



Firms and their problems: systemic innovation in Calgary

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Introduction

- This presentation follows on our analysis of the regional drivers of recruitment and retention of talent into the Calgary system with an analysis of firm innovation
- In this, we explore and identify the dynamics of regional innovation and concern ourselves with identifying systemic characteristics (RIS)
- Our analysis is based on the notion that innovations can be characterized by the problems they solve
- We look forward to completing the analysis of innovation in the public/civil society sector for an integrated view - we use the same tools
(See: B. Li, *Triple Helix VII*, Glasgow, June 2009)

Introduction

■ Innovations:

- Accepting the knowledge economy concept, we expect firms must continuously be in flux and evolve (Foray 2002, 39)
- Such continuous problem solving is fractal, hence more interesting to distinguish innovations by the problems they address than by their scope
- Analysis reveals a complex network of factors:
 - individual, social, organizational and systematic factors
 - “distributed cognition” - hybrids of factors (Rogers & Ellis, 1994)

Introduction

“...organizational and social constraints and practices impact upon individual, cognitive processes and the realization of these in specific tasks. Any adequate characterization of work activities therefore requires the analysis and synthesis of information from these, traditionally separate sources...”

–Rogers & Ellis (1994) p. 119

Innovation through Problem-Solving

**Problem Type I:
Meeting Client Needs**

**Problem Type III:
Developing New
Markets**

**Problem Type II:
Building Firm Capacity**

**Problem Type IV:
Navigating Market
Barriers**

Distributed Knowledge Typology

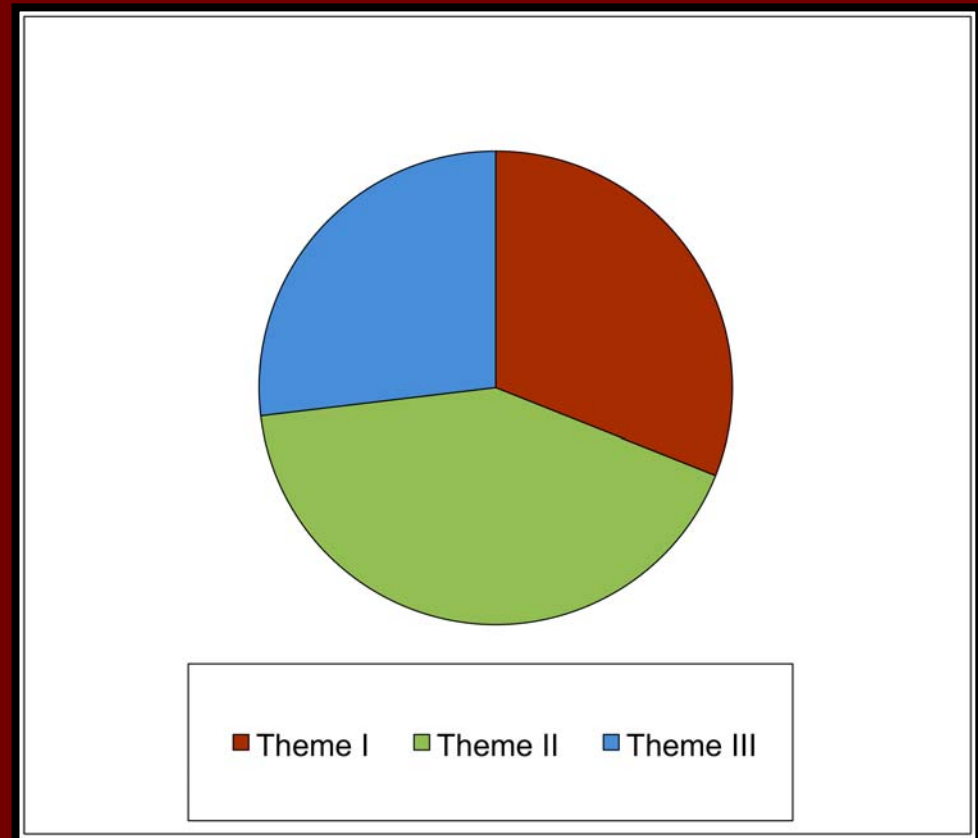
	Internal	Local	Non-Local
Codified	Manuals, formal procedures, etc.	e.g. Local grey literature, etc.	Sci. literature, trade papers, etc.
Tacit	Embodied, mentoring, etc.	Mentoring, workshops, networks, etc.	Training workshops, invisible colleges, etc.

