Understanding & Enabling Networks
in Digital Government

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ABSTRACT
This tutorial will provide an overview of how network theories and visual-analytic methods are used to understand and enable digital government.

Categories and Subject Descriptors
J.4 [Social and Behavioral Sciences]

General Terms
Management, Measurement, Human Factors, Theory

Keywords
social network analysis, multidimensional networks, network visualization

1. INTRODUCTION
This tutorial will introduce theories and concepts of social network analysis. It will describe methods for (i) collecting network data (ii) computing network metrics (iii) visualizing network data, (iv) statistically modeling of network data. The tutorial will provide practical applications for the discovery, diagnosis, and design of digital government networks using UCINET and CIKNOW software.

2. NETWORKS IN DIGITAL GOVERNMENT
The first module will provide an historical overview of the motivations to view social and organizational systems from a networks perspective. It will illustrate the wide range of contexts in which network theories and methods have advanced our understandings. The session will conclude with a brief introduction to the concepts of social networks, cognitive social networks, knowledge networks, cognitive knowledge networks and their relevance to digital government.

3. NETWORK THEORY, DATA & VISUAL ANALYTICS
3.1 Network Theory
This module outlines a contextually based multi-theoretical multilevel (MTML) model to investigate the dynamics for creating, maintaining, dissolving, and reconstituting social and knowledge networks in digital government communities. Using examples from research on communities involved in disaster response, environmental engineering, and public health, this module illustrates the potential of the MTML framework to understand and enable digital government communities [1, 2].

3.2 Network Data
Advances in digital technologies (e.g., Web 2.0) invite consideration of organizing within communities as a process that is accomplished by global, flexible, adaptive, and ad hoc networks that can be created, maintained, dissolved, and reconstituted with remarkable alacrity. Increasingly these networks are multidimensional including individuals as well as digital artifacts and concepts. This session will introduce the concept of “multidimensional” social networks where nodes can be people, organizations, documents, keywords/concepts, analytic tools, etc. The session will describe how the “relational metadata” harvested from individuals’ use of Cyberinfrastructure and Web 2.0 can help us understand and leverage these multidimensional networks. The session concludes with web-based demonstrations to illustrate these concepts.

3.3 Network Visual-Analytics
This module begins by defining various concepts used in network analysis: actors and attributes of actors, relations and properties of relations as well as two-mode networks and multi-dimensional networks. Next it describes how these concepts influence strategies for the collection of network data. The session then defines and describes how various common network metrics are computed at the actor, dyadic, triadic, sub-group, and component level. The session concludes with a demonstration of various tools that can be used to visualize [3,4] and enable [5] networks.

4. ACKNOWLEDGMENTS
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5. REFERENCES


