



LEARNING NETWORKS

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BUILDING AND SUSTAINING LEARNING NETWORKS

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LEARNING NETWORKS

Learning is often involved as a 'by-product' of network activities – for example, emerging through exchange of views or through shared attempts at problem-solving. But it is also possible to see learning as the primary purpose around which a network is built; this concept of a 'learning network' can be expressed as: *'a network formally set up for the primary purpose of increasing knowledge'*. Such networks share a number of characteristics:

- they are formally established and defined
- they have a primary learning target – some specific learning/knowledge which the network is going to enable
- they have a structure for operation, with boundaries defining participation
- processes which can be mapped on to the learning cycle
- measurement of learning outcomes which feeds back to operation of the network and which eventually decides whether or not to continue with the formal arrangement

Examples include 'best practice' clubs (whose members have formed together to try and understand and share experiences about new production concepts), 'co-laboratories' (shared pre-competitive R&D projects), supplier associations and sectoral research organisations (where the aim is to upgrade knowledge across a system of firms). Learning may also involve 'horizontal' collaboration (between like firms) or 'vertical' cooperation (as in supply-chain learning programmes), or a combination of the two. Bessant and Tsekouras offer a typology of such arrangements (Bessant and Tsekouras 2001).

LEARNING NETWORKS IN PRACTICE

Amongst examples of such arrangements in operation is the case of Toyota where an active supplier association has been responsible for sustained learning and development over an extended period of time (Dyer and Nobeoka 2000). Hines reports on other examples of supplier associations which have contributed to sustainable growth and development in a number of sectors particularly engineering and automotive. (Hines, Cousins et al. 1999) Marsh and Shaw describe collaborative learning experiences in the wine industry, whilst another study reports on experiences in the agricultural and food sector in Australia.(AFFA 1998; Marsh and Shaw 2000). Case studies in the Dutch and UK food industries, the construction sector and aerospace provide further examples of different modes of learning networks organised around supply chains. (Fearne and Hughes 1999; AFFA 2000; Dent 2001)

In an earlier paper we reported data from six UK supply chain learning networks studied in depth (Bessant, Kaplinsky et al. 2001) which indicated improvements both for the main customer and its suppliers, confirming that supply chain learning programmes can, in principle, be ‘win-win’ programmes.

There are particular problems for learning networks in developing countries. These economies share a number of common characteristics which inhibit learning processes; their markets tend to be supply-constrained and favour low-income goods, so that the incentives to technical change are often weak and are overly-biased towards process changes. Moreover, they often tend to be low-trust environments, and are generally characterised by low levels of skill and poorly articulated national and regional systems of innovation. In many cases they are often also associated with low levels of competition and dominated by firms with low degrees of specialisation (since in the import-substituting industrialisation era, large conglomerate firms tended to have a wide spread of activities). In the following section we look briefly at two cases involving the use of learning networks in the South African automotive components and furniture industry as an example of what can be achieved in developing country environments, despite the adverse circumstances which these sometimes involve.

THE SALIGNA VALUE CHAIN

(for a more detailed description of this example, see (Morris 2001))

In the forestry industry South Africa is uniquely placed to take advantage of a key development in markets which are sensitive to environmental concerns such as the destruction of rain forests. The most outstanding feature of saligna (a species of Eucalyptus hardwood) is that in South Africa it is a *commercially grown* semi-hardwood. This distinguishes it from other hardwood species grown in indigenous forests in the developing world. Although not a traditional hardwood, saligna has the ability to take colouring well, and can therefore be treated to look like virtually any wood, including all the species of threatened hardwoods.

Traditionally saligna was grown for use in the local mining industry, but the changeover to concrete mining supports led to a sharp decline in domestic demand. (Finance Week, 9 July 1999). In the context of growing environmental concerns in final markets, therefore, the existence of the previously low-priority saligna hardwood plantations, with under-utilised capacity, offers unexpected potential for exporting of furniture to Europe and North America. It is also an opportunity which provides the potential to move furniture producers into new market niches, with higher unit prices.

Exploiting this opportunity requires a reorientation from the previous trajectory of the wooden furniture value chain which has traditionally been focused on the export of pine furniture into increasingly price competitive markets. For example, as can be seen from Table 3, exporters of pine bunk beds have been subject to sustained falls in final product prices. In other words there is a significant learning challenge, dimensions of which are highlighted in table 4.¹

¹ The categories of learning highlighted in Table 4 are drawn from recent theorisation of upgrading processes in the context of value chain theory – see Kaplinsky and Morris (2001a).