Hypotheses

- H0. There exists an innovation system that can be characterized by studying the Calgary CMA
- H1. The innovation system can be identified through the analysis of local/non-local knowledge factors in the innovations of firms in the Calgary CMA
- H2. There is a relationship between problem types and relative importance of knowledge factors as inputs into solving those problems

Calgary CMA Project Update

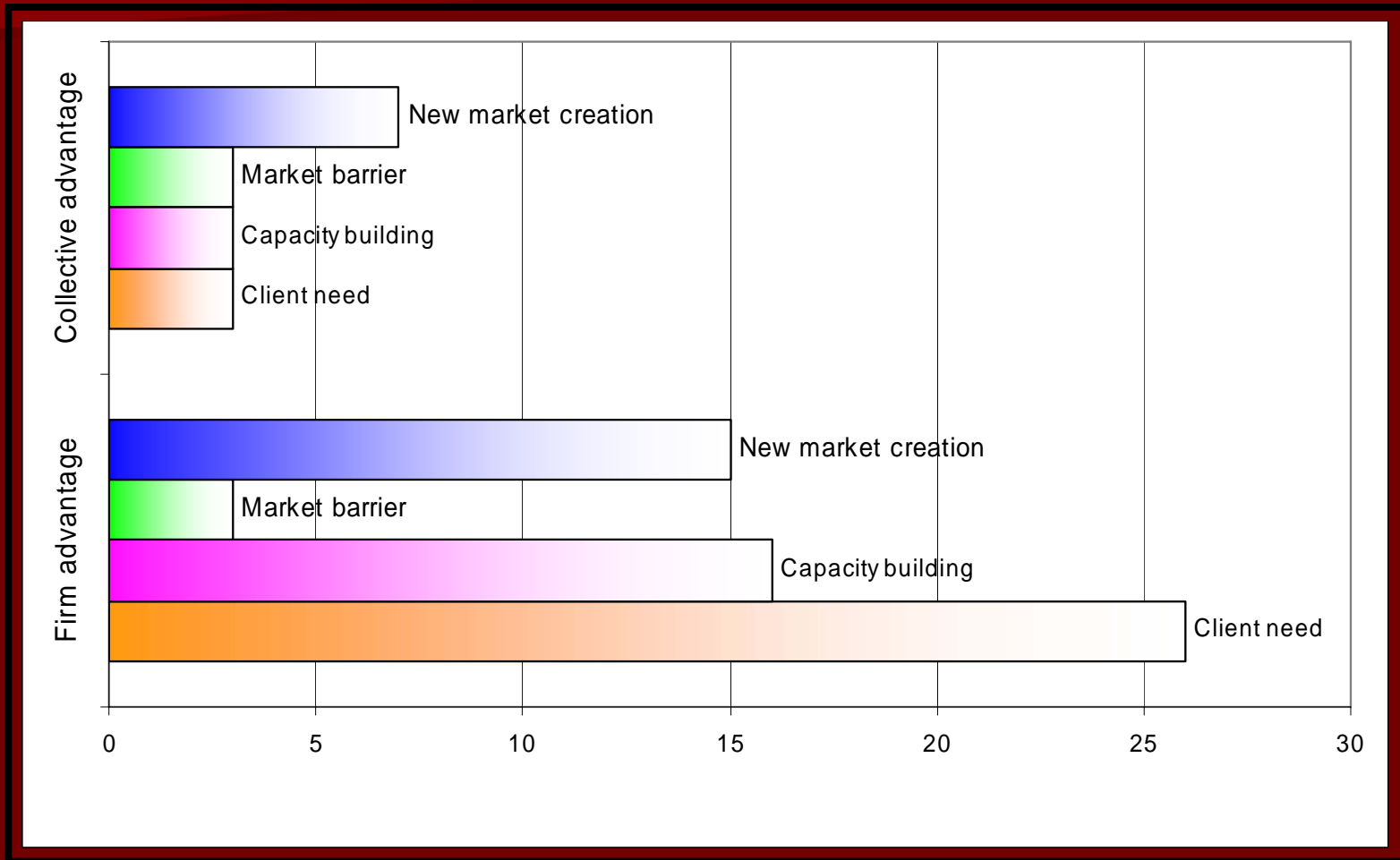
- As of March 31, 2009
 - 121 interviews conducted in Calgary CMA
 - Theme I = 45
 - Theme II = 61
 - Theme III = 39
 - n = 100 have been transcribed
 - (remainder in process)



