Absorptive Capacity in Australian Industry

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Absorptive Capacity Study:
Overall Project Objectives

- Review available literature on absorptive capacity
- Identify and analyse the key factors impacting on absorptive capacity
- Identify any policy instruments used by governments to build absorptive capacity, including any evaluation of their effectiveness.
- Undertake interviews to develop 10 case studies of Australian firms
- Based on the above, develop interview/survey questions to be used to investigate the absorptive capacity of Australian firms.
Globalisation of Supply Chain Relationships
Globalisation of Supply Chain Relationships

Production of Goods & Services

Collaboration & outsourcing: new business models
Production of Goods & Services

Collaboration & outsourcing:
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Globalisation of Supply Chain Relationships

Production of Innovation in Products, Processes, Organisation etc
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Globalisation of Knowledge Flows
Globalisation of Supply Chain Relationships

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Collaboration & outsourcing: new business models

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Building more collaborative & open innovation systems
Globalisation of Supply Chain Relationships

Production of Goods & Services

Collaboration & outsourcing: new business models

Globalisation of Innovation in Products, Processes, Organisation etc

Building more collaborative & open innovation systems

Globalisation of Knowledge Flows

Production of New Enterprises
Collaboration & outsourcing: new business models & production systems

Globalisation of Supply Chain Relationships

Production of Innovation in Products, Processes, Organisation etc

Building more collaborative & open innovation systems

Globalisation of Knowledge Flows

Production of New Enterprises

Enterprise Development Systems
Context

- Significance of SMEs
- Distributed innovation
Main Sources of Information for Innovation in the EU, 1998-2000: Services

- Internal
- Group
- Suppliers
- Customers
- Competitors
- Universities, HEIs
- RTOs
- Confs / jnls
- Fairs & exhibs
- Small
- Med.
- Large

% of Firms

Highly Important Sources
Main Sources of Information for Innovation in the EU, 1998–2000: Manufacturing

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Absorptive Capacity - an Aspect of Knowledge, Learning and Innovation

- Spillovers, Diffusion and Knowledge Transfer
- Dynamic Capabilities and the Resource Based View
- Innovation Management
- Accessing External Technology
- Research- Industry Interaction
- Innovation and Change in SMEs
- Organisational Learning
- Firm Learning
- Technological Learning in Latecomer Firms
- Knowledge Management
- Networks and Clusters
- Learning through Strategic Alliances.
- National Absorptive Capacity
Learning at Different Levels

- Individual
- Entrepreneur
- Project
- Team
- Cluster
- Region
- Nation

- RTO Links
- Sector
- Communities of Practice
- Innovation System

- Contractual
- Alliance
- Inter-firm
- Network

- Firm
- Networ
What is Knowledge?

**Codified:** formal, explicit or
- ‘know what’
- ’know why’

*generally acquired through formal education, reading, conferences etc.*

**Tacit:**
- ‘know how’
- ‘know who’

*generally learnt through experience or close contact with its application. It also tends to be more localized in its relevance - ie linked to a region, technology, sector or firm.*
What is Knowledge for?

**Decision making:** cognitive frameworks for strategy

**Strategic positioning:** building assets, resources, ‘positions’, creating options.

**Innovation:** Products, processes, services, problem solving,
"A firm’s ability to utilize externally held knowledge through three sequential processes:

(1) recognizing and understanding potentially valuable new knowledge outside the firm through exploratory learning,

(2) assimilating valuable new knowledge through transformative learning, &

(3) using the assimilated knowledge to create new knowledge and commercial outputs through exploitative learning."

Lane, et al 2006
Determinants of Absorptive Capacity

Knowledge Sources

Firm

Innovation
Determinants of Absorptive Capacity

Knowledge Sources

Factors that influence Knowledge Flows
- Type of knowledge
- Prior knowledge
- Linkages
- Structures-external & internal
- Culture
- Incentive structures
- Capabilities to implement kn.
- Capabilities to manage change

Firm
Determinants of Absorptive Capacity

Knowledge Sources

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Appropriation

Strategic intent
Summary of Case Studies

• Limited to 10 firms across a range of sectors
  - 2 Micro businesses, 50% private

• Modes of innovation:
  - Short-term incremental (3-6 months)
  - Business model innovation (30%), eg., “open book”

• Mechanisms for acquiring and disseminating knowledge critical
  - Commitment to upgrading
  - Strong strategic intent
  - Only 40% with ‘formal’ external linkages - many ‘informal’
  - Dedicated resources for acquisition
  - Importance of customers and suppliers (but not reliance on suppliers)
  - Retention and re-use procedures

• Major elements
  - Trained/receptive human resources
  - Flexibility in ‘appropriate’ linkages
Key Findings - A

- Building relationships to access distributed knowledge and capabilities is a key issue for firm managers.

