Knowledge Use and Optimism in Australian Manufacturing: The Case of Zip Industries.

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For the past two decades, manufacturing has been in rapid decline in Australia. Using a grounded theory approach, the author examines knowledge management practice in Zip Industries, a private firm that specialises in convenience water appliances, and finds a firm successfully competing by producing in Australia products that are high on intellectual content. Prime issues for Zip Industries are maintaining quality in appliances that require expert fitting and maintenance, maintaining competitiveness, process improvement, and finding consensus on design issues. The organisation is seen as succeeding remarkably well in a complex, competitive environment by building and using strong linkages with clients.

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1. Introduction

The development and use of knowledge by organisations has been a matter of intense popular and academic interest over the past 20 years. The term ‘knowledge management’ was coined by Peter Drucker. As a concept, and organisational practice, knowledge management has been advanced by the work of Drucker and numerous others (Drucker, 1988, Drucker, 1999, Kanter, 1996, McDermott, 1999, Nonaka and Takeuchi, 1995, Reich, 1991, Stewart, 2001). In the decades since Drucker’s pioneering work, numerous themes within knowledge management have emerged and been developed, including communities of practice (Brown and Duguid, 2000, McDermott, 1999, Wenger and Snyder, 2000), information technology use in support of the knowledge-based organisation (Barley, 1986, Barley, 1990, Binney, 2001, Bressand, 1995, Orlikowski, Yates, Okamura and Fujimoto, 1995) and even the vexed issue of accounting for knowledge (Edvinsson and Malone, 1997, Lev, 2000, Roos, 1997, Sveiby, 1998).

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Within the existing literature, relatively little exists that attempts to link organisational type with knowledge management practice.

Popular press articles and books commonly prescribe how organisations should arrange themselves for maximising their development and use of knowledge, but few researchers have critically assessed what the consequences are of organisational type on knowledge development and use. Prominent in the knowledge management literature is the work of Hansen, Nohria and Tierney, who advocated a ‘strategic’ view of organisational type. They urge that organisations opt for either ‘codification’ or ‘personalisation’ of their knowledge use, depending on whether the problems their customers present with are recurrent (‘codification’ choice, reliance on IT systems, in particular), or unique (‘personalisation’ choice, reliance on the knowledge of key staff).

From teaching organisational theory and knowledge management to both undergraduate and post-graduate students over several years the author realized that to date the organisational typology developed by Miles and Snow of Defender, Analyser, Prospector and mixed type organisations (Miles and Snow, 1978) hadn’t been examined for its consequences for modern knowledge management practice. Defender type organizations have to guard against other service/product providers taking market share by paying continuing attention to costs and process improvement, Analyser organizations are the adopt and perfect variety, perhaps first on the scene with a new product or service, but without effective barriers against competitors entering their markets, they cannot secure their advantage. Prospector organizations are ‘out there’ with a particular service or product, and may be able to maintain market dominance through protection of their intellectual capital, or through a reputation for excellence.

Relying on a grounded theory approach, the author interviewed ten middle and senior managers within Zip Industries. The findings reflect the state of knowledge management within Zip Industries at about June 2005. The author used the interviews to test how the separate concerns of sense making, knowledge creation and decision-making were handled by interviewees within the organisation. Interviews were transcribed, and the transcriptions analysed using Nvivo qualitative research software.

2. Study Methodology

Participants

The author’s initial contact within the Division was one person that conformed with what Yin and Sarantakos characterise as an elite, expert source (Sarantakos, 1993, Yin, 1994). That person was interviewed, and asked to identify others in the organization that Morse would refer to as ‘good
informants' (Morse, 1998). Interviews were concluded with the author asking for tips as to who would make a suitable next interviewee within the Zip organization. The sampling approach used was a ‘snowball or chain’ type (Miles and Huberman, 1994 p. 28) As the interview data accumulated, and the characteristics of knowledge development and use became apparent, the questioning process converged on the key issues reported below.

2a. Research Strategies

Data collection

Starting with the author’s one key contact within the Zip organization, three separate interviews were recorded with three senior managers within the Zip organization. At this early stage of the research process the questions posed were very general, beginning with “Tell me what you would typically do in a working day”. As the interviews progressed, the focus of the questions switched to those parts of their responses that gave insight to their methods of sense making, knowledge development and decision-making. All those interviewed were interviewed singularly; interviewees were assured of anonymity in the reporting of their comments. The interviews typically took from 45 minutes to one hour. The key features of the initial three interviews were written up in brief form and relayed back to the interviewees for comment. The interview findings and the responses of the first three interviewees to the initial analysis informed the subsequent interviewing of seven other persons within Zip Industries.