Table 3: Prices received by South African exporters of pine bunk beds

	1996	1999	2000
Exporter 1	£74		£48
Exporter 2	£69	£52	

Table 4: The upgrading challenge

Type of upgrading	Specific challenges
Improving process efficiency	<ul style="list-style-type: none"> ❑ Furniture firms learn to work with saligna ❑ Improvement in overall manufacturing efficiency ❑ Learning to use young trees ❑ Better coordination of deliveries ❑ Different product specifications for raw timber ❑ Improved and consistent input quality ❑ Human resource development
Introducing new products or improving existing products	<ul style="list-style-type: none"> ❑ Designs suitable for saligna wood ❑ Design for manufacture ❑ Learning to utilise new and environmentally friendly lacquers and paints
Functional upgrading	<ul style="list-style-type: none"> ❑ Increasing domestic design content, within individual links or in collaboration between links and with the national system of innovation
Moving to a new value chain	<ul style="list-style-type: none"> ❑ Moving from pine to saligna furniture, from furniture to doors and from doors to industrial products and toys

Although the stimulus for change had been present for some time and the opportunities were recognised, pulling the players together into a learning network took considerable time and external facilitation. To some extent its formation was also triggered by a growing sense of crisis within the industry. The prices offered for pine furniture by global buyers were plummeting, and few South African producers could meet these demands without sinking into unprofitability. Product based on saligna offered the potential to escape these competitive pressures, since saligna would be a low-cost and environmentally acceptable alternative to increasingly scarce and highly-priced traditional hardwoods such as teak and mahogany.

On the other side of the coin, saligna timber suppliers were beginning to see a shift in market demand. The maturation of saligna plantations was complimented by a decline in demand for mining pit props (both because of a decline in mining activity and due to the development of alternative materials). This

created an unexpected surplus of saligna timber and both timber growers and millers dealing with hardwoods had to find a market to realise their sunken plantation investments.

Thus, the value chain restructuring initiative arose from a combination of both extra-national and intra-national pressures. But, within this, although the stimulus to change emanated from both ends of the chain, it was the changing perspective of the sawmills which had the greatest impact. Previously, the sawmills held the rest of the value chain to ransom, for they controlled the quantity and quality of timber supplied to the manufacturers. In the pine value chain they had even blocked attempts to promote value chain efficiency. Now it was *their* desire and need for change which allowed the saligna restructuring initiative to proceed. This provided the foundation for the development of a strong *sense of the interdependence* of players along the value chain.

This willingness to be seen as ‘part of a whole’, induced by emerging over-supply in both product and input markets, was a critical first step in improving the possibilities for cooperation along the value chain. However, translating an awareness of interdependence into *actual* cooperation that holds mutual benefits for value chain stakeholders and overcomes longstanding barriers of trust is a complex process.

The initiative

The first saligna network workshop, organised in early 1999 by a university based research project called the Industrial Research Project (IRP)² was well attended by twenty-six delegates representing government departments, manufacturers, timber traders, industry specialists (both academic and consultants) and timber growers and mills. It brought together stakeholders from all levels of the saligna value chain with a view to promoting cooperative problem resolution. From the outset the interest group was driven by a value chain approach. The facilitators stressed the necessity of a value chain perspective to international competitiveness, the interdependence of the various stages of the saligna value chain in order to achieve vertical and horizontal collective efficiency, and the necessity for the chain to deepen its learning, within and between firms...

² The IRP is a joint project involving the School of Development Studies at the University of Natal and the Institute of Development Studies at the University of Sussex (UK). The points made in this text are only marginally affected by the financial base of the intermediaries. There is little reason why a similar outcome would not have emerged had the initiative been facilitated by an independent firm, or a parastatal. The key issue is not the financial base, but the process methodology adopted by the facilitators, in this case the utilisation of action-research methods.