- **AC** involves a firm's ability to recognise opportunities presented by new knowledge. Firms need a foundation of in-house knowledge that allows them to recognise and evaluate new knowledge.

- Firms may develop **AC** through explicit measures, such as hiring trained staff, R&D activities or establishing strategic alliances. Absorptive capacity also develops as a by-product of other business activities, e.g. through learning associated with problem solving, innovation, and collaboration for other purposes.

- Firms can more easily add to knowledge and diversify in areas in which they already have a knowledge base. Firms also learn from other firms most effectively when the partners are similar in terms of structure, human resource policies and knowledge bases. Thus a firm's capacity to absorb new knowledge evolves over time within a specific organisational and knowledge context.
Learning Drivers and Facilitators in SMEs

- **Strategy**
  - Stretch goals

- **Knowledge base**
  - Formal education
  - Experience
  - Training
  - Kn sharing

- **Focusing device**
  - In-house R&D
  - Problems
  - Customer need

- **Organisation**
  - Routines
  - IT systems
  - Culture

- **External Linkages**
  - Formal & informal networks
  - Collaboration
Building Capabilities & a Learning System: Dynamic Capabilities

**Processes** - managerial and organisational processes, routines or patterns of learning - these processes, which are frequently a key source of differential performance, are often interdependent such that change in one dimension requires change in others. This may be why radical technological change, which requires new approaches to organizing and learning, can often be particularly challenging to incumbents;

**Positions** - 'the specific endowments of technology, intellectual property, complementary assets, customer base, and its external relations with suppliers and complementors'; and

**Paths** - the strategic options open to the firm and the role of increasing returns and dependencies.
Dynamic Capabilities, Learning and Discontinuity

Production Capabilities
- Processes
- Positions
- Paths

Change (Learning) Capabilities
- Processes
- Positions
- Paths

Radical Change Capabilities
- Processes
- Positions
- Paths
Firms with limited capabilities

- do not pick up the signals of new opportunities;
- are less likely to have the strategic intent for innovation driven growth;
- are less able to collaborate in innovation/research;
- are less able to manage research/innovation;
- are less able to capture the benefits of innovation.
The Challenge of Change

Firms face particular challenges in external knowledge acquisition where:

- they have few linkages with the firms or organisations from which they seek to acquire knowledge;
- the fields of knowledge and innovation are new to the firm; and
- the pace of change in technology is rapid and unpredictable.
Knowledge Acquisition in SMEs - a Virtuous Circle for Renovating the Learning System

- Strong capabilities & active knowledge orientation & effective & flexible sharing routines
- Active exploration through interaction
- Network building & extension - deeper social capital
- Knowledge recognition
- Reflection
- Growth & re-investment in resources
- Innovation & Problem solving – stretching knowledge & routines
- Fixed routines, excessive formalization
- Orientation to Growth & Innovation - Strategic Intent
- Risk aversion & orientation to stability
- Under-investment in new knowledge
- Rigid routines & lack of space for experimentation
- Fixed routines, excessive formalization
- Under-investment in new knowledge
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## Assessing Absorptive Capacity: Components of Absorptive Capacity

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<th>Dimension</th>
<th>Components</th>
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| **Strategy**                                   | Vision  
|                                                |   Motivation  
|                                                |   Coherence  
|                                                |   Innovation & Learning  |
| **Human capital**                              | Scientists and engineers, Managers, Technicians, Skilled workers  |
| **Knowledge base**                             | Familiarity  
|                                                |   Cognitive link  |
| **Networking to access external knowledge**    | External Links: Alignment (structure, culture, knowledge); alliances; roles (gatekeepers, boundary spanners, cross functional teams); conferences; grants  |
| **Organisation & routines**                    | Structure: specialisation  
|                                                |   Processes & Routines: R&D, training, monitoring, codification  
|                                                |   Roles (gatekeepers, boundary spanners, change agents)  |
| **Learning processes**                         |                                                                           |
Some Implications