2.b Analysis of Data

After the interview tapes were transcribed by research assistants, the transcripts were interpreted into the software program ‘Nvivo’. Nvivo was used to both analyse and manage the data, enabling ready recall of the comments within the interviews that illustrated the themes discussed in this paper.

3. Background of Zip Industries

A privately owned company, Zip Industries is synonymous within Australia with the supply of continuous hot water. That reputation has been established from the 1960s, primarily through the provision of ‘on the wall’ continuous boil water heaters. For the first three or so decades, Zip targeted commercial builders and buildings for installation of their convenience appliances. In more recent times, Zip has diversified with bathroom water conservation devices, the more basic Birko range of water heaters and chillers, and with its ultra-efficient and attractive below-sink ‘Hydrotap’ range. The Hydrotap range represents a broadening of focus to include the household, rather than commercial market.
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From its manufacturing plant in Condell Park, part of greater Sydney, Zip builds and supplies appliances for markets worldwide. Zip in the UK is fully owned by the parent organization. In other parts of the world, agents are relied on for sales, installation and service. Staffing at the Condell Park site totals about 180 people, with about 220 service people spread across Australia. About 30 people are directly employed in the UK operation.

3. Findings

One of the key tasks for the researcher was to identify whether in practice the Zip organization fitted the criteria of a Prospector organisation, i.e. one that competed primarily on the basis of innovation. The interviews confirmed that Zip is a prospector organization, with a strong focus on being the first into various product areas.

"When we [first] produced them there was nothing like them in the world. We said we're going for boiling water; let's automate the kettle... We always liked to have features in our products that no, other people don't. ... to distinguish ourselves... So our focus has always been having products that are different, of trying to be first and we've been pretty successful at that."

Interview C-10-1

This was balanced with strong, continuing focus upon process improvement

"...we've got employee involvement, there's one thing, and quality circles, there's another thing, they all mean the same thing but continuous improvement really tells us that we are going forward...we're climbing a ladder.

Interview C-6-1.

As a smaller organization, Zip Industries has chosen to avoid adopting ‘bleeding edge’, high cost and high risk IT initiatives. Rather, they have chosen to adopt mature IT technologies, with less risk attached. Much of the process improvements of recent times have come from implementing a broad range of mature information technologies. The focus of these ranges from better control of manufacturing and product service process, to an Internet presence. Having established that the Zip organization constituted a Prospector type organization, the researcher went on to determine what characterised the processes of sense making, knowledge creation & decision making in the organization. In that process, he also delved into the strategic measures that Zip Industries has so successfully adopted to enable its continuing, remarkable growth.

The analysis that follows fits into two broad streams. The first stream relates to knowledge management, and the features of knowledge management that drive success for Zip Industries. Knowledge management in Zip Industries has historically been driven by close attention to the needs of customers in the commercial, rather than consumer market. Other factors include longevity of employment and a passion for the growth and improvement of the
organization. The second stream assesses the strategies of Zip Industries that has enabled it to swim against the tide of manufacturing that has fled Australia in the past decades. Each of these streams will be explained and expanded on below.

Knowledge management in Zip Industries. Innovation through close ties with clients, an engineering culture, high-commitment staffing policy and practice, decision-making.

Probably the most striking features of knowledge management within Zip Industries is what Kanter refers to as ‘close links with sources of need’ (Kanter, C1996). When interviewees were asked what they considered Zip Industry’s core competence to be, a recurrent response was Zip’s capacity to understand customer need. They achieve this through very high levels of interaction with key persons, predominantly their own service staff, but also architects and hydraulic consultants:

“...you blaze a path and we have become good friends with hydraulic engineers around Sydney and, you know, there’s a lot in relationships. But also, they know and we know that the products are the best products...” Interview C-10-1

“Architects, we do a lot of work with them. We do a lot of work with the hydraulic engineers. We do a lot of work with the government departments and we’re doing a lot of work with say facility managers and users.” Interview C-8-1