In its workings the group was driven by a very practical approach – the need to resolve the two key issues of supply and final market limiting the export potential of saligna timber products. In line with this attempt to rapidly move beyond simply talking about cooperation, the group immediately focused upon practical problems and mutually beneficial solutions. Three key linkages within the value chain posing particular problems for vertical efficiency were identified, and small groups with participants from each side of the problematic link were created to identify the key issues. This ensured that participants had a real opportunity to air their grievances and hear those of others. The involvement of a number of competing firms at each level of the value chain created a situation where a failure to cooperate held the risk of missing out on benefits enjoyed by competitors. Finally, stakeholders were encouraged to participate in the small group discussion that related most closely to their own priorities. However, the information and benefits were made accessible to all participants in plenary session.

This proved to be highly successful and the workshop gave birth to the Saligna Value Chain group (SVC group), a cooperative national network of ‘stakeholders’ spread throughout the value chain, coordinated by the Industrial Restructuring Project. All coordination and meeting costs were born by the IRP, the members only being responsible for any costs associated with attending meetings. The SVC group comprised:

- ❑ timber growers, primarily the large companies that also owned the sawmills, but also a few owners of some small plantations
- ❑ the two large corporate sawmill plus an independent small sawmiller
- ❑ timber product manufacturers spread along the spectrum of products - the number varied with each meeting but at least eight formed the hardcore of the group
- ❑ key government departments concerned with plantations, water supply, and manufacturing support
- ❑ a member of the export council
- ❑ two institutions claiming a specialised assistance role to the industry (a consultant with a loose attachment to one of the firms, and a semi government research organisation); they interacted with the group on a more intermittent basis and without a defined role
- ❑ members of the IRP, including action-researchers who had had successful experience with value chain learning in the auto-components sector³

³ See www.kznbenchmarking.co.za; Barnes and Morris, 1999; Morris 2002.

The SVC group operated by establishing technical working groups to examine problems that the group agreed were critical to the value chain's performance. Each group was coordinated by a person from a firm in the value chain (thereby spreading the responsibility of internal change agents beyond the original initiators). The working groups were charged with the responsibility of tackling, through research and experimentation, selected discrete issues. Their brief was to report on how to deliver tangible benefits in their specific sphere to the value chain. The external intermediaries took no responsibility for the practical work of the working groups, except to act, if called upon, as the communication nodal point between a working group and the broader SVC group.

The initial three technical working groups spun off into a number of different groups trying to solve problems and reporting the results back to the main value chain group. These technical working groups all essentially revolved around the two big issues that brought the participants in the SVC group together in the first place, namely:

- ❑ how to maximise the quantity and quality of the saligna timber supply?
- ❑ how to maximise current marketing as well as upgrade final products through a focus on design and branding?

Although some manufacturers saw that the issue of design and marketing was the key to upgrading through *introducing new products or improving old products* or upgrading through *changing the mix of activities*, the issues of quantity and quality of supply tended to dominate the activities of the technical working groups as well as the plenary discussions of the entire group. This was not surprising since, in order of priority, the supply issue:

- ❑ was the major concern of the timber mills who exercised the real power in the SVC group, and whose participants dominated the membership of the technical working groups
- ❑ clearly was perceived as the pre-eminent problem for timber product manufacturers
- ❑ allowed manufacturers to avoid confronting the more difficult issues of increasing the *efficiency of their internal production processes*;
- ❑ seemed to require resolution prior to tackling new design, branding and marketing strategies.

The supply issues spawned overlapping technical working groups dealing with six related challenges:

