Value Chain Innovation: A New Zealand example

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OUTLINE

- Background and motivation for the research.
- Statement of research questions (and definitions of terms).
- Literature review.
- Choice of case study setting.
- Methodology.
- Findings from the case study.
  - A process model of innovation.
- Discussion (including linkages to the literature) and managerial implications.
BACKGROUND & MOTIVATION

- NZ $1.4 million project funded by the NZ Foundation for Research, Science, & Technology: ‘Determinants of innovation and growth in the seafood sector.”

- One of the deliverables: showcase exemplars through case studies of value-chain innovation in the seafood industry.

- The need for value-chain analysis in the UK seafood industry has been identified by the Seafish project (KPMG AS et al., 2004).

- Morgan & Blake (1999) and Morgan et al. (2003) report case study research in the UK food and drink industry under the aegis of the UK Government’s Foresight Programme “to highlight innovation in the food chain and to disseminate the lessons from the processes and outcomes of this innovation to the broader sector.”
VALUE-CHAIN INNOVATION

Research questions.
- What forms do innovations in seafood industry supply chains assume?
- What factors underpin successful innovation?
- What barriers need be overcome?
- More generally [in light of the public-good nature of the research], how can innovations in the value-chains for seafood be stimulated?

A key objective: showcase exemplars.
DEFINITIONS OF TERMS

- ‘Value chain’ is loosely taken as the chain of value-creating activities (both within and across enterprises).
- Operational definition of innovation: “the introduction of a new or significantly improved product or service to the market, or the introduction of a new or significantly improved process to a business.”
- R&D (Research & Development) is mainly the scientific steps associated with the innovation process that also consists of the technical, commercial, and financial steps that are necessary for the successful development and marketing of new or improved products and the commercial use of new or improved processes.
LITERATURE REVIEW

- Rather little on value-chain innovation in aquaculture.
- Broader subject-domains.
  - Product/process innovation in the food industry (Traill & Grunert, 1997).
  - Related industries and/or product-categories (e.g., perishables such as cut-flowers and fresh-produce [Fernie, 2000]) or process industries in NZ such as forestry (Wilson & Sankaran, 2001) and dairy (Stevenson, 1997).
  - Literature on aquaculture (e.g., Heen, Monahan, & Utter [1993]) that features a limited discussion of innovation.
- Research into innovation in the food industry itself is scant because of the low intensity of R&D in the industry (Grunert et al., 1997).
- Harmsen et al. (2000) induced a model of innovation success in ‘low-tech’ (i.e., food) companies.
  - Interplay of three constructs, namely, product orientation, process orientation, and market orientation, and their impact on innovation and thereby firm performance.
  - Related survey research reported by Traill & Meulenberg (2002).
Innovations in combating the environmental problems encountered in Norwegian salmon (also known as Atlantic salmon) aquaculture (Asche et al., 1999).

Catfish aquaculture in the US (Engle, 2003): technological innovations that increase land-use efficiency; increasing need for market-oriented agribusiness approaches to catfish marketing.

Arctic char farming (unsuccessful) vs. Atlantic salmon farming (successful) owing to differential linkage between research and industrial activity: Aarset (1999).

  
  ◆ Value-chain is increasingly dispersed (e.g., on-board freezing facilities).
  
  ◆ Processors need to differentiate through branding, new product development, as well as the supply of more valuable fresh fish.
Why is NZ King Salmon suitable?

- High percentage of sales invested in R&D relative to NZ seafood companies.
- Investment, as a percentage of sales, in the development of new products, new processes, and new markets comparable to larger aquaculture companies overseas.
  - Overseas companies invest more in ‘pure R.’
- NZKS is highly export-oriented (> 50%).
- In the top 1-2% of salmon farming companies worldwide in terms of profitability.
- Offers a ‘cradle-to-grave’ vista of innovation.
- Manner of choosing an ERP system.
METHODOLOGY

- Initial set of 36 themes to explore in the context of innovation within the company as well as the external value-chain.
  - Online sources (e.g., www.kingsalmon.co.nz).
  - Literature on value-chain innovation in seafood and allied industries.
- Snowball sampling to identify respondents.
  - The GM of Sales & Marketing oversees NPD – referred by the GM of aquaculture.
    - New product development (mainly); new process development; R&D.
  - Short session with CEO and GM (Sales & Marketing).

  After a day’s break…

  - The GM (Corporate Services & Finance): accounting for R&D.
  - The GM (Manufacturing) and Process Systems Engineer (conducted a site-visit): continuous improvement programme.
  - Market Services Manager: tie up loose ends regarding innovations in distribution including packaging, handling, etc.
METHODOLOGY, contd.