“...we have fantastic relationships with the people who are responsible for putting these things in and we have a very, very good distribution channel.” Interview C-2-1

Both internally, in interactions with their own staff, and externally, in interactions with clients, Zip people rely on person-to-person contacts, what Hansen Nohria and Tierney refer to as the ‘personification’ of knowledge (Hansen, Nohria and Tierney, 1999). In recent times this personification approach has been augmented with growing use of electronic systems. These systems are, as yet, relatively un-integrated, but as Zip expands its offerings of domestic products the expansion of use of them is seen as enabling the same level of responsiveness to customer need. As stated above, Zip’s caution in adopting sophisticated IT reflects an aversion to being mired with ‘bleeding edge’ technology.

The emphasis upon innovation is enabled by a very strong engineering culture. The majority of those interviewed came from engineering type backgrounds, though many had moved into areas of sales and service. The
products of this engineering culture include a focus on problem solving and a passion for finding new ways:

"I think it [success] comes from passion. I think, you know, that we're a very great group of guys and it's just passion." Interview C-10-1

There is a strong element of collective action in resolving problems:

"...you get to the typical point in a brain storm that's actually irrelevant who came up with the idea..." Interview C-3-1

Such a focus on the collective development of new ideas, and innovation, wouldn't be possible without high levels of commitment by both staff and management. In a very competitive job market, Zip Industries is remarkable for the longevity of employment; many staff have been with the organization for decades. One means that enables this is through psychometric testing of job applicants. Applicants must show a score of 7 on more on the 'conscientiousness' scale of the 16PF test. Other means of building commitment include an apparent preference from recruitment within the 'ranks', many of those interviewed ad moved through a succession of positions within Zip.

As strong as knowledge use obviously is with Zip Industries, knowledge development and use isn't entirely unproblematic. This was most evident when interviews touched on the subject of decision-making within Zip. Decision-making within the Zip organization can be characterised as decentralised, except for the most major decisions. Most decisions are made on a day-to-day basis through delegated authority. Only major decisions go to the senior executive group of 4 managers. This approach is a necessary response to the highly competitive nature of the market:

"There ... are a number of decisions that we do tend to make on the run. Things change, things can change in the market place quickly and you have to be in a position to be able to react or you have to, you know, empower people with the authority to be able to respond. Interview C-1-1

The process reported matches what Simon referred to as a 'satisficing' process, marked by decisions that are both satisfactory or sufficient, but perhaps not optimal (Simon, 1976):

"...certain decisions you make may not be the ultimate decision that you wish, but you've had to downgrade it somewhat to fit the resources available." Interview C-5-1

The major sticking points in the decision-making processes tend to be around design. The Zip organization has a dominance of employees with engineering type backgrounds. Few seemed to have a depth of experience in matters of the style of new or revamped products. The major decision delays and uncertainty came when Zip has to take what one interviewee stated were characterised as
'soft' decisions, when in practice they were anything but 'soft'. These are primarily the decisions about the look of new or revamped products. Design as a sticking point seems to arise from two factors. First, nobody within the senior management group of Zip has a background in design for aesthetic needs. Second, the people they rely upon most for new ideas, architects and hydraulic engineers, seem to carry very limited ideas about effective design:

"...I get to a point where I say "you're not going to architects again, they'll just change it into a square box",".

One of the mechanisms Zip uses to improve the quality of major decisions is through referral to an advisory board. This board is composed entirely of 'outsiders', many of them former employees. This body is reportedly capable of bringing fresh perspectives to the organization.

**Strategy: Intellectual property defence, continuous improvement, attitudes to the threat of China**

Miles and Snow's definition of the Prospector type as having a continuing concern with process innovation was verified in the interviews. All interviewees reported a focus on producing new, groundbreaking products:

"And we as a manufacturer said let's stop being a 'me too' manufacturer and we must concentrate on making what other people don't. And that was our philosophy. We always liked to have features in our products that no, other people don't. Didn't have, to distinguish ourselves." Interview C-10-1

While growth for Zip comes from continuously providing fresh, smart products (the 'exploration' part of Zack's notion of knowledge management strategy), attention to process improvement (Zack's 'exploitation' approach), also drives success (Zack, 1999). Coupled with this is a high level of attention to quality issues.