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1. *Product Matrix Group.* This group was concerned with establishing the timber requirements of various user groups. Understanding requirements and meeting them more precisely could conceivably improve recovery rates. This focus originated from manufacturers complaining about the unreliability of the timber measurement being provided. They claimed they were being sent the wrong sizes and wanted timber in metric sizes. This prompted the mills to respond by saying that they had never been informed of these demands, and hence they had carried on cutting to old imperial measurements for decades. The ramifications of this down the chain were significant. Not only did the raw material supplied create lower wood recovery rates, it also affected production, and had a knock-on effect on design and marketing. For manufacturers were trying to design to fit in with the timber supplied rather than producing designs optimal for marketing and manufacturing – the tail was wagging the dog. Hence this group, led by the sawmills, worked on a variety of issues and spawned a number of overlapping technical working groups, initially through improving knowledge flows through a questionnaire sent to all timber product customers to try and establish optimal sizes and to get consensus on a range of dimensions that manufacturers felt most comfortable with. The mills then experimented with new grading systems to see if this could increase the total availability of clear wood. The mills providing selected manufacturers with uneven lot sizes using 2nd mill runs and random widths letting the manufacturers design and cut their own wood sizes to see if this could maximise recovery rates. Finally they collected more accurate data on total demand and availability in order to determine overall existing and potential supply and usage of saligna in South Africa.
 2. *Young trees working group.* A major problem confronting the sawmills was the length of time a tree stayed in the ground before it was cut. Mature saligna trees tended to be felled only after 20-25 years. Here the interests of millers and manufacturers seems to diametrically opposed. The shorter the length of time before felling, the faster the return on capital for the growers and mills and/or the lower the price of timber sold to the manufacturers. The older the felled tree, the better the quality and density of wood for the furniture manufacturers' products. Hence the question posed by the mills to the manufacturers: what are the real limits to using younger trees between 8 to 16 years old? This would not only address the current timber shortages, but also reduce the costs of the timber for users. The mills provided selected manufacturers in this technical working group with young, much rougher, timber of around 8-10 years old. The manufacturers in turn experimented with its utilisation for different products and partial usage with a product. Success was however relative. The manufacturers using saligna wood for high value added interior furniture found little problem in being able to integrate young timber into their product. However the success was mixed. Those manufacturers who used saligna to produce lower value added garden furniture required much older, stronger timber to withstand the climatic effects of the European outdoors.
 3. *Density and grading.* These two working groups posed another issue of the possible utilisation of *less dense* timber. Younger trees are less dense, and portions of older trees are also of lower density. What densities are suitable for which applications use by furniture manufacturers? This gave rise to the manufacturers again experimenting with creating possible prototypes with different densities of wood and the mills experimenting with different grading systems to differentiate more closely the relative densities of the wood provided. Once again the prototype experiments followed a similar pattern to that of the young timber. Successfully introducing lower density timbers would require a much better grading system, as less dense timber is only suitable

for specific applications, and could prove disastrous for the quality reputation of the timber if used for the wrong applications. Better grading would also help to improve the recovery of “clears”, which the Product Matrix Questionnaire showed were most in demand.

4. *Privatisation and the supply of timber.* The intended imminent privatisation of the state owned forests with large expanses of saligna plantations had major ramifications for nearly all parties within the SVC group. The state-owned company and the government department responsible were intending to only sell the plantations off as one huge lot to a single buyer. The manufacturers saw this as potentially bringing on stream untapped supplies of mature saligna and hence an easy solution to their supply problems. However they were threatened by the possibility of the new buyer adopting an undifferentiated approach to the plantations and adopting an easy route of sending all the felled logs to their chipping and pulping mills. The small independent growers and sawmills wanted the opportunity to bid for these forests and viewed the tender as discriminatory. The one large corporate sawmiller focussing on board timber that did not own much plantation land was concerned at not being able to gain access to this newly available timber resource. The timber plantation and sawmilling company most likely to win the bid, whose timber product division representatives was involved in the SVC group, had its own internal contradictions. For in the absence of the SVC group being able to provide cogent arguments, they were concerned that their parent company dominated by the pulp and paper divisions would adopt the easiest route of consigning most of this pristine timber for chipping, export and pulping. This was the only technical working group led by the external intermediaries who attempted to coordinate the SVC group response and use their own economic expertise, political contacts and influence with the government department most directly involved in the privatisation process. Apart from making the parties involved more cognizant of the possibilities, they had little direct impact on the process. Essentially the response was that the government, the current state owned company and the potential buyer expressed some interest in the overtures from the SVC group. However two issues were raised. Unless the manufacturers could upgrade their products, they would not be able to pay the price required to bid saligna away from other final users, namely chipping and pulping. And following on from this, could the SVC group speak for the mass of manufacturers on a price increase? This created a paralysis, for the SVC group was too small to speak for the mass of the industry, and even within their own ranks, manufacturers were divided between higher value adding producers manufacturing high quality furniture and producers using the resource to make lower value added garden furniture. However it also revealed the power of value chain analysis for the learning process, for in laying bare the various value chains spawned from sawmill to final customer, it showed the alternative utilisation of saligna in a very stark form.
5. *Exporting profile.* The SVC addressed the profile of furniture exports. Essentially this centred on upgrading through moving up the value chain by improving design, branding and marketing. However despite setting up technical working groups along similar lines as those concerned with supply issues, little progress was made. A design and branding working group composed of manufacturers and the government based export council representative produced very little concrete results. The other initiative was a marketing exercise undertaken by a technical working group producing a ‘joint front’ at the 2000 Cologne Fair. The manufacturers in the group pooled their resources and with government assistance, presented one large joint manufacturer/government platform at the Fair. This had mixed results. Garden furniture

dominated and it was undifferentiated in design and product. Manufacturers were basically copying each other rather than cooperating to produce a distinctive and differentiated design brand.

