Conceptual Clarity and Smart Cities Research

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The Problem

• Increased migration to smart cities research & application
  – Cities: to improve quality of life
  – Industry: $757 billion USD market by 2020
  – Practical application flows from the research that is being done

• 12 core terms related to future urban environments:
  – Emphasis on different aspects
  – Conceptual overlap and no consistency of indicator areas
Variation in Terms

- Range of terminology
  - Knowledge City, Sustainable City, Green City, Eco City, Livable City, World (or Global) City, Innovative City, Resilient City, Future City

- Range of indicators
  - Economic Strength, Livability, Cultural Interaction, Labour Market Efficiency, Innovation, Local Capacity, Waste & Land Use
Research Questions

• Why leads to smart city adoption?
• What are the characteristics of a smart city?
• What are the consequences?
Argument

• Smart city characteristics different from consequences.
• ICT focus up front, but end result about quality of life.

Specifically:
• Urban issues, Environmental concerns, and ICT are primary elements that come before adopting a smart city model.
• Governance and ICT are its core characteristics.
• Social and Environment are the key outcomes.
# Concepts Analyzed

<table>
<thead>
<tr>
<th>Intelligent communities</th>
<th>Smart cities</th>
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<tbody>
<tr>
<td><strong>Intelligent Communities Forum</strong></td>
<td><strong>i-Canada</strong></td>
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<tr>
<td>Broadband</td>
<td>Place</td>
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<td>Knowledge workforce</td>
<td>Infrastructure</td>
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<td>Innovation</td>
<td>Collaboration</td>
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<td>Digital equality</td>
<td>Solutions</td>
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<td>Advocacy</td>
<td>Life</td>
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<td>Sustainability</td>
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# Methods: Evolutionary Concept Analysis

(Walker & Avant 1983; Chinn & Jacobs 1983; Rodgers 1989)

<table>
<thead>
<tr>
<th>Evolutionary Concept Analysis: Core Analysis Steps</th>
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<tbody>
<tr>
<td>Surrogate terms</td>
<td>Other terms with the same meaning or that share something in common with the concept. e.g. Smart city; Intelligent community</td>
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<tr>
<td>Antecedents</td>
<td>Key terms (e.g. events or phenomena that precede the concept.</td>
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<tr>
<td>Attributes</td>
<td>The characteristics of the concept.</td>
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<tr>
<td>Consequences</td>
<td>Examples of the concept.</td>
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<tr>
<td>Examples</td>
<td>Effects that follow after an occurrence of the concept.</td>
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Methods

- Literature search
  - 12 databases
  - 4702 unique results
  - +4 sources via hand search

- Substantively address key concepts?
  - 134 articles

- Clarity & originality of framework; Explicit aspects of concept?
  - 47 documents
Findings - Antecedents
Findings - Consequences
Overview of Findings

• Key differences between:
  – What leads to smart city adoption
  – Smart city characteristics
  – Consequences

• Issues, concerns and the ICT pipe dream
  • Urban issues, environmental concerns, ICT competition and potential as a solution and smart city enabler

• Management and technology key facilitators of smart cities
  • Governance and ICT core characteristics

• Quality of life is the ultimate goal
  • Social and Environment key outcomes
Next Steps

• Sense of the academic and industry perspective
• What about the citizen perspective?
• Administrators and elected representatives?
  – 2 national surveys
  – 3,000 residents in Canadian CMAs
  – Admin and elected reps in 33 CMAs
• Research & practical outcomes
  – AMCTO Smart City Summit
  – Partner Report
Questions?

• Thank you!