Continuing, effective attention to quality was a recurrent issue in interviews. Great improvements have been made in ensuring quality in the manufacturing process in recent years. There are, however, some aspects of the performance of Zip's products that Zip has little control over once the product has left their hands. The first is the quality of the installation. While Zip makes great efforts to train and inform installers, poor installations and subsequent poor performance of product occurs, and the average client can't readily discern if fault lies with the product, or the installation. The second issue is water quality. Continuously boiling water is a very aggressive environment. The environment becomes even more aggressive when the water in appliances is sub-standard or high in calcium content. Regardless of the cause of quality issues, a no-questions-asked return and replace policy helps bolster customer confidence:
“The important thing I think is the degrees that you go to try and satisfy that customer and if your customer has really got an issue, and is unhappy we will replace the unit, take it back, fix it. Because that ends up being insignificant in the long-term.” Interview C-3-1

There was a high level of consciousness that this attention to quality was one of the key features that differentiated Zip’s products from those of their competitors. Others means by which Zip remains competitive include deliberate attention to what the competition is doing:

“...we get the competitors products every now and then and look at what they do, that’s not always the best,...” Interview C-3-1,

and a strong focus on continuing to offer fresh product: When asked if Zip had an over-proliferation of products, the response was:

“I suppose, we’re always guilty of working on something new, but that’s progress. You can’t sit on your laurels, especially in Australian manufacturing.” Interview C-4-1.

The improvement in flexible manufacturing process is another element of Zip’s strategy. As one interviewee reported:

“...when I came over to Zip it was pretty much knife and fork manufacturing and we’ve been able to bring in some robotic welders, turret presses, automatic turret presses. Improved our manufacturing facilities dramatically for a privately owned company.” Interview C-9-1

Both the machinery and system mix, and the skill flexibility of staff has enabled extraordinary capability:

“We’ve had instances where customers have pitched up here, ...[what they] need isn’t a stock item, and they are here to collect it, and I’ve had a couple of instances where customers are, and I’ve said to them “Can you wait 20 minutes?”, and they’ve said “yeah what’re you going to do?” and I’ve said “I’ll build you one”. “ Interview C-3-1

The same interviewee, with a depth of manufacturing experience, reported with satisfaction that:

“We’ve got it down [to]... a batch of 1. This is one of the few places where I have seen that you can actually do it. Interview C-3-1

While Zip benefits from a stream of good ideas from its own R&D department, it also has a great capacity to productively engage contractors, in particular. Much of their intellectual property is held jointly with those contractors. This intellectual property protection is seen as effective within Australia, but interviewees were realistic about its usefulness in the wider world:

“... we have patents, a hell of a lot of patents around the world. We also have ... good relationships with a lot of people in Asia. I guess from that the
best you can do is do whatever you can to protect your property, but it's never going to stop somebody from making a copy. Ah, how good's a patent?" Interview C-5-1

Part of what makes Zip Industries continue to be strong is its optimism. While some within the organization expressed unease about China, in particular the poor record of Chinese businesses in respecting intellectual property rights, the dominant sentiment was that the bulk of manufacturing of Zip products will remain in Australia:

"...I wouldn't like to see us move to China. It's becoming increasingly difficult these days, because everyone seems to want to go there. I would rather see young people working here rather than working there." Interview C-9-1.

There was also a strong sentiment that a Chinese competitor couldn't readily replicate Zip's competitive advantage, in particular its strong ties with customers, and its internal capabilities:

"[if] China wanted to manufacture our product it would be cheaper but they would not have the engineering resources and the application to continually improve that product. So, I think we'd always stay ahead of them." Interview C-10-1

There was also expressed a sense that perhaps some Australian businesses have over-rated the competitive capacity of Chinese manufacturing to:

"I've been over there [China] a couple of times previously ... and looking at how they do things, and their quality, and their competitive prices and things like that, and there are some real challenges that I think Australian industry needs to be waking up to. There's a feeling like 'what are we supposed to do, we can't compete'. Well, that's nonsense, as far as I am concerned." Interview C-3-1

4. Conclusion:

Zip Industries provides a striking example of how, given the correct focus on the fundamentals of effective knowledge management, the needs of customers, a strong engineering culture, high commitment employment practices, innovation and product development practices, continuing growth and success is possible within manufacturing in Australia. Challenges remain for Zip as it expands into consumer markets, and furthers its use and integration of information technologies.
Reference


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