6. *Embryonic industrial clustering.* The SVC group also provided a spur to an embryonic cluster of three furniture manufacturers operating in very different segments addressing the upgrading of their internal production processes, organisation, and layout so as to internalise the efficiencies of world class manufacturing. This group had considerable success in reorganising production layout and work organisation at the firms concerned, and in passing on their experience to each other through a process of learning-by-visiting, complemented by world-class-manufacturing facilitation provided by the IRP.⁴

The determinants of successful saligna value chain restructuring

The first tentative attempts at value chain restructuring predated the SVC programme. Despite the efforts of these *internal change agents* in the form of two manufacturers, and hypothetical buy-in from the main saligna timber mills, the actual process of cooperation was slow, failing to advance rapidly beyond bilateral talks between various manufacturers and individual mills.

Indeed it was only when these internal change agents sought the assistance of *external intermediaries* that the pre-conditions for cooperation, so ripe yet so frustratingly dormant, were realised. In late 1998 the Industrial Research Project held a workshop for furniture firms. Two manufacturers involved in the use of saligna, both of whom were eager to promote cooperation between saligna users and suppliers, attended. Seeing the close relationship between the principles of industrial restructuring being promoted and their own goals for saligna, they suggested that the researchers become involved in facilitating a saligna interest group.

The combination of external intermediaries and internal change agents from within the value chain (manufacturers) was critical in arranging the first saligna workshop. As much as an external agent was required to overcome trust barriers, the support of key internal agents lent credibility to the process, encouraging stakeholders to see the proposed workshop as offering a viable possibility of delivering real benefits. Industry supporters of the idea of cooperation played a critical role in publicising the event, and invitations to the workshop from the intermediaries were noticeably more effective when industry supporters had already broached the subject of a saligna network with the invitee. Various other external attempts to get manufacturers in the South African timber products sector to work cooperatively have struggled to get off the ground, or have failed entirely, and this can be attributed largely to the fact that these were policy driven programmes “imposed” on the industry from the top down. South African experience has shown that even the offer of financial incentives is not enough to widely encourage firms to cooperate. Thus, in low trust environments it is extremely difficult to encourage cooperation through the medium of policy support mechanisms unless there are already *key industry players prepared to champion the cause of cooperation and network building.*

⁴ Although this group is no longer in existence, their experience is also being passed on to other manufacturers in other sectors through the medium of a CDRM being prepared by the IRP under a government-support programme.

Equally important in creating a favourable internal environment for this particular network was gaining initial support from key players at all levels of the value chain, in this case specifically the buy-in of key sawmills as well as manufacturers. *A restructuring network requires a 'critical mass' of relevant stakeholders* before it is likely to be successful. Relevance and criticality may be variously defined by position in the value chain, size of the firm or simply interest in finding solutions to a particular problem. However, unless enough of the key stakeholders are involved to actually affect change, the network is unlikely to get beyond the theoretical stage.

The historical lack of trust pervading the sector combined with the general discrete individualism of economic existence, created a particular challenge for the external intermediaries (the IRP research team). The pre-eminent role thrust upon them was as external facilitator in order to *mobilise, coordinate and sustain* the dynamism of existing value chain support for the process. As external intermediaries, they played a catalytic function in building the trust necessary for cooperation. Of major importance was the fact that the local and international members of the research project:

- ❑ brought international expertise, status and esteem (particularly important in the developing country context)
- ❑ had established some level of credibility within the furniture sector and a number of other key local manufacturing sectors
- ❑ were able to use their credibility to leverage top-level government buy-in from the two key government departments (Trade and Industry, and Water and Forestry) which in turn strengthened the image of the process within the saligna value chain, and
- ❑ were clearly neutral - this was critical in successfully involving the whole of the saligna value chain, for despite a relatively positive attitude towards cooperation, lack of trust and general suspicion about motives remained an issue within the sector.

