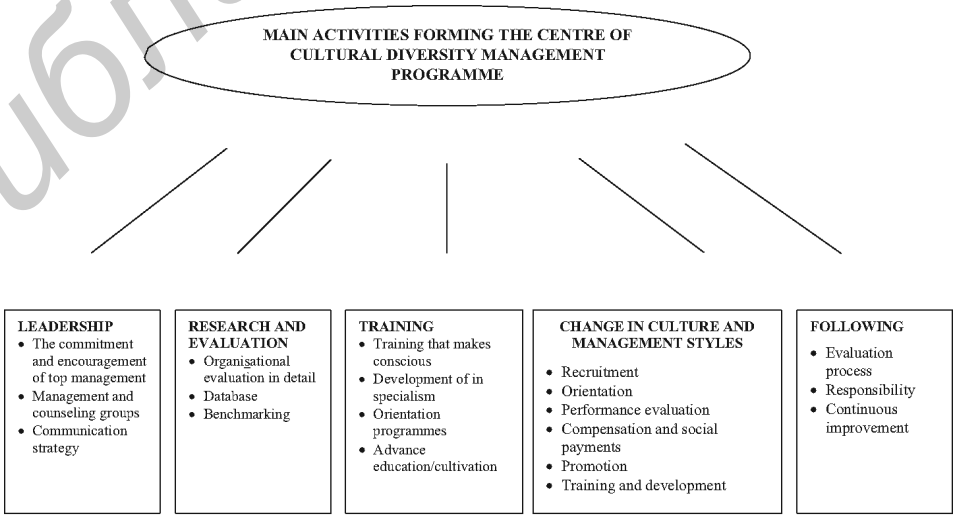

Figure 3 – An example of a cultural diversity management program

• *Service data* - the data you give to a social networking site in order to use it. Such data might include your legal name, your age, and your credit-card number,

• *Disclosed data* - what you post on your own pages: blog entries, photographs, messages, comments, and so on,

• *Entrusted data* - what you post on other people's pages. It's basically the same stuff as disclosed data, but the difference is that you don't have control over the data once you post it—another user does,

• *Incidental data* - what other people post about you: a paragraph about you that someone else writes, a picture of you that someone else takes and posts. Again, it's basically the same stuff as disclosed data, but the difference is that you don't have control over it, and you didn't create it in the first place,

• *Behavioral data* - data the site collects about your habits by recording what you do and who you do it with. It might include games you play, topics you write about, news articles you access (and what that says about your political leanings), and so on.

• *Derived data* - data about you that is derived from all the other data.

The classical example is Multilingual Annotation Interface. MAI is a web based tool designed to allow human annotators to create an annotated corpus of sentences in different languages. The creation of an annotated corpus is a fundamental step to enable our system to effectively process news feeds and extract the desired information. Processing a news article and representing its information content in some structured format is not a trivial task for an automated system as it would be for a human: computers cannot understand natural language – Fig. 4.

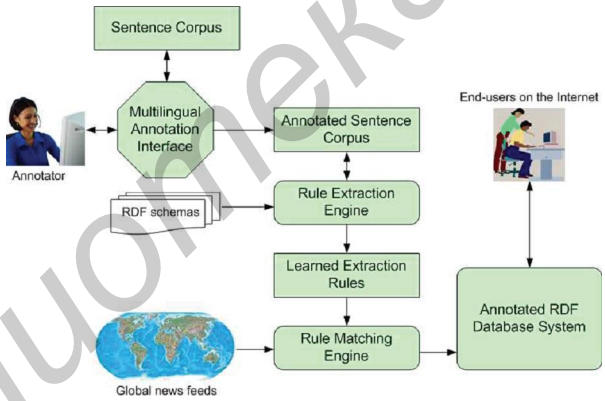

Figure 4 – Basic example for the Multilingual Annotation Interface

Reference

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