- Need to expand the scope of innovation (not just the development of new products and/or the deployment of new technologies).
  - Night-shift operation in primary processing (organizational innovation).

- Data analysis (Strauss & Corbin, 1998).
  - Concepts and associated indicators.
  - Overarching categories

- Iteration between data collection and analysis: numerous follow-up questions through e-mail.

- Respondent validation.
The Link between Innovation and Corporate Strategy

- Company’s focus on a hard-to-farm species (King Salmon).
  - Increasing quality discernment on the part of end-consumers in Japan and latterly, Australia; labelling laws (e.g., Japan).
  - Premium in markets (e.g., Japan) increases with value-addition.
  - Greater premiums through packaging and branding product.

- Getting away from the frozen-food, commodity market.
  - Industrial processors of frozen product typically lump together Chinook and Atlantic salmon.

- Differentiation through quality and reliability of supply.
  - A major reason for vertical integration (besides retaining the benefits from value-creation); costs are relatively secondary.
  - In Norway, increasing economies of scale and operating capital requirements push for integration (Tveterås & Kvaløy, 2003).

- Desire to get away from the see-sawing nature of commodity markets.
  - Demand-driven supply chain entails new product development.

- Focus on bottom-line/revenue growth rather than volume growth.
Differentiation away from commodity markets

NPD research (including by-product utilisation)

New process development

Continuous improvement programmes

Focus on one species

Species characteristics

High unit cost of raw material

Standardisation

Production research

Improved processes in manufacturing and distribution

Better ways of growing “raw material”

Revenue and bottom-line growth

A Process Model of Value-chain Innovation at NZ King Salmon.
“Pure R” VS “D”

- Arises out of vertical integration.
- Drivers of production research.
  - Slow maturation of king salmon.
  - Seasonality of maturation cycles.
  - The very *location* of value-addition: the fish farm.
    - Easier to add value to a lower-cost raw material.
- Drivers of developmental research.
  - Difficulty of farming King Salmon!
    - By-product utilization (high marginal returns).
    - Criticality of not destroying value once harvested (e.g., by poor slicing), given the long maturation cycles.
    - Salmon kebabs (seal-bitten, scale-damaged salmon).
The process model of innovation would be particularly relevant to integrated aquaculture firms that focus on niche species.

In the food industry, it appears that in any firm, at most one orientation/core-competency (product, process, and market) will be dominant (Harmsen et al., 2000).

- Product orientation “has to do with respect for the product manufactured, an emphasis on pride of craftsmanship, an emphasis on product quality, even a positive emotional attachment to the products.”
- The process-oriented company “emphasizes efficiency, cost management, and thinking in terms of the whole food chain, not just the manufacturing step.”
- Market orientation has several elements, namely, focus on the customer, external orientation, focus on being responsive to customers, and focus on more market players (e.g., competitors) than just customers.

At NZKS, the product and process orientations are intertwined.

- ‘Product’ in an integrated firm such as NZKS connotes both “value-added product” (e.g., salmon dips) and the “core product” (i.e., whole fresh chilled, farmed, king salmon).
- The raw material itself is a source of differentiation.
- NZKS has deep ‘respect for the product manufactured’ (fresh, chilled farmed king salmon) and ‘an emphasis on product quality.’
- A process orientation falls out naturally from a product orientation that is defined with reference to the “core product.”
Hypotheses for Further Testing

- Greater the strategic focus on differentiation away from commodity markets, greater the investment in new product development.
- Greater the strategic focus on differentiation through quality and delivery reliability, greater the investment in new process development and continuous improvement.
- Greater the cost of harvesting a unit of raw material, greater the investment in R&D in by-product utilization.
- Greater the cost of harvesting a unit of raw material, greater the effort involved in the continuous improvement of processing and distribution.

[The following may be applicable only for aquaculture.]

- Longer the maturation cycle of the species, greater the investment in production research for that species.
- Greater the seasonality in the maturation cycle of the species, greater the investment in production research for that species.
Lessons to learn from NZ King Salmon: A case study for teaching purposes is available

- R&D pays off!
- Innovation needs to be clearly driven by and aligned with competitive strategies.
  - The process model of innovation would be relevant for integrated niche aquaculture firms.
- Need to create a culture of innovation.
  - Pursuing ideas from the coalface, serendipity.
- Customer/market-focus in new product development (NPD): locate NPD in Sales & Marketing, strong links between R&D and marketing; recruit managers with experience in the FMCG sector.
- Cross-functionality in the R&D effort.