Through the involvement of neutral *intermediaries with concrete and real expertise*, as opposed to simply facilitative skills, the saligna value chain group was able to avoid the danger of becoming (or appearing to become) an initiative designed to favour a particular stakeholder or group of stakeholders in the value chain. This was a real threat, given that the saligna manufacturing sector was at this stage dominated by smaller firms unable to take on the logistical burden of organising such a group. At the same time, given prevailing negative sentiments towards the sawmills, traditionally seen as wielding undue and unreasonable control over the industry, a group organised by the mills would have been viewed with considerable suspicion by manufacturers. The two mills primarily involved in supplying the saligna sub-sector are positioned as rivals, and an interest group facilitated by one would be unlikely to attract the support of the other.

However, although internal change agents have a crucial role to play in championing and maintaining the cause of value chain co-operation, the specific actors playing this role shift and change. The initial thrust for setting up the SVC group came from the furniture manufacturers, and although power was most concentrated amongst the millers, they tended to play a more supportive role. However, as the

group solidified the sawmills began to play an increasingly important role in co-ordinating many of the working groups. This has been accelerated with the timber supply problem becoming less acute. As the wood shortage eased, so the vociferousness of the manufacturers, and their role as enthusiastic leaders, started to diminish. The leadership roles then radically shifted and it was the millers who became most concerned that the SVC group did not lose its momentum and collapse, emerging as the new internal change agents in the latter stages of the SVC group's existence.

Did the SVC achieve any lasting upgrading momentum?

The upgrading effects of the SVC group were felt in the first three of the upgrading trajectories - the issue of upgrading through shifting core competencies to another value chain was simply never present on the agenda. However the upgrading impact across the trajectories was not uniform. It has been decidedly mixed, reflecting the pressing concerns brought to the table by the participants. Although there were advantages in allowing the members of the SCV to define the agenda, this was also disadvantageous since immediate concerns and pre-occupations were not necessarily targeted at the points where the greatest inefficiencies lay. Furthermore they were used to disguise where the major efficiency weaknesses lay in the value chain.

Listing generally in some rough order of greatest impact, the activities of the SVC group yielded the greatest efficiency gains in terms of

- ❑ internal firm process upgrading primarily of a technical nature
- ❑ markedly ratcheting up inter-firm process and supply chain efficiency between the mills and manufacturers
- ❑ facilitating important product developments - both within and between chain links - through the young tree and wood density experiments
- ❑ and some, although on the whole unrealised, gains in changing the mix of activities within firms and up the value chain through emphasising design, finishing and marketing.

Although upgrading the internal operating processes of the firms in the value chain was unfortunately not an explicit focus of the activities of the SVC group, work on the numerous supply issues between the mills and the manufacturers in the value chain did in fact have an upgrading impact on the internal production processes of the manufacturers through challenging the technical parameters of what could be produced at the manufacturing firms. But, with the exception of the triadic cluster of furniture firms spawned by the SVC group (which essentially operated alongside, rather than within, its institutional framework), the SVC group did not, by and large, challenge its own participant firms directly in terms of intra-firm production processes they were using, particularly in respect of operational efficiencies and world class manufacturing processes. Indeed it could be cogently argued that the timber product firms, with the exception of one manufacturer, avoided opening up the black box of firm inefficiency, using the initial enthusiasm of the mills to sustain the SVC group and their willingness to assume the role of 'mea culpa' for past problems to shift the focus away from this critical upgrading trajectory.

Finally the major emphasis on insufficient supply of Saligna logs, with consequent attempts to influence the government privatisation plans, acted to obscure a fundamental weakness in the way the Saligna timber products value chain was structured. The manufacturers tended to treat the supply issue simply as a logistics problem, coupled with the failure of the powers that be in government and the plantation/milling conglomerates to perceive the potential for building a long term sustainable Saligna hardwood manufacturing export sector. While there was more than a grain of truth in this view, grounded in the dominant hold exercised by the alternative wood, pulp and paper value chain within the corporate structure of the two big plantation/milling conglomerates, it conveniently masked a fundamental economic reality also driving the process.