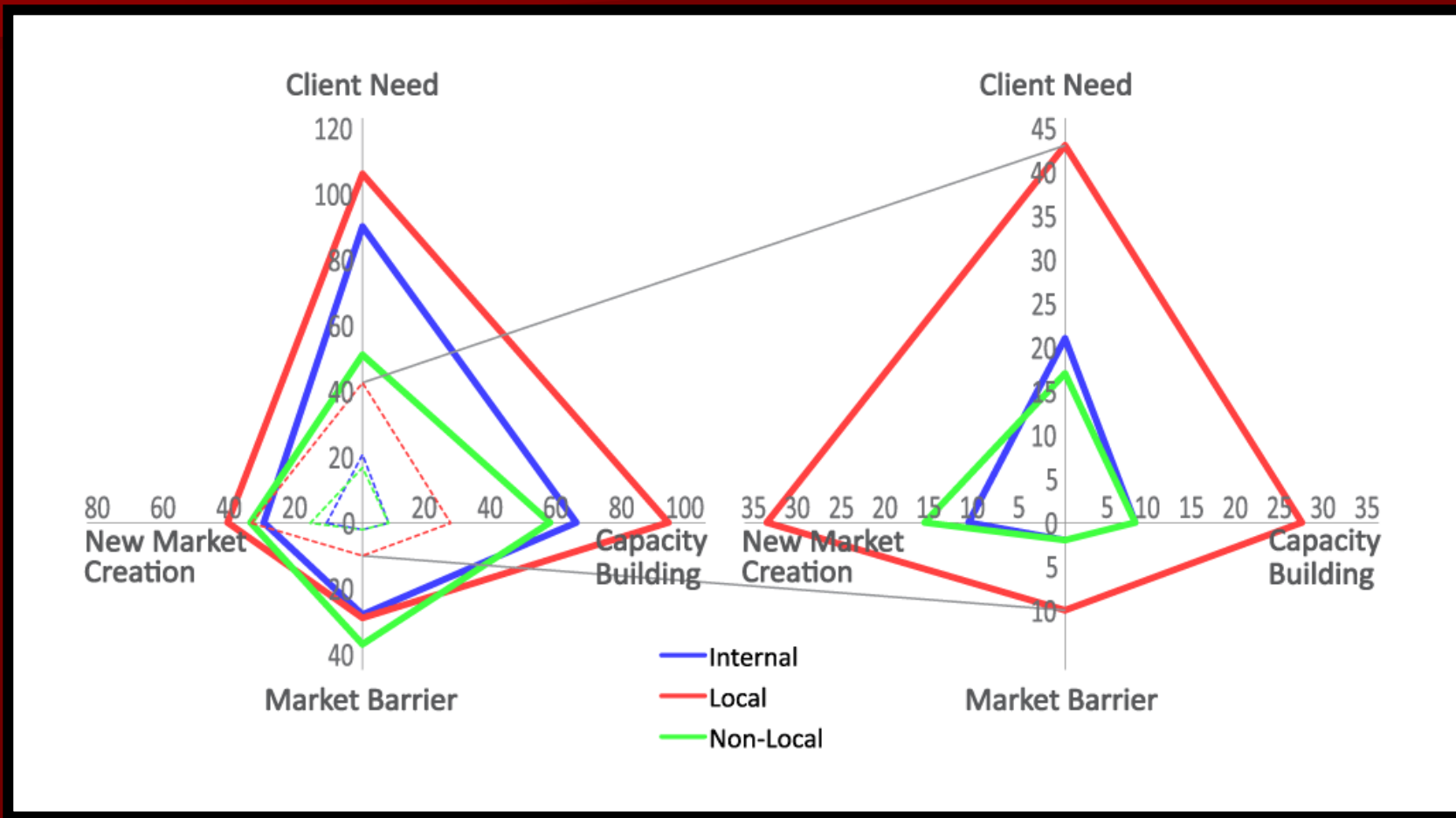
Methodology

- Coding of Interviews (n=29)
 - Coding with extraction of phrases not words
 - inspected for mentions of plausible innovations
 - Firm or collective advantage
 - innovations described through tagging suite of knowledge resources required
 - one or more of tacit or codified; and one or more of internal (to the firm), local (to the city region) or non-local
 - the frequencies of each type of knowledge factor alone, and in combination, were recorded
 - rely on the first three of Alexander's (1988) "nine principle identifiers of salience"
 - primacy, frequency and uniqueness