- Information is not knowledge
- Capabilities cannot be bought - they must be built
- AC is an important part of a firm's innovation capabilities and hence its development is a dimension of innovation management.
- AC is largely situation-specific. It is a function of the relationship between capabilities, structures, routines and policies particular to a firm. For this reason it is not possible to develop a set of reliable standard indicators of AC.
- Change in the knowledge base for innovation tends to create cognitive failures and competency traps
- Only a small proportion of SMEs are dynamic (ie constantly adapting and changing) in terms of innovation and growth.
- Scientific knowledge should not be considered as a 'public good' in any simple sense.
- Although clusters are sometimes suggested as a means of stimulating innovation in SMEs, without the capabilities to absorb and use knowledge, membership of a network is of little value.
- Knowledge diffusion is an active process of innovation- Australia cannot simply free-ride on innovation/ R&D in other countries
- The issue is not just human resources or funds for R&D - it is capable firms- the capability gap.
Why do most SMEs not organise these capability improvement services for themselves?

- Many SMEs have trouble identifying and articulating their specific needs in a way that can easily form a clear demand for service providers and service providers seek to provide generic services with a high level of replicability/knowledge re-use,
- Most SMEs do not know how to identify and evaluate experts and also how to assess the costs and benefits of interaction with an expert;
- Cognitive failure, due to a lack of relevant knowledge, may lead the firm’s senior managers to simply not grasp the relevance of particular areas of new knowledge and hence to be ‘boundedly rational’; and
- Firms may lack the complementary assets that will have a major role in shaping the level of return to investment in knowledge acquisition,

Program Design

- Entrepreneurs and SME managers tend not to see government agencies as credible or relevant sources of advice; and
- generic programs are far less successful than programs that are locally focused and sensitive to the context.
Targeting Measures for Developing Absorptive Capacity & Innovation in SMEs

Framework Conditions
- Innovation implementation
  - Tech support centres
- Capability development
  - Regional centres
- Awareness of opportunities
  - Support Collaboration
  - Info resources
  - Diagnostics
  - Info provision
  - Training
  - Brokering
  - Outplacement of researchers
  - Marketing support
  - Financial support
  - Export development services
  - Staff placement
  - Mentoring
  - Guides to tech & mngmt
  - Regional centres
  - Seminars, forums
  - Info collaboration
  - Seeding networks
  - Training programs
  - Tech support centres

Strengthen Business & Social Infra.
- Direct Services
  - Strengthen Business & Social Infra.
  - Strengthen
  - Training programs

Strengthening Supply Side
- Incentive to innovate
  - Stimulate demand
  - Procurement
  - Roadmaps foresight
  - Needs identification
  - Info resources
  - Develop business tools
  - Benchmarking
  - Subsidise consultants
  - Develop consultants
  - Depreciation
  - Training subsidy
  - Regional centres
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Overall policy coordination
- Needs identification
- Info resources
- Develop business tools
- Benchmarking
- Subsidise consultants
- Develop consultants
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## Approaches to Supporting Knowledge Acquisition & Application

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<th>Focus of Intervention</th>
<th>Mechanism</th>
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| **Raising awareness** | ✧ Inter-firm networks to assist firms to identify and respond to new & emerging opportunities.  
✧ External consultants to facilitate collective assessment/planning  
✧ Diagnostic capability |
| **Strengthening knowledge and understanding** | ✧ Networking and improved access to information and knowledge  
✧ External agents to catalyse the formation of networks and knowledge sharing |
| **Stimulating implementation** | Provision of experts (typically academics) to work within firms. |
The range of policy instruments has tended to be reduced and streamlined over the past decade;

There is a trend to delivering company support through 'one stop' shops such as Enterprise Ireland;

There has been an increase in the focus on support for university-industry links in particular and networking in general;

Many countries have developed technology oriented diagnostic services at the forefront of their interface with firms;

Human capital development through explicit training and placement schemes, and as a by-product of R&D support programs is a major feature of the instruments.
Functional Characteristics of Effective SME Innovation Capability Support Programs

- **Focus:** Commercial & Competence
- **Services:** Flexible & Competent
- **SMEs:** Growth Oriented Innovation objective
- **Funding:** Support & co-funding
- **Linkage:** Sustained, local & links to wider networks