Basically the price of sawn Saligna timber supplied to the manufacturers is not high enough to shift economic attention away from chipping and pulping logs. Although figures are not available, the argument put forward by the mills was that timber would be made available if furniture manufacturers paid higher prices. However, the timber products manufacturing sector is dominated by too many firms engaging in low value adding activities pitched at the lower segments of the final market (for example, garden furniture). The Saligna wood is being used as a cost reducing resource and not as a value adding resource. For many firms, the cheapness of the wood dominates, and the final products exhibit too little high quality design, hardly any value adding branding, and insufficient emphasis on finishing.

Consequently the greatest upgrading weaknesses of the SVC group can be summed up in the failure to:

- ❑ tackle intra firm process efficiency through lowering operating costs and increasing operational efficiency to world class manufacturing standards,
- ❑ shift the mix of activities within firms towards a greater emphasis on high quality finishing and original design, create supporting collective design and export marketing activities.

THE AUTO COMPONENT BENCHMARKING CLUBS

(for more detailed description of these cases see (Barnes and Morris 1999))

The shift from import substituting industrialisation (ISI) to trade liberalisation, a major drop in tariff protection and rapid integration into the world economy in the 1990s, meant that the South African auto component sector faced significant challenges. Either they became internationally competitive quickly or the assemblers would source most components internationally and domestic producers would fail. The potential crisis facing them was highlighted by a university research project aimed to assist industrial restructuring of selected sectors in the province of KwaZulu-Natal. The research results, comparing local firms with international competitors, were disseminated widely through numerous workshops and firm visits, and the quantitative data shocked a number of firms in the industry. It catalysed some of the firms' CEO's to push the academics involved to play a completely different role – as *neutral external intermediaries* to form and operate a continuous improvement cluster. With partial government financial support and firm membership fees (on a 65:35 ratio) the KwaZulu-Natal Benchmarking Club was formally launched in January 1998.

The KZN Benchmarking Club was founded with 12 member firms – 11 component companies and one large assembler. The executive consisted of 2 member firm representatives plus two external facilitators from the service provider (i.e. the external intermediaries). The Club was based on providing the following services to its members: an annual benchmark comparing each firm against a 'like for like' international competitor; a lengthy (strictly confidential) diagnostic report measuring the operational performance⁵ levels of each firm member including a survey of their five major customers and suppliers; a monthly newsletter outlining aggregated benchmark findings; quarterly workshops discussing generic findings, common problems and various solutions to competitiveness problems; encouragement of information sharing through visits etc.

However lack of trust, fear of sharing information, and old ISI mindsets looking to blame anyone else (e.g. government, assemblers, suppliers etc) for their problems, government inefficiencies and bureaucratic stupidity, meant that it took some time to really take hold as a proper functioning cooperating cluster generating collective efficiencies. The key moment occurred when the firm members took ownership of the cluster – for example, when the quarterly workshops were shifted from a neutral (university) venue to one of the firm premises, and the firm representatives (as opposed to the external intermediaries) gave lead presentations focussing on their own experience in sorting out various problems. From then on the previous reluctance to share information very rapidly faded, and the lack of trust dissipated. The success of the KZN Club led, within a couple of years, to two other sister Clubs being formed in the other heartlands of the automotive component industry – first in the Eastern Cape (Oct 1991) and later in Gauteng (mid 2001). These Clubs operate along the same operational and governing principles as the original KZN Club. What had started off as a small single regional cluster, by March 2003 had grown to three linked clusters covering the entire country and comprising 52 automotive firms (with another 5 currently in the process of negotiating membership). Linked not only by a common service provider and a common information newsletter with minor changes for club specific 'news', but also because member firms often attended each others quarterly workshops thus spreading knowledge sharing between the Clubs.

The success of these clusters can best be measured along four criteria: increasing *knowledge sharing*, significant *learning* and spontaneous *firm visits* by members; major improvement in their *operational performance* as reflected in a variety of competitiveness indicators; and finally, the spread of the Clubs as *new members* were attracted. The clusters are primarily based on firms wanting to ensure continuous improvement and operational performance enhancement in order to make them more internationally competitive through their membership. The best quantitative indicator of the impact of these three clusters on the member firms is the impact they have had on the competitiveness of the cluster members as measured by improvements in the operational performance of Club member firms. Although a wealth of information is available and is shared with firms on a regular basis, only the overall summary (table 1) of progress in process upgrading of Club member firms both in relation to their own improvements and relative to an international sample of benchmarked firms is presented below.