Innovations (n=76) x Type

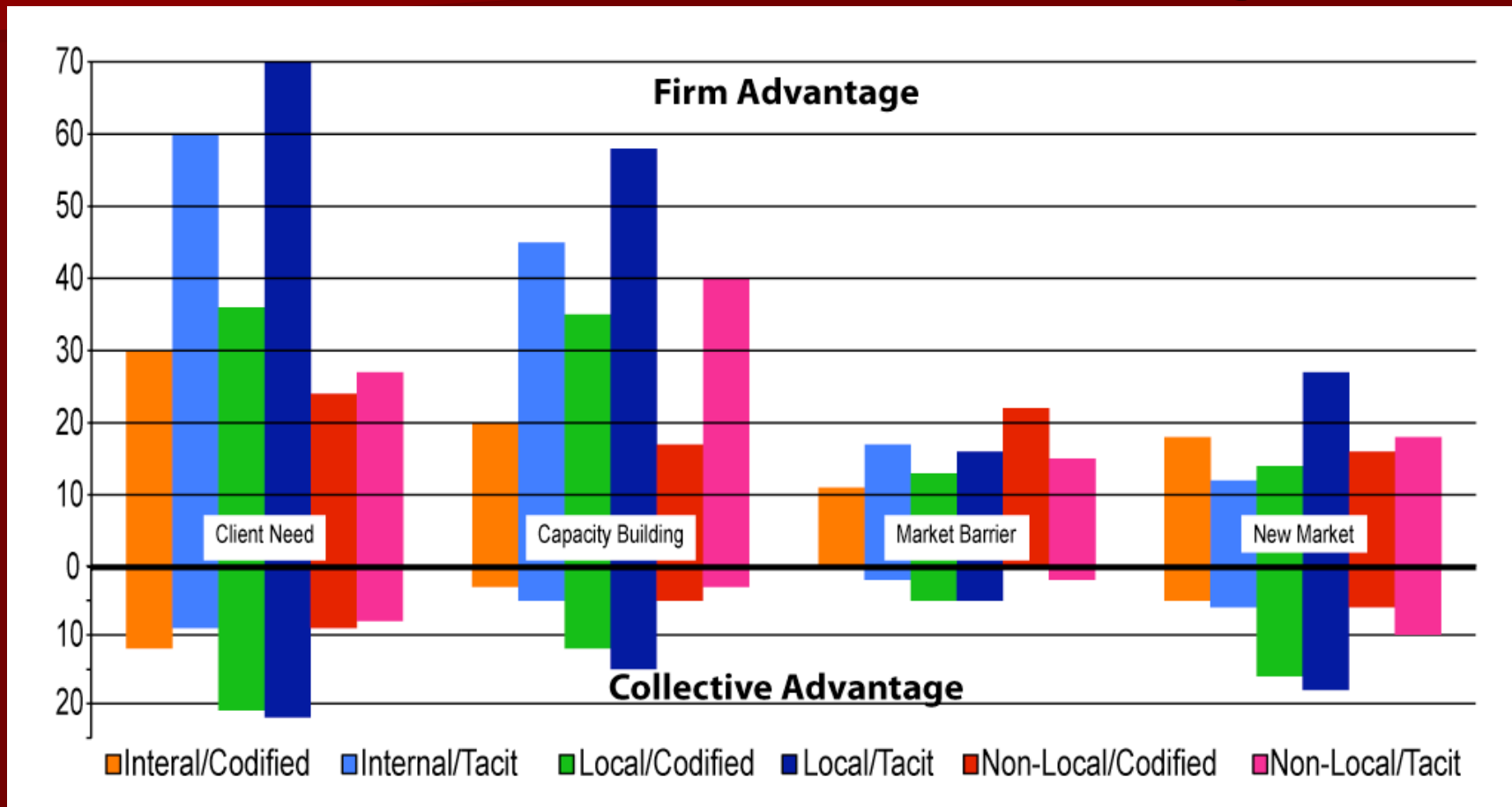


Firm vs Collective Advantage



Problem Type x Knowledge Factor

- Firm vs. Collective Advantage -



Illustrative Quotes

I “...What we would do is look at what might be new technologies or equipment or new methodologies and apply them, bring them to a client's attention and then apply them with the client - we'll do that.”

II “...we try to build our capabilities to operate in that environment and develop a reputation. On the technical side, what we need to do is make sure that we have the capabilities to operate...”

III “...if you use the right tools, you get past... barriers and people start talking about the things that motivate them to make decisions or influence them to make decisions.”

IV “...we try to watch what's going on throughout the market. That way, we can source new resources of talent and creativity, new markets and potentially new merger/acquisition opportunities.”

Discussion

- H0 / exploring Calgary's innovation system through the CMA lens
 - Despite relative importance of local sources of knowledge, pipelines do exist and are relevant!
 - Key knowledge and resources extend beyond the CMA boundaries
 - Important for addressing market barriers and developing new markets
 - Oil/gas fields / dispatch of knowledge/outourcing/resources
 - CMA lens provides a view of a Calgary centred innovation system that extends over an array that defies totally 'geographic' description

Discussion

- H1 / characterization of the Calgary innovation system
 - Overall, heavy reliance on local knowledge factors provides strong evidence for the identification of the system
 - Differential reliance on non-local factors
 - Warrants sector-level analysis and inter-sector flow analysis – *so far qualitative*
 - Tacit knowledge is key (see cluster literature)

Discussion

- H2 / relative importance of knowledge factors in solving problems: (firm vs. collective advantage)
 - The market barrier/client need axis is similar for both firm and collective advantage
 - The New market/capacity building axis shows a shift in emphasis toward non-local in “new market” in collective advantage. – Can we scan globally and collaborate to harness locally?
 - Codified non-local exceeds tacit only for firms surmounting of market barriers. – Is this where the sector and invisible college publications are a key source?
 - Local codified is more important for collective advantage

Discussion

- H2 / relative importance of knowledge factors in solving problems:
 - Client needs draw heavily on internal and local tacit knowledge
 - Non-local tacit knowledge is relatively important for firms building capacity
 - Firms address new market development and market barriers using knowledge factors fairly evenly



Thank you!

The Calgary Team:

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