⁵ This was gauged through a market driver approach measuring the following critical success factor indicators: cost control (work in progress, raw material stock, finished good stock, total inventory), quality (customer return rates, internal reject rates), external flexibility (lead times, delivery frequency), capacity to change (output per employee, absenteeism, job turnover, training expenditure) R&D expenditure on new product development

Table 1: Learning, operational performance change, and comparative advantage of Club members⁶

CSF	KPI	South African Firms						Comparator Firms	
		N	1998	1999	2000	2001	<i>Improvement 1998/99-01</i>	W. Europe N=14	Emerging economy N=12
Cost control	Total inventory (Days)	32	62.6	54.3	47.6	42.0	32.8%	31.2	38.6
	Raw material (Days)	32	32.3	27.9	25.2	21.8	32.7%	17.2	19.2
	Work in progress (Days)	32	12.4	8.9	8.1	8.2	34.3%	5.3	8.6
	Finished Goods (Days)	32	17.8	17.5	14.3	12.1	32.0%	8.6	9.5
Quality	Customer return rate (PPM)	23	3270	2638	1406	1240	62.0%	549	624
	Internal reject rate (%)	25		4.9	4.2	3.9	20.7%	1.9	3.5
	Supplier return rate (PPM)	21		21989	14637	18518	16.0%	8319	13213
Flexibility	Lead time (Days)	17		19.9	19.1	17.9	9.9%	16.8	12.0
	Supplier on time & in full delivery (%)	23		78.7	82.1	82.2	4.5%	92.2	92.3
	On time & in full delivery to customers (%)	25		92.2	92.8	92.7	0.6%	96.1	93.5
Capacity to change	Training spend as % total remuneration	30		1.3	1.7	2.0	56.2%	1.3	3.1
	Absenteeism (%)	27	4.4	4.3	4.1	4.0	9.4%	4.2	5.7
Innovation capacity	R&D expenditure (%)	24	1.64	1.70	1.67	2.12	29.5%	1.83	2.90

Source: KwaZulu-Natal/Eastern Cape and Gauteng Benchmarking Club database

It is clear that the Benchmarking Clubs as continuous improvement clusters have had a major impact on the internal operational performance of the firms who are members. With the exception of delivery reliability to customers, progress for all of the measures in South Africa has been significant. Despite improvement, the South African components sector has in most respects some way to go before it reaches the global frontier, but given the relatively strong performance of the emerging country

⁶ This table shows both the learning path and the distance between South African component firms and their international competitors. Time series performance data only exists for 32 South African based component firms (3-4 year period) and there is uneven data amongst this sample hence the varying sample size. Performance in 2001 is matched by a sample of 26 international firms, for which we unfortunately do not have time-series data. The comparative sample is split up so as to chart the performance of South African component firms in relation both to old- and new competitors.

competitors relative to those in Western Europe, there is every prospect of the South African firms making up a good deal of this competitiveness gap. Generally speaking, South African component firms performance increase is better where internal factors (work-in-progress control, training, absenteeism) are involved than where they are dependent on external factors (raw material inventories, supplier performance). From a value chain perspective this suggests that the growth of learning is still predominantly in the first-tier components suppliers and has not yet diffused widely up the value chain. The relatively poor performance in terms of inventory control is accounted for by logistic problems along the value chain, especially with regard to incoming materials (minimum-sized import quantities; problems at the ports) and distance to the export market (for stocks of finished goods). In general there are clear indications that significant process upgrading has occurred and a substantial movement towards international competitiveness amongst these firms is under way. Clearly a number of factors apart from the Club's operations have played their part in this, but certainly from all accounts the horizontal cooperation, trust building, knowledge sharing and inter firm learning embedded in the operations of these three clusters have played a major and critical role in the process.

The area where improvement has been sub-optimal has been between firms and their external environment – i.e. in areas where the Benchmarking Clubs have had little direct control and influence – throwing up the limits of horizontal cluster cooperation between manufacturing enterprises. It is therefore not surprising that pressure built up to tackle problems along the value chain and as the broader environment as the next arena of operation.

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